



---

An Open Access Journal Available Online

# **Socioeconomic and Demographic Predictors of Residential Satisfaction within Public Housing Estates in Northern Nigeria**

*Joy Joshua Maina*

*Department of Architecture, Ahmadu Bello University Zaria-Nigeria*

*Correspondence email: jjmaina@abu.edu.ng*

**Received: 21.09.2020 Accepted: 21.06.2021**

**Date of Publication: June, 2021**

**Abstract:** This study examined relationships between residential satisfaction, socioeconomic and demographic characteristics of residents to address the dearth of user input proffered as a major reason for failure of public housing delivery in Nigeria. Results from a survey of 178 respondents across eight selected public housing estates in Northern Nigeria analysed in SPSS v.24 through descriptive statistics, Pearson chi-square correlations and logistic regression reveal that length of stay ( $p=0.001$ ) and marital status ( $p=0.006$ ) significantly associate with residential satisfaction. Monthly income, length of stay and marital status emerged as significant predictors of residential satisfaction ( $p<0.05$ ). The odds of residential satisfaction increasing is higher among residents who earn monthly incomes above 100,000 NGN (OR=2.422), have lived within the estates for more than 10 years (OR=2.288), accommodate household sizes of 4-6 persons (OR=1.279) within units containing more than 3 bedrooms (OR=1.346) which are owner-occupied (OR=1.118). Contrarily, residential satisfaction decreases if respondents are male, married, aged 30 years and above with large families of more than six persons. The study concludes that demographic profiling of residents is useful in the planning of future public housing developments and projections of support infrastructure. Consequently, updated employee databases ought to be a priority especially in government ministries, departments and agencies. Policies of providing 2-3 bedroom units also require revision as well as

flexible plans, which allow for extensions to houses especially increasing the number of bedrooms by residents in future.

**Keywords:** Residential satisfaction, Socioeconomic status, Demographic predictors, Public housing, Nigeria

## 1.0 Introduction

The lack of user input at inception has arguably been one of the most proffered reasons for failures recorded within public housing programs in Nigeria. Muoghalu's 1984 study of residential satisfaction (RS) within public housing in Enugu concluded that planning for residents without their input and consideration translated to dissatisfaction. This is because residents do not always approve what has been approved by technocrats as units provided failed to address actual living conditions of many families. Aduwo et al. (2016) argue that the lack of participation of end users at grassroot and local levels to a large degree accounts for the massive failure of low-income housing programs in the country. The authors add that accurate data on households would have ensured tangible impact in housing delivery. Similarly, Jiboye (2014) observed that existing housing development has been devoid of relevant user housing preferences and socioeconomic adaptations, with the criteria guiding design based on developer's standards and not on housing needs and values of occupants. Although housing delivery problems are enormous and complex, a focus on end user characteristics including needs and values would undoubtedly reduce

problems associated with poor housing developments as well as uncontrolled transformation of housing units. This would have also ensured better quality of life and mitigated health related issues from stress owing to incompatibility of changing family needs within inflexible public housing units occupied by the same residents over long periods of time.

Socioeconomic status (SES) and demographic data constitute information readily available to policy makers and planners prior to conceptualisation of housing programs. These have been extensively employed in developed countries to address public housing interventions related to health (Bowen & Quintiliani, 2019), education (Martens et al., 2014) and wellbeing of elderly citizens (Fang et al. 2019) to mention a few. Unfortunately, few studies specifically examine relationships between SES, demographic data and RS in Nigeria. Although Okpoechi (2018), Adewale (2015), Waziri et al. (2014a), Waziri et al., (2014b) and Jiboye (2014) address this issue, the aforementioned studies were either conducted within privately owned residential estates or within public estates located in Southwest Nigeria. Consequently, a gap exists for investigating relationships

between demographic data and RS within public housing estates in Northern parts of the country. This is very pertinent for policy making towards future projects as the Federal Government through its sustainability plan to mitigate effects of the COVID 19 pandemic plans to embark on direct construction of 300,000 housing units across the country (FGN, 2020). Feedback from residents of current public housing estates will provide relationships between RS, housing conditions and demographic profiles of end users towards prediction of possible trends and improvement of public housing delivery in future. Such trends would for instance, specifically inform policy makers of geographic locations of acute housing needs as well as housing decisions likely to be preferred by residents based on their demographic profile. These in turn exert enormous influence on the type and magnitude of infrastructure provided as well as housing typologies to better suit end user requirements in future.

This study examines relationships between SES and demographic data of residents and levels of satisfaction with their housing environment in Northern Nigeria. Objectives to guide this inquiry include:

1. Exploring levels of association between SES and demographic variables with RS.
2. Determining predictors of RS from SES and demographic data of public housing residents in the study area.

## 2.0 Literature Review

Several studies investigate factors associated with RS, with literature revealing three tendencies. These are operationalisation of SES/demographic variables, SES and demographic correlates and predictors as well as low numerical values of demographic and SES variables in predictive and associative models of RS.

### 2.1 Operationalisation of SES and Demographic Variables within RS Research

Demographic and SES variables are employed interchangeably especially within the Nigerian context, with demographic variables often subsumed as SES. However, social science research considers occupation, educational attainment and income as the triumvirate of SES indicators especially as it relates to measurement of social class (Diemer et al. 2013). SES is described as an index of “one’s position within a power hierarchy via relatively objective indicators of power, prestige and control over resources such as income, wealth, education level and occupational prestige” (Diemer et al. 2013, p. 79). SES variables are interwoven in that higher educational qualifications usually result in prestigious jobs, which often translate to higher incomes and better earnings. Demographic variables on the other hand characterise human populations into segments such as age, gender, marital status etcetera depending on the focus of investigation. While

SES delineate a population along social and economic indices, demographic variables provide an overview of individual attributes across a wide spectrum, which often subsume SES variables.

Studies predicting influence of SES and demographics on RS commonly report nine variables describing characteristics of respondents in Nigeria. These are educational qualifications, occupation or employment, income, gender, age, marital status, tenure, length of stay

and household size (Table 1). Other variables included in some RS studies are typology, ethnicity/tribe, floor levels, availability of space, family life cycle, previous housing experience as well as class/level for studies on student housing. Consequently, studies report these variables either as SES (Benjamin, nd; Okpoechi, 2018; Adewale et al. 2018; Ogunde, 2013; Ibem & Aduwo, 2013; Mohit et al. 2010) or as demographic variables (Amole, 2009; Ukoha & Beamish, 1997).

