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Articles

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Personal Time Management Practices and Efficiency of Construction Artisans at Work in Akwa Ibom State

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Abstract: This study provides an insight into the influence of personal time management practices on the efficiency of construction artisans for enhanced construction performance. The objectives were to; evaluate the extent of use of time management practices, utilization of productive knowledge, and influence of personal time management on utilization of productive knowledge among construction artisans in Akwa Ibom State. This study adopted the exploratory survey design approach using structured questionnaires purposively administered on 190 artisans with 171 valid responses. Data were analysed using descriptive, relative importance index, Kruskal Wallis and correlation analysis. It was found that 26.3% of the personal time management practices have significant extent of use, while 25.0% of the critical productive knowledge of workers were significantly utilised. The time management practices mostly used are geared towards ensuring early arrival at work, avoiding time wasting tasks, prioritizing tasks daily, delegating responsibility and seeking help at difficult times. The personal critical productive knowledge of workers mostly utilised are practical competence, collaboration and team working ability, negotiation, creative and leadership/control competences. The study concluded that the present use of time management practices have not significantly contributed to the utilization of productive knowledge by the

artisans hence low efficiency at work. The study therefore recommended that artisans should endeavour to use other identified personal time management practices which would enhance the utilization of productive knowledge and high levels of competences for efficiency at work place.

Keywords: Artisans; Construction; Efficiency; Productive knowledge; Time management; Akwa Ibom.

1.0 Introduction

The construction industry in Nigeria has been noted for its significant contribution to overall national development. Building and construction sector is one of the top five sectors used in measuring the National Gross Capital Formation (NGCF) and the Gross Domestic Product (GDP) of any country and its effect on other sectors, makes it a significant front for sustainable development (Isa, Jimoh and Achuenu, 2013). One of the fundamental conditions of achieving successful construction projects is that the projects must be completed within the contracted duration. In view of the importance of time in project performance, literature is replete with various improvement methods to overcome the issues of time performance in construction projects (Memon, Roslan and Zainun, 2014). Human resources have been observed to be central to the performance of the construction industry of most nations (Lerman, 2013). Bamisile (2004) observed that in spite of advancement in technology, plant and equipment and in particular robotics, the construction industry is one of the few that still relies on individual skills of artisans. Similarly, Odediran and Babalola (2013) observed that, the types of manpower mostly needed in large quantity for housing construction in Nigeria and globally are artisans and labourers. Artisans in the construction industry play a crucial role in the practical realisation of any construction project, they are mostly engaged in the technical aspect of construction and at the management level serve as frontline manager (supervisor); giving the role of interpreting the company policies into practical realization of the organizational goal of employer (Abiola, 2004). The artisans are therefore crucial to time savings in construction business, hence Memon et al. (2014) noted that effective hiring and use of artisans can help to improve the time performance of construction projects. Nowadays, issues of time and timing have become very essential to managers and employees in construction industries. As a result of expanding global competition and increased demands for immediate availability of products and services the temporal dimension of work within the last two decades has become more important (Orlikowsky and Yates, 2002). Omolayo and Oluwafemi (2012) opined that in work organizations, it is highly important that time be consciously used because the effective use of time is an important issue in organizational efficiency, organizational effectiveness, understanding human behaviour, education and travel behaviour. Personal time management, according to Randy (2007), is the act or process of planning and exercising conscious control over the amount of time spent on specific activities especially to increase efficiency or productivity. Personal time management is a necessity in any project development as it contributes to the project completion within the scope and duration. Personal

time management skills increase productivity and positively impact all aspects of an individual worker's activities in construction. Studies have identified the consequences of poor personal time management to include lateness, poor quality jobs, anxiety, stress, poor productivity; poor work progress and general project time overrun (Dodd and Sunheim, 2005; Claessens, Eerde, Rutte, and Roe, 2007 and Elsabahy, Sleem and El Atroush, 2015). According to Claessens (2004) literature on how individuals deal with time at work is relatively scarce when compared to the popular attention for time issues at work. This assertion is particularly true in the Nigerian construction industry as attention has not been given to how an artisan can manage his time for efficiency and general productivity which can improve time performance of projects especially in the study area. British Business Professional Skill Development (BBPSB) (2010) also observed that the Pareto principle of the 80/20 rule applies in the time we spend at home and at work. It means that 80% of our results come from only 20% of our time, implying that only a small portion of our available time is usually spent on top priorities. This study therefore, aims at ascertaining and providing insight on the extent to which personal time management of a worker may influence the extent of utilization of worker's productive knowledge for overall efficiency at work in Akwa Ibom State.

1.1 The Objectives of the Study

The objectives of the study are; (i) to evaluate the extent of use of various time management techniques employed by different construction artisans in Akwa Ibom State, (ii) to evaluate the extent of utilization of the productive knowledge of the artisans at work, and (iii) to assess the influence of personal time management on the extent of utilization of productive knowledge in the study area.

1.2 Research Hypotheses

Three hypotheses were postulated for this study. The first, states that there is no significant variation in the extent of use of time management practices among construction artisans in Akwa Ibom State. The second, states that there is no significant variation in the extent of utilization of productive knowledge among the artisans and the third, states that there is no significant correlation between the use of the time management practices and the utilisation of productive knowledge by the artisans in the study area. The results of these hypotheses will provide an insight into the importance and influence of time management to the achievement of productive knowledge in the study area. The results will also enlighten the stakeholders in the construction industry on the time management techniques that can enhance the productivity of artisans.

2.0 Review of Related Literature

A number of studies have been carried out on personal time management and productive knowledge which provided basis for the questionnaire formulation for this study. Hassanzabeh and Ebadi (2007) measured the share of the effective factors and time management using a sample of 112 managers to collect data with questionnaire. The result showed that share of each factors and time management are different among managers, with respect to years of experience, background experience in management and education. A relationship was also established

between effective factors in time management and the extent of time management among managers. Omolayo and Oluwafemi (2012) investigated the influence of workers' attitude towards time and work on perceived job performance in private and public sectors. The study which was carried out in Ado-Ekiti and Ibadan metropolis utilized one hundred and eighty (180) workers drawn from five (5) different organizations and found that there was no significant difference in the attitude of workers towards time in private and public sectors; that there is a significant joint influence of workers' attitude towards time and work on perceived job performance as well as on perceived job performance in the private sector, but there is no significant independent influence of workers attitude towards work on perceived job performance in the private sector. It was also found that there was no significant independent influence of workers' attitude towards time and work on perceived job performance in the public sector. Adeojo (2012) determined the effect of time management on high organizational performance using LASACO ASSURANCE Company, by administering questionnaire on the company's employees in Nigeria. The study brought out the differences between effective time management and time management, and established that effective time management is an important tool for high organizational performance. Mamman (2013) evaluated time management in the Nigerian civil service. The evaluation and survey research design which was on a stratified random sample of 300 civil servants in Nigeria showed low appreciation of the process of time management and its principles with traces of time wastage or mismanagement during working hours. Eshaghieh and Eslami (2015) investigated the effect of time management on productivity of human resources in social security organization of Yazd city in Iran. The descriptive survey utilized questionnaire administered on 290 employees of the Social Security (Department of Health) of Yazd city. Partial least squares were used to examine the relationship between time management criteria and employee productivity. The results showed that at 95 percent confidence level, there is a positive and significant relationship between personal, environmental, organizational/time management factors and employee productivity. Most of the studies were not done in Nigeria, and even the viewed ones in Nigeria were not based on artisans hence necessitating this study.

2.1 Time and Personal Time Management Practices

According to Carroll (2010), time is a duration or relation of events expressed in terms of past, present, and future, and measured in units such as minutes, hours, days, months, or years. Time brands moments in the universe, measures the duration that may elapse between events and it is a medium through which we move, hence serving as an agent of change. Ojo and Olaniyan (2008) also stated that time is a limited period during which an action, process, or condition exists or take place. It is an essential resource every manager needs to achieve the goals and objectives of an organization. Time passes at a pre-determined rate whatever happens hence it cannot be saved but can only be spent and once misused it can never be regained (Haynes, 2001 and Adeojo, 2012).

Time, which is an important factor in performance, is also noted to be a fundamental asset for both individuals and organizations (Varlamova, 2008). Therefore time, like any other scarce resource must be managed and used judiciously by establishments and individual persons. Personal time management as earlier noted by Randy (2007), is the act or process of planning and exercising conscious control over the amount of time spent on specific activities especially to increase efficiency or productivity. Claessens (2004) opined that time management covers three broad aspects namely: (1) time awareness behaviours (such as, self-awareness of one's time use, which helps to accept tasks and responsibilities that fit within the limit of one's capabilities), (2) planning behaviours (planning and prioritizing tasks and activities), and (3) monitoring behaviours (such as, providing a structure for managing time by an ongoing assessment of progress towards a goal and the implementation of this feedback in task execution). Several studies (Randy, 2007; Varlamova, 2008; Ojo and Olaniyan, 2008; British Business Professional Skills Development- BBPSD, 2010 and Adeojo, 2012) identified different time management practices used at work places to include the use of to-do-list daily, prioritizing tasks daily, use of daily planner, delegating responsibility as much as possible, basing work on daily energy, completing more important tasks at optimum energy, scheduling time for interruptions, reducing time through creativity, schedule and control of calls/phone, seeking help at difficult times, grouping tasks, setting goals, setting time limit for tasks, rewarding oneself for excellence, relaxing at appropriate time, avoiding procrastination, always analyzing/monitoring time spent, avoiding time wasting tasks, and ensuring early arrival at work for planning.

2.2 Critical Productive Knowledge Requirements of Construction Artisans

According to Vokes and Brennan (2013) the skill acquisition processes lead to the development of some productive knowledge necessary for certain skill behaviour of workers. These critical kinds of knowledge, also referred to as the elements of competence, ability and behaviour determine how effective a worker can carry out a task assigned to him. Some of the critical knowledge identified by previous studies are accuracy and precision, timeliness/time allocation competence, continuity/sustainability awareness, speed and efficiency competence, foundational competence, practical competence, creative competence, situational awareness, integration/reflexive competence, cross-discipline awareness, work development & promotion ability, teaching competence, communication competence, resource allocation competence, collaboration and team working ability, waste avoidance and minimization ability, leadership/control competence, safety consciousness, negotiation competence, flexibility and adaptability competence (Scottish Further Education Unit, 2005; Vokes and Brennan, 2013). These critical productive knowledge requirements therefore served as sources of the twenty critical knowledge used in this study.

3.0 Methodology

This study adopted the exploratory, descriptive and deductive approaches

with the aid of structured questionnaire which was piloted by survey of construction professionals who are conversant with the topic. This was to determine whether the questions have substantially captured the required home qualities and the housing sustainability attributes. These were tested for reliability and validity and found to be of high level with Cronbach α ranging between 0.72 and 0.87 thus can be highly acceptable, since the value of alpha is desirable with the range higher than 0.6 (Gliem and Gliem, 2003). The study population consists of construction artisans operating in Akwa Ibom State. From the 190 samples of questionnaire administered on the study population, 171 were completed accordingly. This comprises Masons (44), Carpenters (38), Iron-bender/welders (36), Painters (29), and Electricians (24) selected by stratified purposive sampling to form the study sample. The purposive sampling technique ensured that the sample covered some artisans operating in the three senatorial districts in the State. The variables used for the study were categorized into: personal time management practices and productive knowledge of artisans.

Through the guidance of the group discussion during the pilot study nineteen personal time management practices and twenty critical knowledge requirements of workers, were identified from the related articles reviewed in this study. The measurements were on a five point Likert-scale: poor=1, low=2, moderate=3, high=4 and very high=5. In analyzing the collected data, the total weight value (TWV) was then calculated for each of the variables. The TWV was arrived at from the summation of the products of the number of responses for the rating of each variable and the respective weight value for each rating. The relative importance index (RII) method was used in this study to determine the respondents' perception of usage level of the time management practices and the extent of utilisation of productive knowledge by the artisans in line with the formula used by Enshassi, Mohamed and Abushaban (2009) as shown in equation 1

$$RII = \sum W / A \times N \quad \ldots\ldots\ldots\ldots (1)$$

Where W is the weight given to each variable by the respondents and ranges from 1 to 5; A – the highest weight = 5; N – the total number of respondents.

A cut-off score of RII computed was determined by summing the weights and dividing by the total number of weighting items and highest weight respectively: (1+2+3+4+5)/5/5 = 0.60. Thus, events that have RII that are higher than 0.60 are defined as significant, those with RII equal to 0.60 are moderate, while those less than 0.60 are insignificant. This approach adapted from Ujene (2014) is with the expectation that the use of 0.60 as reference value will effectively cover only important variables in terms of their usages, influence and application. The variation in the perceptions of use of the time management practices and utilisation of productive knowledge were analysed using Kruskal Wallis tests, while the correlations between the use of time management practices and utilisation of productive knowledge were with spearman rank correlation.

4.0 Presentation of Results

The results arising from the analysis of the data are presented as follows:

4.1 Features of the respondents

The features of the artisans used for the study were investigated as a

background to the understanding and discussion of the respondents used. For this purpose, five features namely: sex, age, senatorial zone of operation, highest educational qualification and years of experience were used to investigate the characteristics of the artisans. The result presented in Table shows that the percentage of the artisans who are males range between 93.1% and 100% among the senatorial zones investigated, while the females ranged between 0 and 6.9 %. About 97% of the artisans investigated were 18 years and above were, while the sampled artisans were uniformly spread across the senatorial zones investigated. The result also shows that majority of the artisans are holders of ordinary level (West African School Certificate and National Examination Council certificate) and first school leaving certificate, while majority of them have working experiences ranging from 6 to 15 years. The result indicates that majority of the artisans sampled have the required knowledge and experience for the information provided in this study.

Table 1: Descriptive results of respondents features

Features	Sub features	Masons		Carpenters		Iron-benders		Painters		Electricians		Total	
		N	%	N	%	N	%	N	%	N	%	N	%
Sex	Male	43	97.7	38	100	36	100	27	93.1	23	95.8	167	97.7
	Female	1	2.3	0	0	0	0	2	6.9	1	4.2	4	2.3
	Total	44	100	38	100	36	100	29	100	24	100	171	100
Age	1-17yrs	2	4.5	1	3.6	1	2.8	1	3.4	0	0	5	2.9
	18-60yrs	31	70.5	24	62.2	26	72.2	22	75.9	18	75.0	121	70.8
	>60yrs	11	25.0	13	34.2	09	25.0	6	20.7	6	25.0	45	26.3
	Total	44	100	38	100	36	100	29	100	24	100	171	100
Senatorial zone of Operation	Eket	14	31.7	12	31.6	11	30.6	10	34.5	8	33.3	55	32.2
	Ikot-Ekpene	14	31.7	14	36.8	12	33.3	9	31.0	7	29.2	56	32.7
	Uyo	16	36.4	12	31.6	13	36.1	10	34.5	9	37.5	60	35.1
	Total	44	100	38	100	36	100	29	100	24	100	171	100
Qualification	FSLC	13	29.5	9	23.7	9	25.0	8	27.6	4	16.7	43	25.1
	City&Guild	6	13.6	5	13.2	4	11.1	3	10.4	3	12.5	21	12.3
	O/L	14	31.8	15	39.5	14	38.9	10	34.5	10	41.7	63	36.8
	OND/HND	8	18.2	8	21.0	8	22.2	7	24.1	5	20.8	36	21.1
	B.Sc	3	6.9	1	2.6	1	2.8	1	3.4	2	8.3	8	4.7
	Total	44	100	38	100	36	100	29	100	24	100	171	100
Experience	1-5yrs	6	13.6	5	13.2	4	11.1	4	13.8	1	4.2	20	11.7
	6-10yrs	12	27.3	9	23.7	9	25.0	7	24.1	3	12.5	40	23.4
	11-15yrs	14	31.8	15	39.5	14	38.9	10	34.5	10	41.7	63	36.8
	16-20yrs	8	18.2	7	18.4	7	19.4	7	24.1	8	33.3	37	21.6
	>20yrs	4	9.1	2	5.2	2	5.6	1	3.5	2	8.3	11	6.5
	Total	44	100	38	100	36	100	29	100	24	100	171	100

4.2 Evaluation of extent of use of Time management practices

In order to evaluate the extent of use of time management practices among construction artisans, nineteen time management practices were identified from literature. Respondents were then requested to indicate their assessment of the level of use of the time management practices. The results presented in Table 2 show that about 26.3% of the identified personal time management practices have significant extent of use with RII equal or greater than 0.60, while about 73.7% are not significantly practiced by the artisans. The result also shows that practices mostly used by the artisans are "ensuring early arrival at

work", "avoiding time wasting tasks", "priotising tasks daily", "delegating responsibility" and "seeking help at difficult times". The result is an indication that the artisans have not been using most of the available techniques of personal time management. The result is similar to that of Mamman (2013) that there is low appreciation of the process of time management and its principles among the civil servants in Nigeria. The implication of low appreciation of the time management practices may be poor quality jobs, anxiety, stress, poor productivity; poor work progress and general project poor performance (Dodd and Sunheim, 2005; Claessens, Eerde, Rutte, and Roe, 2007).

Table 2: Result of extent of use of time management practices

	Masons N=44		Carpenters N=38		Iron-benders N=36		Painters N=29		Electricians N=24		Total N=171	
Time management practices	RII	Rank	RII	Rank	RII	Rank	RII	Rank	RII	Rank	RII	Rank
Ensuring early arrival at work	0.90	1	0.86	1	0.79	2	0.81	1	0.84	1	0.85	1
Avoiding time wasting tasks	0.86	2	0.83	2	0.83	1	0.80	2	0.79	2	0.83	2
Priotising tasks daily	0.73	3	0.65	3	0.67	3	0.69	3	0.66	4	0.68	3
Delegating responsibility	0.67	4	0.61	5	0.64	4	0.65	4	0.68	3	0.65	4
Seeking help at difficult times	0.63	5	0.62	4	0.58	6	0.63	5	0.64	5	0.62	5
Relaxing when necessary	0.58	9	0.57	8	0.58	6	0.63	5	0.60	8	0.59	6
Setting time limit for tasks	0.60	8	0.58	7	0.58	6	0.57	8	0.61	7	0.59	6
Setting goals	0.61	7	0.59	6	0.57	9	0.54	10	0.56	10	0.58	8
Basing work on daily energy	0.56	12	0.55	11	0.61	5	0.59	7	0.58	9	0.58	8
Rewarding oneself for excellence	0.57	10	0.56	9	0.56	11	0.57	8	0.62	6	0.57	10
Grouping tasks	0.62	6	0.56	9	0.54	12	0.54	10	0.55	11	0.57	10
Scheduling time for interruptions	0.54	13	0.53	12	0.57	9	0.53	12	0.52	14	0.54	12
Avoiding procrastination	0.57	10	0.52	13	0.49	15	0.50	16	0.55	11	0.53	13
Doing main tasks at optimum energy	0.54	13	0.52	13	0.50	13	0.51	15	0.53	13	0.52	14
Reducing time through creativity	0.52	15	0.47	18	0.50	13	0.52	13	0.49	16	0.50	15
Use of to-do-list daily	0.50	16	0.50	15	0.48	16	0.50	16	0.48	17	0.49	16
Use of daily planner	0.50	16	0.49	16	0.46	17	0.52	13	0.48	17	0.49	16
Always analyzing time spent	0.48	18	0.48	17	0.46	17	0.46	18	0.52	14	0.48	18
Schedule & control of calls/phone	0.43	19	0.39	19	0.39	19	0.43	19	0.44	19	0.41	19

4.3 Evaluation of extent of utilization of critical productive knowledge

In order to evaluate the extent of utilization of critical productive knowledge requirements among construction artisans, twenty critical productive knowledge requirements were identified from literature. Respondents were then requested to indicate their assessment of utilization of critical productive knowledge of workers. The result presented in Table 3 shows that about 25.0% of the identified personal critical productive knowledge of workers have significant extent of use with RII equal or greater than 0.60, while about 75.0% are not significantly utilised by the artisans. The result also shows that personal critical productive knowledge of workers mostly utilized by the artisans are practical competence, collaboration and team working ability, negotiation and creative as well as leadership/control competences.

The result is an indication that the artisans have not effectively utilized most of the available critical productive knowledge of workers. This may be attributable to poor time management which hinders effective performance at work in line with the findings of Adeojo (2012). The implication of the artisans' non-attainment of most of the critical

knowledge at work place may also be poor quality jobs, anxiety, stress, poor productivity; poor work progress and poor performance (Dodd and Sunheim, 2005; Claessens, Eerde, Rutte, and Roe, 2007).

