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Analysis of Tenants' Satisfaction with Public Housing Estates in Sub-Sahara City – A Case of Enugu City, South East, Nigeria

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Abstracts

The tasks confronting planners and policy makers and all those concerned with providing housing, are to be able to identify the factors which determine adequate and satisfactory housing, and use them as inputs to housing design and development. However, most of the previous studies in this direction have been cursory and unrelated in scope and application. Hence, the need to have an empirical feedback on the satisfaction of this units of houses in the public housing estate is put forwards as a problem of the research. The aim of this study is therefore is to examine the factors influencing tenants' satisfaction with their dwellings units in the public housing estates in Enugu Urban, South east, Nigeria as well as x ray how each of these satisfaction attributes are influenced by the residents' socio-economic characteristics. The data were derived from a questionnaire survey of 366 tenants derived from 4131 housing units in the estates and analyzed using descriptive and principal component analyses and multiple linear regression. The housing estates were stratified into three residential densities (High, medium and low). A simple random sample technique was used to select the estates from each of these the residential density estate. 1, 3 and 7 housing estates were selected from high, low and medium residential density housing estates respectively. The result of the study identified five tenants' satisfaction determinants in the residential housing estates in Enugu Urban that explain 81.773 percent of observed variation in public housing satisfaction variables. The satisfaction determinants were: management attitudes/Facilities, (52.69%), closeness to facilities (31.45%), external outlook factor(15.40%), building designs(12.02%), and rooms' details(10.22%). The understanding of the revelation from the study will help the urban planners and housing technocrats in developing countries with relevant information that will guide them in housing improvement and development and for their future planning activities are more inclusive, pro-poor and hence sustainable.

Key words: *Housing estate, Tenants, Development, Satisfaction*

1. Introduction

Housing has been universally acknowledged as one of the most essential necessities of human life and is a major economic asset in every nation. Adequate housing provides the foundation for stable communities and social inclusion (Oladapo, 2006). Coakes S.J, Steed L.G (2001) have established a strong correlation between housing, good health, productivity and socio-economic development. Also, Fleury-Bahi G, Felonneau M (2008) have observed that there is a significant association between housing conditions and physical and mental health of an individual. People's right to shelter is thus a basic one and the provision of decent housing to all requiring them should be the hallmark of every civilized society and one of the criteria for gauging development. Furthermore, So and Leung (2004) have also established a significant correlation between the quality of life and the comfort, convenience and visual acceptability of the house. Therefore the significance of adequate housing to the social well-being of the people in any society cannot be overemphasized. However, the provision of adequate housing in Nigeria and other developing nations alike still remains one of the most intractable challenges facing human and national development. Previous attempts by all stakeholders, including government agencies, planners and developers to provide necessary recipe for solving the housing problem have yielded little or no success. Thus, for the past few decades, access to adequate housing has remained one of the most unattainable expectations of the majority of urban dwellers in Nigeria.

Since housing is no doubt an important national investment and a right of every individual, the ultimate aim of any housing program is to improve its adequacy in order to satisfy the needs of its occupants. Nevertheless, the housing situation in Nigeria is characterized by some inadequacies, which are qualitative and quantitative in nature (NHP, 1991; Oladapo, 2006). While the quantitative housing problem could be solved by increasing the number of existing stock, the qualitative inadequacies are enormous and complex. In fact, Ozdemir (2002) cited Oladapo, (2006) considered the qualitative problem as the major challenge of urban housing in Nigeria. Pastresearches have observed that the failure of many public and private housing projects was due to the lack of adequate thought and consideration given to adequate housing, as relevant factors or parameters which combine to determine tenants housing satisfaction were ignored (Onibokun, 1973; Ebong, 1983). If the housing sector is to improve the quality of the residential buildings it produces in meeting these needs and expectations, it then take a proactive approach to understanding what is being produced. This can be done effectively through the assessment of the users' satisfaction on the quality performance of the dwelling houses. In the actual-aspiration gap approach the construct of satisfaction rests on the conceptual frame work as developed by scholars such as Djebarni & Al-Abed (2000), Diogun (1989) and Amerigo & Aragones (1990). As postulated, people are viewed to have a perception of the main attributes of their physical environment. These attributes are evaluative based on certain standards on this aspiration (i.e. what people believe they may reasonably aspire to be or enjoy).