**Table 1: Description of SES and other Demographic Variables in RS Studies**

<i>Variable</i>	<i>Description</i>	<i>Source(s)</i>
<b>SES</b>		
Educational qualifications	Highest educational attainment of respondent. Categories depend on contextual nomenclature	Hassan et al. (2019), Nguyen et al. (2017), Ibem & Amole (2012)
Occupation/Employment	Primary job/work, employment sector of a respondent (usually the household head)	Okpoechi (2018), Ibem et al. (2015a), Diemer et al. (2013)
Income	Earnings, wealth, purchasing power of a household commonly operationalised as average monthly or annual income	Gunseuk (2016), Amole (2009)
<b>Other demographic variables</b>		
Age	Numerical value denoting how old a respondent is	Adewale et al. (2015), Waziri et al. (2014a)
Gender	Biological, societal or behavioural categorisation of a person's sex, usually male or female	Galster (1987), Onibokun (1976)
Marital status	Classification based on whether a person is married or not. Other categories employed in RS studies include divorced, separated or widowed	IBem et al. (2015b), Jiboye (2014)
Tenure	Ownership status of a household regarding the dwelling usually operationalised as owner-occupier/homeowner or tenant/renter	Elsinga & Hoeskstra (2005)

---

Length of stay	Total period or length of time a person or household has lived within a house and environment	Makinde (2015)
Household size	Number of persons which make up a social unit living in the same house sharing one hearth or meals	NBS (2016)
Typology	Description of the house, dwelling or structure type such as single freestanding bungalow, terrace, semi-detached, duplex, multi-family dwelling, apartment, tenement, hostel, traditional compound etcetera	Ukoha & Beamish (1997)
Ethnicity/Tribe/Race	Social category of people sharing the same culture, social norms, language and other behavioural traits	Makinde (2015)
Floor levels	Floor level containing the dwelling, room or apartment employed in studies on multi-level housing such as terrace housing, student hostels, condominiums and apartments	Hassan et al. (2019), Amole (2009)
Availability of space	Space allocation within a dwelling in respect to social norms and family needs in a cultural context	Ukoha & Beamish (1996)
Life stages/Family cycle	Stages in the life cycle of a family. These include (1) Household head under age 45 with no children; (2) Youngest child under age 5; (3) Youngest child aged 5-14; (4) Youngest child aged 14+; (5) Head aged 45+ with no child living at home	Galster (1987)
Previous housing experience	Type of dwelling and housing experience prior to current housing conditions which may influence subjective evaluations and perceptions of current dwelling	Mohit et al. (2010), Galster (1987)
Class/Level	Academic year of student respondents. Features largely in studies involving student hostels and accommodation	Amole (2009)

---

## ***2.2 SES and Demographic Correlates and Predictors of RS***

The second trend in the RS literature relates to generalisation of findings concerning SES and demographic correlates and predictors. Holistically, studies of demographic or SES predictors of RS are

inconclusive especially across different contexts. Assessed individually, subtle trends emerge. For instance, several studies associate higher educational qualifications with lower RS especially within the context of public housing. The main reason

proffered for this observation is that higher education exposes individuals to higher aspirations and lifestyles. Consequently, highly educated residents are likely to be dissatisfied within prototype public housing over time. Nguyen et al.'s 2017 study examined satisfaction among 499 residents of social and cheap commercial apartments in Hanoi, Vietnam. Employing logistic regression analyses, the authors report that "those with higher education tend to have higher standards and aspirations, which may lead them to be less satisfied with their home" (p. 8). Hassan et al. (2019), Ogunde (2013) and Jagun et al. (1990) proffer similar findings. In the case of Hassan et al. (2019), results from a study of 125 single unit houses and 31 private multi-level apartments in Pakistan revealed RS inversely relates to higher educational qualifications as well as income for the same reasons proffered by Nguyen et al. (2017). Ogunde's study of subsidised public housing schemes across Ogun State in 2013 illustrates the same point, that educational status significantly but negatively correlates with RS. This is similar to reports from Black residents in the US where educational levels negatively predict RS (Jagun et al., 1990). In a study of student hostels across Southwest Nigeria, Amole (2009) found that as economic status of students increased, RS decreased, supporting previous research. The study examined RS among 1,022

university students using categorical regression analyses. Amole explains that these results are not surprising because increase in economic status implies increase in aspirations and decrease in satisfaction as long as the housing situation remains the same. Okpoechi (2018) however presents contradictory reports with income positively predicting RS. In a study of 15 mid income housing estates in Owerri, income significantly and positively predicted RS. These findings accrue from logistic regression analyses of responses from 344 residents engaged in private business ventures outside of government employment. Residents in private housing with higher incomes have greater choice of housing and can therefore afford to improve their homes or move to another one if need be (Nguyen et al., 2017). Conversely, residents with lower earning power are often restricted in their choice of housing in part owing to limited funds. Likewise, findings on the predictive effect of employment on RS especially within public housing units are inconclusive. Ibem et al. (2015b) report that public sector residents of government built mass housing estates were satisfied with their housing environment including the neighbourhood because owning a home is an important achievement. Additionally, the policy of owner occupation for civil servants is likely to positively support feelings of residential satisfaction (Ibem et al., 2013). Onibokun (1976) on the other

hand reports SES variables, including employment status, predicts lower RS in public housing after examining responses obtained from both questionnaire and interview surveys of 199 female household heads in Ontario, Canada. The research hypothesis tested an association between tenants' characteristics and their assessment of satisfaction with their housing. Results from analyses of variance revealed significant associations between tenants' characteristics and RS. In the case of employment status, the association was negative. Studies on age as a predictor of RS tend to report older residents are most satisfied in single level bungalows because they probably have fewer expectations and have adapted to their housing conditions and environment over time. Age however tends to be negatively associated with RS in multi-level public housing. Following their study on similarities and differences in residents' perception of housing adequacy and RS in Ogun State, Ibem et al. (2015a) opine that satisfaction with housing conditions increases with age as 44% of residents aged 60 years and above were happy with their housing situation. Similarly, Adewale et al.'s 2015 study within core areas of Ibadan revealed that age significantly and positively associates with neighbourhood satisfaction. Older residents aged 61-70 years recorded the highest satisfaction levels. The reverse is the case in multi-level

