Significance Of Frequency Of Power Supply On Residents' Satisfaction In Private Housing Estates In Enugu, Nigeria

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ABSTRACT

Service facilities are of great importance to the adequate functioning of any housing unit. In Enugu metropolis, the private housing estates are occupied by different classes of residents with dissimilar approaches to the extent of satisfaction. The task is to identify the common factor across the classes that influence satisfaction in private housing estates. The objective of this study was to investigate the frequency of power supply and its relationship with residents' satisfaction with performance of service facilities' in private housing estates in Enugu with a view to providing feedback conditions for improved satisfaction in the private housing estates. The methodology adopted for this research was survey design. The focus was on four private housing estates in Enugu metropolis randomly selected from the research population. After stratification, based on housing type, two hundred and fifty six occupied housing units were randomly selected. Data was collected from primary sources using questionnaires and observation schedules. Frequency of power supply (which is a service facility variable) and residents' satisfaction with performance of service facilities (a composite variable aggregated from - Satisfaction with power supply source, satisfaction with frequency of power supply, satisfaction with mode of water supply, satisfaction with frequency of water supply) were of interval variables scale; hence, Pearson Product Moment correlation tool was used to test the significance of the relationship. It was established that there is a significant relationship between frequency of power supply and residents' satisfaction with performance of service facilities' in private housing estates in Enugu metropolis with a significant probability value of 0.010. This implies that number of hours electricity is supplied to the housing estates by electricity distribution companies residents affect residents' level of satisfaction within the population of study. It was recommended that it is vital that Electricity Distribution Company in charge of the study area should improve on its services as it was shown the residents' satisfaction is affected by frequency of the power supply.

Keywords: power supply, private housing estate, residents' satisfaction, service facilities

INTRODUCTION

As researchers continue to offer solutions to improve deficiencies in housing conditions, efforts are continuously made at addressing the challenges posed by inadequacies in the housing sector. Man has some basic needs and housing is one of them; thus, satisfaction is the fulfilment derived from a need (Umeora, Olotuah, &Ezeji, 2019).The idea of residents' satisfaction was established as ways of evaluating housing on the basis of defining the gap among aspiration in housing and existing situations. When a balance is attained between the existing housing situations and the residents' aspiration in housing, residents turn out to be satisfied (Salleh, 2008). Measuring satisfaction is imperative because knowledge of the elements that contribute to residents being satisfied or dissatisfied. The provision and adequate performance of the facilities in buildings often create willingness for residents to continue to reside in any building but if they are in poor a poor state, would definitely lead to residents' dissatisfaction.

The significance of service facilities in the appropriate functioning of any building and housing in general cannot be underestimated, as the performance of these services can promote the desired satisfaction level of the residents (Oladapo & Adebayo, 2014).The housing service facilities therefore comprise all facilities attached to housing unit for it to function well. Although, the usefulness of residents' evaluation of services has been questioned but empirical evidence points to its numerous merits as performance evaluations cannot rely entirely on objective criteria. Often, evaluations based on objective criteria only merely restate view of public policy and are remote from the user preferences. Enlisting subjective evaluations would enable planners to refocus limited resources to consider user priorities. Ibem, Adeboye and Alagbe (2015) noted that there is need to combine objective and subjective criteria in housing, since objective criteria alone would have no meaning when isolated from subjective criteria thereby having implications on residents' life. In any housing development, users play key roles by providing relevant information that could ultimately determine the value and level of satisfaction they desire.

There have been quite a number of private housing estate developments in Enugu, however evaluation of residents' satisfaction in the estates has not been done. Previous studies by Mohit and Azim (2012) as well as Jiboye (2009) have assessed the level of residents' satisfaction based on the prevailing housing conditions in public housing estates in Hulmale, Maldives and Lagos, Nigeria respectively. Jiboye (2010) as well as Ibem and Aduwo (2013) focused on elements which affect residents' level of satisfaction in housing estates in Nigeria, such as: the residents' socioeconomic characteristics, housing characteristics, service facilities in the building, the neighbourhood facilities, the process of acquiring housing (for rent, lease or ownership) and management component. Despite the studies, there is shortage of empirical works on residents' satisfaction in private housing estates in Enugu, Nigeria. From literature, service facilities in buildings are water supply, conveniences, power supply and proper waste disposal means. For the purposes of this study, only power supply was considered, thus, the objective of this study was to investigate the frequency of power supply and its relationship with residents' satisfaction with performance of service facilities 'in private housing estates in Enugu with a view to providing feedback conditions for improved satisfaction in the private housing estates. A null hypothesis was put forward which sought to establish the significant relationship frequency of power supply and residents' satisfaction in the estates. It stated that there is no significant relationship between frequency of power supply and residents' satisfaction with performance of service facilities' in private housing estates in Enugu metropolis.

