RICHTMANN PUBLISHING

A Critical Appraisal of Residents' Level of Satisfaction with Architectural Designs in Public Housing Estates in Benin City Nigeria

Kingsley Okechukwu Dimuna

Department of Architecture,
Ambrose Alli University, Ekpoma, Nigeria

Abiodun Olukayode Olotuah

Department of Architecture,
Federal University of Technology, Akure, Nigeria

Abstract

Housing plays a significant role in the Socio-economic and physical development of any nation. Housing which is regarded as the oldest aspect of architecture has been found to have a profound impact on its inhabitants. This is so because architecture has been attributed to have some impact on the physical, psychological and emotional needs of occupants both positively and negatively. There is therefore a nexus between architectural schemes, the environment and residents. This study examines the residents' satisfaction level in terms of architectural designs in six built and occupied housing estates in Benin City, Edo state, Nigeria. Data were collected in 2018 from six (6) housing estates namely: Oluku Housing Estate, EDPA Housing Estates Ugbowo, Federal Housing Estate, Oregbeni, and Federal Housing Estate on Ikpoba Hill, Iyekogba Housing Estate, Ebo and Andrew -Wilson Housing Estate, Evbuoriaria; through administration of structure questionnaires, interviews and direct observations. Data analysis involved the utilization of descriptive statistical tools such as means, standard deviations, and categorical regression. The result revealed that architectural design of the estates has a positive effect on residents' satisfaction and this is significant at 5% (p=0.000) which means enhancement in the architectural design of the estates results in high satisfaction levels. The paper proposes that architectural design of any building should consider the way of life of the people, the economic means and affordability of the low-income workers in order to achieve the desired goal. It further recommends that architectural design process should be explored to the fullest in the determination and realization of housing quality and hence residents' satisfaction in the built environment.

Keywords: Housing, Architectural designs, Residents' satisfaction, Benin City

1. Introduction

Since man's existence on earth, shelter has been one of his most important concerns. Man's longing for the provision of decent housing is a clear demonstration of his resolve to protect himself properly from the vulnerability of his socio-physical environment such as rain, sunshine, diseases and wild animals (Akinbode, 2000). In the same vein, Osuide (2004) notes that housing is an essential element of every human settlement and it hold singular importance in the general strategy of development.

Housing can be defined as the provision of any form of structure, erection of building which is man-made for the purpose of accommodating a person or persons. However, a broader definition by The Nigeria's National Housing Policy, NHP (2006, p 2) defined housing as:

E-ISSN 2281-4612
ISSN 2281-3993

Academic Journal of
Interdisciplinary Studies

Vol 8 No 3
November 2019

"The process of providing functional shelter in a neighbourhood supported by sustainable maintenance of the built environment for the day-to-day living and activities of individuals and families within the community".

Corroborating this, (Omole, 2001) posits that housing in its complete corollary is more than simple shelter in view of the fact that it embraces the complete social services and utilities that will build a liveable community or neighbourhood environment. According to Akinbode (2000), all through the Palaeolithic and Mesolithic Ages, (c.12000 - 3000 BC), man was not successful in establishing an enduring safe haven or dwelling on the surface of the earth. It was not until the Neolithic Age some 12000 years ago that man succeeded in founding the village as end result of centuries of great efforts between him and his natural environment. Human housing and shelter have been fundamentally transformed ever since the early days when man sheltered himself in caves or on three branches. In modern times, housing has developed into sophisticated structures and become multifaceted in design, that it is perhaps, the foremost aspect in the spatial organisation of human societies. It is the boldest imprint of man's habitation of the surface of the earth.

It is incontrovertible that housing is a veritable unit of the society and that the housing environment exerts as profound impact on the health, efficiency, social behaviour, satisfaction and general welfare of the community (Rapoport, 1969; Mabogunje, 2003; Osuide, 2004; Olotuah 2007). Thus, without doubt housing clearly mirrors the cultural and socio-economic ideals of the society at a given point in time. Indeed, housing has been described as the best physical and historical evidence of civilization in any community (Akinbode 2000).