dwelling. Mohit et al. (2010) assessed RS in newly designed public low cost housing in Kuala Lumpur, Malaysia with the aim of investigating factors, which influence RS as well as examining their role in the overall satisfaction process. Employing results from descriptive statistics, correlations and multiple regression, the study found that age, household size and employment of wives negatively correlated with RS. Etmnani-Ghasrodashti et al., (2017) report similar findings from their assessment of RS in Mehr housing scheme in Iran. Results of factor and regression analyses of 200 questionnaires from residents revealed that age was a significant but negative predictor of RS. This implies that elderly respondents were more dissatisfied residing in the multi-level residences examined. This was largely due to accessibility and adaptability issues encountered by older residents within multi-level dwellings. Stairs make accessibility and socialisation more difficult for older residents in high-rise buildings than for younger occupants. Gender, marital status and household size likewise present inconclusive results as predictors of RS depending on study context. Gunseuk (2016) examined effectiveness of the Korean government's housing plans by analysing the housing satisfaction of residents from a pool of 2012 and 2014 Korean Housing Surveys. Regression analyses of a sample of over 53,000 respondents revealed

that men are more likely to be satisfied than their female counterparts. Gender was also a significant and positive predictor of RS among residents of public housing in Ogun State (Ibem et al., 2015b; Ibem & Amole, 2012). Nguyen et al. (2017) however report that gender had no impact on RS from results of their study in Vietnam. Gunseuk's study reported that married couples without children specifically showed the highest housing satisfaction, collaborating Onibokun (1976) who reports single parent families recorded lower RS scores than their married counterparts. "Respondents who were separated or divorced tend to have larger-sized families, complain about inadequate repairs within the house, unfriendly neighbours, privacy. . . and inadequate outside recreation space more than married respondents' (p. 330). A reason proffered for these observations was that single parents tend to take on raising a family alone without the added support from a spouse. Extra help is likely to come in form of close relatives who are unlikely to live nearby within the same estate. Marital status was however not a significant predictor of RS in some studies (Adewale et al., 2018; Ibem et al., 2018). Regarding household size, Ibem and Aduwo (2013) report that the number of persons in a household significantly predicts RS among residents of Public-Private Partnership schemes, Turnkey projects, Core housing and Shell

strategies in Ogun State. This collaborates observations made by Gunseuk (2016) that larger household sizes are associated with RS, in contrast to reports by Mohit et al. (2010) who assert household size is negatively associated with RS in their study of public low-cost housing in Malaysia.

Tenure, length of stay and typology present marked tendencies as predictors of RS. Generally, owner-occupiers are more satisfied in public housing compared to tenants (Lawanson & Onifade, 2013; Elsinga & Hoeskstra, 2005; Galster, 1987). Regarding length of stay, Adewale et al. (2020) report that residents who have lived longer in an environment become dependent and attached to the area. Satisfaction is thus likely to be higher among older residents compared to new occupants (Makinde, 2015; Ogunde, 2013; Amole, 2009). Satisfaction with length of stay in public housing tends to be associated with owner-occupants who have likely made extensive social investment in the area, thereby developing strong friendships with neighbours and other residents within the neighbourhood. This is directly opposed to tenants who, having little motivation to put down their roots in a neighbourhood or make extensive modifications, display what Onibokun (1976) describes as relative deprivation. This is a situation where continued living in unchanged housing situations with changing housing needs leads to

decrease RS over time. Regarding typology, RS tends to be higher for occupants of stand-alone or semi-detached bungalows than other typologies such as multi-level, terrace or row housing (Ibem et al., 2018; Ukoha & Beamish, 1997; Jagun, 1990).

Other demographic variables notably ethnicity, race or tribe, floor levels, availability of space, life-cycle stages as well as class/level appear in comparatively few studies than the aforementioned variables. A compilation of trends for these variables is therefore likely to present biased conclusions.

### **2.3 Low Predictive and Correlation Values of SES and Demographic Variables in RS Models**

The third and last trend in RS literature relates to low beta and correlation values of demographic and SES variables in predictive and associative models of RS. Two categories of studies attempt to predict or associate tenant characteristics with RS. The first are studies on SES or demographic variables only (Okpoechi 2018; Adewale et al., 2015; Waziri et al., 2014a, 2014b; Jiboye 2014). The second category employs some form of regression analyses of tenant characteristics along with extracted factors from residents' assessment of overall housing environments to predict RS (Hassan et al., 2019; Adewale et al., 2018; Ibem et al., 2018; Ibem & Aduwo, 2013; Amole, 2009; Ukoha & Beamish, 1997). An

issue in regressing demographics alongside extracted factors from residents' assessment of overall housing satisfaction is the difficulty in extracting variance explained solely by demographic variables.

Consequently, results from both groups generally produce low correlation and beta values. Benjamin's (nd) study of private housing estates in Abuja recorded weak but positive values based on Cohen's guidelines for interpreting correlations (Field, 2013). Ukoha and Beamish (1996) likewise report SES variables had minimal effect on satisfaction, corroborating observations made by Adewale et al. (2018) that SES do not significantly influence RS. Averagely, variance reported for SES ranged from 6-7% across studies (see Okpoechi, 2018; Ukoha & Beamish, 1996). Several RS studies from different countries however assert the importance of investigating demographic variables likely to predict RS in order to improve housing policies (Nguyen et al., 2017; Gunseuk, 2016). Residents' characteristics are particularly invaluable as they present available information about users prior to design. The lack of user input prior to planning and design has frequently been cited as a contributing factor to failure recorded in mass housing programme delivery in Nigeria (Makinde, 2015; Jiboye, 2014; Aduwo et al., 2013; Ibem et al., 2013). Additionally, residents' characteristics have been extensively

employed in social science research to predict other housing related phenomena such as health (Bowen & Quintiliani, 2019) and education outcomes of children in public housing (Martens, et al., 2014).

This study examines only SES and demographic factors that associate and predict RS in public housing across selected estates in Northern Nigeria.