Study Area
Enugu was the administrative capital of the old Eastern Region; capital of old Anambra State and later became the capital of Enugu state with its creation as a new state in 1991. According to Williams (2008), Enugu was one of the towns Europeans made popular in West Africa because of abundant availability of coal discovered in the town. The town situates between latitudes 06° 21' N and 06° 30' North of the equator, longitude 07° 26' E and 07° 37'E of Greenwich Meridian. It comprises three LGAs, which are; Enugu East, Enugu North and Enugu South.

The town shares boundaries with Nkanu East Local Government Area (LGA) in the east, in the west with Udi Local Government Area, in the north with Igbo-Etiti and Isiuzo Local Government Areas and in the south with Nkanu West Local Government Area. Enugu city as at 2006 had a population of 722,664 and nearly two million according to 2015 projection; population density is about 427.6 persons per square kilometre (National Population Commission, 2006). Exodus of people from all parts of Nigeria to the southeast regional capital coupled with rural-urban migration has caused a rise in population of Enugu. According to Okoye and Chigbu (2017), this movement of people to the town has constituted problems to existing infrastructural facilities, sanitation of the environment and public services.

LITERATURE REVIEW
Theoretical Framework – Theory of Housing Satisfaction
There are indications from literature that there are various approaches to theoretical frameworks as applied in housing research. The approaches are regularly based on disciplinary orientation, philosophical orientation, purpose of the evaluation and theory-based approaches.

Theory of housing satisfaction is a branch of Theory of housing adjustment which was propounded by Morris, Winter & Murphy (1975). According to Vera-Toscano and Ateca-Amestoy (2008), the perceptive construct of satisfaction can be viewed as decision that residents or households make, when considering the level to which their actual housing situation reflects their ideal housing situation that they desire. The theory of housing satisfaction states that housing norm is fashioned by social criteria used by residents in making choices in housing, thereby establishing level of satisfaction in housing. This theory explains the manner households appraise their existing housing conditions as a multidimensional development affected by a number of factors. These are: social background, housing unit characteristics and neighbourhood characteristics.

Theory of housing satisfaction forms from Theory of housing adjustment by plainly averring that the characteristics of the household is essential to the understanding their ideal housing situation of which they desire. When a resident examines the link between their aspired housing situations and their existing housing situation, satisfaction or dissatisfaction would manifest (Galster & Hesser, 1981). In the event that satisfaction is not attained, the household would try to redefine their subjective measures. Except for these, households would be seen to manifest dissatisfaction, as they at that point seek to change their household characteristics or dwelling unit characteristics.

Housing deficiency is said to exist if housing condition does not fit into the occupant's family and cultural norms. Thus, evidence of this deficiency can be in the form of housing inadequacies and dissatisfaction, thereby leading to housing adjustment behaviour. Ibem, Adeboye and Alagbe (2015) as well as Abubakar, Tareef and Abdullah (2015) asserted that housing satisfaction can be improved upon using housing adjustments parameters by including the residents' cultural affinity and their varying desires. Housing adjustments are expected as the basic needs of households continue to be dynamic. Housing adjustment may be regarded as a review of residents' housing aspirations to resolve the differences in housing conditions by modification or transformation of the housing to bring the housing at par with users' needs.

The main inference of this theory of housing satisfaction is residents' satisfaction which is basically the appraisal of the level of deficiencies in housing conditions which residents experience thereby leading to the inability to get complete values anticipated from the current housing condition. Thus, theory of housing satisfaction is adopted for this work.

Empirical review

Muoghalu, (1987) noted that empirical evidence on appraisal of residents' satisfaction which dates back to 1950s, was focused mostly on public housing and limited essentially to the western world where public housing intervention has been massive, as well as deeply entrenched. In Nigeria, residents' satisfaction evaluation was associated with Federal government slum clearance programme of pre-independence days in Lagos. In some of the states of Nigeria, various housing estates exist which range from low-cost housing to upper-class housing, intended to mitigate the consequences of shortage of the housing stock. A visit to some private housing estates shows some inadequacies in the estates, such as: ineffective waste disposal management, poor public infrastructural utilities, lack of social institutions and other social amenities thus leading to housing dissatisfaction. According to Aneze (2009) as cited in Eni (2014), there is poor quality in housing facilities, resulting in psychological housing problems usually associated with urban development and social services are poor. The need to embark on an evaluation study into the range of housing needs to uncover the qualitative and quantitative aspects has not received attention adequately (Olotuah & Bobadoye, 2009).