Table 3: Result of extent of utilization of critical productive knowledge

	Masons N=44		Carpenters N=38		Iron-benders N=36		Painters N=29		Electricians N=24		Total N=171	
Critical knowledge required	RII	Rank	RII	Rank	RII	Rank	RII	Rank	RII	Rank	RII	Rank
Practical competence	0.69	1	0.70	1	0.67	1	0.64	3	0.64	3	0.67	1
Collaboration and team working ability	0.63	4	0.65	2	0.66	2	0.56	11	0.64	3	0.63	2
Negotiation competence	0.58	14	0.65	2	0.61	5	0.66	1	0.58	11	0.61	3
Creative competence	0.63	4	0.52	15	0.64	3	0.66	1	0.58	11	0.60	4
Leadership/control competence	0.60	10	0.56	7	0.61	5	0.61	5	0.64	3	0.60	4
Teaching competence	0.62	7	0.58	5	0.59	10	0.56	11	0.62	8	0.59	6
Work development & promotion ability	0.63	4	0.55	9	0.61	5	0.53	15	0.63	6	0.59	6
Communication competence	0.60	10	0.55	9	0.57	12	0.57	10	0.65	1	0.59	6
Waste avoidance and minimization ability	0.55	18	0.63	4	0.61	5	0.63	4	0.55	16	0.59	6
Accuracy and precision	0.61	8	0.53	13	0.57	12	0.60	6	0.61	9	0.58	10
Safety consciousness	0.59	12	0.54	12	0.59	10	0.60	6	0.59	10	0.58	10
Flexibility and adaptability competence	0.64	2	0.52	15	0.57	12	0.59	8	0.58	11	0.58	10
Speed and efficiency competence	0.55	18	0.57	6	0.51	19	0.59	8	0.63	6	0.56	13
Resource allocation competence	0.56	16	0.56	7	0.63	4	0.50	20	0.57	14	0.56	13
Continuity/sustainability awareness	0.64	2	0.52	15	0.46	20	0.54	13	0.65	1	0.56	13
Situational awareness	0.59	12	0.51	19	0.60	9	0.54	13	0.53	17	0.56	13
Foundational competence	0.61	8	0.53	13	0.54	16	0.52	17	0.53	17	0.55	17
Planning /organising competence	0.52	20	0.55	9	0.53	18	0.52	17	0.56	15	0.54	18
Integration/reflexive competence	0.58	14	0.50	20	0.54	16	0.53	15	0.53	17	0.54	18
Cross-discipline awareness	0.56	16	0.52	15	0.55	15	0.52	17	0.53	17	0.54	18

4.4 Evaluation of agreement of perception among artisans

In order to ascertain if significant variation exists among the artisans concerning the extent of use of time management practices and utilisation of critical productive knowledge areas, the first and second hypothesis were postulated as earlier stated. The hypotheses were tested with Kruskal Wallis test at $p \leq 0.05$. The decision rule is that if p-value > 0.05, the hypothesis is accepted, but if p-value $\leq$ 0.05 the hypothesis is rejected. The results presented on Table 4 show that the p-value for the first hypothesis is 0.892, while that of the second hypothesis is 0.066 both of which were greater than the significance level of 0.05, thus the null hypotheses were accepted, implying that there is no significant variation in the perceptions of the artisans concerning the extent of use of time management practices, as well as the level of utilization of the productive knowledge among the artisans. The similarity in opinion may be attributable to the level of education of majority of the artisans who were holders of ordinary level and first school leaving. The implication of this finding is that stakeholders can rely on the perceptions of any group of the artisans on information concerning their time management and productive knowledge.

Table 4: Results of Kruskal-Wallis test for Comparison of respondents' perception

Items compared among Artisans	Extent of use of time management practices	Extent of utilization of critical productive knowledge
No of variables (N)	19	20
Mean Rank of Masons	52.789	60.675
Mean Rank of Carpenters	45.237	36.725
Mean Rank of Iron Benders	44.816	52.675
Mean Rank of Painters	47.342	45.275
Mean Rank of Electricians	49.816	57.150
Chi-Square	1.113	8.819
P-value	0.892	0.066
Significance level	0.050	0.050
Decision	Accept	Accept

4.5 Influence of time management practices on utilisation of productive knowledge

In order to evaluate the influence of use of time management practices on utilisation of productive knowledge, the five most significant time management practices which attained the cut of score off 0.60 were correlated with five most important productive knowledge requirements. The third hypothesis postulated was also tested with the spearman rank correlation, with same decision rule as former. The result presented in Table 5 reveals that the test of correlation between 'ensuring early arrival at work' and the significant productive knowledge have p-value ranging from 0.053 to 1.000, which are more than 0.05 hence accepting that there is no significant correlation. The correlation between 'avoiding time wasting tasks' and the significant productive knowledge have p-value range between 0.195 and 0.723, more than 0.05 thus indicating that there is no significant correlation, except with creative competence with a p-value of 0.001. This implies that 'avoiding time wasting tasks' correlated significantly with the creative competence of the artisans. This may be because the artisans through their creativity are able to avoid tasks that could eat up their time. The correlation between 'prioritizing tasks daily' and the significant productive knowledge have p-value range between 0.071 and 0.992, more than 0.05 thus indicating that there is no significant correlation, except with leadership/control competence with a p-value of 0.001. This implies that 'prioritizing tasks daily' correlated significantly with the leadership/control competence of the artisans. The result also shows that 'delegation of duty' and 'seeking help at difficult times' did not significantly correlate with practical competence, collaboration and team working ability, and negotiation competence with p-values of more than 0.05, while the two time management practices correlated significantly with creative and leadership/control competence with p-values less than the significance level.

Table 5: Correlation of extent of use of time management practices and level of utilisation of productive knowledge

Variable correlated	Mean	SD	R	P-value	Decision
Ensuring early arrival at work	**4.228**	**0.958**			
Practical competence	3.357	0.748	0.148	0.053	Accept
Collaboration and team working ability	3.152	0.695	0.098	0.203	Accept
Negotiation competence	3.058	0.683	0.105	0.171	Accept
Creative competence	3.023	0.833	0.089	0.247	Accept
Leadership/control competence	3.000	0.728	0.000	1.000	Accept
Avoiding time wasting tasks	**4.129**	**1.038**			
Practical competence	3.357	0.748	0.100	0.195	Accept
Collaboration and team working ability	3.152	0.695	-0.068	0.376	Accept
Negotiation competence	3.058	0.683	-0.027	0.723	Accept
Creative competence	3.023	0.833	0.221	0.004	Reject
Leadership/control competence	3.000	0.728	0.093	0.224	Accept
Priotising tasks daily	**3.409**	**1.039**			
Practical competence	3.357	0.748	-0.022	0.770	Accept
Collaboration and team working ability	3.152	0.695	-0.022	0.780	Accept
Negotiation competence	3.058	0.683	0.000	0.992	Accept
Creative competence	3.023	0.833	0.138	0.071	Accept
Leadership/control competence	3.000	0.728	0.249	0.001	Reject
Delegating responsibility	**3.246**	**1.187**			
Practical competence	3.357	0.748	0.093	0.227	Accept
Collaboration and team working ability	3.152	0.695	-0.088	0.251	Accept
Negotiation competence	3.058	0.683	-0.083	0.280	Accept
Creative competence	3.023	0.833	0.226	0.003	Reject
Leadership/control competence	3.000	0.728	0.252	0.001	Reject
Seeking help at difficult times	**3.082**	**1.299**			
Practical competence	3.357	0.748	0.024	0.753	Accept
Collaboration and team working ability	3.152	0.695	-0.053	0.491	Accept
Negotiation competence	3.058	0.683	-0.025	0.743	Accept
Creative competence	3.023	0.833	0.205	0.007	Reject
Leadership/control competence	3.000	0.728	0.305	0.001	Reject

The result generally indicates that the present extent of use the few personal time management practices do not result in adequate utilization of the required productive knowledge of the artisans. This result, which may be attributable to poor usage of the available personal time management practices by the artisans, supports the findings of Eshaghieh and Eslami (2015) which states that a positive and significant relationship exists between personal, environmental, organizational and time management factors, taken together and employee productivity at work. The implication of this finding is that if artisan and supervisors do not ensure optimal utilization of the available time management practices, then not much of the expected productive knowledge will be attained by the workers, this may thus lead to poor productivity; poor work progress

and poor performance (Dodd and Sunheim, 2005).

5.0 Conclusion and Recommendation

This study has evaluated nineteen personal time management practices and twenty critical productive knowledge requirements of workers, with a view to providing an insight into the influence of personal time practices on the effectiveness of construction artisans for enhanced construction performance in Nigeria. It was found that about 26.3% of the identified personal time management practices have significant extent of use with RII equal or greater than 0.60, while about 73.7% are not significantly practiced by the artisans. The time management practices mostly used by the artisans are ensuring early arrival at work, avoiding time wasting tasks, prioritizing tasks daily, delegating responsibility and seeking help at difficult times. It was also concluded the artisans have the same opinions about the extent of use of the personal time management practices. The study also found that only about 25.0% of the identified personal critical productive knowledge of workers have significant extent of utilisation with RII equal or greater than 0.60, while about 75.0% are not significantly utilised by the artisans. The personal critical productive knowledge of workers mostly utilized by the artisans are practical competence, collaboration and team working ability, negotiation competence, creative competence and leadership/control competence. It was concluded that the present extent of use of time management practices have not significantly contributed to the utilization of productive knowledge by the artisans hence low efficiency at work. The study therefore recommends that artisans should endeavour to use other identified personal time management practices which would enhance the utilization of productive knowledge and high levels of competences for effectiveness at work place. Supervisors and governments agencies should develop schemes for training artisans for both time and resource management for optimal efficiency at work place.

Limitations of the Study

This study is limited to evaluation of nineteen personal time management practices and twenty critical productive knowledge requirements of artisans in Uyo metropolis. Therefore, the result could be improved by further studies on other towns as well as time management and productive knowledge not covered in this study. In spite of these limitations the result could provide reasonable insight into the extent to which personal time management practices can influence the efficient utilization of productive knowledge of construction artisans for enhanced construction performance in Akwa Ibom State, as well as guide for further studies.

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Effects of Socio-economic Characteristics on Residents' Participation in House Design in Akure, Nigeria

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Abstract: Residents' participation has become a topical issue in housing design research. Residents' participation is necessary in order to enhance the level of residential satisfaction. There are factors, which determine the level of residents' participation in the design of their houses. This paper reports on a doctoral research study that examined the factors that predict the level of residents' participation in house design in Akure, Nigeria. A cross sectional survey of 304 household heads in the transitional and peripheral zones of the city was conducted. Data were collected through structured questionnaire surveys, focus group discussions and observations. The data were subjected to Single-Factor Descriptive Analysis and Categorical Regression Analysis. Findings show that the significant predictors were marital status, age, employment status, level of education, tenure status, source of finance, and level of affordability. Gender and monthly income were, however, not significant predictors in this context in contrast with some previous works. The paper recommended adoption of residents' participation by architects and policy makers in order to achieve residential satisfaction. It concludes by showing that knowledge about the influence of such factors would assist in the

development of strategies for residents' participation in house design in the study area.

Keywords: Akure, socioeconomic Factors, demographic factors, house design, residents' participation

1. Introduction

Housing is a basic need of man, the inadequacy which undermines his inherent abilities of and potentialities o man since his existence under threat (Olotuah, 2000). Man needs to live in an environment that provides him with physical, mental, and social wellbeing (Omole, 2001). In order for this to happen, such environments should be designed according to his unique lifestyles and behaviours; which could be achieved through his involvement in the housing process. Human needs and preferences are influenced by several factors. Every society has an identity, and the cultural ideals of the people make up this identity (Adedayo, 2010). As argued by Rapoport (1969), architecture and culture depend on each other and are inseparable. In the light of this, Hadjiyanni (2007) called for development of culturally sensitive housing. Therefore, researchers should fashion methods that allows users' active participation in the housing process (Isa and Jusan, 2012).

Resident users must not only be part of the housing process, but also the centre of it, showing some level of control during the decision-making process (Martinez et al, 2007). Every decision about their residential environment will have an impact on the residents' lives hence their views should count throughout the process, because, they are experts in defining their own needs. However, the level of residents' participation may vary depending on the kind of project involved. In developing countries like Nigeria, residents are usually not involved in housing decisions because it is viewed as solely the responsibility of experts (Adedayo, 2012). Jiboye (2012) supported this by stating that, in developing countries like Nigeria, most of the public and private housing projects failed largely due to the non-consideration of the occupants' requirement or what satisfies their residential requirements and the resulting low residential satisfaction (Ibem, 2010; Jiboye 2004; Ojo and Oloruntoba, 2012; Ukoha and Beamish, 1997). Several scholars have highlighted the potentials of residents' participation in housing development. As averred by Carroll and Rosson (2007), residents' participation in housing have been found to lead to a high level of satisfaction with the product. For a living environment to be meaningful to people, residents' involvement in planning, design, construction, evaluation and management has become unavoidable (Sani, Ulucay and Ulucay, 2011). This should be the goal of housing policies especially in developing countries like Nigeria.

Furthermore, Sanoff (2000) stated that when people have no control over the housing process, the result of the process might become a barrier to achieving personal fulfilment and a burden on the economy. This is usually a burden on the economy because of abandonment of several government-initiated housing programmes in Nigeria, which did not meet the requirements of its target groups (Olayiwola, Adeleye and Ogunshakin, 2005). In addition, Jiboye (2010)

argued that since housing is without doubt an important national investment and a right of every individual, the ultimate aim of any housing programme should be to improve its adequacy in order to satisfy the needs of its occupants. Since the 1920s during the colonial era, Nigeria has come up with several housing policies (Aribigbola, 2011a). The housing policies have focused on solving the quantitative (housing deficit) problems, while neglecting the qualitative aspects (Jelili, Adedibu and Ayinla, 2006; Olotuah, 2007). Therefore, the implementation of these policies and programmes did not involve the residents (Olotuah, 2007; Olayiwola, Adeleye and Ogunshakin, 2005). This is a manifestation of the centrally managed, expert-controlled and paternalistic approach to housing, which requires a paradigm shift in emphasis towards placing the stakeholders at the centre of the housing process (UNDP, 1997; Faniran and Adeboyejo, 2004). This could be achieved through residents' participation.

In reality, participation needs to transform architectural planning from an authoritarian act, which it has been over the years, into a process (De Carlo, 2005). This process begins with the discovery of users' exact needs, understanding and interpreting them through design, before entering the phase of use (De Carlo, 2005). In order to enable transformative participation, architectural knowledge ought not to be applied as an abstraction from the outside, but developed from within the context of the given situation (Till, 2005). The housing process should not keep the occupants in a passive role but in the active. Participation should not be understood as a static process but as one that is evolving and progressive; that constructs itself reasonably (Petrescu, 2005). This is very important in planning for resident's participation in house design.

Thus, in developing and implementing strategies for residents' participation in house design processes, it is expedient to identify the factors that influence them. Although several research studies (Bremer and Bhuiyan, 2014; Chengcai, Linsheng and Shengkui, 2012; Elsinga and Hoekstra, 2005; Leung, 2005; Markovich, 2015; Plummer, 2000; Yau, 2011) have evaluated factors that influence participation in housing development, management, and services especially in developed countries, little or no empirical work has been done in less developed countries such as Nigeria. It should not be assumed that the findings from these developed countries are generalizable to less developed countries like Nigeria; since their states of affairs are not identical. This is due to cultural differences between Nigeria and other developed countries. In addition, Adedayo (2012) averred that it is widely known and accepted that no two communities are the same. Likewise, no two countries are the same. Therefore, it is necessary to conduct similar research in less developed countries like Nigeria. The aim of this study is to highlight the significant contributing factors that determine the extent of residents' involvement in house design in the residential neighbourhoods of Akure, Nigeria.

2. Overview of Socio-economic Factors that Influences Residents' Participation in House Design

Residents' participation in house design is considered very important due to its potential to enhance residential satisfaction. Nevertheless, several

factors can predict the level of participation in house design. These factors could be diverse in nature, but the most common ones used in research are socioeconomic and demographic. Hence, Churchman (1987) observed that socioeconomic status has been the most common characteristic considered to be of interest to determine participants in housing development.

Several researchers have identified socioeconomic and demographic factors that have influenced participation in several fields. Yau (2011) identified age, gender, educational level, tenure status and household income as factors that influence participation in housing management. Bremer and Bhuiyan (2014) submitted that tenure status and income level influences residents' participation in community-led infrastructure development. Furthermore, Plummer (2000) identified factors affecting participation to include employment status and education. Most of these studies considered socioeconomic and demographic variables in their study of participation in several spheres, and it would be fitting to identify which of them applies to participation in house design. However, in this study, marital status, level of affordability, and sources of finance are considered along with these socioeconomic and demographic variables due to their potential to influence participation in house design. Marital status was used in this study because Ibem and Amole (2013) found that it influences satisfaction. Moreover, participation has been found to have a relationship with satisfaction (Carrol and Rosson, 2007). Housing finance is also a very important consideration in housing, that Tao, Wong and Hui (2014) considered it in their study of residential satisfaction. In addition, Sharipah (n.d.) established a link between level of affordability and the planning and design of housing. Also, it is necessary to determine whether the findings from developed countries in this area of research could be applicable to less developed countries such as Nigeria.

The key issue about this study is that, in order to appropriately design for residents' participation in house design, there is a need to understand the factors that could support or inhibit their involvement in the process. These factors could be socioeconomic or demographic in nature, amongst other factors. It is through the understanding of these influences that developing countries like Nigeria can identify aspects of utmost consideration in planning for residents' participation in house design.

3. The Study Area

Akure is the capital city of Ondo State in South-Western Nigeria. It is a medium sized city with population of 360, 268 people according to the 2006 National Population and Housing Census (FRN Gazette, 2009). Using 3% yearly increase, the population of the city for 2016 will be 484, 170 people. With the population increase, it is expected that the challenges of access to affordable and conducive housing due to pressure on existing housing stock will also increase. Akure is located about 311km North East of Lagos, about 370m above sea level. Additionally, the state has been classified as an oil producing state while Akure has been classified as a Millennium Development City (Aribigbola, 2011b). All these factors contribute to influence population growth of the city.

4. Conceptual Framework of the Study

The study conceptualized levels of residents' participation in house design as influenced by socioeconomic and demographic characteristics of the residents. Levels of residents' participation in house design was construed as the dependent variable while the socioeconomic and demographic variables were the independent variables. The study hypothesize that the socioeconomic and demographic variables will influence the levels of residents' participation in house design. The dependent variable, levels of residents' participation in housing design, was construed as multifaceted: as self-management, conspiracy, informing, diplomacy/dissimulation, conciliation, partnership, and empowerment. This is because the levels of participation for this research was an adaptation of Choguill (1996). Participation should influence residential satisfaction, though it is beyond the scope of this study.

5. Methodology

This study relied on primary data collected through a structured questionnaire survey, focus group discussions (FGD) and observations. The structure of the questionnaire is according to the themes of the study in order to make the sequence of questions easy to follow, thus easy to read for the respondent. The themes of the study are socioeconomic and demographic characteristics of respondents, and the levels of residents' participation in house design. Since the questionnaire is standardized, it ensured that respondents answered similar questions. The first section relates to the first theme and is about socioeconomic and demographic characteristics of the respondents, while the second section is about levels of residents' participation in house design. For the FGD, the respondents were asked questions that relate to residents' participation in house design.

The socio-economic and demographic variables were defined as shown in table 1, and the respondents were asked to select from the options provided. The levels of participation as defined by Choguill (1996) were adapted to this study. The adapted levels in ascending order include self-management (1: lowest), conspiracy (2), informing (3), diplomacy/dissimulation (4), conciliation (5), partnership (6), and empowerment (7: highest). The above denote how the levels of participation in several attributes of house design for this study are defined. In Choguill (1996), diplomacy and dissimulation are two different levels. However, for this research, they were used as one single level because of their similarities, in which case the residents are made to believe that they influence decisions, which had been made by others. Choguill (1996) explains the levels as follows: self-management occurs when the residents plan and control their housing by themselves without any support from outside. Conspiracy occurs when residents are not considered or allowed to participate in the formal decisionmaking process. Informing occurs when information flows only from to planners to the residents, and the residents are not given the opportunity for a feedback. Conciliation occurs when the planners devise solutions that are eventually ratified by the residents. Partnership occurs when the residents and the planners agree to share decision-making responsibilities. Empowerment occurs

when the residents enjoy more decision-making and control powers than the planners. The respondents were asked to select the option that corresponds with their level of participation in the different attributes of house design.

The study areas includes the transitional and peripheral zones of Akure as defined by Owoeye and Omole (2012) shown in figure 1. They developed these concentric zones through an application of the Burgess Theory of Concentric Zones to Akure city. Zone 1 is the core of Akure, which is characterized as slum and by spontaneous traditional developments and has been fully developed for several decades. This zone was excluded because majority of the buildings in these zones are most likely to have been inherited, therefore its residents are not likely to provide all the required information about the design of the houses as required in this research. Next to this is Zone 2, which is the transitional zone, and Zone 3 is the peripheral zone, which is farther from the core of the city. This study is limited to households living within the buildings located in the transitional and peripheral concentric zones of the city. This is because housing developments in these zones are more recent and the residents are more likely to provide all the information required for this research. Figure 1 also shows the locations of the areas within each of the concentric zones that make up the study area (represented with large dots).

The Ministry of Housing and Urban Development, Akure (MHUD), has divided Akure into sixty-six (66) residential districts. The map of the residential districts was superimposed on the map of Owoeye and Omole (2012) to arrive at the map in figure 1. This study used a sample size of 15% in identifying the number of districts that were studied, which is higher than the percentage (10%) used in a similar study by Oyetunji and Ajayi (2014). This is above the percentage used in the previous study because, the higher the percentage, the closer to the distribution and the more closely the representation of the sample. This translates to two districts out of the thirteen in the transitional zone, and four districts out of the twenty-six in the peripheral zone of Akure. Fanibi and Don Bosco Districts were randomly selected in the transitional zones, while Aule, Ijapo, Alagbaka Phase 1 and New Town Districts were randomly selected from the peripheral zone. These six districts make up the study area for this research. The districts were randomly selected from each concentric zone to remove the element of bias from the research and to enable the generalization of the results upon the other similar districts within both zones of Akure.