Most buildings especially the pubic residential estates are erected with the general desire to satisfy the housing demands of the public. In Enugu, most of these public housing estates are occupied

by varying categories of persons and arguably the occupants have different feeling concerning the extent of housing quality satisfaction derived from their unit of houses dwelled by them. (Okoye & Chigbu , 2017). At times, residents do build additional structures or bedrooms in the already designed houses, this is arguably an indication that they may probably are not satisfied with the houses in the estate as it was designed. Since there are no empirical prove on them whether there building produce the expected needs and desire of the dwellers, it becomes imperative that actual satisfaction assessments on the housing quality of these estates are made.

Therefore the tasks confronting planners and policy makers and all those concerned with providing housing, are to be able to identify the factors which determine adequate and satisfactory housing, and use them as inputs to housing design and development. However, most of the previous studies in this direction have been cursory and unrelated in scope and application. (Okoye & Chigbu , 2017). Hence, the need to have an empirical feedback on the satisfaction of this units of houses in the public housing estate is put forwards as a problem of the research. Moreso, proper understanding of the influence of the tenants' socio-economic characteristics on their satisfaction of these housing qualities in these estates have not been explored and these have been lacking in previous works like that of Okoye & Chigbu (2017). The aim of this study is therefore is to examine the factors influencing tenants' satisfaction with their dwellings units in public housing estates in Enugu Urban, Nigeria as well as x ray how each of these satisfaction attributes are influenced by the residents' socio-economic characteristics . The basic questions of this study remain, what are major determinants that influence tenants' satisfaction with their estates?, how were the satisfaction attributes influenced by the residents' socio-economic characteristics Two hypotheses were forwarded in the study, firstly, that tenants' satisfaction determinants cannot be identified and classified in the residential housing estates in the study area, secondly, that each residents' satisfaction attributes cannot be influenced by their socio-economic characteristics. . This study will serve as a good feedback to government and housing technocrats in third world nations generally, and Nigeria in particular, by providing them with relevant information that will guide in housing improvement and development. The study is further significant in that, the determining factors of housing satisfaction in most policy decisions on housing planning and development are not usually considered comprehensively. The outcome of the study will assist in looking at housing satisfaction level of all income groups in a holistic manner rather than from the narrow urban rich perspective. This study focused primarily on the examination of tenants' satisfaction factors among different public housing estates in Enugu metropolis. The selected public housing estates will cover the three residential density status in the study area. The parameters that were used to assess the satisfaction of the tenants were based on the tenants' satisfaction attributes.

2. Theoretical and Conceptual Framework

2.1 Satisfaction Model and Theory

Satisfaction as a process of evaluation between what was received and what was expected is the most widely adopted description of resident satisfaction in the current literature (Payne, 1977). This strand of theory appears to have origins in the discrepancy theory (Potter & Cantarero (2006). Over the years, a number of authors have used some form of comparison to model satisfaction and early contributions include contrast theory which states that residents world exaggerate any contrast between expectation and product evaluation (Anantharajan, 1983).

The most well-known descendent of the discrepancy theory is the expectancy disaffirmation paradigm (Amerigo & Aragones 1990)|, which state that, of performance exceeds expectations; customers will be positively satisfied (disconfirmed). On the other hand, if performance fails to meet expectations, residents will be negatively (disconfirmed) dissatisfied resident expectations are formed on basis of buyers past buying experience, statement made by friends and associates as well as markets and competitor information and promises (Owusu, (2007).

2.2 Housing Quality Deterioration in Nigeria.

Housing problems in Nigeria urban centres have been accented by the rapid growth in the 1950s (United Nations, 2019) it has been ascertained Mabogunje, 2008) that rapid population increases couple with a high rate of urbanization affects quality of urban housing. Such rapid rate of population increase derives from high natural growth rate and urban-directed migration.

The total urban population for Nigeria cites of 20,000 people or more his increased from 3.1 million or 11% of the total National population in 1952-1953 census (Oloto, and Adebayo, 2012) to an estimated 29.87 million or 31% by 1985 (Federal Republic of Nigeria (F.G.N), 1981) and the study is different today. Most of our cities are with population average or almost 1 million while Lagos alone is almost 4.5 million (NHP (2012).

Mabogunje (1985) argued that such high urban population growth rate poses great problems for urban management, employment, social infrastructure, provision of adequate quality and quality urban housing is difficult or impossible. The above developments produced a great pressure and deterioration in the quality of housing condition and deterioration in the quality of housing in Nigeria urban centre (Adedire,et al, 2017).