Housing evaluation has been viewed from different perspectives, but there is unanimity that it involves-collection of data on an entity or procedure, analysing the collected data, interpreting and presenting it (Ibem, 2011). The implication of this is that evaluation can be used in diverse disciplines in proffering solutions to a range of problems about human undertakings, policies, programmes and projects. According to Adrianse (2009), satisfaction in housing has been a valuable pointer in the evaluation of the outcome of any housing programme. Residents' satisfaction in housing is associated with the degree of adequacy and quality, as well as its characteristics in terms of meeting the residents' well-being; since

individuals would want their house to be a home for resting after a day's hustle and bustle. Given such circumstances, the adequacy level should include socio-cultural activities of residents which could be beneficial to the residents; thus, going further than just the engineering or structural considerations.

While explaining the notion of satisfaction, Onibokun (1974) referred to it as a human concept which involves four interacting variables – the tenant, the dwelling, the environment and the management. In this concept, the tenant's subsystem is at the centre, and acts as the recipient of all the feedback from the other subsystem. The dwelling subsystem is the housing unit which forms part of an environment where the unit is located. There is also the management subsystem or component of satisfaction. This subsystem comprises of the entire institutional arrangement under which public housing is administered. Furthermore, the tenant's view of a dwelling is influenced by socio-cultural characteristics, the life style, economic status and the behavioural patterns of the housing inhabitant. It is on this basis that a system approach for evaluating tenants' satisfaction was developed. Thus, according to Fleury-Bahi *et al.* (2008), residential satisfaction is indeed strongly associated with one's attachment to the living space and is generally related to the quality of the space.

Measuring housing satisfaction is important because an understanding of the factors that make a tenants satisfied or dissatisfied can play a critical role in formulating successful housing policies.

The facilities in the housing unit comprise all amenities attached or built into the housing unit for effective functioning of the housing unit. Akubueze (2004) noted that water supply, energy resources and administrative systems are necessary for effective functioning of housing and the society in general. Ogunbayo, Ajao, Alagbe, Ogundipe, Tunji-olayeni, and Ogunde (2018) in a study on housing estates constructed under Public Private Partnership (PPP) in Ogun state, Nigeria, noted that housing facilities roles were shown as those amenities that allow the housing unit to perform its function. Thus, because of importance of adequate performance of facilities as element of building there may be need to often carry out intermittent checks to find out the dependability level as this is essential to prevent failure while in use which may in turn affect residents' level of satisfaction. Ariffin, Zahari, and Nadarajah, (2010) studied the factors likely to distress residents' level of satisfaction in privately developed estates in Malaysia and established there was dissatisfaction with facilities in the buildings except for number of electric sockets in bedrooms and size of dwellings. The study of Mohit and Azim (2012) in Maldives indicated that majority of the residents in public housing in Hulhumale, Maldavies, were highly satisfied with building services and public facilities in the housing estates. Also, Mohit, Ibrahim and Rashid (2010) in a study carried out in Malaysia, discovered that bulk of the residents in public low-cost housing estates in Kuala Lumpur, Malaysia were highly satisfied with support services attached to the housing units and social environment of the estates. Ibem and Aduwo (2013) noted that residents of public housing estates in Ogun State were dissatisfied with the existing housing conditions, but recorded satisfaction with dwelling unit features and services.

Pina and Kowaltowski (2005) carried out a research in Brazil and noted that the factors influencing the level of satisfaction in housing to include: provision of basic amenities in the housing unit, common services like- good road networks and functional sewer systems. Jiboye (2009) studied level of residents' satisfaction (using public housing tenants) in Lagos and noted that residents were highly satisfied with the physical features of the housing units; but were dissatisfied with the housing management pattern and neighbourhood/environmental features. With the insights gotten from existing literature, it can be deduced that availability of public facilities, physical features of housing unit and the neighbourhood/environment facilities define the level of residents' satisfaction.

METHODOLOGY

The research design adopted for this research was survey method; this was done through use of questionnaire to get data from respondents in the area of study. The research population for included completed private housing estates within Enugu city, built and inhabited before the year 2016. The sampling method adopted for the study was stratified random sampling which was based on building typesin the estates. The building types in the estates were: 1-bedroom and 2-bedroom bungalows

combined, 2-bedroom blocks of flats and 3-bedroom blocks of flats combined, 1-bedroom, 2-bedroom and 3-bedroom bungalows combined as shown in Table 1.