### **3.0 Methodology**

#### **3.1 Study Area**

The sample for the study was pooled from public housing estates across the three geopolitical zones of Northern Nigeria. Two estates, one in Sokoto and the second in Dutse were randomly selected in the Northwest, two in the Northeast located in Potiskum and Gombe while four in Abuja, the Federal Capital Territory represent the Northcentral zone. The estate in Sokoto consists of 500 units made up of 2 and 3 bedroom bungalows, the former designed as semi-detached units and the latter as freestanding houses. The population in Dutse, the Jigawa State capital has 200 units comprising 2, 3 and 4 bedroom bungalows. The estate in Gombe contains 200 units made up of 2 bedroom semi-detached bungalows and 3 bedroom freestanding units. At the time of the survey in 2019, 115

of the houses were occupied and constitute the study population in Gombe. The study population in Potiskum, Yobe State comprised 50 units of both 2 and 3 bedroom bungalows. In Abuja, the first estate consisted of 2 bedroom semi-detached units in 30 blocks, making a total of 60 units. The second, third and fourth estates comprise 2 and 3 bedroom housing units contained within multi-level blocks in Garki, Maitama and Wuse typical of housing for public sector workers constructed in the FCT. The total population of the study was 1,033 units as illustrated in Table 2. Sample size was computed as a ratio of  $N$  (1,033) and  $1+N(e^2)$ , where  $e$  represents 0.05 margin of error (Yamane, 1967). This yielded a sample of 288, which was rounded up to 290. To compensate for possibilities of low retrieval rates observed in previous housing studies especially in the Northwest geopolitical zone (Maina et al., 2021), about 15% of this number (45) was added to the sample size, resulting in 335 questionnaires distributed across the estates (Table 2). The total number of retrieved questionnaires was 221 (67%) out of which 178 (53%) were appropriately filled and included in the final analyses.

**Table 2: Sample Size and Distribution across Study Areas**

<i>Location</i>	<i>Description</i>	<i>Estate population</i>	<i>Distributed</i>	<i>Retrieved</i>	<i>Analyses</i>
Abuja	2 bedroom semi-detached units	60	30	23	22
	2 & 3 bedroom multi-storey units	108	100	62	40
Potiskum	2 bedroom units	50	50	25	18
Gombe	2 & 3 bedroom units	115	55	41	41
Sokoto	2 & 3 bedroom units	500	50	27	23
Dutse	2, 3 & 4 bedroom units	200	50	43	34
Total		1,033	335	221	178

### **3.2 Data Collection and Analyses**

In this study, RS was measured using 31 items describing housing environments through a survey questionnaire adapted from Ibem and Aduwo (2013). Respondents were requested to rate their satisfaction with each item on a 5 point likert scale, with 1 denoting the resident was very dissatisfied and 5 implying the resident was very satisfied with the item. The items were categorised under four sub-systems namely housing attributes, housing services, neighbourhood environment and management features. Items under housing attributes include satisfaction with sizes of living and dining spaces, bedrooms, cooking and storage spaces, type of house, bath and toilet facilities, external appearance of the house, natural lighting and ventilation, noise levels, location of the house as well as levels of privacy. Water

supply, sanitary services as well as electricity supply constitute housing services. Items relating to the neighbourhood environment include proximity to nearest market, schools, workplaces, recreation, sporting and healthcare facilities, urban infrastructure, quality of communal activities, level of crime and criminal activity etcetera. Management related items comprise cost and rent of housing, rules and regulation of residency, facility management, cleanliness, security to life and property etcetera. Mean Residential Satisfaction Score (MRSS) was computed for each respondent as an average of ratings obtained from all 31 items. The mid value of 3 on a 5 point likert scale was employed to categorise satisfaction for each respondent. If MRSS of a respondent was lower than 3.00, the respondent was categorised as

dissatisfied (0) but satisfied (1) if this value was equal to or above 3.00.

Nine variables describe residents'

characteristics and constitute independent variables in this study as shown in Table 3.

**Table 3: Levels of Measurement of Variables**

<i>Variable</i>	<i>Measurement levels</i>
Education	0=Up to Secondary School; 1=Tertiary education (Diploma, First degree, PG)
Income	0=Up to 100,000NGN; 1=Above 100,000NGN.
Gender	0=Female; 1=Male
Marital status	0=Unmarried; 1=Married
Age	0=18-30 years; 1=30 years +
Length of stay	0=Up to 10 years; 1=10 years +
Household size	0=1-3 persons; 1=4-6 persons; 2=6 persons +
Tenure	0=Tenant/Renter; 1=Owner occupier
Number of bedrooms	0=1-3; 1=3 bedrooms +
RS	0=Not satisfied; 1=Satisfied

All items except household size were operationalised as binary variables in two categories. Educationally, respondents were classified as having been educated up to secondary or tertiary level. The latter include qualifications obtained from higher institutions of learning such as Higher National Diploma (HND) and university degrees. Monthly income was stratified into two groups with residents earning up to 100,000 NGN classified as 0 and those earning above this amount classified as 1. This categorisation was based on average exchange rate of 360 NGN per dollar in 2019 when the survey took place. Using average household size of 4.9 people per household in urban areas (NBS, 2016), families on average need to earn above 105,840 NGN monthly to maintain the minimum UN standard

of 2 USD per day in order to remain above the poverty threshold. This figure was approximated to 100,000 NGN per month and employed for analysis. Values for gender, marital status, age, length of stay and tenure follow classifications generally employed in previous studies. Household size, measured as number of persons, was classified under 1-3 as 0, 4-6 as 1 and more than 6 persons as 2 denoting large families (see Table 3). Typology was substituted with number of bedrooms because respondents often selected typologies not found within particular estates surveyed. This was probably due to lack of adequate understanding of house types. For instance, a number of residents selected duplexes in estates containing only stand-alone or semi-detached bungalows. Number of

bedrooms were more easily understood as well as appropriately filled by respondents and were thus employed in the analysis. Employment was not included in the present analysis as the public estates surveyed were largely allocated to civil servants based on owner-occupier basis. Consequently, educational qualifications and monthly income were more differentiated among the sample than employment sector and served as SES variables in the analyses.