Good housing is virtually a pre-requisite for decent living. Thus, every unit of the society such as the individual, the family and the community requires decent housing as a precondition not only for survival under different climatic environments but also fort healthy interactions with other members of the society. Good housing impacts positively on productivity, as decent housing significantly increases workers' physical and mental health and overall quality of life and consequently growth and human development. Osuide (2004) states that having a safe place to live in, is one of the essential ingredient of human dignity, physical and mental health and impact largely on the quality of life and this improves human development. Similarly, Van Wky & Van Wky (2001) opine that good housing has a huge prospective to provide people with the prospect to live complete individual lives, and therefore contribute absolutely in the direction of all features of development – psychological, social, economic, and cultural. Housing is key worries for the entire people in all part of the globe as the comfort of people of a nation is reflected in its citizens get pleasure from a certain standard of living (Oliverira, Caraayannis, Ferreira, Jalali, Carlucci & Ferreira,2018).

Residential and neighbourhood satisfaction are significant indicators of housing value and state, which have an effect on individual's quality of living. According to Dimuna (2017) the provision of adequate and quality housing, and well organized urban services, is informed by the need to: Enhance quality of life; promote greater community integration; and social integration of the population. Achieving these goals require a well articulated architectural designs of housing units and creation of well planned layouts and congenial environments, for the satisfaction of the residents. The concept of Housing satisfaction in the opinion of (Djebarni & Al-Abel, 2000) refers to the measure of pleasure derived by an individual or family in respect to their present housing condition. Satisfaction gauges the disparity between definite and required households housing and neighbourhood situations (Galster, 1987).

Previous studies Olotuah (2016); Ajanlekoko (2001); and Mabogunje (2003) have exposed that many years of express government involvement in housing have not been able to resolve the predicament of inadequate and poor quality housing. In similar vein, (Ukoha & Beamish,1997) assert that appraisal of housing requirements by different governments in Nigeria has shown intense efforts on the quantity of dwelling units needed, rather than on the significance of quality, users' tastes and satisfaction. This assertion could be true especially in public housing.

Public housing could be described as type of housing which is provided by various levels of governments for the citizens through the use of public funds. As a result of many interested groups

involved in the provision of public housing, many research works has been done on many aspects of its provision. Among these are public housing policies, institutional frameworks for provision and management of public housing, public housing finances as well as public housing schemes and their outcomes (Ibem & Azuh, 2012). However, not much has been done in area of the impact of architectural schemes on the residents of public housing estates. It is because of this that this study on housing satisfaction in public housing estates in Benin City was undertaken; in order to examine the problems associated with housing satisfaction in these public housing estates; and provide ways of improvement for the satisfaction of residents.

This study therefore, intends to examine the levels of satisfaction in terms of architectural designs of the dwelling units in the selected housing units, with a view to seeking how public housing estates in Benin City could be improved for the satisfaction of the residents.

2. The Study Area

The study area is Benin City, the capital of Edo State of Nigeria. The Benin Metropolis comprises three local government areas – i.e Oredo, Egor and Ikpoba Okha, which make up the Benin Metropolis. Benin Metropolis is one of the major urban centres in Nigeria. It is a pre-colonial city and its urban history dates back to the 7th century B.C. (The Columbia Encyclopaedia, 2007). Rapid development has stretched the metropolis towards Oluku in Ovia North East and Eyaen in Uhumwunde Local Government Areas. However, this study is concerned with some public housing estates in Benin City and covers Ikpoba Hill, Ugbowo, Oregbeni, Oluku, Andrew Wilson (Evbuoriaria) and Iyekogba Housing Estates as shown in Figure 1.

Geographically, Benin City, lies within the latitude $6^{0}20^{1}$ and $6^{0}31^{1}$ North and longitude $5^{0}32^{1}$ and $5^{0}41^{1}$ East. It has a landmass of 112.5 square kilometres (Ministry of Land and Survey, 2005).

Benin City is the most urbanized town in Edo State and seat of the State Government and the Oredo Local Government. These dual roles have attracted large number of people, mostly employed by government establishments. As a result of these developments, there has been a rapid growth of large scale commercial and service establishments in the city, as well as some modern processing industries (Adegboyega, 2006; Aiworo, 2016). Until recently, Benin City had a weak industrial base. There are few manufacturing industrial and small/medium scale enterprises, most of which are agro-based. Some of the economic activities that are the major employers of labour in the city are: Guiness, Brewery, Bendel Brewery, Nigeria Bottling Companies, 7Up Bottling Companies, financial and insurance institutions, pharmaceutical factories, table water, furniture making, metal works, plastic factories, Petroleum Storage Deport and petroleum products retail outlets.