Copies of the questionnaire were administered on the transitional and peripheral concentric zones of Akure. The number of housing units in the transitional zone was 1571 buildings, while for the peripheral zone was 3878 buildings, which brings the total to 5449 buildings. The sample size for the study is 359, which was generated with Sample Size Calculator; an online application for calculating sample size, using confidence level of 95%. This number of respondents for each of the zones was determined according to the proportion of their contribution to the population size. Simple random sampling was used to select the houses that were studied and heads of households in each house was the basic

focus of questionnaire administration and other research enquiries. This was because in Nigeria, heads of households (mostly males) play the dominant role, and makes most, if not all decisions (Ayeni, 2012). So, most of the decisions about participation would be made by them. The percentage return for the questionnaires was 84.7% (304 copies). Single-Factor Descriptive Analysis and Categorical Regression Analysis were used in the analysis for this research.

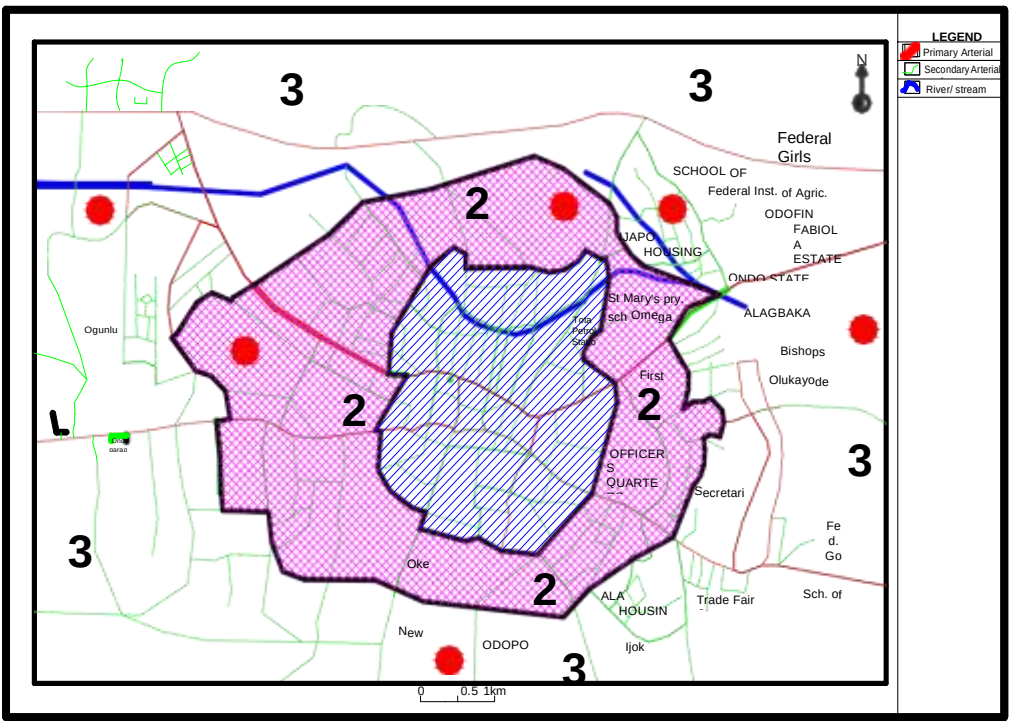

Figure 1: Road Map of Akure with overlay of the concentric zones showing the study areas
Source: Ministry of Housing and Urban Development, Akure; Owoeye and Omole, 2012; Fakere, Arayela and Folorunso, 2017

Prior to the fieldwork, a pilot survey was conducted in the study area. This was done to identify possible problems that might arise from the questions during the field survey and if there are any problems with the overall structure of the questionnaire. Thus, it was carried out to pre-test the research instrument and assist with the clarity of terms used. Twenty (20) questionnaires were used for the pilot testing in the study area. These were used to run Cronbach's Alpha Reliability Test for this study. In order to facilitate meeting of respondents, data was collected during morning and evening hours as well as on weekends, at their homes. The outcome was of assistance in reframing the questionnaire and other research instruments as necessary. Cronbach's Alpha test for reliability was conducted with the research questionnaire for this study. The Cronbach's Alpha Test yielded a value of 0.872, which means that the sections require no revision. This is because, according to George and Mallery (2003), no revision is required for the questionnaire if the value is 0.7 and above. The FGDs were conducted on

environmental sanitation days in the communities when the residents usually have their residents' association meetings.

6. Results and Discussions

6.1 Socioeconomic Variables of Respondents

In order to have a better understanding of the residents under study, it is necessary to present the frequency distribution of their characteristics. As part of the measures to assess the profile of residents, the respondents were asked to indicate their gender. Table 1 shows the gender distribution of the respondents in the study area. Generally, in the study area, 66.4% are males while 33.6% are females in the study area. This shows that generally, male household heads are about twice as much as the female household heads in the study area. For the study, respondents were asked to indicate their age ranges. Table 1 shows the age range of the respondents across the study area. 7.2% of the respondents are between 18 and 30 years of age, 32.2% are aged between 31-40 years, and 31.2% are within the ages of 41 to 50 years. 20% of the respondents are within the ages of 51-60 years, 6.6% are within the ages of 61-70 years and 2.6% are above 70 years of age. This shows that most of the respondents (83.4%) are between 31 and 60 years of age. It indicates that study covered a large population of working and active residents, which is necessary for active residents' participation. For the study, respondents were asked to indicate the ranges of their monthly income. Table 1 reveals that for monthly income of respondents in the study area, 23.3% earn below N50,000, 31.2% earn between N50,000 and N99,999, and 20.7% of them earn between N100,000 and N149,999. 9.5% earn between N150,000 and N199,999, 19% earn between N200,000 and N249,999, and 8.2% earn N250,000 and above. 0.7% of the respondents did not indicate their monthly income. Most (51.9%) of the respondents earn less than N 150,000. This should have implications for participation in house design because finance is required in the design and construction of houses. The FGD revealed that most of the houses in the study area were private developments, and that people developed their houses in piecemeal due to meagre resources at their disposal. For the study, respondents were asked to indicate their highest level of education. Table 1 shows that for respondents' highest level of education, 1.3% have no formal education, 1.9% have only primary education, and 10.9% are educated up to secondary school level. 12.2% have Ordinary National Diploma (OND), National Certificate in Education (NCE) or Advanced level education, and 39.8% of the respondents have Higher National Diploma (HND) or Bachelor of Science degree as highest education level. Those with postgraduate education (Masters degree or Postgraduate Diploma, etc.) are 27.9%, while those that are educated to doctorate level are 5.9%. This shows that majority of the respondents (73.6%) are graduates; therefore the level of education in the study area is very high.

For the study, respondents were asked to indicate their employment status. Table 1 shows that for employment status distribution, 1.9% are unemployed and 28.2% are self-employed. 8.2% are employed in the private/ corporate sector, 51.6% are civil/ public servants, while 9.9% are retired. This shows that majority

(88.2%) of the respondents in the study area are employed in one form or another and have a source of income.

Respondents were asked to indicate their tenure status. This is because it has the potential to influence their level of participation in house design. Table 1 shows tenure status of respondents in the study area, and it reveals that 39.8% of them rented their houses privately, and 45.7% are owner-occupiers. 0.7% of the respondents inherited their houses, 5.6% are living in a family house, 9.2% are living at their employers' quarter, while 1.9% have free occupation of their places of abode. However, 0.3% did not give any response to the question. The majority of the respondents (85.5%) either owned the houses or rented it. For the study, respondents were asked to indicate their marital status. Table 1 shows that for the marital status of respondents, a proportion of 11.5% are single, 82.6% are married, 4.3% are widowed, 0.7% are divorced, and 1% are separated. This shows that majority of the respondents in the study area are married. This should have a positive effect on the level of participation in house design. This is because people would usually seek a conducive living environment for their families, which is an outcome of marriage (Bonilla and Trejos, 2015). For the study, respondents were asked to indicate the sources of finance to acquire the house. Table 1 reveals that for the respondents' source of finance, 70.7% used their personal savings, and 1.6% borrowed from mortgage institutions. 1.9% of the respondents borrowed from commercial banks, 12.5% borrowed from cooperative societies, and 7.2% sourced their finance from housing loans. 1.6% borrowed locally from friends or relatives, while 3.9% are freely occupying the houses. 1.6% of the respondents did not indicate their sources of finance for the houses. This shows that majority of the respondents (70.7%) saved up the money to acquire the houses they live in. This might be because the homeowners constructed their houses on piecemeal until completion as revealed through the FGD.

For the study, respondents were asked to indicate their level of affordability of the house of their residence. Table 1 shows the level of house affordability of respondents in the study area and it reveals that 6.9% of them rated their houses as highly unaffordable, 8.9% rated it as not affordable, 77.6% rated it as affordable, and 6.6% rated it as highly affordable. This means that generally, the houses are affordable for the respondents. This indicates that people tend to go for houses that are affordable for them irrespective of their income level because they have the choice. The affordability of the house for homeowners is enhanced because they make the construction of their own houses a long-term project. As aforementioned, majority of the housing stock in the study area and Nigeria generally are private developments. This is because several government interventions in housing have not been able to solve the housing deficit problem over the years. In fact, in 2007 the Federal Housing Authority in Nigeria put housing deficit in the country at 12 million housing units (Akeju, 2007). Six years later, the housing deficit problem worsened to 16 million housing units as estimated by World Bank (2013). For this reason, citizens have no choice but to seek the means to housing themselves with their resources, and that is why the residents of the study area stated through the

FGD that they construct their building over a long period in piecemeal

Table 1: Socioeconomic and demographic characteristics of respondents in the study area

Factors	Frequency (n=304)	Percentage (%)
Gender		
Male	202	66.4
Female	102	33.6
Age		
18-30 years	22	7.2
31-40 years	98	32.2
41-50 years	95	31.2
51-60 years	61	20
61-70 years	20	6.6
Above 70 years 8 2.6		
Income		
Below N50,000	71	23.3
N50,000- N99-999	95	31.2
N100,000- N149,999	63	20.7
N150,000- N199,999	29	9.5
N200,000- N249,999	19	6.2
N250,000 and above	25	8.2
No response	2	0.7
Level of Education		
No formal education	4	1.3
Primary	6	1.9
WASC/NECO/O' Level	33	10.9
OND/NCE/A' Level	37	12.2
HND/ B. Sc.	121	39.8
Postgraduate	85	27.9
Doctorate	18	5.9
Employment Status		
Unemployed	6	1.9
Self Employed	86	28.2
Private/Corporate Sector Employee	25	8.2
Civil Servant	157	51.6
Retired	30	9.9
Tenure Status		
Privately Rented	121	39.8
Owner Occupied	139	45.7
Inherited	2	0.7
Family House	17	5.6
Employer's Quarters	28	9.2
Free Occupation	6	1.9
No response	1	0.3
Marital Status		
Single	35	11.5
Married	251	82.6
Widowed	13	4.3
Divorced	2	0.7
Separated	3	1
Source of finance for house		
Personal Savings	215	70.7
Mortgage Borrowing	5	1.6
Financial Institutions	6	1.9
Cooperative Societies	38	12.5
Housing Loan	22	7.2

Local Borrowing	5	1.6
Free Occupation	12	3.9
No Response	1	0.3
Level of Affordability		
Highly Unaffordable	21	6.9
Not Affordable	27	8.9
Affordable	236	77.6
Highly Affordable	20	6.6

6.2 Levels of Residents' Participation in House Design

This study is about the levels of residents' participation in house design, and it is pertinent to understand level of participation in house design in the study area. For the levels of participation used in this study (Choguill, 1996), levels 1 to 4 indicate lower levels of participation, while levels 5 to 7 indicate higher levels of participation. Table 2 reveals that 6.2% of the respondents designed their houses by themselves without restrictions from any architect, 46.7% of them did not have any form of contact with the architect, 4.9% were only informed about the decisions already made about the design, and 14.8% indicated that the architect had too much control over decision-making about the design. 7.2% of the respondents chose the design from alternatives already developed by the architect, 13.1% discussed their needs with the architect with whom they made joint decisions about the design of the house, while 6.9% made the major decisions while the architect made only minor ones about the design.

Table 2: Level of Residents' Participation in House Design

	Levels	Freq. (%)
1	I did it by myself without restrictions from any architect	19 (6.2)
2	I did not have any form of contact with the designer about it	14(46.7)
3	I was only informed about decisions made about it	15 (4.9)
4	The architect had too much control over decision making about it than I did	45(14.8)
5	I chose it from alternatives that were developed by the architect	22 (7.2)
6	I discussed my needs with the architect and made joint/ equal decisions about it	40 (13.1)
7	I made the major decisions while the architect made only minor ones	21 (6.9)

6.3 Predictors of Level of Participation in House Design

The research further investigated predictors of level of participation in house design in the study area. It was viewed as necessary to identify the factors that predict the level of participation in the design of the houses in the study area. Categorical regression analysis was carried out using optimal scaling method with the criteria for convergence set at 0.00001. In carrying out this analysis, the level of participation in house design was the dependent variable and respondents' marital status, highest level of education, tenure status, sources of finance for building or renting the house, level of affordability, employment status, monthly income,

gender and age were the independent (predictor) variables. Table 3 shows the result of the multiple categorical regression analysis carried out to identify the predictors of respondents' level of participation in house designs. The result shows that much of the variance in the dependent variable is explained by the regression model with Multiple R = 0.758, and R2 = 0.575. This indicates that the regression model explains 57.5% of the variance in the level of participation in house design in the study area, which is moderately high. However, other variables beyond the scope of this study could explain the remaining percentage. The result also shows that (F=13.069, df = 28, P = 0.000), which also indicates that the result and regression model are statistically significant at $p<0.0001$ and therefore there is significant relationship between socioeconomic characteristics of respondents and residents' participation in house design. The F-statistic (13.069) is higher than F-critical (1.518) which indicates that there is a significant relationship between residents' socioeconomic characteristics and the level of residents' participation in house design. Fcritical was calculated with degree of freedom (df = 28, 271). This is consistent with Churchman (1987), who found a relationship between socioeconomic characteristics of residents and participation in housing development. From table 3, it is evident that out of the nine variables, seven were significant predictors of level of participation in house design. The variables identified to have significant effect on level of participation in house designs in order of importance include tenure status (Beta = 0.607, F = 166.103, P = 0.000), and highest level of education (Beta = 0.231, F = 27.321, P = 0.000). Others are source of finance (Beta = 0.179, F = 19.468, P = 0.000), age of respondents (Beta = 0.153, F = 9.562, P = 0.002), marital status (Beta = -0.098, F = 5.233, P = 0.000), employment status (Beta = 0.080, F = 3.744, P = 0.006), and level of affordability (Beta = 0.074, F = 3.359, P = 0.036). The strongest significant predictor however, is tenure status of the residents, while the weakest significant predictor is level of affordability. This is partially in consonance with Yau (2011), which highlighted that gender, age, educational level, tenure status and household income as factors that influence participation. Tenure status contributed the most in predicting the level of participation in house design in this context. This is expected because tenure status of residents goes a long way in determining whether residents would be involved in the design of the houses of their abode. In this context, mainly homeowners are involved in the design of the houses, while other groups of residents do not participate in the design of the houses. In the same vein, level of education is a significant predictor of level of participation in house design in this context and this is not surprising. The level of education in this context is very high and educated people tend to know the importance of being a part of the process of shaping their living environment; and this influences their level of involvement in the design of the houses of their abode. These findings are in consonance with the findings of Yau (2011), which reported that better-educated people tend to participate more actively in housing in their neighbourhood.

It was not surprising that respondents' source of finance is a significant determinant of level of participation in

this research. This is because when people have access to money to finance a house, they could think about participating in the design of such houses because they are responsible for its construction. In this context, majority (70.7%) of the respondents financed their houses through personal savings, while the remainder financed their houses through one form of borrowing or another. This shows that most were able to save for their housing. The FGD revealed that most of the respondents saved up the money over a long period, and constructed the houses in piecemeal until the houses were completed. It also revealed that it took up to ten (10) years to construct some of the houses from the foundation to finishings. Age of respondents is also a significant predictor in this context, and this was not surprising. It is significant because, most of the respondents (90.6%) are within the age ranges of 18 years and 60 years, showing that most of them were in their productive years. This is because at the age of 18, one is considered an adult in Nigeria, while the general retirement age for workers in Nigeria is 60 years (Awulor, 2017). Therefore, the age of the respondents have significant influence on the level of participation in house design in this context. Marital status is a significant predictor in this research, and this was expected. Marital status is significant because most (82.6%) of the respondents are married and this influences the level of participation in house design. People that have families tend to desire to have a befitting place of abode for their families to live in, and this influences their decision to participate in deciding how such environments would be shaped (Bonilla and Trejos, 2015). For example, the FGD revealed that women's priorities are about deciding how their kitchen and store would be designed more than other spaces. It also revealed that even when men are at the forefront of the participation process, they allow the women to make the decisions about these spaces. This is because by culture in Nigeria, women prepare the meals for their husbands and family members and therefore spend more time in the kitchen than men do. Employment status is one of the significant predictors in this context and this was expected. This is so because, people receive income when they are employed, and therefore, this increases the possibility of them being involved in the design of their houses. This agrees with the findings of Yau (2011) and Plummer (2000). It was also expected that, level of affordability is a significant predictor of participation of level of participation in house design. It was significant in this context because of the high rate (84.2%) of affordability in the study area. The FGD revealed that most of the houses in the study area are privately constructed and owned. Since most of the houses are privately constructed, the people that can afford to construct their own houses would be involved in the design process. Those that cannot afford to build their own houses would therefore, not be involved in the design of their houses.

From table 3, it is clear that out of the nine variables used, two were not significant predictors of the level of participation in house design. The variables include gender (Beta = 0.057, F = 1.892, P = 0.170), and monthly income (Beta = 0.066, F = 2.038, P = 0.155). This indicates that attributes such as monthly income and gender of respondents do not make significant contribution to the level of participation in house design in this context. This is

rather surprising because Yau (2011) found that gender influences residents' participation. Likewise, Chengcai et al (2012) and Bremer and Bhuiyan (2014) found that income influences residents' participation. However, the reason for this could be explained. Gender was not significant because majority (66.4%) of the respondents are males. Therefore, more males are household heads in the study area due to the culture in this part of the world. In Nigeria, males (especially husbands or oldest males) are usually considered household heads (Ayeni, 2012). Apart from that, widows and single mothers could be considered as household heads as well due to the absence of their husbands. In addition, income level was not significant because a good number of the respondents (54.3%) were not owner-occupiers and did not participate in the design, and therefore has no financial investment in the design of the houses.

Table 3: Coefficients of socio-economic predictors of Participation in House Design

Socio-economic Characteristics of Respondents	**Standardized Coefficients**				
	Beta	**Std. Error**	***df***	***F***	**Sig**
**Marital Status	-0.098	0.043	4	5.233	0.000
**Level of Education	0.231	0.044	4	27.321	0.000
**Tenure Status	-0.607	0.047	5	166.103	0.000
**Source of Finance	0.179	0.040	6	19.468	0.000
*Affordability	0.074	0.038	2	3.359	0.036
**Employment Status	0.080	0.041	4	3.744	0.006
Monthly Income	-0.066	0.046	1	2.038	0.155
Gender	0.057	0.041	1	1.892	0.170
**Age	-0.153	0.050	1	562.831	0.002

Dependent variable: Level of participation in house design; **Significant predictors (P<0.01); * Significant predictors (P<0.05)

R = 0.758; R^2 = 0.575; *F* - value = 13.069; *p*-value = 0.000; *df* = 28

7. Focus Group Discussion

FGDs were conducted in the course of this study. It revealed that most of the houses in the study area were privately developed, and that several of the homeowners developed their houses in piecemeal until completion due to meagre resources at their disposal. This is for people that can afford to save up finance for their own housing or have the means to collect loans from other sources. The residents revealed that, it took them several years to complete their houses before moving in due to reliance on their meagre resources and high cost of building materials in the country. In the design of their houses, the aspects that women prioritise are deciding how their kitchen and store would be designed more than other spaces. It also revealed that even when men are at the forefront of the participation process, they allow the women to make the decisions about these spaces. This is because by culture in Nigeria, women prepare the meals for their husbands and family members and therefore spend more time in the kitchen than men do.

8. Conclusion and Recommendations

This paper examined the factors that are predictors of level of participation in house design. It assessed how socioeconomic and demographic variables influence the levels of residents' participation in house design.

This was done by using these variables as factors, which could predict the level of participation in house design. The study showed that 46.7% of the respondents did not have any form of contact with the architect that designed the house; in other words, they did not participate in the house design. This is the group with the highest percentage among all the different levels of participation in this study. In addition, it also shows that 27.2% of the respondent were involved in the process of design of the house. The study also showed that socioeconomic and demographic variables are indeed significant predictors of participation in house design, confirming the finding from previous studies. This study has been able to contribute to existing body of knowledge by showing how socioeconomic variables influence level of participation in house design in this context.