Following the tradition of previous studies, descriptive statistics, Pearson chi-square tests of association and logistic regression analysis were applied to address the aim of this study. Descriptive statistics present an overview of the distribution of variables across the sample in simple frequencies and percentages. Levels of association between RS, the criterion variable and residents' characteristics were evaluated through Chi-square tests ( $\chi^2$ ), with significance set at 0.05. Effect sizes from Cramer's V results of the analyses were interpreted based on Cohen's suggestions of less than 0.3 being small, between 0.3 and 0.5 medium and above 0.5 large (Field, 2013). Logistic regression models were employed to examine residents' characteristics that predict RS in the study area. Specifically, Binary Logistic Regression (BLR)

was employed in the final analysis because model coefficients ( $\beta$ ) and odds ratios (OR) directly display marginal effects of independent variables. This ensures results are more intuitive and interpretable across a wide range of disciplines (Nguyen et al., 2017). BLR is employed to predict a dichotomous variable measured at two levels-0/1, pass/fail, satisfied or dissatisfied. Independent variables entered into the model may take binary, categorical or continuous measurements, which need specification during the process of analysis (Field, 2013). OR represents the odds of a respondent categorised as satisfied over being categorised as dissatisfied. Field (2013) explains that OR greater than 1 indicates that as the predictor increases, the odds of the outcome occurring increases as well. Significant predictors usually have 95% CI range above 1, meaning that 95 times out of 100, the OR will positively increase since its lower boundary is above 1.

#### 4.0 Results and Discussion

Results from the analyses of descriptive statistics reveal that 89% (n 158) of respondents are educated to tertiary levels. Only 11% (n 20) are educated at secondary school level, presenting the widest gap between sub-categories of variables in Table 4.

**Table 4: SES and Demographic Profile of Respondents**

<i>Variables</i>	<i>Overall (n 178)</i>	<i>MRSS</i>	<i>Remark</i>	$\chi^2$	<i>Sig</i>
<b>Education</b>				<i>0.093</i>	<i>0.216</i>
Up to Secondary school	20 (11%)	2.90	Dissatisfied		
Tertiary	158 (89%)	3.10	Satisfied		
<b>Monthly Income</b>				<i>0.143</i>	<i>0.057</i>
Up to 100,000 NGN	104 (58%)	3.02	Satisfied		
100,000+ NGN	74 (42%)	3.16	Satisfied		
<b>Gender</b>				<i>0.039</i>	<i>0.602</i>
Male	98 (55%)	3.05	Satisfied		
Female	80 (45%)	3.10	Satisfied		
<b>Marital status</b>				<i>0.207</i>	<i>0.006</i>
Unmarried	66 (37%)	3.21	Satisfied		
Married	112 (63%)	3.00	Satisfied		
<b>Age in years</b>				<i>0.108</i>	<i>0.149</i>
18-30	63 (35%)	3.17	Satisfied		
30+	115 (65%)	3.02	Satisfied		
<b>Length of stay</b>				<i>0.247</i>	<i>0.001</i>
Up to 10 years	118 (66%)	2.99	Dissatisfied		
10 years+	60 (34%)	3.25	Satisfied		
<b>Household size</b>				<i>0.142</i>	<i>0.167</i>
1-3 persons	35 (20%)	2.95	Dissatisfied		
4-6 persons	100 (56%)	3.14	Satisfied		
6+ persons	43 (24%)	3.04	Satisfied		
<b>Tenure</b>				<i>0.096</i>	<i>0.202</i>
Renter/Tenant	37 (21%)	2.88	Dissatisfied		
Owner occupier	141 (79%)	3.13	Satisfied		
<b>Number of bedrooms</b>				<i>0.050</i>	<i>0.506</i>
1-3	148 (83%)	3.07	Satisfied		
3+	30 (17%)	3.12	Satisfied		
<b>Residential satisfaction (RS)</b>					
Dissatisfied	75 (42%)				
Satisfied	103 (58%)				

Households earning up to but not more than 100,000 NGN account for 58% (n 104) of the sample compared to 42% (n 74) who are high-income earners. This suggests that low to mid-income earners inhabit public housing estates in Northern parts of the country. Men make up 55% (n 98) of respondents, slightly higher than females, who account for 45%

(n 80). This result differs from previous studies where male household heads made up 89% of the gender category (Maina et al., 2016), implying that females are becoming more empowered to represent household heads within the context of public housing in Northern Nigeria. Demographics also illustrate that married residents form the

majority of respondents (63%, n 112), a result that is reflected in the age category as a similar proportion (65%, n 115) of respondents are aged 30 years and above. Regarding residency, two-thirds of the sample (66%, n 118) have occupied their units for up to but not more than 10 years, as against one-third (34%, n 60) who are residents for over a decade. Average household sizes of 4 to 6 persons dominate the sample (56%, n 100), followed by large households of more than 6 persons (24%, n 43) and small families of 1 to 3 persons (20%, n 35). Approximately four in five respondents are owner-occupiers (79%, n 141). Only 21% are tenants or renters of the housing units, majority of which are three bedrooms or less (83%, n 148). These statistics support descriptions of housing units sampled across the study area described in the methodology.

Overall, MRSS was 3.08 across the sample, just slightly above the mid-point value of 3.00. This result is

also reflected across the various sub-categories of variables as only four (21%) of the 19 sub-variables examined on Table 4 were dissatisfactory.

Dissatisfied respondents include residents who are not tertiary-educated (M 2.90) and have stayed in the estates for up to but not more than 10 years (M 2.99), who live in small households (M 2.95) or are tenants (M 2.88). On average, satisfaction was highest among residents who have stayed for more than 10 years in the surveyed estates (M 3.25) and lowest among tenants and renters (M 2.88). Although 58% of residents were satisfied with their housing environment (Table 4), a deeper inspection of RS scores in Figure 1 reveals that this percentage is due to many respondents recording values around the mid-point value of 3 which is neutral. This result suggests that residents were often neither satisfied nor dissatisfied with their housing situation. There were however, no very dissatisfied respondents.



Figure 1: Residential satisfaction levels across the study area

Results from Pearson chi-square analyses ( $\chi^2$ ) reveal that only length of stay ( $p=0.001$ ) and marital status ( $p=0.006$ ) are significantly

associated with RS. Income ( $p=0.057$ ) approached but failed to achieve significance at 0.05 (Table 4). Overall, all variables record small

size effects, as values from  $\chi^2$  associations were all less than 0.3, supporting earlier observations that SES and demographic variables weakly correlate with RS. Nonetheless, results from logistic

regression analyses, presented in Table 5 reflect findings from the chi-square statistics as length of stay, marital status and income emerged as significant predictors of RS.