Currently, there are several State Government and Federal Government ministries and agencies offices spatially located in the metropolis (Adegboyega, 2006; Aiworo, 2016). For example, The State Government Secretariat Buildings, Palm House Building, Civil Service Commission Building, High Court, Magistrate Court, Court of Appeal, Central Hospital all in Sapele Road, Benin City. The Federal institutions in the city include: University of Benin, University of Benin Teaching Hospital, Benin Airport, Federal Court of Appeal and Federal Secretariat Complex houses most of Federal Ministries in the State. The City also has recreational facilities like Ogba Zooligical garden; Communication outfits in the metropolis to aid dissemination of information are: Nigerian Television Authority and Radio Nigeria, Edo Broadcasting Television and Edo Broadcasting Radio and Independent Television and ITV Radio, etc.

Benin City has been growing rapidly in population compared to other Nigerian cities. For instance, the population of the city rose from 53,753 in 1952 census to 100,694 in 1963 (Sada, 1984). This gave an annual growth rate of 5.5% between 1952 and 1963 (Ozo, 1982). The population of the city in the 1991 census, was 780,976 (NPC, 1991); while in 2006 it rose to 1,085,676 with the male and female population put at 542,554 and 543,122 respectively (NPC, 2006). Based on 5.5% growth rate for urban centres (Aiworo, 2016), using the 2006 population census figure projected that in 2018, the population of Benin City will be around 2,070,537. As the metropolis continues to grow in population, so are the demands for housing.
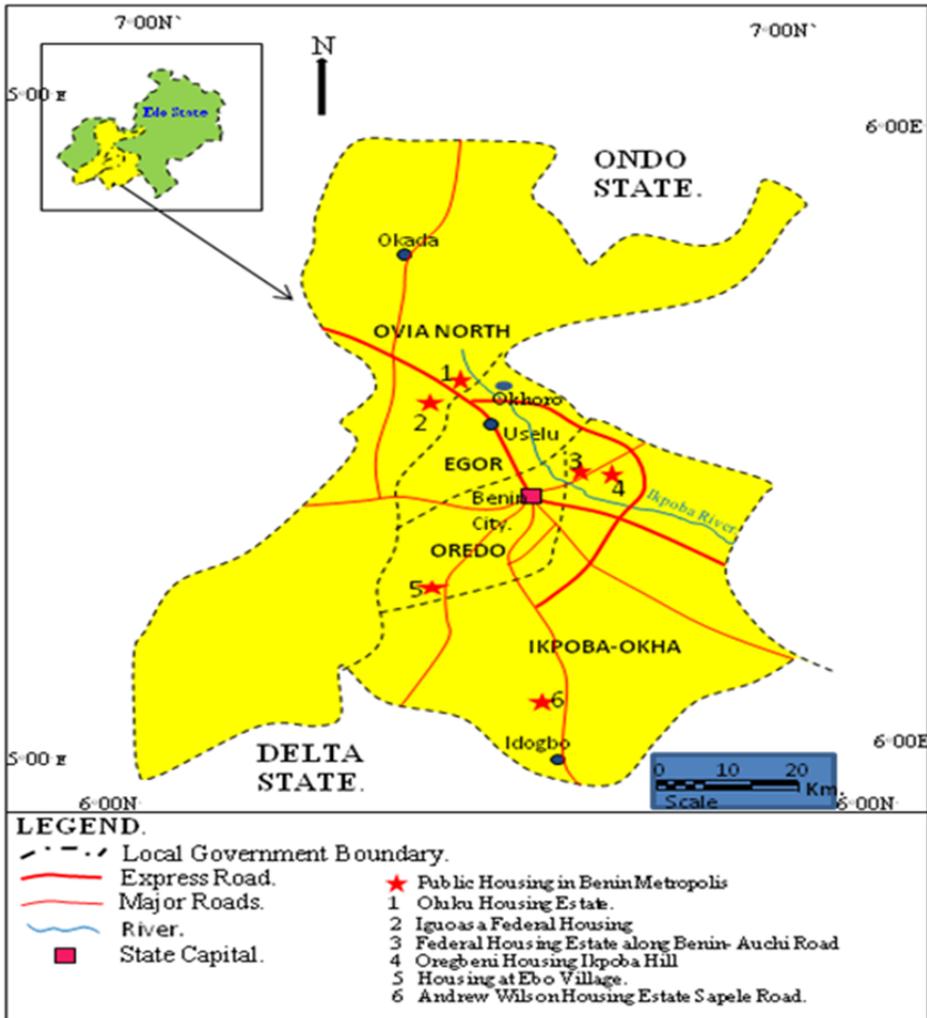
Fig. 1: Location of Public Housing in Benin City
Source: Cartography Studio, A.A.U. Ekpoma, 2014