The predictive power of the regression model in the level of participation in house design was found to be moderately high with adjusted R Square of 0.575. This means that, not only do these variables predict the level of participation; this predictive power is also appreciably high. This relationship is also absolute since p-value = 0.000. This means that these variables predict the level of residents' participation in house design, with the exception of gender and monthly income. Nevertheless, it is possible for the result to be different in another context. Therefore, further research is required in order to examine this relationship in order to discover what the result would be in other contexts. Architects and policy makers in the design of houses will require such research in future for individuals and the public. This is because the housing policies in Nigeria generally do not support residents' participation in public housing projects (Adedayo, 2012). Hence, it is through such knowledge that the process of house design could be refined as necessary.

Through studies such as this, the development of strategies for residents' participation in house design would be more easily achieved, since the factors that influence it are known. For instance, since employment status is a significant predictor in this context, developers could use it as a criterion to determine the level of participation in the design of housing projects. This is because they would have the financial means to meet their obligations in the housing process. Tenure status could also be used, where owner-occupiers could have a higher level of participation than other groups because they would live there in the longer term and because of their status as owners. However, this does not imply that other groups should not participate in the process. This is fundamental in realizing the goals of residents' participation in house design, and contributes immensely to achieving higher residential satisfaction. Residential satisfaction incorporates human aspects of the built environment and is therefore important to residents' participation. Therefore, policy makers in Nigeria should adopt residents' participation in house design because it has the potential to enhance residential satisfaction.

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Unfolding the Potentials of Geographic Information System on Property Taxation in Lagos State

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Abstract: Technological advancement has turned the entire world into a global village with its attendant benefits to virtually all professions including estate surveying and valuation. It is against this background that the paper examined how the administration of property taxes can be enhanced using Geographic information system (GIS) with focus on GRA Ikeja, Lagos State. The map of GRA was obtained, digitised and exported into the GIS environment. The arc view 3.2a software was used, from which queries were carried out. GIS software was used to demonstrate how information concerning properties can be accessed from a database that contained all property types in GRA Ikeja. The database includes the facilities in each building, location, its rental value, and the property owner. Attribute data of the properties such as street name (parcel address), land use, ownership, building type, owner's occupation, owner's sex, title on the property, age and state of origin etc were collected. In addition, interview was conducted with some residents of GRA Ikeja, Lagos state. The study covered a total of the 1705 buildings in the GRA that were captured through the use of the aerial map which was further digitised. The digitised map when inputed into the GIS software automatically numbered all the buildings and roads in the area. Database query was used to retrieve information stored in the data base using structured query language [SQL] Queries were generated basically through data base extraction in arc view 3.2a. Various queries were run to satisfy the user's expectation(s). The results showed the vital roles of using GIS in the management of a simple data within a system, which was used in the creation, storage, and retrieval, manipulation of spatial and non-spatial data. The results further showed that administration

of property taxes can be carried out within the comfort of one's home with the aid of GIS. The paper concluded that GIS as a vital part of technological advancement is very important to the administration of property taxes.

Keywords: Geographic information system (GIS), Land Use Charge, Query, Property Taxes.

1. Introduction and Statement of Problem

The world we live in is made up of a lot of geographical features, natural resources and man- made features. Information about the location, nature, type, quality and quantity of these features play an important role in our everyday life. The compilation, updating, organizing, storage and usage of these details from time to time are of benefit to us. They provide us with required choices for planning, management and development of resources, thereby helping to make certain decisions for both the present and the future (Ayeni and Ifechukwu 2003).

In the past, corporate organizations and government at various levels have made different attempts aimed at collecting and presenting geographic information in an acceptable form. One of the earliest forms is the map, which is a collection of various geographic data of a particular location on the surface of the earth. This location is defined by a set of coordinates with reference to a coordinate system at a given scale e.g. Geographical coordinate system – longititude and latitude (Longley and Goodchild 2001, Bruce 1996).

Nearly all government information has a geographic dimension - a street address, a transportation corridor, a river, and a city lane. All kinds of descriptive information can be linked to a particular place to present a rich and detailed picture of a neighbourhood, a park, a coastline, or an industrial site.

Geographic Information System (GIS) offers unique opportunities to analyse and compare these disparate types of information, opening up new opportunities to deliver both information and services.

Landed properties form part of man-made geographical features in which information on location, nature, type, quality and quantity are sought by people in all walks of life from Estate Surveyors and valuers and agents for the purposes of transactions including tax administration, among others. Since landed properties have geographical dimension, which could be street addresses, transportation, corridors, rivers or city lanes, these descriptive information could be linked together to enhance property tax administration.

GIS is an information system that is used to input, store, retrieve, manipulate, analyse and output geographically referenced data or geo-spatial data (landed properties inclusive) in order to support decision making for planning and management of land use, natural resources environment, transportation, urban facilities, and other administrative records. Integration of Geographic Information System (GIS) and remote sensing provides a means to update time oriented information and mapping of dynamic features of the earth surface (land and properties inclusive) for management and planning.

An increasing common application of remotely sensed data is for change detection.

Change detection is the process of identifying differences in the state of an object or phenomenon by observing it at different times (Singh 1989). This

paper focuses on the ways by which Geographic Information Systems (GIS) can make property tax administration easier thereby leading to better service delivery.

Concept of Geographic Information System (GIS)

Many definitions of GIS have been suggested over the years, and none of them is entirely satisfactory, though many suggest much more than a technology. Today, the label, GIS is attached to many things: amongst them a software product that one can buy from a vendor to carry out certain well-defined functions (GIS software), digital representations of various aspects of the geographic world, in the form of datasets (GIS data), a community of people who use and perhaps advocate the use of these tools for various purposes (the GIS community); and the activity of using a GIS to solve problems or advance science.

GIS is a computer system capable of capturing, storing, analysing, and displaying geographically referenced information; that is, data identified according to location. Practitioners also define a GIS as including the procedures, operating personnel, and spatial data that go into the system.

GIS: - is a container of maps in digital form: a computerized tool for solving geographic problems; a mechanized inventory of geographically distributed features and facilities a is tool for revealing what is otherwise invisible in geographic information a tool for performing operations on geographic data that are too tedious or expensive or inaccurate if performed by hand (Longley and Goodchild 2001).

GIS can be defined as a computerized system that facilitates the phases of data entry, data analysis and data presentation especially in cases when we are dealing with geo-referenced data.

This means that a GIS user will expect support from the system to enter (geo-referenced) data, to analyse it in various ways, and to produce presentations (maps and other) from the data. Many kinds of functionality should come with this: support for various kinds of coordinate systems and transformations between them, many different ways of 'computing' with the geo-referenced data, and obviously a large degree of freedom of choice in parameters such as colour scheme, symbol set, medium et cetera (Rolf and Maguire 2001).

GIS has been defined as the art, science or technology dealing with the acquisition, storage, processing, presentation and dissemination of geo-information. A GIS can also be defined as a configuration of hardware, software, communication networks and analytical procedures for the extraction of information from data to support decision-making so as to achieve planning or managerial objectives (Ayeni and Ifechukwu 2003).

Burrough and Macdonnell (1998) defined GIS "as a powerful set of tools for storing and retrieving at will, transforming and displaying spatial data from the real world for a particular set of purposes". This is often called the "toolbox definition" of GIS, because it stresses a set of tools each designed to solve specific problems (Clarke 1999).

If GIS is a tool box, a logical question is: what type of tools does the box contain? Several authors have tried to define GIS in terms of what it does, offering a functional definition of GIS. Most authors agree that the functions fall into categories and that the categories are sub-tasks that are

arranged sequentially as data move from information source to a map and then to the GIS user and decision maker.

Another view, for example states that GIS are "automated systems for the capture, storage, retrieval, analysis, and display of spatial data."(Clarke 1999). This can be referred to as a process definition.

GIS is an information system that is designed to work with data referenced by spatial or geographic coordinates. In other words, a GIS is both a database system with specific capabilities for spatially-referenced data, as well as set of operations for working with the data (Star and Estes 1990).

This definition stresses that the GIS is a system for delivering answers to questions or queries, so that this is an information system-sort of definition.

Dueker (1979) defined GIS as "a special case of information systems where the data base consists of observations on spatially distributed features, activities or events, which are definable in space as points, lines, or areas. A geographic information system manipulates data about these points, lines and areas to retrieve data for ad hoc queries and analyses".

The term GIS according to Steven (1994) has various meaning. It could be termed an 'industry', 'a product', 'a technology', and 'a science' depending on the user. To a software developer ,it is an industry, the system marketer and data provider will see it as a product, while the application specialist, or academic researcher will see it as technology or science.

Goodchild and Steyeart (1993) views geographic information systems as "the generic issues that surround the use of GIS technology, impede its successful implementation, or emerge from an understanding of its potential capabilities".

Typically, data associated with properties is held in a computer assisted mass appraisal (CAMA) system that is responsible for sale analysis, evaluation, data management, and administration, and for generating notices to owners. CAMA systems are usually implemented on top of database management system (DBMS) and can be linked to the parcel database using a common key.

The task involves a geographic database query to locate all the property sales of a similar type within a specified distance of an owner's property. First the owner's property must be found in the property data using a query. Then a geographic query can locate all comparable properties valued similarly within 1 mile of the owner's property.

Hence Geographic Information Systems are integrated, spatial, data management programmes with which we bring together, store and retrieve spatial data from the real world. From the foregoing - GIS can be conclusively described as a set of tools comprising appropriately chosen hardware component, and a software component made up of technically designed databases with a set of fail-proof data handling programs that are all technically integrated for the collection, storage, retrieval, manipulation and dissemination of processed spatial data of a given area.

Anatomy of A GIS

GIS is characterised by the immense storage requirements Antenucci and Philip (1991), Frank (1998), Ayeni and Ifechukwu (2003), Longley and Goodchild (2001), Read and Lam (2002) and the hybrid nature of the system. It is made of the following:

The Network

The most fundamental of the well-defined component parts of a GIS is the network, without which no rapid communication or sharing of digital information could occur, except between a small group of people crowded around a computer monitor. GIS today relies heavily on the Internet, and on its limited-access cousins, the intranets of the corporations, agencies and the military. The internet was originally designed as a network for connecting computers, but today it's is rapidly becoming society's mechanism of information exchange, handling everything from personal messages to massive shipments of data, and increasing numbers of business transactions.

The recent histories of GIS and the Internet have been heavily intertwined. The Internet has proven very popular as a vehicle for delivering GIS applications for several reasons. It is an established, widely used platform and accepted standard for interacting with information of many types. It also offers a relatively cost-effective way of linking together distributed users (for example, telecommuters and office workers, customers and suppliers, students and teachers. The interactive and exploratory nature of navigating linked information has also been a great hit with users. The availability of multi –content site gateways (portals) with powerful search engines has been a further reason for success.

Hardware

The second piece of the GIS anatomy is the user's hardware, the device that the user interacts with directly in carrying out GIS operations by typing, pointing, clicking, or speaking and which returns information by displaying it on the devices screen or generating meaningful sounds.

Traditionally this device sat on an office desktop, but today's user has much more freedom, because GIS functions can be delivered through laptops, personal digital assistants (PDAs), in-vehicle devices, and even cellular phones.

Software

This third piece of the GIS anatomy runs locally in the user's machine. This can be as simple as a standard Web browser (e.g. Microsoft Explorer or Netscape) if all work is done remotely using assorted digital services offered on large servers. More likely it is a package bought from one of the GIS vendors. Each vendor offers a range of products, designed for different levels of sophistication, different volumes of data, and different application niches

Database

This consists of a digital representation of selected aspects of some specific area of the Earth's surface or near surface, built to serve some problem-solving or scientific purpose. A data base may be built for one major project, such as the location of a new high-voltage power transmission corridor, or it might be continuously maintained, fed by the daily transactions that occur in a major utility company (installation of new underground pipes, creation of new customer accounts, daily service crew activities).

It might be as small as a few megabytes (a few million bytes, easily stored on a few diskettes) or as a large terabyte (a trillion bytes, occupying a storage unit somewhat larger than a shoe box). GIS databases can range in size from a megabyte to several petabytes.

Management

In addition to these four components- network, hardware, software and data base- a GIS also requires a management. An organisation must establish procedures, lines of reporting, control points and other mechanism for ensuring that its GIS activities stay within budgets, maintain high quality, and generally meet the needs of the organization.

Finally, a GIS is useless without the people that design, program and maintain it, supply it with data and interpret its result. The people of GIS will have various skills, depending on the roles they perform. Almost all will have the basic knowledge needed to work with geographic data.

Functions of GIS

GIS is a computerized, integrated system used to compile, store, manipulate, and output mapped data.

i. Compilation

Data compilations involve assembling all of the spatial and attribute data that are to be stored in a computerized format within the GIS. A base map is a set of standard requirements for data. It provides accurate standards for geographic control, and also defines a model or template that is used to shape all data into a compatible form. This conversion process, referred to as "conversion" or "digitizing," converts paper maps into numerical digits that can be stored in the computer can be performed using various techniques – scanning, line digitizing which uses a tablet and a tracing stylus.

ii. Storage

Once the data have been digitally compiled, digital map files in the GIS are stored on magnetic or other (e.g., optical) digital media. Again, different GIS software packages will employ different storage formats. In most cases, however, data storage will be based on a generic data model that is used to convert map data into a digital form. The two most common types of data models are raster and vector. Both types are used to simplify the data shown on a map into a more basic form that can be easily and efficiently stored in the computer.

iii. Manipulation

Once data are stored in a GIS, many retrieval, analysis, and output options are available to users. These functions are often available in the form of "toolkits." A toolkit is a set of generic functions that a GIS user can employ to manipulate and analyze geographic data. Toolkits provide processing functions such as data retrieval, measuring area and perimeter, overlaying maps, performing map algebra, and reclassifying map data. A GIS usually includes a basic set of computer programs or "tools."

iv. Output

The final functional task of a GIS is to generate output; usually a map. GIS-generated maps are compiled from the many data sets contained in the digital GIS and match exact user specifications. Map output may employ several colors and symbology schemes, and will be sized and scaled to meet user needs.

Scientific Foundations and Generic Questions.

Critical to the success of property taxation is a high-quality, up-to-date geographic database that can be linked to a CAMA system. Considerable effort must be expended to design, implement, and maintain the geographic database. Even for a small community of 50,000 properties it can take several months to collect the geographic descriptions of property parcels and their associated attributes. Linking GIS and CAMA

system can be quite straight forward providing that both systems are based on DBMS technology and use a common identifier to effect the linkage between a map feature and a property reward. For example in the USA a unique parcel number is used while in the UK a unique Property reference number is used.

Clearly, the system is dependent on a clear and unambiguous definition of parcels, and common standards about how different characteristics (such as size, age and value of improvements) are represented. The GIS can help enforce coding standards and can be used to derive some characteristics automatically in an objective fashion. For example using GIS it is very easy to calculate the area of properties from the boundary information.

Fundamentally, this application, like many others in GIS is about maintaining an unambiguous and accurate inventory of geographic features. To be effective it must employ methods of description and representation that are clear, understood by every user of the system, and work the same way every time they are used. These are all core objectives of scientific method, and although the application is clearly not driven by scientific curiosity, it nevertheless follows procedures that are much like those used in a scientific laboratory.

A compilation of information concerning properties is very important in property taxation which can be enhanced using a classical operational GIS system. It requires an up-to-date inventory of properties and information such as locational address, owner's name, assessed value, property type, characteristics, etc.

It is also possible to use GIS for more strategic modelling activities. The many tools in GIS for charting, reporting, mapping and exploring data help sourcing officers to understand the variability of property value within their jurisdiction.

Once a property data base has been created, it becomes a valuable asset to government for taxation purposes.

Property tax laws in Lagos State

Population increase has brought the need for more social amenities and services by the people which invariably puts financial burden on the government. As a way out of this, the Lagos state Government enacted the Land Use Charge Law in 2001.

The most popular property tax laws in operation are tenement rate edict, neighbourhood improvement charge law, and development charge law. Other property tax who are operation in the state were inherited from the constitution and other act entrenched in the constitution, they include capital gain tax, consent fees, stamp duty, registration fees and ground rent charge (land use act), withholding tax and lastly land use charge law. Some of these laws, fees and charges will be discussed in brief in the following paragraph.

- Capital Gains Tax (CGT): It is the first tax paid when a property was purchased before the deed of assignment can be stamped to validate the transaction. Capital Gain Tax supposed to be a proportion of the gain or profit paid to the government as tax. It is a universal tax paid all over the world in line with income tax laws. However, in Lagos State 10% of the value or purchased price of the property will be paid to the state government.

- Stamp Duty: It is also a universal tax recognized all over the world just like the Capital Gain Tax (CGT). Stamp Duty is a payment for the stamping of the deeds of assignment or conveyance. In Lagos State, one is expected to part with 5% of the cost of the property to the state government. Comparing this percentage charged by Lagos State government with that of other states or even with rate charged all over the world, that of Lagos is outrageous. For instance, in United Kingdom the rate is just 1% of the cost of the property.
- Registration Fees: It is a fee payable everywhere in the world for entering the detail of deed of assignment or conveyance in a register of title. In most countries the fee is a very small amount and it is fixed. It has nothing to do with property in question. The logic is that the effort required in writing the detail of any property is the same and it does not reflect the value or the cost of the property.
- Consent Fees: Unlike registration fees, stamp duty and capital gain tax which derived their origin from the world tax, consent fees is applicable in Nigeria only. It derived its existence from the Land Use Decree (now land use Act) of 1978. According to section 21- 27 subsection 4 of land use act which provided that for any transaction on land on which a certificate of occupancy (COFO) had been granted to be valid, the consent of the Governor must first be obtained. For properties whose titles are over ten years the fees is 15% of the cost of the property while for properties whose titles are below 10years the fees is 20% of the cost of the property.
- Development Charge: It is a rate payable on all state lands which is meant to fund the provision of infrastructure within the estate. The rate varies from scheme to scheme. It is payable on government land especially in high brow areas like Lekki which payment started during the tenure of Rtd Brigadier Raji Rasaki when he was the military Governor of Lagos State. Initially it was just #179.00 per square meter but due to increase in the cost of provision of infrastructure it was increased to #12,500.00 per square meter. This rate also varies depending on the location and the infrastructure provided within the neighbourhood.
- Neighbourhood Improvement Charge (NIC): According to Neighbourhood Improvement Charge Law Improvement means “the provisions, in an area declared as improvement area, of one or more of anything of any quality permanently attached to the estate of developed or undeveloped property or the land resulting from the expenditure of capital or labour by the state government, to enhance the value of the said estate or developed or undeveloped property or land, or its utility or amenity thereof and it includes buildings, fencing, road, reclamation works, drainage and other infrastructural facilities similar to those provided by the state government in any of the state government estate or developed properties or land owned by any of its agent. This is a levy on owner of private estates for which State Government has provided infrastructure. It is backed by the Neighbourhood Improvement Charge Edict 1986 but its implementation started in 1989. It is calculated as the

land area multiplied by #2:00 and then by number of years beginning from 1989 or otherwise.

- Ground Rent Charge: it emanated from land rates law of 1984 which covers ground rent, premium and other incidental charges payable by the property owners to the government. This is a levy the state government on every land owned by the government. The rate varies according to areas and size of land. It is measured in square meters and rent is revisable at every five years. As with government owned land, ground rent is also collectible on any private land involving application for certificate of occupancy from the government. It is always charged once in this case. It is an annual due.
- Tenement Rate: It is also referred to as property rating. It is a universal tax paid all over the world in line with income tax laws. It started with British Poor Relieve Act of 1601 which was introduced to Nigeria in 1915 as assessment ordinance. It was amended in 1958 to become assessment Act Cap 15 laws of Nigeria and Lagos. The reform of 1976 brought in significant changes by not only introducing tenement rating all over the country but also set clearly the structure of administration of the local government authorities. With the reform Lagos State government enacted the Tenement Rate Edict in 1985. Therefore, tenement rate is a levy imposed on the occupier of all rateable hereditament within the jurisdiction of the rating authority. The amount payable is 10% of the rateable value.
- Land Use Charge: It was introduced in 2001 in order to harmonize the fragmented land related charges (ground rent, neighbourhood improvement charge and tenement rate) being collected by the state and local governments. After due consultation with all the chairmen of the local governments in the state in 2001, Lagos State Administration decided to utilize the collection machinery of the state to harness the land use charge revenue in order to enhance uniformity, efficiency in collection and convenience for its citizens. The amount collected is shared between the state and the local governments, sometimes between the local governments alone.

Assessment of Land Use Charge

To determine the annual amount of land use charge payable, the formulae to be used as designed by the Commissioner for Finance is:

LUC—MX (LA*LV) + (BA*BV*PCR)

Where:

LUC is annual amount of land use charge in Naira;

M is annual charge rate expressed as a percentage of the assessed value of the property

LA is the area of parcel of land in square meters

LV is the area value of a land parcel in the neighbourhood per square meters in naira

BA is the total developed floor area of building in the plot of land in square meters.

BV is the average value of medium quality buildings in the neighbourhood per square meters in naira.

PCR is the property code rate for the building and which accounts for the building being of higher or lower value than the average building in the neighbourhood and which also accounts for the degree of completion of construction.