**Table 5: Logistic Regression Analyses of SES and Demographic Variables**

Variable	Model 1		Model 2	
	OR (95% CI)	$\beta$	OR (95% CI)	$\beta$
Education Tertiary (1)	1.451 (0.550-3.830)	0.372	1.325 (0.469-3.746)	0.282
Monthly income 100,000+ NGN (1)	1.704 (0.900-3.226)	0.533	<b>2.422 (1.120-5.240)*</b>	0.885
Gender Male (1)			0.950 (0.483-1.871)	- 0.051
Marital status Married (1)			<b>0.380 (0.175-0.826)*</b>	- 0.968
Age 30+ (1)			0.735 (0.330-1.637)	- 0.308
Length of stay 10 years+ (1)			<b>2.288 (1.015-5.158)*</b>	0.828
Household size 4-6 (1)			1.279(0.508-3.218)	0.246
Household size 6+ (2)			0.699 (0.231-2.114)	- 0.358
Tenure Owner-occupier (1)			1.118 (0.479-2.606)	0.111
Number of bedrooms 3+ (1)			1.346 (0.551-3.376)	0.311
-2LL	238.112		215.716*	
R <sup>2</sup>	0.032		0.187	
Prediction from Classification tables	58.4%		69.1%	

Dependent variable: Residential Satisfaction \* $p < 0.05$

Logistic regression analyses were run in two models, the first containing only SES variables (education and monthly income) while the second contained SES and all demographic variables (Table 5). Model 1 was insignificant and variance was very low at 3.2%. OR for tertiary education (1.451) and monthly income (1.704) were however above 1, implying SES variables are influential but insignificant predictors of RS.

Including all demographic variables in the second model however improved not only significance and overall prediction from 58.4% in model 1 to 69.1%. Variance increased to 18.7%, doubling variances recorded in previous studies on SES between 6.9% (Okpoechi, 2018) and 7% (Ukoha & Beamish, 1996). This result suggests that demographic variables exert stronger influences on RS over SES variables in the context of public

housing, especially when delivered through owner-occupier basis. By including other demographic variables in model 2, monthly income became the strongest predictor of RS (OR=2.422,  $\beta=0.885$ ), followed by length of stay (OR=2.288,  $\beta=0.828$ ). Marital status with OR of 0.380 negatively predicts RS with beta value of -0.968 (Table 5). Other insignificant but influential predictors of RS with positive beta values are number of bedrooms (OR=1.346,  $\beta=0.311$ ), education (OR=1.325,  $\beta=0.282$ ) and tenure (OR=1.118,  $\beta=0.111$ ). Household size above 6 persons (OR=0.699,  $\beta=-0.358$ ), age (OR=0.735,  $\beta=-0.308$ ) and gender (OR=0.95,  $\beta=-0.051$ ) negatively predict RS. These results imply that RS increases with higher values of income, length of stay, number of bedrooms, education and tenure status but decreases with higher values of gender, marital status, age and household size.

In line with previous studies conducted within private houses and apartments (Okpoechi, 2018; Nguyen et al. 2017), income eventually emerged as a significant and positive predictor of RS following the addition of other non-SES variables. This result supports the assertion that demographic variables maybe stronger predictors of RS than SES because income emerged as a significant predictor of RS only when demographic variables were added in model 2. A possible reason for this result is that most public housing estates are allocated

to civil servants employed by government based on grade level, which in turn is dependent on educational attainment. Because of the inter relationship between education, employment and monthly income, differences in income only become evident when other more differentiated demographic variables are considered. Specifically, the odds that residents who earn more than 100,000 NGN will be happier with their housing situation are higher than for residents earning less as submitted by Okpoechi (2018) and Nguyen et al. (2017) but contradicts Amole (2009) probably because the latter focused on student hostels and not public housing. Students operate as transient tenants within public hostels and are unlikely to behave like residents of owner-occupied housing units. Consequently, educational qualifications also record positive beta values across both models in the present study. Specifically, tertiary graduates are more likely to be satisfied with their housing situation than secondary school educated residents. Similarly, residents who have lived on the estates for more than 10 years are more likely to be satisfied probably due to extensive social networking and place attachment developed over time. Such residents are more likely to participate in neighbourhood associations and interventions as well as invest in home-based ventures all linked to improved quality of life and overall well-being (Adewale et al., 2020).

Again in support of previous literature (Lawanson & Onifade, 2013; Elsinga & Hoeskstra, 2005), owner-occupiers are more likely to be satisfied than tenants or renters. Owning a home is a milestone for many citizens worldwide. In the African context, a man's home is his palace. Thus owning a house especially within planned neighbourhoods reflects one's social status in life. This is a laudable achievement for many Nigerians. Results also reveal that residents are likely to be happier in houses with more than three bedrooms, supporting submissions by Ukoha and Beamish (1997) who questioned the validity of continued construction of 2-3 bedroom-housing units by government in view of large family sizes of average civil servants in Abuja. Findings from the present study also explain why transformations persist especially increase in number of bedrooms within public housing estates as reported by Aduwo et al. (2013). This calls for a re-think and flexible designs on the part of planners and architects for possibilities of incorporating more bedrooms in future by residents as the need arises. Gender, marital status, age and household size negatively predict RS. Males are more likely to be dissatisfied than females. Married household heads are likewise more likely to be dissatisfied compared to unmarried ones from this study. This trend also holds true for residents older than 30 years, especially if they

live in large households with more than six persons. The finding on older residents is unexpected considering previous studies report older people especially those above 60 years are likely to be satisfied in public housing (Ibem et al., 2015a; Waziri et al., 2014b). A possible reason for this is that the age range in the present study subsumes most of the active working group from 30 to 60 years, thus younger residents in previous studies fall into the older group in the present study. Future studies will need to stratify more age ranges in order to delineate limits of age for RS studies. Overall, married men 30 years and older in charge of large households are likely to be dissatisfied in public housing within Northern parts of Nigeria. This stratum typifies the active working class who in many cases are responsible for catering to their nuclear and extended families as well as the larger society. Consequently, RS, also associated with satisfaction with life is likely to be low with residents within this demographic bracket.

## **5.0 Conclusion and Recommendations**

This study explored relationships between SES, demographic characteristics of residents and RS in public housing. Results from a survey across eight owner-occupied housing units in Northern Nigeria reveal three resident characteristics significantly predict RS. These are monthly income, length of stay and marital status, with the latter

inversely related to RS as a negative predictor. The study concludes that demographic variables proffer more insight into relationships between RS and residents' characteristics largely because they are more differentiated than SES variables in the context of public housing where allocations depend on employment and educational qualifications. Consequently, only income, which differs according to grade level emerged as a significant SES predictor following the addition of other demographic variables in the second model.