Table 1: List of Private estates in Enugu metropolis stratified by housing type as it exists in the estates

S/N	1-bedroom and 2-bedroom bungalows combined	1-bedroom, 2-bedroom and 3-bedroom bungalows combined	1-bedroom and 2-bedroom flats	2-bedroom and 3-bedroom flats combined
1	Nwannedinamba estate	Goshen estate	Elim estate	COSCO estate
2		Bethel estate		Refiners Estate
3		Elim estate		Central Bank quarters
4				Elim estate

Source: (Field work 2018; Goshen, 2011; Obodoh, 2009; Copen Group, 2014)

Resulting from the stratification above, random sampling by balloting was carried out to pick estates to represent the various building types:
(i) 1-bedroom and 2-bedroom bungalows combined: Nwanne di na mba estate
(ii) 1-bedroom, 2-bedroom and 3-bedroom bungalows combined: Bethel estate and Elimestate
(iii) 1-bedroom and 2-bedroom terrace flats: Elim estate
(iv) 2-bedroom and 3-bedroom flats combined: Central Bank quarters

Sampling size was derived using Cochran formula for finite population:

$$n = \frac{Z^2 \times \sigma^2_p \times N}{(N-1)e^2 + Z^2 \times \sigma^2_p}$$

Where:

n = size of sample for finite population
N = research population = 766 housing units
σ_p = standard deviation of population assumed = 0.5
e = significance level (precision/acceptable error) chosen = 0.05
Z = standard variate at a given confidence level = 1.96 for a confidence level of 95% (Kothari, 2004)

Sample size of 256 respondents was derived and distributed to the estates. The questionnaire, based on some indicators of environmental well-being, elicited responses about some aspects of the environment. The respondents were also required to rate their level of satisfaction based on a five-point Likert scale corresponding to- 1. Very dissatisfied 2. Dissatisfied 3. Neutral 4. Satisfied 5. Very satisfied.

Table 2: Respondents Population in Sampled Estates

Number	Nwanne D.N.M	Bethel	Elim	CBN quarters	TOTAL
Existing	50	131	324	261	766
Sampled	17	44	108	87	256

Source: Fieldwork, (2018)

The copies of questionnaire were administered to randomly, selected households in the estates. Women, where available, were the desired choice for obtaining responses because of their strategic position in the

home. Rapoport (1980) as well as Muoghalu (1987) noted that women are better selected as respondents because women are more critical of housing than the husbands; also women are home-makers, stay at home and interact with the housing environment.

RESULTS AND DISCUSSION

Descriptive summary measures and frequency distribution for the variables studied were calculated. Pearson's Product Moment Correlation analysis was also conducted to test significant relationship between the two interval variables selected from the research data using Statistical Package for Social Sciences (SPSS).

Main source of electricity supply in the building

The data collected from respondents showed that all the buildings within the study area have public power supply as the main source of electricity supply as is shown in Table 3.

Table 3: Aggregated data on main source of electricity supply

Value label	Valid Percent	Cumulative Percent
Public power supply	100.0	100.0
Solar panels	0.0	100.0
Personal power generating set	0.0	100.0
Total	100.0	

Source: Fieldwork, 2018

Analysis of frequency of power supply

The aggregated records from the enquiry of the frequency of electricity power supply indicated that bulk of residents (34.7%) pointed that there is 12 hours of electricity/day in the study area. Also, notwithstanding the highest percentage 12hours of electricity supply, less than 6hours of supply/day still returned high percentage (33.9%) as can be seen in Table 4. Electricity supply was however erratic with 30.9% of the respondents stating this.

Table 4: Aggregated data on frequency of power supply

Value label	Valid Percent	Cumulative Percent
Erratic	30.9	30.9
Less than 6 hours daily	33.9	64.8
12 hours/ day	34.7	99.6
Above 12 hours daily	.4	100.0
Total	100.0	

Source: Fieldwork, 2018

Analysis of level of resident's satisfaction with frequency of power supply

The results as presented in Table 5 showed that most residents in the sampled housing estates considered the frequency of power supply to be negative (dissatisfied and very dissatisfied) with dissatisfied as the highest percentage (54.7%).