Thus, the assessed value of the property is calculated using (LA*LV) + (BA*BV*PCR). However, the Commissioner for Finance in accordance with the provisions of section 5(2) of Land Use Charge Law sets the value of the annual Land Use Charge rates in the state for year 2004 applicable to eligible property as follows: Owner occupied residential property – 0.0375% per annum; Residential property- 0.125% per annum; Commercial property – 0.375% per annum and Industrial premises of manufacturing concerns – 0.125%

Shortcomings of The Land Use Charge

Just as the case of compensation under Land Use Act, the method of assessment of property under Land Use charge is another statutory valuation as the Commissioner for Finance is the one who sets the value of annual charge rate and property code rate thus making the tax payer not having or see in advance how much he is to pay. This is against the principle or certainty in taxation. The law consolidated taxes with different bases and principles, which result in higher taxes to the taxpayer. By the principle of taxation, you cannot base an annual tax on capital values rather it should be based on annual values. The uproar was as a result of high incidence of the tax on the premises concerned. A typical example is a property at 96, Awolowo Road, Ikoyi with an annual rental value of #800,000.00 while the land use tax demanded was #590,322.48. Before the introduction of Land Use Charge, annual sum payable to both the state and local government as ground rent and tenement rate was #97,029.00.

The Land use charge incorporates ground rent. Before its enactment, only allotees of state lands pay ground rent. Under the law everybody will now have to pay even on properties inherited. It brings together everybody into the tax bracket irrespective of the individual tax liability under the provision of tax law. Land Use Tax abolished the collection of tenement rates which is the constitutional duty of the local government.

The enumeration and assessment of the tax were carried out by unprofessional people against the provision of cap 111 laws of the Federation of Nigeria empowering Estate Surveyors and Valuers to carry out valuation of interests in lands in Nigeria. Geo-coding which serves as the basis of collection and administration left much to desire as it is fraught with many errors, omissions and addition. It neither shows the description of each property nor the capital value. With the use of GIS, all these shortcomings can be minimized.

2. Research Methodology

The map of GRA was obtained, digitised and exported into the GIS environment. The arc view 3.2a software was used, from which queries were carried out.

GIS software was used to demonstrate how property taxes can be administered from a database that contained all property types in GRA Ikeja. The database includes the facilities in each building, location, its rental value, and the property owner. Attribute data of the properties such as street name (parcel address), land use, ownership, building type, owner's occupation, gender, tenure, age and state of origin.

In addition to this, interview was conducted with some residents of GRA Ikeja, Lagos state.

The study covers a total of the 1705 building types in the GRA that were captured through the use of the aerial

map which was further digitised. The digitised map when inputed into the GIS software automatically numbered all the buildings and roads in the area. Various queries were generated and run basically through data base extraction in arc view 3.2a.

Digital Database of Buildings and Plots in GRA Ikeja.

GIS as a computer system is capable of capturing, storing, analysing, and displaying geographically referenced information; that is data identified according to location and the systematic process of data collection, classification, sorting, retrieving & dissemination.

Hence, a digital database was created for GRA, Ikeja for the different attributes based on the data normally required by clients that require properties. Imaginary attributes were entered as discussed earlier due to the sensitivity of the real data.

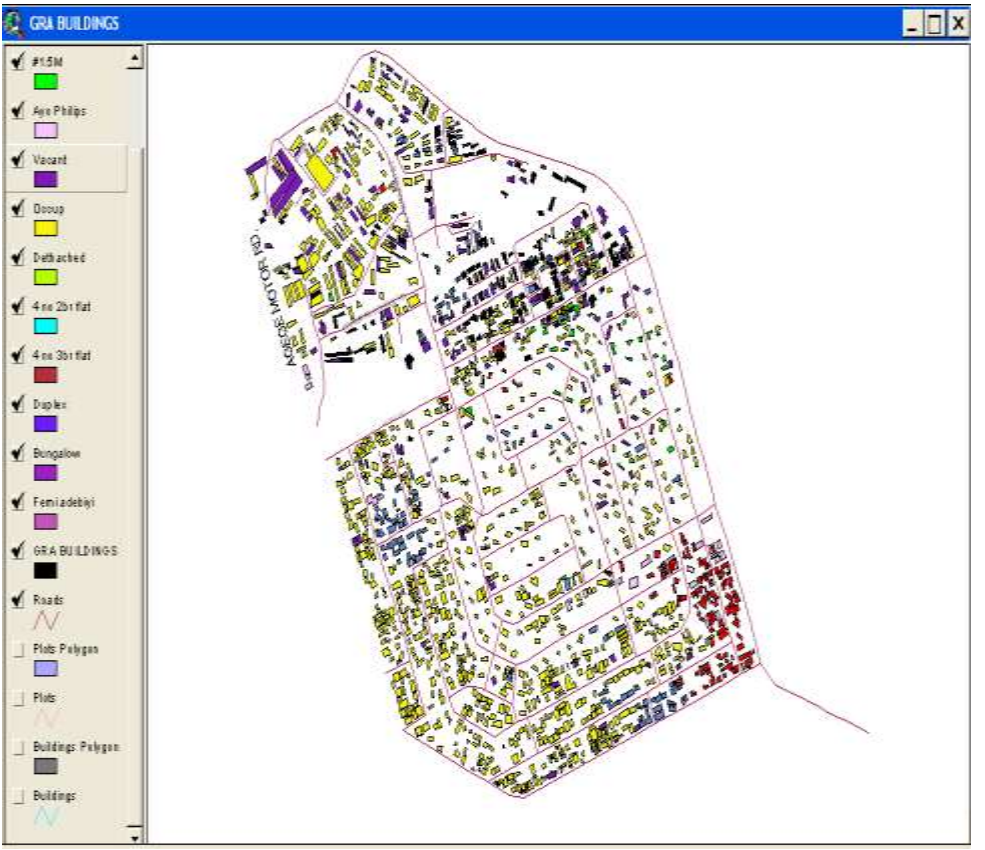
Spatial Search and Query

Various search for queries were conducted to satisfy the user's expectation(s). For example, show properties that are equal to #1.5 million. For each query performed the properties affected by the query operation are highlighted in different colours other than that of the imported polygon. Different queries have different colours and each query has same colours of polygon all through. Twelve queries were carried out and the map of GRA highlighting the attribute data is also included.

The queries are as follows:

- Select and show all buildings that have a rental value of #1.5m
- Select and show the layout of Ikeja GRA
- Select and show all properties that are vacant
- Select and show all 4 no 3BR flat
- Select and show all Ayo Philips Assets
- Select and show all buildings that have 3 toilets and 3 bathrooms
- Select and show all bungalows
- Select and show all duplexes
- Select and show all occupied properties
- Select and show all detached buildings
- Select and show all terrace buildings

The following graphical results (Map 1-13) show all the query results listed below.



Map of GRA highlighting the following features :

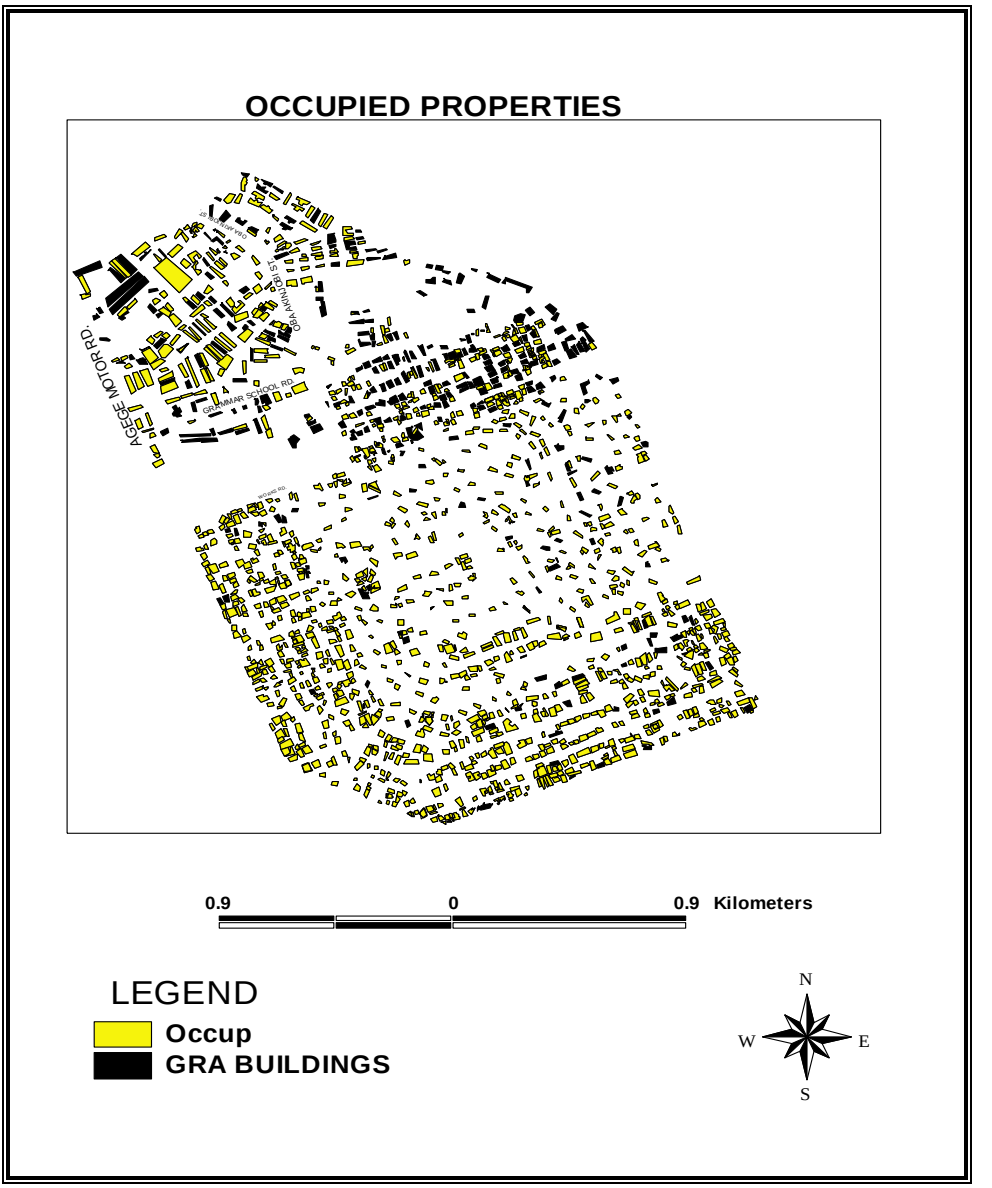
- Buildings with #1.5m rental value
- Ayo Philips assets
- All vacant properties
- All occupied properties
- Detached buildings
- The road network
- GRA buildings
- Femi Adebiyi's assets
- All bungalows
- All 4no 3br flat
- All 4no 2br flat

The pages overleaf show all these views.

MAP 2
Query 1: Select and show all buildings in GRA.
The map above shows at a glance all the various buildings in the GRA, the map also includes the roads in the GRA. There are 1,705 buildings in all.

MAP 3

Query: Select and show all properties of Ayo Philips. The GIS software enables the property the property manager to view at a glance all the assets of his client.

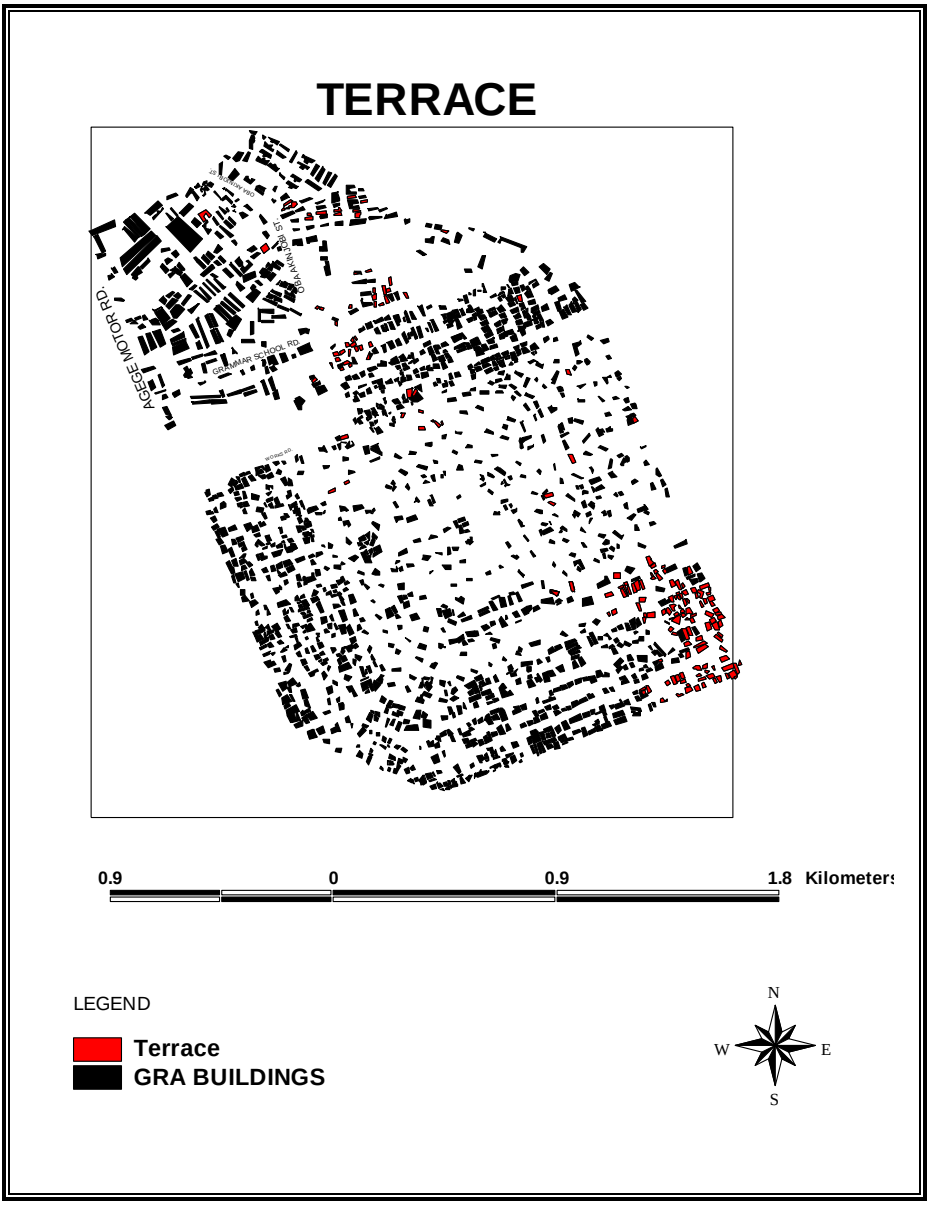


MAP 3

Query: select all buildings that are occupied.

In the estate manager's search for properties, he would not bother to check out the above properties in that they are already occupied. Hence the dark patches represent the vacant properties.

MAP 4
Query: select all buildings with a rental value of #1.5m
A client may come up with a request for any property that does not exceed #1.5m; this map displays all properties within that range.



MAP 6

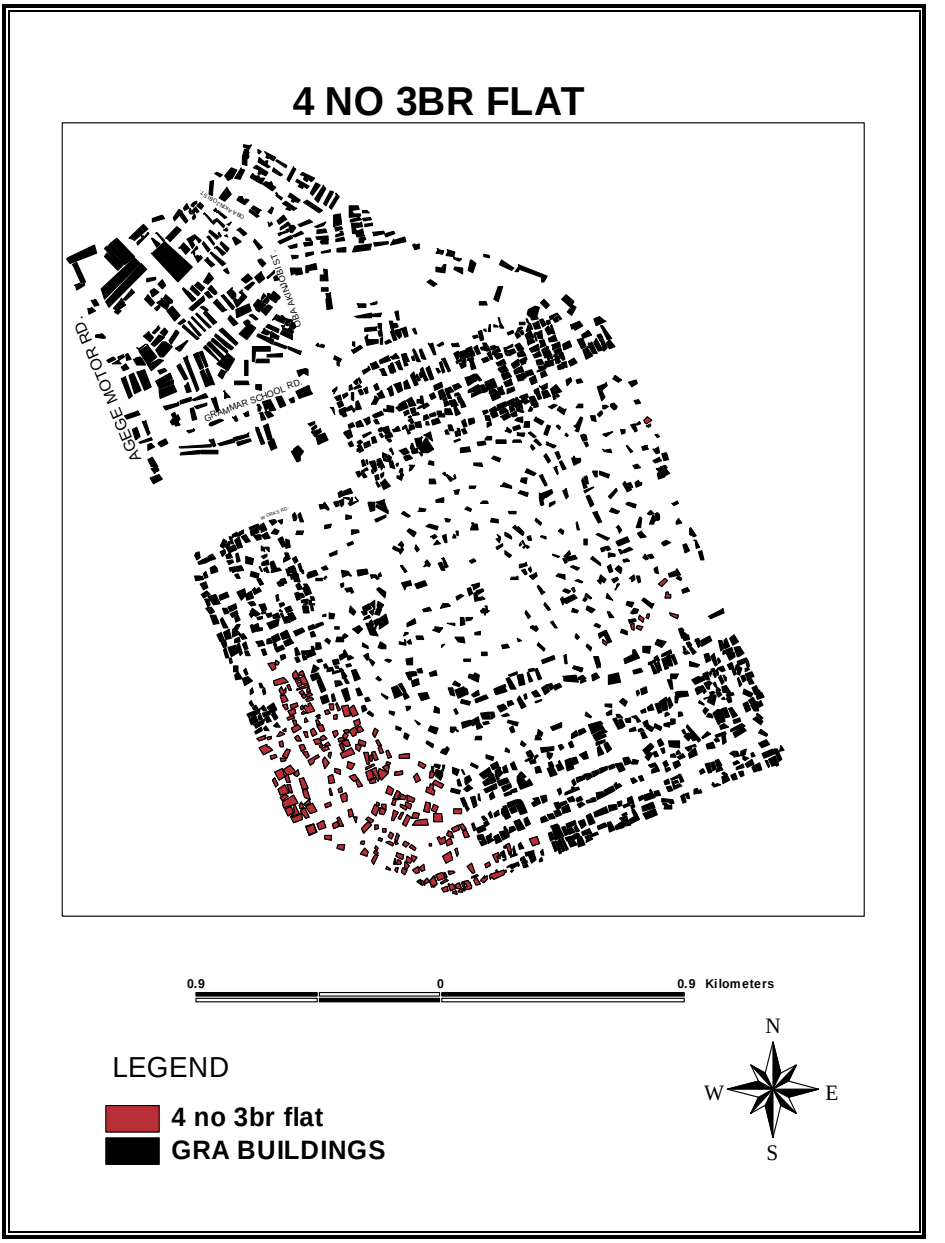
Query: select all buildings that are terrace

Often clients come with specific requests of the particular type of properties that they require i.e. terrace, the map above will direct the estate manager as to the point from which he may begin his search.

MAP 7

Query: select all detached buildings.

This is similar to map 6. Here the estate manager directs his search towards the buildings highlighted in green alone, then he goes ahead to check if any suits his client's requirement.



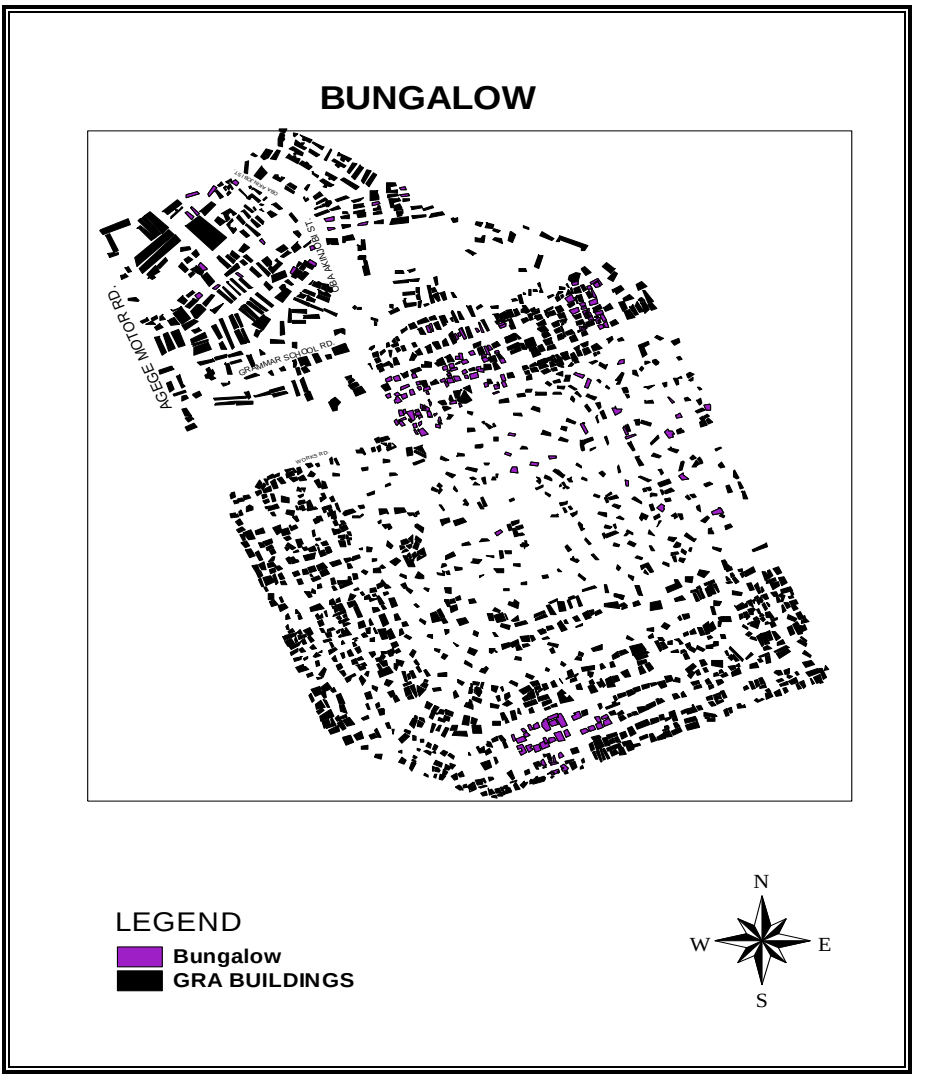
MAP 8

Query: select all 4 no 3br flat

A request for 4 no 3br flat will warrant this query and the above will be displayed. It can be observed that all the flats are located on the same part of the map.