The general inadequacies of housing condition and deterioration in the quality housing in Nigerian urban centres are revealed in a number of issues for example, house occupancy ratio ranging from 3 to 5 person per room had been recorded for many towns and cities in the case of Lagos an overall average of 5.2 person/room was obtained in a survey of rooming house facilities (Master plan for metropolitan Lagos, (1980). Similarly, the percentage of households occupying one room ranged from 41.2 percent for Sokoto to 76 percent for Lagos metropolitan area such measures reveal the seriousness of overcrowding in the urban centres. Study has shown that provisions of amenities in

the dwelling are generally inadequate, housing facilities both external and internal, shortage of accommodation and increasing house rents. The deteriorating state of housing quality is synonymous with our urban centres, conventionally; it has been seen in all areas as our urban centres turning into slum and ghettos. Effort to revive the situation has not been encouraging; the urban renewal programmed has not been successful. Urban renewal is a relative comprehensive community improvement to refashion and rebuild the physical structures of a particular segment of the city. In order to enable it cope more successfully with the many problems confronting it. According to Agbola (1985) such problems might include poor housing, traffic congestion due to narrow lanes, inadequate site for commercial and industrial growth, poor environmental quality, and neighbourhood decays. Other urban renewal projects have been carried out in other cities in Nigeria with the aim of correcting or renewing the cities.

2.3 Factor Influencing Resident Satisfaction on Housing.

This research study is hinged on the premise that housing characteristic, location and demographic characteristics are interconnected to one another as a significant predictors of housing satisfaction. For a residents to be satisfied with a housing unit, the significant predictor must relate to each other and effectively too.

This expression suggests that factors influencing Resident satisfaction on housing quality are those significant predictors which work together to make if house complete; whole and function for satisfaction. Resident satisfaction on housing's the researcher presents three significant predictors- Housing characteristics, location and demographic characteristics which form the focal point of this study.

3. Case study area

The selected case study is Enugu, the capital of Enugu State and is located in the South-Eastern geopolitical region of the Federal Republic of Nigeria as shown in Figure 1. Enugu City is located between $06^0 21^0$N and 06^0 30^0 latitude and between longitude 07^0 26^0 E and 07^0 37^0 E. The land area of the city is estimated at about 72.8 square kilometers. Enugu Urban consists of three local government areas, namely: Enugu North, Enugu South and Enugu East as shown in Figure 2. Enugu is the foremost headquarter of the former south east region of Nigeria. It has 24 prominent residential neighbourhoods. Enugu urban registered a population of 62,764 in 1952; the 1991 Census shows the population count of Enugu to be 462, 514, accommodated in 28 residential patterns. This increased to 722,664 in 2006 and is estimated to be 1,414,785 in 2022. The spatial scope of this study is limited to the neighbourhood in the Enugu metropolis, Enugu south, Enugu

north and Enugu East Local government areas.