Recommendations target policy and research. The present study demonstrates that demographic variables significantly predict RS and explain almost a fifth of the total variance in RS. This is higher than obtained in previous studies. Findings reveal that residents who earn high incomes and intend to live for more than a decade are likely to be the most satisfied within public housing in Northern Nigeria especially if they have medium sized families and are owner-occupiers allocated to houses with more than three bedrooms. Following this observation, government employment databases ought to provide researchers with demographic data from which similar evaluations can be made prior to conceptualisation of future housing developments to aid planning. Consequently, updating official government databases with employee demographic information

ought to be highly prioritised as current practices in government circles rarely support nor reflect this need. This will go a long way in bridging lack of user information in housing delivery in the country. Policy of providing 2-3 bedroom-housing units also needs revision in light of study findings. Designers need to go beyond standard prototype floor plans to projecting expansions in future. This requires flexibility and further studies into incremental designs more than ever before as such decisions will invariably exert additional pressure on infrastructure such as roads, water and electricity supply, open and recreational spaces, commercial facilities etcetera to support larger populations.

A limitation of this study is the lack of consideration of employment due to the nature of sampling which included only public housing units allocated to civil servants. Future models would benefit from including employment sector as a SES variable. Additionally, future studies ought to examine other demographic variables such as typology, floor levels, previous housing experiences as well as life cycle stages towards improving RS models in both public and privately developed estates.

## References

- Adewale, B. A., Ibem, E. O., Amole, B. & Adeboye, A. B. (2018). Assessment of residential satisfaction in the core area of Ibadan Metropolis, Nigeria. *Journal of Human Behavior in the*

- Social Environment*, 1-28.  
<http://dx.doi.org/10.1080/10911359.2018.1502116>.
- Adewale, B. A., Ibem, E. O., Amole, S. A. & Adeboye, A. B. (2020). Place Attachment in Nigerian urban slums: Evidence from inner-city Ibadan. *Cities*, 107, 1-10.  
<http://dx.doi.org/10.1016/j.cities.2020.102902>.
- Adewale, B. A., Taiwo, A. A., Izobo-Martins, O. O. & Ekhaese, E. N. (2015). Age of Residents and Satisfaction with the Neighbourhood in Ibadan Core Area: A Case Study of Oke Foko. *Global Journal of Arts Humanities and Social Sciences*, 3(2), 37-45.
- Aduwo, E. B., Edewor, P. A. & Ibem, E. O. (2016). Urbanisation and Housing for Low-Income Earners in Nigeria: A Review of Features, Challenges and Prospects. *Mediterranean Journal of Social Sciences*, 7(3 S1), 347-357.  
<http://dx.doi.org/10.5901/mjss.2016.v7n3s1p347>.
- Aduwo, E. B., Ibem, E. O. & Opoko, A. P. (2013). Residents' Transformation of Dwelling Units in Public Housing Estates in Lagos, Nigeria: Implications for Policy and Practice. *International Journal of Education and Research*, 1(4), 1-20.
- Amole, D. (2009). Residential satisfaction in students' housing. *Journal of Environmental Psychology*, 29, 76-85.  
<http://dx.doi.org/10.1016/j.jenvp.2008.05.006>.
- Benjamin, O. A. (n.d.). *Users' Satisfaction with Residential Facilities, Neighbourhood Features and Management in Private Housing Estates in the Federal Capital Territory, Abuja, Nigeria*. Retrieved April 01, 2020, from Academia.com: [www.academia.com](http://www.academia.com)
- Bowen, D. J. & Quintiliani, L. (2019). Socioeconomic Influences on Affordable Housing Residents: Problem Definition and Possible Solutions. In A. B. Cakmakli (Ed.), *Different Strategies of Housing Design* (pp. 1-9).  
<http://dx.doi.org/10.5772/intechopen.86960>. IntechOpen.
- Diemer, M. A., Mistry, R. S., Wadsworth, M. E., Lopez, I. & Reimers, F. (2013). Best Practices in Conceptualizing and Measuring Social Class in Psychological Research. *Analyses of Social Issues and Public Policy*, 13(1), 77-113.  
<http://dx.doi.org/10.1111/asap.12001>.
- Elsinga, M. & Hoekstra, J. (2005). Homeownership and housing satisfaction. *Journal of Housing and the Built Environment*, 20, 401-424.  
<http://dx.doi.org/10.1007/s10901-005-9023-4>.
- Etminani-Ghasrodashti, R., Majedi, H. & Paydar, M. (2017). Assessment of Residential Satisfaction in Mehr Housing Scheme: A Case Study of Sadra New Town, Iran. *Housing, Theory and Society*, 1-20.  
<http://dx.doi.org/10.1080/14036096.2017.1298536>.

- Fang, M., Mirutse, G., Guo, L. & Ma, X. (2019). Role of socioeconomic status and housing conditions in geriatric depression in rural China: a cross-sectional study. *BMJ Open*, 9, 1-8.  
<http://dx.doi.org/10.1136/bmjopen-2018-024046>.
- FGN (2020). *Bouncing back: Nigeria Economic Sustainability Plan*. Economic Sustainability Committee.
- Field, A. (2013). *Discovering Statistics using IBM SPSS Statistics (4th Edition)*. SAGE.
- Galster, G. (1987). Identifying the Correlates of Dwelling Satisfaction: An Empirical Critique. *Environment and Behaviour*, 19(5), 539-568.  
<http://dx.doi.org/10.1177/0013916587195001>.
- Gunseuk, Y. (2016). *Housing Satisfaction in South Korea*. MPA/MPP Capstone Projects, University of Kentucky, Martin School of Public Policy & Administration.
- Hassan, S. Z., Naeem, M. A., Waheed, A. & Thaheem, M. J. (2019). Assessment of Socio-economic profile and residents' satisfaction living in apartments and single unit houses in Islamabad, Pakistan. *International Journal of Strategic Property Management*, 23(5), 284-297.  
<http://dx.doi.org/10.3846/ijspm.2019.8067>.
- Ibem, E. O. & Aduwo, E. B. (2013). Assessment of residential satisfaction in public housing in Ogun State, Nigeria. *Habitat International*, 40(2013), 163-175.  
<http://dx.doi.org/10.1016/j.habitatint.2013.04.001>.
- Ibem, E. O. & Amole, D. (2012). Residential Satisfaction in Public Core Housing in Abeokuta, Ogun State, Nigeria. *Social Indicators Research*, 113(1), 563-581.
- Ibem, E. O., Adeboye, A. B. & Alagbe, O. A. (2015a). Similarities and differences in Residents' Perception of Housing Adequacy and Residential Satisfaction. *Journal of Building Performance*, 6(1), 1-15.
- Ibem, E. O., Ayo-Vaughan, E. A., Oluwunmi, A. O. & Alagbe, O. A. (2018). Residential Satisfaction among Low-Income Earners in Government-Subsidized Housing Estates in Ogun State, Nigeria. *Urban Forum*,  
<http://dx.doi.org/10.1007/s12132-018-9337-4>.
- Ibem, E. O., Opoko, A. P., Adeboye, A. B. & Amole, D. (2013). Performance evaluation of residential buildings in public estates in Ogun State Nigeria: Users' satisfaction perspective. *Frontiers of Architectural Research*, 2, 178-190.  
<http://dx.doi.org/10.1016/j.foar.2013.02.001>.
- Ibem, E. O., Opoko, P. A. & Aduwo, E. B. (2015b). Satisfaction with Neighbourhood Environments in Public Housing: Evidence from Ogun State, Nigeria. *Social Indicators Research*, 1-25.  
<http://dx.doi.org/10.1007/s11205-015-1188-y>.