3. Literature Review

Housing satisfaction according to (Bonaiuto & Fornara, 2017) refers to experience of pleasure or gratification a resident derives from a dwelling unit or place (e.g., house or building, environment). Hui & Yu (2009) opine that it describes the gap linking occupants housing needs and housing aspirations and the reality of the present residential condition. Residential housing satisfaction in the views of Olatubara & Fatoye (2006) is a manifestation of the extent to which the inhabitants of a residence believe that their housing facilitates the realization of their aspirations. The authors posit that it is a measure of the extent to which housing (quality) performance is meeting the residents expectation in terms of benefits and desires. The concept entails that the residents' desires and aspirations have been satisfied and that the residents are contented in their residence. Unhappiness indicates that the occupants are not contented and the result of this would be the yearning to move or, possibly, to modify the dwelling unit. Obstacles to making these alterations,

such as lack of choice or resources could end in unending dissatisfaction (Ukoha & Beamish, 1997).

The concept of housing satisfaction has been used according to **(**Djebarni & Al- Abed, 2000) for four main purposes:

i. It is used as a key predictor of an individual's perceptions of the general quality of life;
ii. It serves as an indicator of incipient residential mobility and hence has changed housing demand and influenced neighbourhood changes;
iii. It is used as an evaluation method to determine the success of developments built by private and public sectors; and
iv. It serves as an appraisal tool to measure residents' perceptions of inadequacies in their present housing environment in order to enhance current housing situation.

Housing satisfaction studies have attracted interest over the years due to widespread consumer protection after World War II, as a result of shift in interest of firms from production to marketing-to adaptation of output to needs and desires of the consumer Engel (1978). The latest era of consumerism was attributed to late United State President, John F. Kennedy who in is his message to Congress on March 15, 1962, outlined the four fold rights of the consumer as the right to safety, the right to be informed, the right to choose, and the right to be heard (redress) (Engel, Ibid:585). The introduction of environmental psychology into architectural design and planning professions has facilitated a better understanding of consumer (user or residents) perspectives Moughalu (1986).

In housing studies, diverse opinions have accelerated interest in housing satisfaction evaluation. However, Moughalu (1986) had noted that most of the housing evaluation studies have been based on objective verifiable indices to the neglect of subjective indices. There has been a growing concern for this method of evaluation. Proponents such as Sheldom & Land (1972); Campbell & Angus (1976); and Hempel & Tuker (1979) see both the objective and subjective methods as complementary in policy formulation and planning. While others such as Sundquist (1975); Schneidder (1976) have argued that subjective views of housing residents or consumers furnish areas of social dissatisfaction as well as expectations; Campbell (1974) had opined that by incorporating the results of subjective views into planning we create a fuller and truer society.

In Nigeria, where the government has promised decent, quality and affordable housing in decent environment (NHP, 2006); the only way to reveal the gap between promise and delivery, government lack of responsiveness to residents' tastes and preferences and so overcome the "tunnel vision" of experts according to Davis et al, (1965) and Hayman (1981) cited in Moughalu (1986) is through subjective evaluations. Evaluation, according to Egunjobi (2000), is a systematic way of learning from experience so as to improve current activities and promote further learning. It is processes which endeavour to establish as systematically and objectively as feasible to significance, effectiveness and impact of activities. In other words, evaluation establishes criteria for defining success and assessing the extent to which these criteria have been achieved by the project (venture). Evaluation can be quantitative, in which case numerical values are estimated for the net project impacts or it can be qualitative, in which case the purpose is to understand the way in which the project has affected and is being affected by the populations who have been exposed to it.