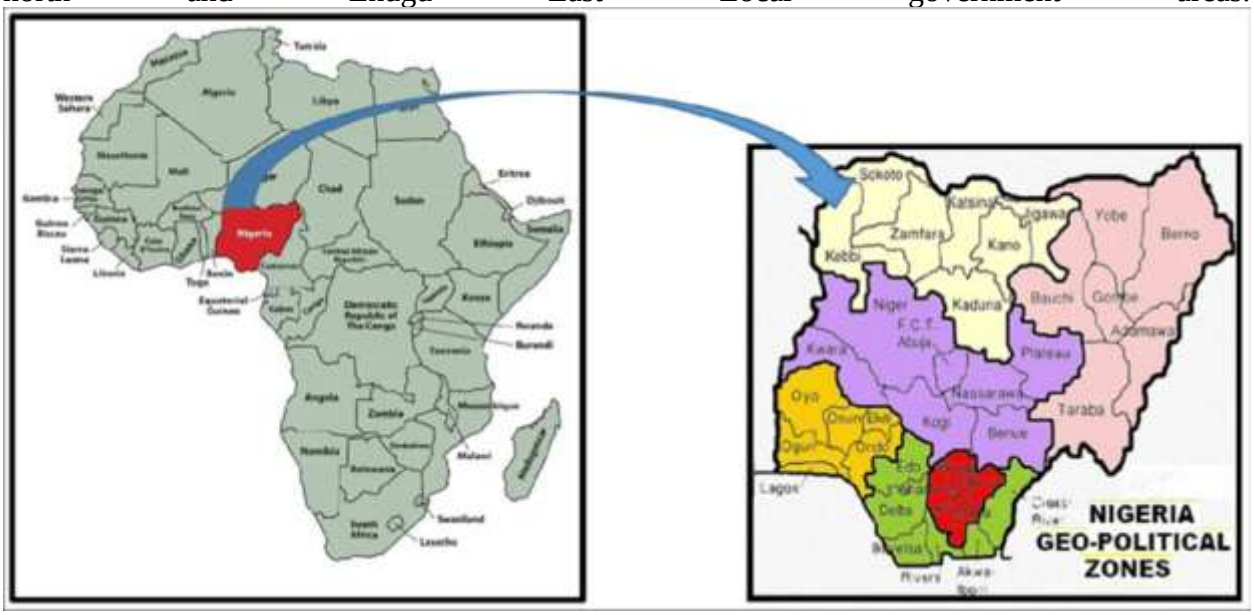

Figure 1: Map of Africa showing Nigeria

Source: Ministry of Lands Survey, Enugu State, 2018.

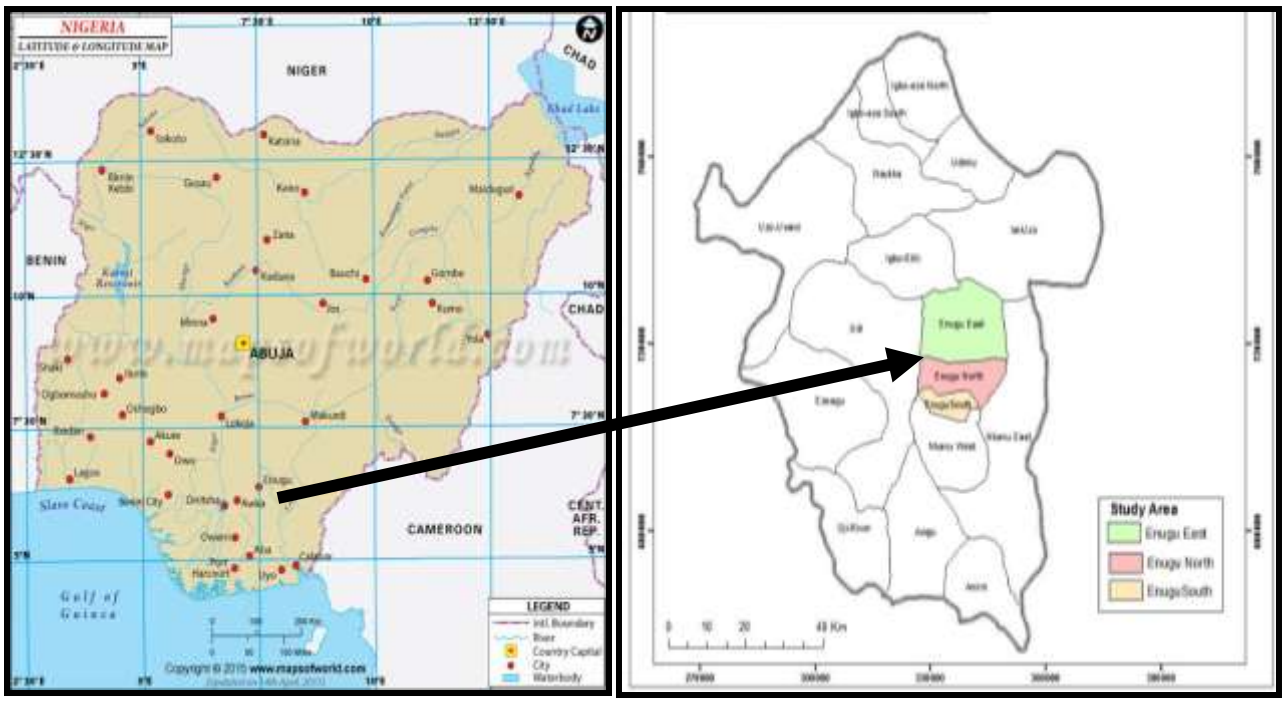

Figure 2. Map of Nigeria showing Enugu and that of Enugu State showing Enugu urban
Source: Ministry of Lands Survey, Enugu State, 2018.