Table 5: Aggregated data on level of resident's satisfaction with frequency of power supply

Value label	Valid Percent	Cumulative Percent
Very dissatisfied	29.2	29.2
Dissatisfied	54.7	83.9
Neutral	5.1	89.0
Satisfied	10.6	99.6
Very satisfied	.4	100.0
Total	100.0	

Source: Fieldwork, 2018

Test of Hypotheses

The hypothesis: 'there is no significant relationship between '*frequency of power supply in the buildings and satisfaction with performance of service facilities in the private housing estates in Enugu metropolis'* was tested.The variables –Satisfaction with power supply source, satisfaction with frequency of power supply, satisfaction with mode of water supply, satisfaction with frequency of water supply were aggregated into a composite variable as '*satisfaction with performance of service facilities'* on the one hand and on the other hand, '*frequency of power supply'* the two variables were of interval variables category. Therefore, Pearson's product moment correlation analysis tool was used to test the significance of relationship. The result of the analysis showed a Pearson's correlation coefficient value of 0.168 having a significance probability point of 0.010 and Table 6 shows the results. This infers that there is a weak relationship existing between the two variables; also, the significance probability point of 0.010 indicates significance. For that reason, it can be established that a weak relationship exists between the two variables and which is also significant. The null hypothesis is therefore rejected and the alternate hypothesis accepted, thus states that '*There is significant relationship between frequency of power supply'in the buildings and satisfaction with performance of service facilities in the private housing estates in Enugu metropolis'.*

Table 6:Pearson's product moment correlation analysis result of relationship between FOPS and SWPS

		Satisfaction with performance of service facilities
Frequency of power supply	Pearson Correlation	.168**
	Sig. (2-tailed)	.010
	N	236

Source: Field work, 2018

Private housing estate can stir up satisfaction and welfare of residents as well as the societies in which people live. To achieve this for residents' satisfaction, the provision and proper functioning of the housing unit facilities and services need to always be addressed. Unfortunately, housing sector in Nigeria has constantly witnessed shortcomings towards attaining its objectives, especially in provision of quality housing unit services and facilities.

Following the results of the analysis of data, it was established statistically that there is a significant relationship between frequency of power supply' in the buildings and satisfaction with performance of service facilities in the private housing estates in Enugu metropolis. This, therefore, implies that the frequency of power supply to housing estates affects residents' level of satisfaction within the population of study. This agrees with Mohit and Azim (2012) which found out that availability and performance of service facilities within the dwelling units of the housing estates affects the residents' satisfaction. Salleh (2008) further noted that one of the paramount parameters for an effective housing programme, is the suitability of residential facilities and services to the intended user. This suggests that attention has to be paid to the facilities and services in the housing unit to be used by the residents, since they are among the parameters by which residents evaluate their housing. Furthermore, the power supplies to the housing estates in the study area most times are given at night when people must have slept. For greater parts of the day, the residents rely on alternative power sources especially mechanical generators which cause environmental pollution. The pollution ranges from noise produced by the generator sets to release of carbon monoxide to the atmosphere, contributing to ozone layer depletion. Also, for security reasons, when these generators are on, the residents hardly hear what happens in the neighbourhood in case of emergency or burglary.

In housing, on the one hand, proper management of the service facilities make residents (for tenants) willing to pay for their housing amidst competition with others. For owner-occupiers, they will feel more fulfilled that the home they procured with their hard earned money gives them the desired satisfaction. On the other hand, inadequate provision of the facilities foretells varied fears in residents' welfare (both

tenants and owner-occupiers alike) leading to dissatisfaction. It could be inferred that provision of facilities in the housing units is principal in having a neighbourhood bereft of epidemic hazard.

CONCLUSION

The attainment of adequate housing unit which in turn affects residents' satisfaction has been indicated. Likewise, there is need to boost the elements that can lead to the accomplishment of adequate housing to realise satisfaction with the housing unit. Even though, satisfaction may be a relative term to residents, nonetheless the performance of service facilities in the housing unit are relevant to satisfaction; thus, should not be neglected by the different providers. Private housing developers should realize that every aspect of housing rotates around qualitative assessments and by incorporating the subjective assessments of the residents with planner's objective criteria, the defects that produce dissatisfaction be removed. Adequate provision and functioning of service facilities is vital as the data analysis results presented show that frequency of electricity power has a significant relationship residents' satisfaction in the private housing estates. Public electric power services supplied on community basis, which are not functioning properly, should be looked into by the agencies. Electricity supply with 12hours supply per day and also erratic in the study area, though the problem of the electricity supply is a national one. Though, local problems such as bad 'transformers/over loading of transformers, feeder pillars, illegal connections in the neighbourhood and transmission wires, over and over again compound the sorry situation of electricity supply. To facilitate this, it is vital that Electricity Distribution Company in charge of the study area should improve on its services as it was shown the residents' satisfaction is affected by frequency of the power supply.

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