MAP 9
Query: select and show all 4 no 2br flat
Unlike the other type of buildings the 2br flats are not located in the same area.

MAP 10
Query: select and show all duplexes



MAP11
Query: select all bungalows

3. Results and Discussion

The paper has shown the vital roles of using GIS in providing a computerized Geographic Information System in the management of a simple data within a system, which shall be used in the creation, storage, and retrieval, manipulation of spatial and non-spatial data.

The above was achieved by converting analogue format into digital format and the system of manual storage and retrieval was modernized through the:

(1) The identification of the present condition of the spatial and non-spatial conventional storage and retrieval system of all the entities and their factors (attributes).

(2) Establishment of spatial relationship between these entities by designing creating and developing database management system for the GIS so as to maintain information and make the information accessible when required using powerful relational database management system software.

4. Conclusion and Recommendation

Geographic Information system as a decision making tool is therefore inevitable in planning and management of the Environment and its natural resources for improving social and economic well-being of the people and the estate management profession.

In view of the above, therefore, there is the urgent need for the replacement of the present analogue system on the method of record keeping and search of properties with the modern method of Geographic Information System (GIS) which is a fast, accurate and secured way of land and property record keeping, retrieval and management towards a sustainable social and economic development.

A comprehensive Geographic Information system (GIS) for the Government Reservation Area, GRA-Ikeja Lagos State should be established so as to enable effective practice of agency and to enable better service delivery in estate management profession.

The internet has proven very popular as a vehicle for delivering GIS applications for several reasons. It is an established, widely used platform and accepted standard for interacting with information of many types. It also offers a relatively cost-effective way of linking together distributed users (for example, telecommunications and office workers, customers and suppliers, students and teachers. The interactive and exploratory nature of navigating linked information has been a great hit with users. The availability of multi content site gateways (portals) with powerful search engines has been a further reason for success.

The above states clearly that the internet is a very essential part of the GIS and it is recommended that government ministries and parastatals involve in tax administration should be connected to the internet to be able to navigate linked information.

The implementation of the GIS software in the management of Geographic Information system (GIS) has been demonstrated. The results of various analyses have also shown that the application of modern technology would go a long way in reducing the tedious and cumbersome manner of conventional system of cadastral records keeping by enhancing the speed, accuracy, reliability and developments in terms of search for properties for taxation purposes.

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Effects of Oil Operations on Epebu Community in Bayelsa State

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Abstract: Exploration and exploitation of oil and gas in the Niger Delta region of Nigeria has being quite heavy since oil was struck in commercial quantities in 1956. These operations have dire consequences on the environment and have greatly impacted the lives of the people in the region; even though crude oil is a resource and ought to be a source of wealth to any given society. The impact of oil activities in the region has become a major issue of concern to all which have evoked the research of their impact on health, the environment, agriculture and the lives of the people generally. Therefore this paper looks into Epebu community and how the operations of the oil company impacted the environment and the lives of the inhabitants generally. While secondary data was used for literature, 95% of the questionnaire administered on the respondents was retrieved. The study revealed that contamination of fresh and ground water (RII = 5.51), internal and external conflicts (RII = 4.77), reduced economic activities (RII = 4.58) and destruction of trees forest (RII = 4.28) are the major effects that oil operations impacted on the community. The principal component analysis conducted also corroborated this as it showed that these four components accounted for 69.19% of the effects on the community. Therefore, the study recommended that the Nigerian Agip Oil Company (NAOC) manage their operations and relationship with the community in a sensitive and professional manner to avoid conflicts and losses as this will result in the reduction of the negative effects oil operations in Epebu Community.

Keywords: Bayelsa State, Epebu Community, Niger Delta, Nigeria, Oil operations

1.0 Introduction

Prior to the discovery of crude oil, the agricultural sector was the main stay of the Nigerian economy; the income earning exports were cocoa (Southwest) groundnuts, cotton, and hisdes/skin (North) and palm oil (Southeast). It accounted for 95% of the foreign exchange earnings, generated over 60% of her employment capacity and approximately 56% of her gross domestic earnings (Salako, Sholeye and Ayankoya 2012; World Bank, 2013). However, since the production and exportation of petroleum began in 1958, activities in the agricultural sector and other industries gradually took a down turn affecting the nation's economy both positively and negatively. Report has it that the proceeds from oil production accounts for 95% of Nigeria's export earnings and over 80% of her revenue which is spent to drive the economy (Nweze and Edame 2016). According to Sagay (2001), oil has been vital in financing the country's economic growth and development in the last 30 years and as a matter of fact government activities will grind to a halt, if money from oil proceeds is not available. In affirmation Ugoh and Ukpere (2010) posit that Nigeria has benefited enormously from oil, both the federal and the state governments are basically dependent on oil resources from the Niger Delta. This degree of dependency indicates the huge resource flow from the region and the high level of operations in the oil industry with resultant negative effects on the people and the environment. The argument from various quarters is that the huge revenue generated by the Niger Delta region does not commensurate with its human and infrastructural development; rather it is plagued with environmental degradation, health, problems, conflicts and poverty (Balouga, 2009; Tuodolo, 2009; Ugoh and Ukpere, 2010; Jike, 2010; Kadafa, 2012; Kaur, 2013; Nwakwo, 2015).

Nigeria is the most populous black nation in Africa and having such a large population with attendant needs that require satisfaction from the petroleum proceeds; it becomes pertinent for the development, well being as well as the environmental and economic sustainability of the region generating this resource to be prioritized (Balouga, 2009). On the contrary, literature has shown a total neglect of the region by the government and multinational oil companies; hence, instead of the petroleum resource to be a blessing it is termed a curse to the host communities of the multinational companies in the region (Saliu, Luqman and Abdullahi 2007; Oviasuyi and Uwadiae 2010; Aminu 2013).

Well documented in literature are the negative effects of oil exploration activities on the people of the Niger Delta region which includes violence, environmental degradation and destruction of the flora and fauna, not forgetting the health problems. According to Nweze and Edame (2016), oil exploration causes a range of environmental problems which includes contamination of both surface and ground water, contamination of soil by oil spills and leaks, increased deforestation as well as the economic loss and environmental degradation stemming from gas flaring. But perhaps there are other issues both positive and negative caused by oil and gas operations which are peculiar to the people of Epebu community which are yet to be discovered; thus this study attempts to identify the effects of the operations of oil and gas activities on these people. The question is, are there any significant changes positive or

negative caused by the activities of the oil and gas multinational company (NAOC) to this community and the indigenes in general? Is the presence of the oil company a blessing or a curse to these rural dwellers?

2.0 Study Area

Epebu is a community in Ogbia Local Government Area of Bayelsa State. The 47 towns and villages in Ogbia kingdom speak the same language with the same culture and way of life. The main occupations of these people are fishing, farming, palm oil milling, trading, timber lumbering, palm wine tapping, brewing of local gin, weaving and carving (Jim-Ogbolo 2011). The area is blessed with crude oil and agricultural produce such as sugar cane, cassava, mango, banana, plantain and cocoyam. Apart from these resources, there are abundant timber trees, raffia palm and Indian bamboo. Epebu is a community in Ogbia Local Government Area and shares the same social and economic life as other Ogbia communities. It is located at the extreme of the Ikoli River and can only be accessed by boats since there is no access road. It is bordered on its right by Emadike, left by Okodi, adjacent to it is Ewama and on the far rear are Okigbene and other Ijaw communities of Southern Ijaw Local Government Area. Oil operations in Epebu dated back to 1964 when the first oil well was drilled at Amanobhi Bush called Obama 1, though it was a dry well. In 1995 the second oil well referred to as Prigbene A was drilled at Asaraba Creek and in 1998 the controversial Prigbene B was drilled at Igoniebi Bush. Both Prigbene A and B are connected to Obama Flow Station located at Okoroma/Tereke in Nembe Local Government Area of Bayelsa State. The residents of Epebu co-existed peacefully with neighboring towns for years until NAOC, the only oil company operating within the community, discovered oil at Igoniebi bush. This led to disagreements between Epebu, Emadike, Okodi and Okigbene over the ownership of the piece of land in question. Eventually the crisis climaxed between Epebu, Emadike and Okigbene leading to the death of several people and the total destruction of Emadike community. However, the aim of this study is to examine the effects of oil operations and the impact made on Epebu community and its inhabitants.

3.0 An Overview of Oil Operations in the Niger Delta

Crude oil exploration in Nigeria dated back to 1908 with the discovery of deposits at Araromi area in Ondo State. Later in 1956, Shell D'Arcy now Shell Petroleum Development Company (SPDC) of Nigeria discovered oil in Oloibiri in the present day Bayelsa State and commercial production commenced in 1958. By 1961 a host of other multinational oil companies have made their way into the Niger Delta region of Nigeria carrying out oil operations both on-shore and off-shore. Presently, the operations of the oil industry are quite visible in the region with a high network of pipelines, oil wells and flow stations spanning a vast expanse of land and wetlands. SPDC alone operates over 31,000 square kilometers. Other Multi-National Oil Companies (MNOCs) include Mobil, Chevron, Texaco, Elf, NAOC, Pan Ocean and some Nigerian indigenous companies like Dubril, Summit and Consolidated Oil. (Sagay 2001; Ohwofasa , Anuya and Aiyedogbon, 2012; Kaur, 2013; Akujuru, 2014).

Sagay (2001) identified oil operations to include onshore seismic prospecting, onshore drilling, oil production and gas processing. He opined that all these phases of petroleum exploration and production have grave environmental effect that retard and stunt the growth of flora and fauna and other renewable resources. The ground water is equally polluted due to spills from storage tanks, pipelines, and abandoned wells. Bearing same opinion Saliu et al (2007) and Akujuru (2014) opined that all stages of oil related activities from exploration and drilling to transportation result in the destruction of the natural environment and the livelihood of the local inhabitants who depend on the land and creeks of the Delta for their survival. On the other hand, Jike (2010) opined that the seismic explosions and vibrations in the course of oil explorations create ample stress for existing structures in the built environment. In summary, Nweze and Edame (2016) stated that the petroleum industry covers the exploration and production of crude oil as well as petroleum refining, marketing and all of which impact on the environment and the people of the Niger Delta region immensely.

Nigeria is the largest petroleum producer in Africa and the seventh largest producer of sweet crude oil among OPEC member countries (Ugoh and Ukpere, 2012). Its benefits to the country cannot be over emphasized since its derivatives dominate the Nigerian economy making up about 98 percent of exports, over 80 percent of government's annual revenue and 70 percent of budgetary expenditure (Ohwofasa et al. 2012). Balouga (2009) asserted that oil production is central to the development of Nigeria and constitutes the backbone of the economy and in fact it provides the only immediate hope for the development of the rest of the economy. With such revenue generated for the nation, it is imperative that the development of the region and its people be put into consideration by all stakeholders. In fact, the well-being of the inhabitants should have being improved after several decades of minting money. However, in terms of costs and benefits, majority of the local people bear all the environmental costs but receive no economic benefits (Sagay 2001). The experience in the region has being massive poverty, illiteracy, unemployment, poor infrastructural development, epileptic or non-existent utilities, lack of roads and potable water. Oil and gas production has caused farming and fishing outputs to be on the decline, due to widespread pollution. Environmental challenges include coastal erosion and rising sea level, which has led to large portions of the landmass being eroded, acid rain resulting from gas flaring which damages roofs and causes respiratory and other medical problems. Meanwhile, the primary beneficiaries of the oil operations are the oil companies, the highly paid technical and managerial staff and the plethora of corrupt officials, politicians and military personnel (Sagay, 2001, Balouga, 2009, Tuodolo, 2009; Jike, 2010, Ugoh and Ukpere, 2012; Kaur 2013). On the contrary Tuodulo (2009), Adams (2014), Okolie- Osemene (2015) and Nwankwo (2015), were of the view that, the oil companies, Shell in particular have largely contributed to the development of the Nigerian economy and that of the host communities in the Niger Delta with regards to social responsibility. According to the various authors (op.

cit) Shell's participation in community development activities include educational programmes by awarding scholarships for primary and secondary schools to university education, skills development programmes, the construction of water pipelines, access roads, the presentation of farming equipment to farmers and training them in its usage, and the provision of electricity within oil producing communities. However, Saliu et al. (2007); Tuodolo (2009); Oviasuyi and Uwadiae (2010) and Aminu (2013) are of the view that these contributions are minimal and insignificant when compared with the level of damage done to the environment and the host communities.

One trademark of the oil industry in the region is violence and protests due to the formula for sharing the revenue from mineral resources which gradually reduced and virtually disappeared from 50% of all proceeds of mineral resources allocated to producing states in the sixties (1960-1969) to one and half percent by 1992. The relevant laws and statutes that expropriated land from the owners vesting all mineral resources in the federal government even made matters worse (Sagay, 2001; Salako et al., 2012). These issues led to peaceful protests initially which later turned violent with bombings of pipelines and flow stations, kidnappings and oil theft. All of these activities and incidents resulted in loss of lives, facilities, resources and revenue of the government, MNOCs and the host communities.

Well documented in literature are the effects of gas flaring and oil spillage. As stated by Takon (2014), the consequences of gas flaring are enormous; so a deadline was set for 1985 to end flaring which was extended to 2004 but that was not feasible hence, it was further postponed to 2008. But obviously, gas flaring is still ongoing in the region with its negative effects on humans and the ecosystem; however, the 2015 report of the Department Petroleum Resources (DPR) shows amounts paid as fine by gas flaring defaulters. The question then is, does the money benefit those who suffer the consequences of the gas flaring directly? Quite enormous are the effects of the operations of oil companies in the Niger Delta region but few are discussed in the next section.

3.1 Effects of Oil Operations

Several problems can be associated with the disturbance caused by oil and gas exploration and their related activities such as site clearance, road construction, Right of Way for pipelines, and other land modifications necessary for the drilling of exploration and production wells and also the construction of production facilities. In the USA, Yousif and Nancy (2005) asserted that exploration for and productions of petroleum have caused local detrimental impacts to soils, surface and ground waters, and the ecosystem in the 36 producing states. While Delt and Igben (2012) averred that the increased operations of petroleum exploitation like seismic surveys, land acquisitions, drilling, transportation, storage, waste dumping and associated oil spillages have increased the degradation of the physical environment and resulted in the deprivation and destruction of economic livelihoods of the people in the Niger Delta region. The entire region is laden with a network of pipelines, oil wells and flow stations indicative of the huge oil and gas operations which impact on the

environment and the people negatively. The pipelines and other means of transporting crude oil and petroleum often lead to oil spillage contaminating land and water. Takon (2014) asserted that oil spillage, gas flaring and blowouts which are by-products of oil operations in Niger Delta releases crude oil, chemical wastes and toxic substances which are sometimes caused by equipment failure, operation mishaps, human error or deliberate destruction of facilities arising from criminal activity into the atmosphere. Bearing similar opinion is Atubi (2015) who asserted that oil operations involve the release of hydrocarbons and other noxious materials into the atmosphere, gas combustion with the generation of intense heat and flares and the disposal of industrial wastes; these may affect the fertility of the inhabitants in such a manner that fecundity may fall and the birth of abnormal babies may increase. Thus, the effects of the operations of the oil industry on the host communities and their environment are discussed in the succeeding sub-section.

3.1.1 Effects on Health

Oil operations are known to have deleterious effects on human health especially gas flaring and oil spillage which contaminates the air, land and water. Most communities in the Niger Delta region do not have access to portable water but depend on water from the rivers and rain water for sustenance. The hydrocarbons released into the environment and gases such as CO and CO2 have negative effect on human health. Skin contact with certain chromium compounds can cause skin ulcers and ingesting large amounts of it can cause stomach upset and ulcers, kidney and liver damage and even death (Egbe and Thompson, 2010). Generally, the environmental pollution caused by oil operations can cause health problems like respiratory problems, increased blood pressures, heart rhythm changes, stomach irritation, muscle weakness, changes in nerve reflexes, swelling of brains and liver, lungs diseases and cancer, kidney and heart damage, diarrhea, asthma, eye infections, bronchitis, skin infection, headaches, dizziness, nausea, vomiting, eye and throat irritations, as well as breathing difficulties (Oseji, 2011; Salako et al., 2012 and Atubi, 2015).

3.1.2 Effects on Mangrove and Aquatic Life

The UNEP 2011 report on Ogoniland revealed that oil pollution in many intertidal creeks has left mangroves denuded of leaves and stems, leaving roots coated in a bitumen-like substance sometimes 1 cm or more thick. The report explained that mangroves are spawning areas for fish and nurseries for juvenile fish and that the extensive pollution of these areas is impacting the fish life-cycle negatively. Hence, fishes tend to leave polluted areas in search of cleaner water, and fishermen must therefore also move to less contaminated areas in search of fish. This situation which is a usual occurrence in most host communities of MNOCs definitely makes life more difficult for the rural dwellers. A similar situation is found among fishing communities in Angola which rely almost exclusively on fishing as a source of livelihood (Baumuller, Donnelly, Vines and Weimer 2011). They asserted that the whole of the sea space around Cabinda province in Angola is negatively affected by oil production. The fishermen complain that the bay of Cabinda no longer yields fish and they have to travel farther in order to succeed in their expedition

which is obviously uneconomical. According to Egbe (2012), statistics has shown that the majority of oil spills incidents between 1976 and 1980 occurred in the mangrove swamp zones and the offshore areas of the Niger-Delta, which constitute the most productive biological areas. Within six months, mangrove vegetations die while the adverse effect on crabs, molluscs and periwinkles is almost immediate. Meanwhile, the mangrove forest not only provides shelter, nutrients and nursery for some species of aquatic animals but also acts as a filter for major towns in Niger Delta; it serves as a buffer from storms, which reduces damage to property and loss of life in the communities (Takon, 2014). Explaining further, he stated that the forest is also a repository of unorthodox medicines, source of fire wood and charcoal, timber for industry, and construction materials for riverine communities.

3.1.3 Effects on Soil Fertility and Agriculture

The Niger delta is a region with a massive rural population and one of their principal activities and means of lively is agriculture; a source of employment and income to rural dwellers. But the oil and gas operations in the region have become a major threat to this means of sustenance. Egbe and Thompson (2010) asserted that oil spills have degraded most agricultural lands of host communities and have turned hitherto productive areas into wastelands because of increased soil infertility due to the destruction of soil micro organisms. Oil spill hampers proper soil aeration as oil film on the soil surface acts as a physical barrier between air and the soil. Egbe (2012) was of the view that the government places too much importance on the oil industry to the detriment of agriculture. He asserted that the overbearing dependence on crude and petroleum is a harbinger to hunger, starvation and unemployment since crude/petroleum is not only an exhaustible resource but beyond the exploitation capabilities of rural dwellers. Ubani and Onyejekwe (2013) and Digha (2015) examined the moisture content and bacteria count of the soil with a view to ascertaining the effect of gas flaring on the fertility of the soil. Their results showed that the soil closer to the flare site has the lowest moisture content and bacteria count but increased with distance away from the flare site. This means gas flaring inhibits the thriving of indigenous bacteria species in the soil thereby reducing its fertility.

The studies of Oseji (2011), Ozabor and Obisesan (2015) and Olisemauche and Avwerosuoghene (2015) indicated that gas flaring has led to a general increase in temperature of the environment and the effects of the flaring include acid rain, air pollution, temperature rise and deforestation and reduction in agricultural produce. Some of the effects on crops include the stunted growth and red leaves observed in the cassava, plantain, palm trees, yam and other crops. The consequence is migration of the inhabitants of such areas who are mostly farmers to other towns whose environment is friendly for farming activities.

3.1.4 Effects on Fresh Water and Groundwater

Most communities in the Niger Delta region are surrounded by rivers, creeks and ponds from which they fish, bath and consume. The pollution of these sources of water by oil operations results in dire consequences for

inhabitants. Contamination affects both fresh and underground water. For example, if rivers, streams and wells that provide water are contaminated, the people in the area will not only find it difficult to access portable water but the fishes and other water bodies will also be destroyed. The report of the UNEP (2011) indicated that water taken from wells in communities adjacent to contaminated sites in Ogoniland contained hydrocarbons 1,000 times higher than the Nigerian drinking water standard of 3µg/l. Meanwhile, these local communities continue to use the water for drinking, bathing, washing and cooking as they have no alternatives despite being aware of the pollution and its dangers. Egbe (2012) averred that oil pollution on the water surface could prevent natural aeration and lead to the death of trapped marine organism. In some cases, fish may ingest the spilled oil or other contaminated food materials with oil and die or even become inedible for humans.