Adriaanse, (2007) and Kelleke & Bertoz, (2006) opine that knowledge of residents' housing satisfaction is an important channel for many planners, architects, developers, and policy makers who make housing available to array of persons. Other studies on the subject (Awotona, 1991; Vrbka & Combs, 1991; Nwaka, 2005; Akinmoladun & Oluwoye, 2007) have shown that housing satisfaction is predisposed by factors such as users' characteristics, dwelling unit characteristics, management, and environmental and location factors. (Morris & Winter, 1978) cited by Ukoha & Beamish (1997) identified facilities and services available as determinants of housing satisfaction.

Other studies by Johnson & Abernathy, (1983) observed that availability of desired building features and structural types significantly affect housing satisfaction. Similarly, Galster (1980) and Kinsey & Lane, (1983) shown that Single-family homes have been associated with higher levels of satisfaction than multifamily housing**.** Another study (Ozo, 1986), revealed that poor housing conditions are results of shortage of internal facilities such as (kitchen, bath, and toilets). These

internal facilities according to Muoghalu (1984) intensify the inconvenience of lack of privacy when shared by residents.

Examination of the previous studies has shown that there is a strong correlation linking area of housing norms and residents' housing satisfaction. Building and architectural features are among the housing norms that aid the understanding of housing satisfaction. Thus, examining the specific housing variables and their relationship to the architectural designs of the dwelling units in the selected housing estates in Benin City will provide a better understanding of housing satisfaction in these housing estates. Ogu (2002); and Potter & Cantarero, (2006) noted that housing or residential satisfaction essentially evaluates residents' perceptions of and feeling for their housing units and surrounding environment; suggesting that the two are interchangeable concepts that serve the same purpose in housing research. This study evaluates the residents' perception of their estates using the architectural design sub-system.

4. Methodology

Data were obtained from both primary and secondary sources. The primary sources of data were from observations, focus group discussions, and oral interviews, administration of structured questionnaires made during visits to the residents of the six Public Housing Estates. The study adopted the multiple case studies strategy in increasing an understanding of the differentiation amongst the housing estates in the study areas as advocated by Yin (2009). The study examined six completed and occupied housing estates in Benin City, namely:

   i.   Federal Housing Estate, Ikpoba Hill,
   ii.   Iguosa Housing Estate, Oluku;
   iii. EDPA Housing Estate, Ugbowo;
   iv.   Oregbeni Housing Estate;
   v.   Andrew Wilson Housing Estate, Evbuoriaria; and
   vi.   Iyekogba Housing Estate, Ebo.

The fieldwork data were generated from structured and semi-structured questionnaires administered to the residents and other stakeholders. For this study, comprehensive data on residents' levels of satisfaction with public housing estate were required. Consequently, a field survey was carried out to obtain primary data. The data was obtained from visits to the six estates used as case study for the research. Basically, data collection was done using the random sampling technique. A total of 1200 copies of a questionnaire were administered to heads of households across the six (6) estates covered. However, the administration of the questionnaires was based on the number of housing units in each estate. All housing units in the estates covered were numbered and the housing units falling on the odd numbers were selected. A combination of statistical tools was used in the analysis of the data. A regression analysis was used to examine the determinant of residents' housing satisfaction and test the research hypothesis.

5. Presentation and Analysis of Result

Table 1 shows the breakdown of the demographic information of respondents. The gender distribution shows the number of males and females in the estates. Specifically, for Iyekogba (Male=66%, Female=34%), Ikpoba hill (Male=60%, female=40%), for Andrew Wilson (male=69%, female=31%, for EDPA (male=72%, female=28%), for Oregbeni (male=55.50%, female=44.50%) and for Oluku (male=69%, female=31%). The table 1 also shows the age distribution for residents in the estates. As observed, the number of resident less than 30 years have the lowest representation across the following estates, Iyekogba (11%), Ikpoba hill (13%), Andrew Wilson (3%), for EDPA (15.50%), Oregbeni (8%) and for Oluku (3%). Those between 31-45 years are more in Oluku estate (46%) and Andrew Wilson (46%). Residents between ages 60- above appear to be more in Oregbeni (42%) and followed by Ugbowo (24%). The educational qualification of resident in the estates reveals that residents with 1st degree are highest for EDPA (38%). Residents with SSCE appear to be highest for Oregbeni (52%), followed by Ikpoba-hill (50%) incidentally, these estates are also part of the oldest. Residents with post-graduate degree appear to be highest

for EDPA (32%). Also, data on the type of occupancy of residents showed that owner-occupier for Iyekogba (61%), Ikpoba hill (78%), Andrew Wilson (68%), for EDPA (66%), Oregbeni (73%) and for Oluku (68%) while for tenant-occupier the statistics are; Iyekogba (39%), Ikpoba hill (22%), Andrew Wilson (32%), for EDPA (34%), Oregbeni (27%) and for Oluku (32%). It is important to note however that though most of the housing units were allotted on an owner-occupier basis, most of the original owners have rented or leased these units to other individuals.