4. Research methods

4.1 Research Design and Study Population

The study adopted survey research design. The population of the study comprised of housing units in the various public housing estates. The household heads (tenants) that have lived in the estates continuously for not less than a year formed the respondents. The collection of primary data was accomplished by conducting reconnaissance survey and administering copies of questionnaire. The survey was conducted among the household heads (tenants) that have lived in the public Housing estates of Enugu Metropolis.

4.2 Sample size determination

In determining the sample size in this research work, Yaro Yamani (1967) population sampling size formula was be used. The formula is stated below.

$$S.\ Sn = \frac{N}{1+(N\ e^2)}$$

Where S.Sn = Sample size
N= Population
E = error margin or exponential point
I = constant

In order to obtain the number of questionnaire to be administered in each of the selected housing estate, this formula below was used. Note that the number of the housing units got from the Enugu State Housing Cooperation (ESHDC) in all the selected housing estates was 4,131

$$S.sn = \frac{4,131}{1 + 4,131\ (0.05)^2}$$

$$S.sn = \frac{4,131}{1+ 4,131\ (0.0025)}$$

:- S.sn = 365.56

This simply means that 366 copies of questionnaires were administered in the study.

4.3 Data collection instrument and variables investigated

The major instrument that was used in the survey are the questionnaire. The questionnaires were given to the household heads that represent the tenants. Only respondents who have lived for one year and above were considered in the study. The questionnaire comprised of two parts. The first part of the questionnaire examined many socioeconomic aspects of residents, including gender, age, educational attainment, years of schooling, occupation, income level, household size, and period of residency in the estates. The second part was composed of structured and unstructured questions on relevant indicators of housing satisfaction in the various housing estates. The structured or closed questions were meant to tailor the respondents to specific answers that addressed the aim and the hypothesis of the study. Respondents' satisfaction levels with these variables was obtained using a five-point likert scale ranging from very dissatisfied (rated as 1), to very satisfied (rated as 5). The information from the questionnaire helped to ascertain the residential satisfaction of the study area. . Ubani et al (2014) stated that likert scale is a five point scale in which the interval between each point on the scale is assumed to be equal and it is used to register the extent of agreement or disagreement with a particular statement or an attitude, belief or judgments. The questionnaire was first of all tested with few randomly selected residents in the estates before administering it to the sampled residents in area. This was done in order to assess the level of comprehension of the contents of the questionnaires by the respondents and make minor changes in the grammar to avoid ambiguity of any sort.

Twelve variables were used to measure tenants' satisfaction indices are listed in Table 1 and as was adopted by Okoye & Chigbu (2017). They were included in the questionnaire as the possible variables that influenced tenants' satisfaction with housing estates the study area.

Table 1: The 12 variables used to measure tenants' satisfaction indices

1. Satisfaction with Estate Facilities and Amenities
2. Satisfaction with overall appearance of housing estate environment
3. Satisfaction with dwelling spaces
4. Satisfaction with dwelling interior design
5. Satisfaction with overall appearance of dwelling
6. Satisfaction with dwelling ventilation
7. Satisfaction with lighting in dwelling
8. Satisfaction with privacy in dwelling
9. Satisfaction with number of rooms

10. Satisfaction with nearness to facilities
11. Satisfaction with management involvement and response rate
12. Satisfaction with management's attitude on rules and regulation

4.4 Data collection and analysis

The stratified, systematic and simple random sampling technique was used in this study. A questionnaire survey of six (6) housing estates from the eleven (11) in the Enugu Metropolis was carried out in the study. Using the stratification techniques, three different categories of public housing representing three income levels - low, medium and high incomes exist in Enugu. Among these categories of housing, there are 7 estates in the low-density (high income), 3 in the medium - income, (medium density) and 1 in the high density (low- income) are seen in Table 2

Table 2: Public housing Estates in Enugu

	Name of Estates	**Location**	**Density status**
1	Riverside	Abakpa	High
2	Federal Housing Estate	Abakpa	Low
3	Trans Ekulu Phase VI	Trans\Ekulu	Low
4	Coal City- Ikenga	Okpara Avenue	Low
5	Mary land- Lomalinda	Maryland	Medium
6	Real Estate	Uwani	Medium
7	Republic	Abakpa	Medium
8	Liberty Estate	Opp IMT gate	Low
9	Golf	New market axis	Low
10	Ebeano	Ogui	Low
11	Ekulu East-Former Zoo	Ogui	Low

Source: ESHC, Newsletter, 2010, Researchers' Survey, 2024

Out of these numbers, 3 estates - namely, Federal Housing Estate, Trans Ekulu Phase VI and Golf from the High-income; 2 estates - namely, Real Estate and Mary land- Lomalinda from the medium- income; and 1 estate - namely, Riverside from the low-income estate categories were randomly selected for the survey. The selected estates had a combined total of 4,131 housing units. Below is the Table 3 showing the proposed questionnaires administration.