3.1.5 Effects on Economic Activities

The rural dwellers in the oil rich zone mainly engage in fishing and farming for sustenance and also for trading but threats to this source manifests in the depletion of aquatic lives, reduction and abandonment of farm lands and loss of biodiversity resulting from over exploitation of existing resources and the resultant pollution. Fishing and farming produce have reduced drastically as oil and gas operations in the region gained ascendancy (Egbe, 2012). Thus, most rural dwellers seek alternative means of survival and migrate to better locations and urban centres leading to the dissertation of most rural communities.

Akujuru (2014) asserted that the impact of oil operations on economic activities includes:

1. Loss of arable land, vegetation and forest resources.
2. Increase in land and water transportation with attendant consequences like aggravation of shore erosion, disturbances between life and fishing activities.
3. Improper disposal of dredge spoils along water ways, channels causing blockades to bush paths and waterways used for access to farmlands, fishing parts and timber logging areas.
4. Oil pollution which pollutes drinking water sources destroys fisheries and farms and generally destroys the ecosystem.

3.1.6 Effects on Peace and Stability

A major aftermath of oil activities in host communities is inter-communal and intra-communal conflicts which often leaves the people worse off. Watts, Ike and Dimieari (2004) explained that intra-community and inter-community conflicts may operate simultaneously, and one may spill over into, or be generative of, the other. They examined the relations between resources, firms, states and communities and the circumstances under which the oil-producing communities become sites of extreme conflict and violence. Hence, assessed the conflicts between Ogoni/Eleme/Okrika in Rivers State; Warri in Delta State, Epebu/Emadike in Bayelsa State amongst others. While, Dimieari (2005) gave a vivid account of the conflicts that rocked Nembe kingdom for many years because of proceeds from oil operations. He asserted that in the coastal area of Bayelsa State all the communities are

involved in at least two unrelated conflicts, over territorial claims of oil rich land, or as in the case of the conflict between Akassa and Egweama, on mere suspicion that the land may be rich in oil. Most conflicts result in loss of lives and properties; for example, the conflict in Pereamabiri claimed more than sixty lives and was the result of a faction seeking access to SPDC. When crisis and conflicts persist in such areas it hinders the growth and development of the area and its people, hence people begin to wonder if the resource is a blessing or a curse. Consequently, instead of the development and general improvement in the well being of the people; poverty, illiteracy, hunger and the desertation of such areas becomes the order of the day.

3.2 Oil Activities in Bayelsa State

Although, Bayelsa State is one of the highest oil producers in the Niger Delta, there is paucity of research on the activities of MNOCs in Bayelsa State. Ereibi (2011) is of the opinion that considering the level of damage done to the environment by oil operatives, host communities ought to have been developed but that is not the case; citing that the proceeds of the first oil well of Oloibiri and others were not used to develop the communities infrastructurally and otherwise. He argued that MNOCs were expected to manage exploitation activities responsibly, sensitively and effectively in such a way that biodiversity, ecosystem, fauna, the soil system and the atmosphere were preserved, productive, stable, healthy and safe for human livelihood. That this would have prevented the region, especially the host communities from becoming a breeding ground for crime, youth restiveness, repression/violence, disarticulated and divided communities, deaths, prostitution, heightened health hazards/illness and the destruction of facilities.

Efere (2014) identified these as the negative impact of oil exploration in Bayelsa State:

1. Crop productivity: prevention of crops from germinating, reduced cultivated plots, low yield of crops, infertile land and a reduced percentage of people involved in farming.
2. Livestock: difficulty in providing suitable drinking water for livestock, loss of local breed and deterioration of animal health, displacement of livestock from their habitat, scarcity of suitable grasses and shrubs for animals and loss of local breed.
3. Forest: retarded growth of valuable forest trees, extinction of some valuable species of trees, difficulty in harvesting mature forest trees because of lack of access roads and poor regeneration of cut trees.
4. Aquatic habitat: constraint to aquatic production, reduction of aquatic population, difficulty in rearing aquatic animals in ponds, destruction of fish eggs and the loss of financial resources from aquatic culture.
5. Agriculture: agricultural activities declined seriously over the past two decades which in turn affects the standard of living of farmers.

4.0 Methodology

The research was conducted using primary and secondary data. The secondary data was obtained from relevant scholarly articles and were used for literature, while the primary data was obtained from administered questionnaires and interviews. Questionnaires were administered to 60 respondents which were selected on the

basis of one person per household. There are 220 houses in Epebu which were numbered serially and stratified approach was used in selecting the 60 houses starting with the 4th house. A total of 57 questionnaires (representing 95%) were retrieved and used for analysis in this study. Before administering the questionnaire, it was subjected to criticism by colleagues both in the academia and in practice while all their comments were taken into consideration with necessary corrections made. The statistical tools used for data analysis include the frequency distribution and percentages. Frequency distribution and percentage tables were used to order the data collected so as to show the various groupings of the respondents and also the range and the percentage of observations falling within each groupings. Relative importance index (RII) was also used to identify the mean and ranking of each variable after applying Liker Scale of 1 – 5 indicating the level of importance of each variable. This was done in order to identify the most important effects that oil operations have on the community. Finally, a further test was conducted using principal component analysis (PCA) to identify the various components (variables) that the respondents identify to be of great importance and hence, require further treatment.

5.0 Data Presentation and Analysis

The data collected were collated and analysed as shown in Tables 1 – 5.

Table 1: Effects of Oil Operations on Epebu Community

Statements (Variables)	1	2	3	4	5	Total	RII	Ranking
Contamination of Fresh water and Ground Water	1(1)	2(4)	12(36)	21(84)	21(105)	314/57	5.51	1st
Internal and External Conflicts	0(0)	0(0)	2(6)	9(36)	46(230)	272/57	4.77	2nd
Reduced Economic Activities	0(0)	0(0)	1(3)	22(88)	34(170)	261/57	4.58	3rd
Destruction of Trees and Forest	0(0)	4(8)	5(15)	23(96)	25(125)	244/57	4.28	4th
Affects Crops Negatively	0(0)	5(10)	5(15)	21(84)	26(130)	239/57	4.19	5th
Reduced Agricultural Produce	1(1)	1(2)	8(24)	24(96)	23(115)	238/57	4.18	6th
Destroy fishes and other water bodies	1(1)	2(4)	8(24)	22(88)	24(120)	237/57	4.16	7th
Destruction of Ponds and Fishing Waters	1(1)	2(4)	9(27)	22(88)	23(115)	235/57	4.12	8th
Negative impact on soil fertility	1(1)	2(4)	11(33)	20(80)	23(115)	233/57	4.09	9th
Destruction of Fishing Gears and Boat	3(3)	5(10)	6(18)	26(104)	17(85)	220/57	3.86	10th
Disrupted Peace and Stability	4(4)	6(12)	13(39)	8(32)	26(130)	217/57	3.81	11th
Reduced size of farm land	1(1)	8(16)	10(30)	20(80)	18(90)	217/57	3.81	11th

Table 1 reveals the effects of oil operations on Epebu Community. The Table shows that contamination of fresh and ground water was ranked as number one effect with RII of 5.51. This was followed by internal and external conflicts, RII of 4.77 coming second in order of ranking. Reduced economic activities and destruction of trees and forest having RII of 4.58 and 4.28 respectively were ranked third and fourth. With RII above 3, it could be concluded that all the variables identified constituted the effects of oil operations in Epebu Community. It could be deduced that contamination of freshwater and groundwater ranked first because any spillage in the community renders both freshwater and groundwater unusable to the people

which will in turn affect their health and also trap the marine organism (see UNEP, 2011; Baumuller et al. 2011 and Egbe, 2012). Communal crises are common occurrences in the study area with a view to establishing ownership of oil producing land. This has resulted into loss of able bodied lives including properties, hence internal and external conflicts came second. This supports the views of Watts et al. 2004 and Dimieari, 2005 that the oil-producing communities become sites of extreme conflict and violence over territorial claims of oil rich land. Oil spillage has greatly affected the source of livelihood of the people of Epebu Community. It has resulted into the destruction of trees and forest which in turn has caused untold damages to economic activities, agricultural production and destruction of ponds/fishing waters hence killing of fishes. It could therefore be concluded that oil operations in Epebu Community has resulted into a lot of damages to the Community.

Table 2: Communalities

Components/Variables	Initial	Extraction
Reduced size of farm land	1.000	.649
Negative impact on soil fertility	1.000	.803
Reduced Agricultural Produce	1.000	.602
Destruction of Trees and Forest	1.000	.575
Affects Crops Negatively	1.000	.614
Destruction of Ponds and Fishing Waters	1.000	.703
Destroy fishes and other water bodies	1.000	.663
Contamination of Fresh water and Ground Water	1.000	.721
Destruction of Fishing Gears and Boat	1.000	.632
Internal and External Conflicts	1.000	.805
Disrupted Peace and Stability	1.000	.710
Reduced Economic Activities	1.000	.826

Extraction Method: Principal Component Analysis.

Table 2 contains the communalities which shows the how much of the variance (communality value) should be considered for further analysis. It is the mathematical sum of all the squared factor loadings for each variable. It is the rule that any factor loading above 0.5 should be selected for further treatment hence, since all the factor loadings are greater than 0.5, all the variables were selected for further examinations.

Table 3: Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	**Total**	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**
1	4.312	35.935	35.935	4.312	35.935	35.935
2	1.640	13.667	49.602	1.640	13.667	49.602
3	1.269	10.576	60.177	1.269	10.576	60.177
4	1.082	9.017	69.194	1.082	9.017	69.194
5	.907	7.559	76.753			
6	.690	5.746	82.500			
7	.545	4.540	87.039			
8	.478	3.985	91.025			
9	.400	3.335	94.359			
10	.340	2.834	97.193			
11	.186	1.552	98.745			
12	.151	1.255	100.000			

Extraction Method: Principal Component Analysis

The total variance explained is as depicted in Table 3. All components with eigenvalues greater than 1 were extracted and this shows that the first four components with eigenvalues of more than one were extracted. They are the underlying factors (components) that really affected the people of Epebu Community. It is evident from Table 3 that the four components, together, accounted for 69.19% of the effects of oil productions in Epebu Community while the contribution of the remaining eight components could be subsumed in the first four components. It could therefore be concluded that with the four components, it is possible to predict 69.19% of the activities of oil companies in Epebu Community.

Table 4: Component Correlation Matrix

	Component			
Component	**1**	**2**	**3**	**4**
Reduced size of farm land	.597	.501	-.119	.166
Negative impact on soil fertility	.669	.508	-.007	-.313
Reduced Agricultural Produce	.580	.393	-.235	-.237
Destruction of Trees and Forest	.653	-.073	-.098	.365
Affects Crops Negatively	.763	-.046	.020	.172
Destruction of Ponds and Fishing Waters	.755	-.358	-.027	-.061
Destroy fishes and other water bodies	.728	-.328	-.159	-.020
Contamination of Fresh water and Ground Water	.743	-.152	.382	.001

Destruction of Fishing Gears and Boat	.684	-.392	.093	.036
Internal and External Conflicts	-.066	-.054	.848	.281
Disrupted Peace and Stability	.196	.579	.516	-.264
Reduced Economic Activities	-.022	.467	-.152	.764

Extraction Method: Principal Component Analysis.

a. 4 components extracted.

Table 4 shows the rotated component matrix of the four components that accounted for 69.19% of the total variability in the original twelve variables. Variables greater than 0.5 were considered ideal for the study since loadings equal to 0.5 were considered average while loadings below 0.5 were considered less important. With this, the first component, contamination of freshwater and groundwater is most highly correlated with negative effects on crops (0.763) as well as destruction of ponds and fishing waters however, it is less correlated with internal and external conflicts (-0.066). The second component (internal and external conflicts) is most highly correlated with disputed peace and stability (0.579). The third component (reduced economic activities) is most highly correlated with internal and external conflicts (0.848). Finally, the fourth component (destruction of trees and forest) is mostly correlated with reduced economic activities. It is evident from Table 4 that the correlations between the four components are strong.

Table 5: Benefits of Oil Operations to Epebu Community

Statements (Variables)	**1**	**2**	**3**	**4**	**5**	**Total**	**RII**	**Ranking**
Awarding Scholarship to Indigenes	0(0)	1(2)	3(9)	18(72)	35(175)	258/57	4.53	1st
Construction of Roads	1(1)	1(2)	0(0)	23(92)	32(160)	255/57	4.47	2nd
Involved in Community Projects	1(1)	0(0)	2(6)	26(104)	28(140)	251/57	4.40	3rd
Provision of Electricity	2(2)	2(4)	5(15)	26(104)	22(110)	235/57	4.12	4th
Improved Educational Facilities	3(3)	3(6)	5(15)	26(104)	20(100)	228/57	4.00	5th
Improved Health Care Facilities and Services	3(3)	5(10)	9(27)	17(68)	23(115)	223/57	3.91	6th
Housing Development	13(13)	0(0)	4(12)	22(88)	18(90)	203/57	3.56	7th
Provision of Portable Water	5(5)	6(12)	9(27)	28(112)	9(45)	201/57	3.53	8th
Improve Standard of Living of Resident	8(8)	5(10)	6(18)	29(116)	9(45)	197/57	3.46	9th
Improve Living Standard of Indigenes	7(7)	7(14)	10(30)	22(88)	11(55)	194/57	3.40	10th

The various benefits that have accrued to Epebu Community as a result of oil operations are listed in Table 5. The table shows that award of scholarship ranked highest (RII = 4.53). Construction of roads within the community was ranked second (RII = 4.47). The third ranking variable is the involvement of NAOC in community development projects (RII = 4.40) while provision of electricity ranks fourth with RII of 4.12. With all the variables having RII above 3, it is could be concluded that the community actually benefited for the activities of the oil company operations. However, it remains to be seen how these benefits

commensurate with sufferings of the community.

4.0 Conclusion and Recommendations

The study examined the effects of oil operations in Epebu Community. It has shown that oil operations have negative effects on the environment and the lives of host communities. With regards to the study area, the worse impact is the contamination of water, reduction in economic activities and conflicts that rocked the community (inter communal and intra-communal crisis). Irrespective of the huge efforts made by NAOC with regards to community development, it is clear that the benefits accruing to Epebu community does not commensurate with the negative impact of the oil operations in the area. It could thus be said that the presence of NAOC in Epebu has spurred community development over the years; however, the negative effects of oil spill, environmental degradation, reduction of economic activities are quite grave. The major consequences of the conflicts that disrupted the peace and stability of the community left an indelible mark they are yet to recover from. In other words, oil operations affected the community positively but the negative effects are quite immense. Therefore, this paper recommends that the NAOC manage their operations and relationship with the community in a sensitive and professional manner to avoid conflicts and losses. This will result in reduction of the negative effects oil operations in the community.

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Impact of Road Rehabilitation on Property Value: A Case of Lasu-Isheri Road, Igando, Lagos State

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***Abstract*:** The importance of transportation cannot be de-emphasized either in a city, town or neighbourhood. The necessity that every area should possess quality transportation systems as well as good road networks that can serve the present population and ease movement cannot be ignored. The research therefore aims at assessing the impact of road rehabilitation on property values using Lasu-Isheri road Lagos as a case study. To achieve this, the residents and Estate Surveyors and Valuers in the study area and Ikeja respectively were consulted to get information to aid in arriving at a reasonable conclusion. Questionnaires were administered to 84 residents in the study area while 73 (87%) was retrieved and 52 to the Estate Surveyors and Valuers who have management properties in the study area, 44 (85%) was retrieved. Analysis and Presentation of data were done using frequency tables and percentages, mean. The study revealed that road rehabilitation majorly has a positive effect on areas where it was carried out; hence it is recommended that government should keep rehabilitating roads both to their benefit and that of the residents in the area. This will help enhance the economic development of the area, increasing land and rental values and also encourage developers to invest.

Keywords: Estate Surveyor and valuer, Lagos, Lasu-Isheri, Property Value, Road rehabilitation,.

1. Introduction

It is a well-known fact that transportation is an integral part of any city, town, neighborhood or place whether rural or urban. It is therefore very necessary that every area should possess quality transportation systems as well as good road networks that can serve the population and ease movement. However, whenever the

population exceeds the available roads or they are found to be inadequate (traffic), road rehabilitation has to be considered which can come in form of expansion of old roads or construction of entirely new ones.

The evident excess in a population's demand for road occurs via the increase in economic activities around the area. The growth of an urban area due to influx of people in search of employment usually takes its toll on the land and the built environment as related in Ajayi, Ojo, Olukolajo and Oyetunji (2013). It is the duty of the government to provide infrastructures where they are not available or are inadequate. However, the lack of town planning regulation makes expansion difficult, demolitions of residential and commercial properties including shops situated close to the routes pose same threat, provisions have to be made, which in turn means compensation has to be given to the affected parties or the government can exercise the power of compulsory acquisition.

In most cases the introduction of road rehabilitation proposes to be of benefit to the users and enhance property values after completion but during construction the benefits are not so evident in the short run as a result of equipment noises, dust, and inaccessibility during that period, especially to neighbouring areas if the construction last longer than planned. Mikelbank (2001) suggested that prices rise in response to transportation improvements that occur along shortest-path routes connecting individual homes to the region's CBD or to the local shopping center; in general, prices fell as a response to nearby transportation-related construction. However in California, Huang (1994) found that virtually every major land use study came to the conclusion that transportation improvements positively affect the value of nearby land. Evidently, homeowners and renters always value improvements to the transportation network, whether their perception of the travel benefits is direct or indirect (Siethoff 2002). Ajayi, Ojo, Olukolajo and Oyetunji (2013) asserted that opening up of new roads usually lead to increased economic activities and higher land values among others. . Road construction take so much time especially when government refuse to supply funds intermittently, such project at times span for years making users and residents anticipate its completion. According to Ogboru (2009) during this phase, accessibility is hindered both for residential and commercial property owners even road users have to lay off the road for a while. It becomes very stressful for shop owners to get to their place of work every day, also flooding can occur as a result of the excavated drainages which accompanies the construction. It is on this note that this study strives to show the impact of road rehabilitation on the values of properties and its users

2. Literature Review

Transportation and property are important in physical and economic development of towns and cities all over the world. Property and land values tend to increase in areas with expanding transportation networks, and increase less rapidly in areas without such improvements (Oni, 2009). Several studies have been conducted on the impact of road construction and rehabilitation on property values, they include; Akee (2006), Lacono and Levinson (2009), Aigbe, Ogundele and

Aliu (2012), Alimi, Ayedun and Oni (2014)

For Instance in Canada, Stevenson (1995) study identified the social impact of major roads and its significant potential positive and negative changes in peoples' cultural traditions and lifestyles, their physical and psychological health, their families, their institutions and their community. The Social Impact Assessment (SIA) process can be streamlined by focusing socio-economic data collection on the public issues and possible local impacts. This approach was based on the principle of interaction with the public throughout the assessment, integration of the local community issues and data with the technical project studies, and iteration in the identification and resolution of the potential impacts. The paper concluded that the impacts of roads projects on people and their communities are important and are increasingly having greater influence on the route alignment decisions and roadway design.

Another study by Akee (2006) examined the impact of road construction on rural labor force outcomes in a developing country. This study aimed to document swift changes in economic activities due to the construction of a new road. Two national censuses were utilized which were conducted in the Republic of Palau five years apart (2000 and 2005) which conveniently bracket the road construction period. The data allowed the researcher to identify households that moved within the five year period, thereby correcting any internal movement attributable to the road construction. The researcher employed two different methods; a difference-in-difference procedure and first-difference procedure. It was discovered that households respond quickly to the new employment opportunity once the new road is functional. The impact of road construction on average household wages and income was concluded to show no difference at all, it becomes negligible.

In Minnesota, Lacono and Levinson (2009) considered the improvements transportation networks, especially those in growing areas, tend to have on local land markets. They researched the nature and magnitude of benefits accruing to nearby properties that arise from major highway construction or reconstruction projects, specifically those that add capacity to existing highway. The research was carried out by selecting three Minnesota counties as case studies for further analysis. Data was collected on road improvements from a set of construction logs maintained by the Minnesota Department of Transportation (Mn/DOT), and three sets of property data which contain information on past property sales. The researchers used hedonic price models which helped to estimate the determinants of property values in a given location; two different approaches were used i.e. before-and-after technique for limited data, and for larger data, time slices were defined. The method of hedonic regression analysis was applied to the three Minnesota counties and they yielded mixed results in terms of observable changes to locational premiums or discounts associated with being located near an improved highway link. In most of the locations and property types analyzed in this study, no statistically significant change in property values were observed as a result of the construction or reconstruction projects

under consideration. It was concluded that it is possible that the actual effects of the highway improvement were positive, but were too small to be picked up by the statistical methods applied. However, in respect to road rehabilitation, depending on the type of improvement (construction of a new link, capacity addition to an existing link, or upgrading an existing link), the benefit could represent a reduction in the time cost of travel or other variable costs, such as fuel consumption or mileage-related vehicle depreciation. It could also represent an improvement to the level of access that a given transportation network provides.