- Jagun, A., Brown, D. R., Milburn, N. G. & Gary, L. E. (1990). Residential Satisfaction and Socioeconomic and Housing characteristics of Urban Black Adults. *Journal of Black Studies*, 21(1), 40-51. <http://dx.doi.org/10.1177/2F002193479002100105>.
- Jiboye, A. D. (2014). Socioeconomic Characteristics and Satisfaction of Tenants in Public Housing in Lagos, Nigeria. *Africa Development*, XXXIX(3), 31-50.
- Lawanson, T. & Onifade, V. (2013). Comparative Assessment of Housing Satisfaction in Medium Estates of Lagos, Nigeria. In F. A. Emuze (Ed.), *Procs SB13 Southern Africa: Creating a Resilient and Regenerative Built Environment, 15-16 October 2013, Cape Town* (pp. 223-232). SB13, Central University of Free State, South Africa.
- Maina, J. J., Dagoli, M., Abdulkadir, A., Muhammad, N., Mohammed, I., Yusuf, B., Mtan, T. & Abdulrazaq, M. (2021). Satisfaction with Dwelling Unit Attributes and Infrastructure within selected Public Housing Estates in Northern Nigeria. *CSID Journal of Infrastructure Development*, 4(1), 96-111. <https://doi.org/10.32783/csid-jid.v4i1.211>
- Maina, J. J., Abba, M. A., Abba, A. A. & Ibrahim, R. H. (2016). Housing transformation trends in Kundila and Takur Site II estates, Northern Nigeria. *The Professional Builder*, 6(2), 32-44.
- Makinde, O. O. (2015). Influences of Socio-cultural experiences on residents' satisfaction in Ikorodu low-cost housing estate, Lagos State. *Environ. Dev. Sustain*, 2015(7), 173-198, <http://dx.doi.org/10.1007/s10668-014-9545-6>.
- Martens, P. J., Chateau, D. G., Burtland, E. M., Finlayson, G. S., Smith, M. J., Taylor, C. R., . . . Bolton, J. M. (2014). The Effect of Neighbourhood Socioeconomic Status on Education and Health Outcomes for Children Living in Social Housing. *American Journal of Public Health*, 104(11), 2103-2113. <http://dx.doi.org/10.2105/AJPH.2014.302133>.
- Mohit, M. A., Ibrahim, M. & Rashid, Y. R. (2010). Assessment of residential satisfaction in newly designed public low-cost housing in Kuala Lumpur, Malaysia. *Habitat International*, 34, 18-27. <http://dx.doi.org/10.1016/j.habitatint.2009.04.002>.
- Muoghalu, L. N. (1984). Subjective Indices of Housing Satisfaction as Social Indicators for Planning Public Housing in Nigeria. *Social Indicators Research*, 15(1984), 145-164. <http://dx.doi.org/10.1007/BF00426285>.
- NBS (2016). *Nigeria-General Household Survey Panel Wave 3 (Post Planting)*. National Bureau of Statistics (NBS), Federal Government of Nigeria (FGN).
- Nguyen, A. T., Tran, T. Q., Vu, H. V. & Luu, D. Q. (2017). Housing

- satisfaction and its correlates: a quantitative study among residents living in their own affordable apartments in urban Hanoi, Vietnam. *International Journal of Urban Sustainable Development*, 1-13.  
<http://dx.doi.org/10.1080/19463138.2017.1398167>.
- Ogunde, A. O. (2013). *Performance Evaluation of State Subsidized Housing Scheme: A Case Study of Ogun State Housing Projects*. Unpublished Thesis (PhD), Department of Building, Covenant University.
- Okpoechi, C. (2018). Socio-economic Determinants of Housing Satisfaction among Middle-Income Households in Owerri, Nigeria. *Developing Country Studies*, 8(10), 36-44.
- Onibokun, A. G. (1976). Social System Correlates of Residential Satisfaction. *Environment and Behavior*, 8(3), 323-344.  
<http://dx.doi.org/10.1177/136327527600800301>.
- Ukoha, O. M. & Beamish, J. O. (1996). Predictors of Housing Satisfaction in Abuja, Nigeria. *Housing and Society*, 23(3), 26-45.
- Ukoha, O. M. & Beamish, J. O. (1997). Assessment of residents' satisfaction with public housing in Abuja, Nigeria. *Habitat International*, 21(4), 445-460.  
[http://dx.doi.org/10.1016/S0197-3975\(97\)00017-9](http://dx.doi.org/10.1016/S0197-3975(97)00017-9).
- Waziri, A. G., Yusof, N. & Rahim, N. M. (2014a). Occupants housing satisfaction: does age really matter? *Urban, Planning and Transport Research*, 2(1), 341-343.  
<http://dx.doi.org/10.1080/21650020.2014.935467>.
- Waziri, A. G., Yusof, N., Rahim, N. M., Roosli, R. & Yakub, A. A. (2014b). How Socioeconomic Status (SES) Predicts Housing Satisfaction in Nigeria. *International Journal of Managerial Studies and Research*, 2(9), 95-104.
- Yamane, T. (1967). *Statistics, An Introductory Analysis (2nd Edition)*. Harper and Row.