Table 3: Housing units and questionnaires administration.

	Housing Estates	***Housing Units**	**Sample size**
1	Federal Housing Estate	732	65
2	Trans Ekulu Phase VI	997	88

3	Golf	109	10
4	Real Estate	775	68
5	Mary land- Lomalinda	806	71
6	Riverside	712	64
	TOTAL	**4,131**	**366**

Source: * ESHC, Newsletter, 2010, Researchers' Survey, 2024

The total number of streets in each Estate was established during the preliminary survey. Based on an initial assessment and data gathered from Google Earth, it was determined that there are a total of 433 streets across the selected estates. The distribution revealed that there existed 109, 145, as well as 179 streets in the low, medium, and high density housing estates respectively. Therefore, a selection was made of 10% of the total streets in each residential zone. A systematic sampling procedure was employed to select each 5th building on the chosen streets. Systematic sampling technique was used to select the household heads from each of the selected streets to be sampled. The 5th building was always selected, this was to ensure proper representativeness in the streets sampled. However, any building that the household head has not lived up to one year was not be sampled. Proportionate allocation strategy was used to get the sample size for each of the estates using their housing unit' numbers as seen in table 2.The total number of questionnaires share were 366 to household heads, In all, a total of 366 copies of questionnaires were distributed.

4.5 Data Analysis

Two types of statistical tools were employed in this study, inferential and descriptive statistics. The descriptive statistics involves frequencies and percentages. For the inferential statistics, Principal Component Analysis (PCA) and multiple linear regression (MLR) statistical technique were used. Data processing and analysis for this study were performed using the Statistical Products and Services Solutions (SPSS) 22 for windows for statistical analysis of the quantitative data. Principal Component Analysis (PCA) was used to test the hypothesis by considering whether factors that influence tenants' satisfaction with their dwelling units can be identified and classified. This PCA was be used to combine and reduce the tenants' satisfaction attributes into fewer major components. For the MLR, the dependent variable was each of the satisfaction attributes that were derived from the PCA analysis while residents' socio-economic characteristics are the independent variables. For the purpose of this analysis, the variable with more than two categories were recoded into two categories and this made them dummy variables. For instance, respondents who had educational qualification lower than primary school education were grouped as illiterates while those that attended primary school and above were regarded as literates coded '0' and '1' respectively. All other exploratory variables were also coded as binary variable, either 0 or 1. For instance, sex has either Male or female; house type is either permanent or temporary; security of tenure is either rented or self-owned; marital status is either single or married. Instances of respondents who were either widows or divorcee, were graded under married for the purpose of this study. Other variables were collected as continuous variable

5. Results

In the course of the study, 12 primary variables were identified as the possible indices used to measure tenants' housing satisfaction, however, they were later transformed into a fewer orthogonal secondary variables for better management of the data. Principal Component Analysis (PCA) was then used to reduce the 12 identified primary satisfaction variables to 5 orthogonal dimensions. This 5 dimensions derived formed the secondary variables (factors). However, for proper evaluation, the 366 responses were transformed by 12 data matrix and also the varimax rotation was computed. Thus, their respective eigen-values were gotten, and the 5 dimensions were selected in their order of importance as presented in their order of importance. However, before subjecting the data to PCA, the dataset was subjected to the Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy test and Bartlett's Test of Sphericity. The results revealed that the KMO Measure of Sampling Adequacy was 0.738 which is greater than the recommended minimum value of 0.6 and the Bartlett's Test of Sphericity is significant at 0.001. This result implies that the sampling for the study is adequate and the result of the PCA was robust and reliable. The results are presented using texts and tables.

The PCA output shows that five components (factors) express the bulk of the common variance among the 12 primary variables. In this junction, these five dimensions (factors) will continually be referred to as tenants' satisfaction factors. Each of the factors will be given a component name and it is important to note from the table above that each factor has high loadings of between ±0.45 and ±0.95 approximately.