Mkalala, Kamara, Ndong, Iluboudo, Baiod (2009) summarised the Environmental and Social Impact Assessment (ESIA) of the Aflao-Sanvee Condji Road Rehabilitation Project in Togo. The researchers prepared an ESIA report in accordance with the environmental and social assessment guidelines and procedures of the African Development Bank for Category 1 projects. The environmental and social impacts were summarized and the inevitable impacts identified. Descriptions cover expected impacts during the preparation, road construction and operation phases. This was followed by the presentation of the enhancement and mitigative measures proposed to increase the benefits and/or prevent, minimize, attenuate or offset the negative impacts, as well as the monitoring program. The public consultations held during the ESIA and the complementary initiatives related to the Project such as the required compensation plan are discussed. Conclusively, the project was deemed acceptable on the environmental and social level under the conditions stated in the report. There was provision for compensation of the persons concerned.

In Nigeria, Aigbe, Ogundele and Aliu (2012) study examined road facility availability such as traffic light, street light and culvert; and the conditions of the roads in terms of smoothness, presence of potholes, and cleanliness. Data was generated from sixteen roads selected from the three senatorial districts of Lagos State. Simple descriptive statistics and the Road Maintenance and Quality Index (RMQI) were employed in the analysis of data generated The findings of the study are imperatives for the strengthening and refocusing of existing road maintenance strategies that will deliver smooth, time saving, and comfortable roads. The paper conclusively stressed the need for timely and efficient maintenance of roads for improved road service delivery to upgrade the present negative effects of commuting and ensure smooth, easy, and comfortable ride on Lagos metropolitan roads.

South Korea's Hyunwoo, Du-Heon, Jai-Dong, Hee-Sung and Ju-Goang (2012) analyzed the direct-employment-creation effect of South Korea's expressway construction investments with the use of actual data. To determine the direct-employment-creation effects of expressway construction investments, multiple-regression analysis of data regarding 68 expressway sections were conducted. The creation of direct employment means the employment of manpower input directly to the works regarding the construction and maintenance of an expressway, so the employment can be determined clearly through the construction of an expressway. The results of the analysis indicated that the

country's KRW (Korean won) 1 billion worth of expressway construction investments created 7.27 full-time jobs.

Alimi, Ayedun and Oni (2014) in Lagos, Nigeria analyzed the relationship between road improvement and neighborhood properties value in selected parts of Lagos. The data were collected through questionnaire distributed among the residents (both landlord and tenants) of the selected area. The data were then analysed using simple descriptive and analytical statistics. It was deduced that majority of the respondents living in the study areas agreed that road improvements do lead to an increase in rental/capital values. Accessibility is a major factor that determines how much people are willing to pay for a particular location. The study recommended that the three tiers of government (i.e. Federal, State and Local) should take the construction, maintenance and rehabilitation of roads as a matter of great importance because landed property is an indicator of the wealth of a nation and their values can be enhanced through the provision of good roads. The amount of tax payable under the Land Use Charge Law of 2001 is dependent on the value of the property.

Gatauwa and Murungi (2015) analyzed the effects of infrastructure development on real estate values in Meru County, Kenya. The study aimed at establishing the effects of transport networks development, expansion of social amenities, industrial development, expansion of educational institutions and growth in commercial developments on real estate values in Meru County, Kenya. The descriptive survey research design was used in analyzing the data collected. The target population was 955 real estate property owners in Meru County, Kenya but only 191 respondents was the sample size. Stratified sampling technique was used to come up with the sample. It was concluded that the effect of infrastructure development on real estate pricing is evident in Meru County; this is because Meru is one of the areas that have strategic development programs in place which attract investors and speculators. In relation to transportation (road) network, from the findings the study emphasizes it affects real estate values positively 7.462 times. The study goes further to recommend that County governments should create development programs which will open up the rural areas thereby ensuring an even spread of demand in the real estate property across the country and also encourage banks and other financial institutions to come up with financing programs which would be easily accessible to the public and improve ownership and investment in real estate sector.

Al-Mumaiz and Evdorides (2017) investigated the effect of interurban road construction on the adjacent land value which changed as a result of increasing accessibility. A multiple regression model was obtained to predict the percent change in land value (CLV) based on four independent variables namely; land distance from the constructed road, area of land, nature of land use and time from the works completion of the road. The random values of percent change in land value were generated using Microsoft Excel with range of up to 35%. The trends of change in land value with the four independent variables were determined from literature references. Distance variable of up to 3 miles from the road was being used to produce the model. A

series of 0.5 mile distance from the new road was used to study the percent CLV for each distance in the series. Time variable of 20 years after the road works completion and 3 years before was also used in this study with a series of 1 year to estimate the percent CLV for each year in the series. Land use variable gave the capabilities of calculating the percent CLV for different land use; three types of land use (agricultural, industrial, and residential) were used in this study. Land Area variables with a range of 10 to 80 hectare are used to produce the percent CLV for each area in the series. It was concluded that lands with the intermediate distance from the constructed road had the higher percent CLV due to the increase in accessibility and decrease in travel cost and these lands values decrease as the distance increases due to inaccessibility. The diversity in land use application is an important result in this study as recent studies have focused mainly on residential land use.

Conclusively, positive impacts occur usually when the road becomes open for use. A very major positive impact that road rehabilitation has is how it encourages employment. The employment creation effects of expressway construction can be classified into direct, indirect, and other employment creation effects. Direct employment creation refers to the employment of workers including construction workers, experts, engineers, and onsite managers for road construction and maintenance and repair. Indirect employment creation implied the employment of workers required for the production and procurement of construction materials, such as for the production and distribution of wood, cement, steel, and petrochemicals. This was rightly expressed in Mkalala, Kamara, Ndong, Iluboubo and Baido, 2009; Hyunwoo et al, 2012; Akee, 2006 papers.

And also the road rehabilitation causes the displacement of residents according to Stevenson (1995) thereby resulting in inconvenience caused by detours, local road closures, dust, noise, heavy equipment traffic on existing roads, safety hazards, and interference with emergency services. However, resident may benefit from construction employment. When the roadway is opened for use, positive impact result for many residents; Travel time, gas consumption, accidents and inconvenience to users generally decrease. The roadway increases access to jobs, schools, stores, recreation and other community services and amenities. These effects can be reflected in increased land values. However, there may be negative impacts for some residents living near the roadway. These include increased noise, pollution and aesthetic impacts. Some of these impacts can be mitigated. Aigbe, Ogundele and Aliu (2012) explained that residents whose frontage are very close to potholes/failed sections of the roads often times prevent vehicular access on the remaining part of the road by barricading the road at these portions.

3. Research Method

A total of 84 residents formed the sample size under this study. This represents about 70% of the entire study population. And in regards to the second study population, it consists of 52 practicing Estate firms in Ikeja. The rental values between the periods of 2007 - 2013 were also collated on different property types within the study

area. It is however necessary to state that the road rehabilitation was carried out between 2009 and 2010, hence the time before the rehabilitation was from 2007-2008 and after the rehabilitation was from 2011-2013. The analyses were carried out using descriptive statistics such as weighted mean, in addition to frequency and percentage distribution. The mean model is stated as follows:

$$\ddot{x} = \frac{\sum a_i n_i}{\sum x_j}$$

Where: i= response category index
xj= the sum of j factors 1,2,3,……N
ai= constant expressing the weight given to the ith response
nj=the variable expressing the frequency of the ith

The data collected are from the primary and secondary sources. Primary data was gathered through questionnaires while data from secondary sources such as journal materials, other published materials were used for the literature aspect of the study.

4. Data Analysis and Discussion

Questionnaires were administered with responses rate of 87% from the residents in the study area and a rate of 85% from the Estate Surveyors and Valuers with management properties in the study area. Responses were later coded and imputed. The analysis of data was carried out using the Statistical Package for Social Science (SPSS 17.0 for Windows), Microsoft Excel and graphic software. The gathered data are organized and quantitatively summarized in such a way that it enables one to confirm or reject whatever pre-conceived ideas one may have about the relationship between road rehabilitation and property values The result of the analysis are presented as follows;

4.1 Advantages of Road Rehabilitation

Here the respondents were asked to look at the possible advantages experienced by residents as concerns the rehabilitation of Lasu-Isheri road. The questions were set to assist in knowing the positive effects on which the perception and satisfaction will be based.

Table 1: Advantages of Road Rehabilitation (Residents)

S/N	Advantages	Strongly Agree	Agree	Indifferent	Disagree	Strongly Disagree	Total	Mean	RANK
		W=5	W=4	W=3	W=2	W=1			
1.	Direct employment creation	43	24	4	2	0	73	4.48	1st
		a_in_i	a_in_i	a_in_i	a_in_i	a_in_i	327		
		215	96	12	4	0			
2.	Enhanced economic development	30	40	2	1	0	73	4.36	2nd
		a_in_i	a_in_i	a_in_i	a_in_i	a_in_i	318		
		150	160	6	2	0			
3.	Reduced travel time	23	40	7	1	2	73	4.12	3rd
		a_in_i	a_in_i	a_in_i	a_in_i	a_in_i	300		
		115	160	21	2	2			

4.	Reduced travel cost/ transport fare	25	28	11	7	2	73	3.92	4th
		a_in_i	a_in_i	a_in_i	a_in_i	a_in_i	286		
		125	112	33	14	2			
5.	Reduced vechicle operating costs	24	32	4	11	2	73	3.56	5th
		a_in_i	a_in_i	a_in_i	a_in_i	a_in_i	260		
		96	128	12	22	2			

Table 1 shows the result of the weighted mean used to analyze the likert scale questions which helped to ascertain how strongly the respondents agree to the variables (advantages) given; the resident's opinion on the advantages of road rehabilitation. It reveals that the creation of direct employment such as road sweepers, etc. had highest response by the respondents with a Mean of 4.48; next is the enhanced economic development with a Mean of 4.36; then other advantages like the reduced travel times and reduced travel cost are with a mean of 4.12 and 3.92 respectively. The least ranked advantage is the reduced vehicle operating cost with weighted mean of 3.56. The residents are therefore of the opinion that there have been numerous employment creation opportunities since the rehabilitation of the road.

4.2 Disadvantages of Road Rehabilitation

The respondents were also asked to look at the possible disadvantages experienced as regards the road rehabilitation works with the aim of identifying their opinion. This would enable the researcher know in certainty what disadvantages has more significance than the others.

Table 2: Disadvantages of Road Rehabilitation (Residents)

S/N	Disadvantages	Strongly Agree	Agree	Indifferent	Disagree	Strongly Disagree	Total	Mean	RANK
		W=5	W=4	W=3	W=2	W=1			
1.	Loss of property due to road expansion	20	20	19	10	4	73	3.33	1st
		a_in_i	a_in_i	a_in_i	a_in_i	a_in_i	243		
		100	80	57	20	4			
2.	increased safety costs (traffic handling requirements and increased no of accidents)	11	18	17	21	6	73	3.09	2nd
		a_in_i	a_in_i	a_in_i	a_in_i	a_in_i	226		
		55	72	51	42	6			
3.	Increased environmental costs i.e. air pollution	10	18	21	15	9	73	3.07	3rd
		a_in_i	a_in_i	a_in_i	a_in_i	a_in_i	224		
		50	72	63	30	9			
4.	Increase in crime rate e.g. robbery and burglary	13	15	8	31	6	73	2.97	4th

attacks						217
	a_in_i	a_in_i	a_in_i	a_in_i	a_in_i	
	65	60	24	62	6	

Table 2 shows respondents opinion on the disadvantages of road rehabilitation. It is shown that the increase in crime rate e.g. robbery and burglary attacks have the lowest ranking with a mean of 2.97. Then the increased environmental costs and increased safety costs have means of 3.07 and 3.09 respectively, therefore leaving loss of property due to road expansion as the effect ranked the highest with a mean of 3.33. It is inferred from the above that the increase in crime rate was seen as the least influential while the most influential disadvantage was the loss of property due to road which implies that adequate compensation was paid to the affected parties.

4.3 Challenges Faced by Residents

The respondents who were the residents in this case, were asked to give their opinion on the impacts felt by them as residents of the area before and after the road rehabilitation project. Their level of agreement was weighed on a 5-point likert scale with 1 being 'Strongly disagree', 2 being 'Disagree' 3 being 'Indifferent' 4 being 'Agree' 5 being 'Strongly agree'. Tables 3 and 4 puts into perspective the challenges experienced by the residents of the study area before and after the road rehabilitation project.

Table 3: Challenges Faced By Residents before the Road Rehabilitation

S/N	Challenges	Strongly Agree W=5	Agree W=4	Indifferent W=3	Disagree W=2	Strongly Disagree W=1	Total	Mean	RANK
1.	Loss of time due to traffic diversions.	48	21	0	0	4	73	4.49	1st
		a_in_i	a_in_i	a_in_i	a_in_i	a_in_i	328		
		240	84	0	0	4			
2.	Reduction in vehicular speeds due to port holes and bumps	35	33	0	3	2	73	4.32	2nd
		a_in_i	a_in_i	a_in_i	a_in_i	a_in_i	315		
		175	132	0	6	2			
3.	Stress to person from the need to squeeze through narrow roads, potholes, drive very slowly	30	37	3	2	1	73	4.27	3rd
		a_in_i	a_in_i	a_in_i	a_in_i	a_in_i	312		
		150	148	9	4	1			
4.	Reduction in business revenues and decrease in productivity.	25	34	3	4	7	73	3.90	4th
		a_in_i	a_in_i	a_in_i	a_in_i	a_in_i	285		
		125	136	9	8	7			
5.	Noise and air pollution from construction activities.	14	35	14	2	8	73	3.62	5th
		a_in_i	a_in_i	a_in_i	a_in_i	a_in_i	264		
		70	140	42	4	8			

From Table 3 the residents agree to loss of time due to traffic diversions as the most significant challenge faced before the road rehabilitation with a mean of 4.49; noise and air pollution from construction activities is the challenged that is least faced, and has a weighted mean of 3.62. It can be further explained that loss of time due to traffic diversions was seen as the worse challenge before the road was rehabilitated as a result of the previous condition of the road which lead to traffic congestion during the peak periods. Also the reason noise pollution (pollution generally) was seen as the least faced is because these activities were restricted to the road.

In comparison is their opinion about the challenges faced after the road has been rehabilitated. Using the same parameters, Table 4 analyses these challenges by ranking.

Table 4: Benefits derived by Residents after the Road Rehabilitation

S/N	Beneits	Strongly Agree	Agree	Indifferent	Disagree	Strongly Disagree	Total	Mean	RANK
		W=5	W=4	W=3	W=2	W=1			
1.	Increases in business revenues and productivity.	17	10	3	33	10	73	2.88	5th
		a_in_i	a_in_i	a_in_i	a_in_i	a_in_i	210		
		85	40	9	66	10			
2.	Less noise and air pollution from construction activities.	8	3	26	22	14	73	2.58	4th
		a_in_i	a_in_i	a_in_i	a_in_i	a_in_i	188		
		40	12	78	44	14			
3.	Increase in vehicular speeds due to non-existence of port holes and bumps	9	12	2	28	22	73	2.43	3rd
		a_in_i	a_in_i	a_in_i	a_in_i	a_in_i	177		
		45	48	6	56	22			
4.	Freedom of person to drive faster through rehabilitated roads which are wider.	3	8	5	47	10	73	2.27	2nd
		a_in_i	a_in_i	a_in_i	a_in_i	a_in_i	166		
		15	32	15	94	10			
5.	Gain in time due to little or no traffic diversions.	3	3	8	35	24	73	1.99	1st
		a_in_i	a_in_i	a_in_i	a_in_i	a_in_i	145		
		15	12	24	70	24			

Table 4 reveals that increases in business revenues and productivity owing to satisfactory access to their businesses ranked the least benefit in the residents opinion with a mean of 2.88 while the huge gain in time due to little to no traffic diversions, has a mean of 1.99, hence seen as the massive benefit derived from the road rehabilitation project. It can therefore be inferred that the challenge encountered before the rehabilitation, the reductions in business revenue and productivity are now considered a benefit as the business revenues have since then increased because of the presence of competition between businesses and also the extra time

gained while driving.

4.4 Rental Values of Properties in Lasu-Isheri Environs

Estate Surveyors and Valuers were asked to identify the rental values passing on different types of properties in the area between 2007 and 2013. The responses help the researcher deduce the change in rental values before and after road rehabilitation.

Table 5: Rental values of properties in Lasu-Isheri Environs

Table 5 shows the five different property types and their rental values before, during and after road rehabilitation works in Lasu-Isheri between the periods of 2007 and 2013. It is however necessary to state that the road rehabilitation was carried out between 2009 and 2010, hence the time before the rehabilitation was from 2007-2008 and after the rehabilitation was from 2011-2013. Using the different linear lines in Fig 1, for the 5-bedroom detached house a 100% rent increase was obtained as a result of the road improvement works. Similarly a 120%, 150%, 130% and 220% rental increases were obtained on the 4-bedroom detached house, 3-bedroom flat, 2-bedroom flat and self-contained units respectively over the same period.

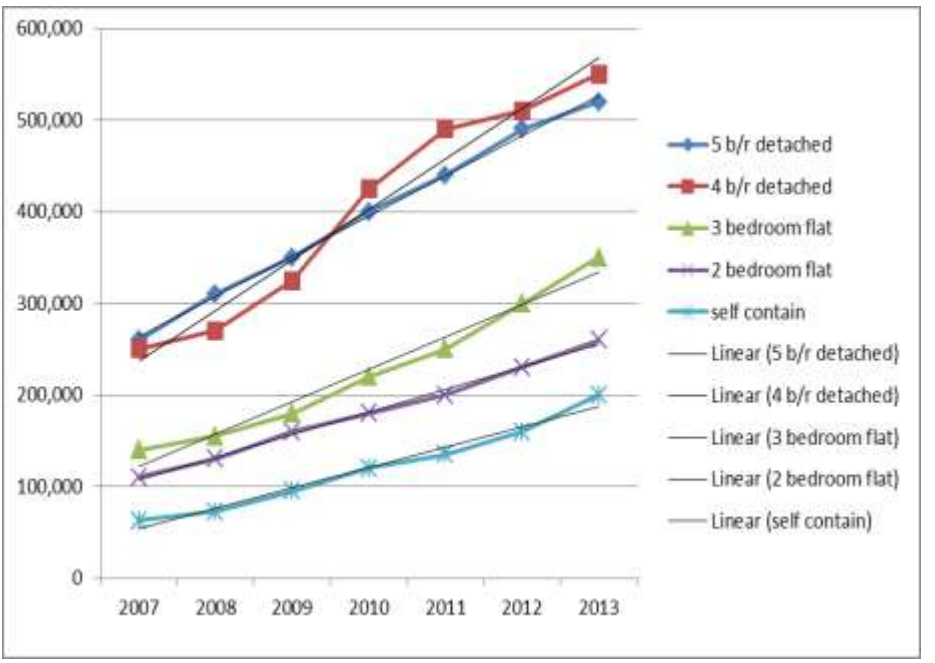
Rental Values of properties around Lasu-Isheri (before, during and after)					
Years	5-bedroom detached house (₦)	4-bedroom detached house (₦)	3-bedroom flat (₦)	2-bedroom flat (₦)	Self-contained units (₦)
2007	260,000	250,000	140,000	110,000	62,500
2008	310,000	270,000	155,000	130,000	72,500
2009	350,000	325,000	180,000	160,000	95,000
2010	400,000	425,000	220,000	180,000	120,000
2011	440,000	490,000	250,000	200,000	135,000
2012	490,000	510,000	300,000	230,000	160,000
2013	520,000	550,000	350,000	260,000	200,000
Rent value increase (₦) between 2007 and 2013	260,000	300,000	210,000	150,000	137,500
% Increase	100%	120%	150%	130%	220%
Ranking	5th	4th	2nd	3rd	1st

From the percentage increase in rental values, it can be seen in Table 5 that the self-contained units benefited from the road rehabilitation works the most with a 220% increase in its rental value, the 3-bedroom flats came in 2nd with a 150% increase in its rental values. Similarly 2-bedroom flats, 4-bedroom detached house and the 5-bedroom detached house came in 3rd, 4th and 5th respectively in the percentage increase their rental values experienced as a

result of the road rehabilitation works. The self-contained unit has the highest percentage increase because there is a high demand by residents in their use. This just goes to prove that the area is dominated by low income earners who reside in self-contained apartments and married couples building families who strive to live in comfortable 3-bedroom flats, hence the demand for both property types are high which produced a significant increase in their rental values.

Fig 1 supports Table 5 by giving a clear graphical representation of trends in rental values of the five properties within the road rehabilitated area.

Fig 1 Graphical Representation of Rental Values of Properties on Lasu-Isheri Road



It can be seen from the graph that between the years 2009 and 2010 there is steepness to the slope showing a drastic rise in rental values during the road rehabilitation process and this rental values continue to increase till the year 2013. This can be attributed to the various benefits associated with the road rehabilitation assuming all other factors that affect rental values remains constant.

6. Conclusion and Recommendation

This research established the impact of road rehabilitation on property values using Lasu-Isheri road as a case study. Results revealed that the creation of direct employment had the highest response as advantage road rehabilitation brings, also the resident's proved that their once experienced challenge of Time loss due to road diversion became the least of their challenge after the road rehabilitation work was completed. Based on the findings, the study recommends that the Government should look into the commencement of more road rehabilitation project in different areas especially those that encounter traffic jams, portholes, bumps and have major

drainage issues. These will helps to enhance the economic development of the area, increasing land and rental values and its availability and also encourage developers to invest. It is the hope of the researcher that the findings in this study will be useful to government at different levels in policy formulation and implementation of measures that will effectively facilitates accessibility through rehabilitative measures taken on road.

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