For clarity purposes, each of the factors was named to match the variables that are found in them.

Factor 1 - **Management attitudes/Facilities**

Factor 2 - **Closeness to facilities**

Factor 3 - **External Outlook factors**

Factor 4 - **Building design**s

Factor 5 - **Rooms' Details**

In other to have a clearer understanding of the output, below is table 4 that shows the factors and the variables that were the subsets with their factor loading as well as the eigenvalue for each component (factor)

Table 4: **FACTOR GROUPINGS OF THE PRIMARY SATISFACTION VARIABLES**

COMPONENT NAMES	FACTOR LOADING
FACTOR 1: **Management attitudes/Facilities** - Estate Facilities and Amenities - management involvement and response rate - management's attitude on rules and regulation	 .940 .913 .871
FACTOR 2: **Closeness to facilities** - nearness to facilities	 .946
FACTOR 3: **External Outlook factors** - overall appearance of housing estate environment - dwelling interior design - overall appearance of dwelling -	 .912 .892 .827
FACTOR 4: **Building design**s - dwelling spaces - privacy in dwelling - lighting in dwelling - dwelling ventilation	 .917 .902 .815 .771
FACTOR 5: **Rooms' Details** - number of rooms	 .865

Source: PCA Result, 2024

In summary, the study identified and classified tenants' satisfaction determinants in the residential housing estates in Enugu Urban into 5 components that explain 81.773 percent of observed variation in public housing satisfaction variables. The identified and classified tenants' satisfaction determinants are management attitudes/Facilities, Closeness to facilities, External Outlook factors, Building designs and Rooms' Details

Discussion of Findings

The study was aimed at examining the factors influencing tenants' satisfaction with their dwellings units in Enugu Urban, South east, Nigeria with a view to raising options for better housing delivery. This study has some striking revelations. The study noted that five major determinants influenced tenants' satisfaction with their estates in the study area. These factors were management attitudes/Facilities (3.224), Closeness to facilities (2.166), External Outlook factors (2.062),

Building designs (1.991) and rooms details (1.735). These factors were further explained individually.

Factor 1: Management attitudes/Facilities

This was highly and positively loaded on 3 variables out of the 12 variables in the study. A variable in this factor was Estate Facilities and Amenities with the factor loading of 0.940. Other variables in this factor include, Satisfaction with management involvement and response rate with factor loading of .913 and Satisfaction with management's attitude on rules and regulation (SAMAR) with factor loading of .871. This Factor 1 with an Eigen value of 3.224, explains 52.69% of the determining variables of tenants' satisfaction with their estates in Enugu urban. Factor 1 is therefore the most significant housing satisfaction factor contributing to 52.69% of the of tenants' satisfaction with their estates in Enugu urban. Factor 1 as defined by **Management attitudes/Facilities** , is therefore identified and classified as one of the major determinants of household tenants' satisfaction for Enugu urban residents.

Factor 2: Closeness to facilities

This was highly and positively loaded on 1 variable out of the 12 variables in the study. The defining variable in this factor was Satisfaction with nearness to facilities with the factor loading of 0.946. This Factor 2 with an Eigen value of 2.166, explains 31.45% of the determining variables of tenants' satisfaction with their estates in Enugu urban. Factor 2 is therefore the second most significant housing satisfaction factor contributing to 31.45% of the of tenants' satisfaction with their estates in Enugu urban. Factor 2 as defined by closeness **to facilities**, is therefore identified and classified as one of the major determinants of household tenants' satisfaction for Enugu urban residents.

Factor 3: External Outlook factors –

These were positively loaded which included; Satisfaction with overall appearance of housing estate environment (912), Satisfaction with dwelling interior design loading on (.892) while Satisfaction with overall appearance of dwelling however loaded (.825). With an Eigen value of 2.062, it explained 15.402% of the determining variables of housing satisfaction for Enugu. Factor 3 as defined by **External Outlook factors**, has been identified and classified as the third major determinants of tenants' satisfaction for Enugu urban residents.

Factor 4: Building designs: These were positively loaded and it has 4 variables out of the 12 variables, it included; Satisfaction with dwelling spaces (.917), Satisfaction with privacy in dwelling (902), Satisfaction with lighting in dwelling (.815) and Satisfaction with dwelling ventilation loaded (.771). With an Eigen value of 1.991, it explained another 12.027% determining variables of housing satisfaction for Enugu urban. Factor 4 as defined by **Building designs,** has been identified and classified as the forth-major determinants of tenants' satisfaction for Enugu urban residents.

Factor 5: Rooms details: This was positively loaded with one variable- Satisfaction with number of rooms loading (.866). With an Eigen value of 1.735, it explained another 10.221% determining variables of housing satisfaction for Enugu. Factor 5 as defined by **rooms detaiks,** has been identified and classified as one of the major determinants of tenants' satisfaction for Enugu urban residents. .

In summary, the above results were consistent with Masselière, et al (2020) and Clinton & Thwala, (2012) findings, which identified physical adequacy or structure-type indicators to include variables such as wall, floor and roofing materials and used in housing demand analysis as reliable determinants of the tenants' willingness-to-pay for housing characteristics.

Further findings in the study shows that each of the tenants satisfaction attributes that were derived from the PCA analysis was significantly influenced by residents' socio-economic characteristics in the study area. The study shows that the ages, marital status and monthly income of the residents have strong influence in each of the tenants satisfaction attributes. Hence the result of the hypothesis using the MLR showed that each of the tenants satisfaction attributes was significantly influenced by residents' socio-economic characteristics. Therefore the null hypothesis was rejected. See table 5

Table 5: Regression results showing influence of residents' socio economic characteristics on each of the tenants satisfaction attribute

No	Tenants satisfaction attribute	Household socio economic factors	T value	P-sig	Remarks	R^2
1.	**Management attitudes/Facilities**	Age	2.003	0.046*	**Significant**	**0.712**
		Sex	0.401	0.688	Insignificant	
		Marital	2.232	0.026*	**Significant**	
		School completion	2.536	0.012*	**Significant**	
		Monthly income	1.024	0.030*	**significant**	
2.	**Closeness to facilities**	Age	0.446	0.656	Insignificant	0.77
		Sex	0.778	0.437	Insignificant	
		Marital	1.887	0.060	Insignificant	
		School completion	1.251	0.011*	**significant**	
		Monthly income	3.595	0.000*	**Significant**	
3.	**External Outlook factors**	Age	0.120	0.904	Insignificant	0.37
		Sex	1.753	0.342	Insignificant	
		Marital	1.334	0.183	Insignificant	
		School completion	3.876	0.000*	**Significant**	
		Monthly income	0.325	0.745	Insignificant	
4.	**Building designs**	Age	4.257	0.000*	**Significant**	**0.88**
		Sex	0.997	0.322	Insignificant	
		Marital	2.677	0.499	Insignificant	
		School completion	3.816	0.000*	**Significant**	

		Monthly income	3.447	0.001*	**Significant**	
5.	**Rooms details**	Age	2.211	0.027*	**Significant**	**0.65**
		Sex	0.637	0.525	Insignificant	
		Marital	0.259	0.795	Insignificant	
		School completion	1.198	0.032*	**Significant**	
		Monthly income	6.067	0.000*	**Significant**	

6. Conclusions

This study has been able to address the onerous tasks that had been confronting policy makers and stakeholders as to knowing the factors determining adequate and satisfactory housing that will serve as a guide for future housing design and development in Enugu State. The study identified and classified the factors that influence tenants' satisfaction with their dwelling units into five components which explained 81.733 percent of observed variation in public housing satisfaction variables. The five factors are management attitudes/Facilities, closeness to facilities, external outlook factors, building designs and rooms' details were the major determinants that influence tenants' satisfaction with their housing estates. Again, each of the tenants satisfaction attributes that were derived from the PCA analysis was significantly influenced by residents' socio-economic characteristics in the study area . It is now obviously clear that the residents in the various housing estates in the area had moderate satisfaction with the houses across the various residential housing estates in the study area. Hence, the study was able to highlight the cardinal explanatory variables which include - proper estate management, nearness to facilities, overall appearance of buildings, availability of facilities and number of rooms in a unit house that would normally influence the interest of tenants in the study areas. It behooves on the State Housing Authority or any private estate developer in the state to cardinally consider these variables while coming up with housing estates in the state. In other word, while planning for any housing development program in the state, these factors must be predominantly considered

Future research should focus on identifying numerous tenants' socio economic factors that could affect satisfaction of housing estates in Enugu. Another area for future research is a comparison of the results of this study with other studies in the context of developing countries

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