Table 1: Respondents' socio-economic characteristics

Estate	Iyekogba	Ikpoba hill	Andrew Wilson	EDPA Ugbowo	Oregbeni	Oluku
	n = 100	n = 200	n = 100	n = 200	n = 200	n=200
(a). Gender						
Male	66	120	69	144	111	138
	66%	60%	69%	72%	55.50%	69%
Female	34	80	31	56	89	62
	34%	40%	31%	28%	44.50%	31%
(b). Age						
<30	11	26	3	31	16	6
	11%	13%	3%	15.50%	8%	3%
31-45	30	54	46	49	50	92
	30%	27%	46%	24.50%	25%	46%
46-59	40	84	39	72	50	78
	40%	42%	39%	36%	25%	39%
60 –above	19	36	12	48	84	24
	19%	18%	12%	24%	42%	12%
(c) Education						
SSCE	24	100	19	28	104	38
	24%	50%	19%	14%	52%	19%
OND/NCE	36	61	31	32	69	62
	36%	30.50%	31%	16%	34.50%	31%
1st degree	33	30	36.5	76	18	73
	33%	15%	36.5%	38%	9%	36.5
Post-graduate	7	9	13.5	64	9	27
	7%	4.50%	13.5%	32%	4.50%	13.50%
(f). Type of occupancy						
Owner occupier	61	156	68	132	146	136
	61%	78%	68%	66%	73%	68%
Tenant Occupier	39	44	32	68	54	64
	39%	22%	32%	34%	27%	32%

Source: Field Work (2018)

The table 2 shows the Relative Satisfaction Index (RSI) and descriptive statistics for the items. The relative satisfaction index (RSI) for "Estate Architectural Design" indicates the following; Toilet condition (TC) =2.8621, Ventilation (VT) =1.835, Bathroom size (BS) =2.4164, Kitchen Size (KS) =2.657, Adequacy of room (AR) =2.81, Room size (RM) =2.817, Suitability of foundation (SF) =2.9257, Size of the living room and (SLR) = 2.8515. Again from the statistics, the RSI index for the variables under estate design all fall between the fairly satisfied regions [2.1-3.00] except for VT which falls under the unsatisfied region. The ranges for RSI score are as follows: 0-1.0 (very dissatisfied); 1.1-2.0 (dissatisfied); 2.1-3.0 (fairly dissatisfied); 3.1-4.0 (satisfied) and 4.1-5.0 (very satisfied). Thus RSI average suggests that the estate occupants are unsatisfied with the Estate design. The MAS values for the variables are as follows; Toilet condition (TC) =1.832, Ventilation (VT) =3.451, Bathroom size (BS) = 0.03859, Adequacy of room (AR) = 3.85 and Room size (RM) = 1.75. The value of Cronbach's alpha ranges between 0 and 1 and the higher the value the higher the internal consistency between the scale items. Nunnally (1979) and Nunnally and Bernstein

(1994) have recommended 0.7 as a satisfactory measure of internal consistency. As observed the Cronbach alpha for all the variables are above 0.70 and this confirms the reliability of the concepts and that they indeed measure what was intended in the study.

Table 2. Relative Satisfaction Index (RSI) and descriptive statistics

	RSI	MS Mean Score	Standard Error	Standard deviaton	Normality Test	Cronbach Alpha
SATISFACTION WITH ESTATE DESIGN						0.970
Toilet condition (TC)	2.8621	1.832	0.03116	0.98526	36.63	
Ventilation (VT)	1.8355	3.451	0.03073	0.97188	57.564	
Bathroom size (BS)	2.4164	2.15	0.03859	1.22024	73.324	
Kitchen Size (KS)	2.6578	1.992	0.03402	1.07568	88.306	
Adequacy of room (AR)	2.817	3.85	0.01969	0.62281	100	
Room size (RM)	2.817	1.75	0.03238	1.02399	100	
Suitability of foundation (SF)	2.9257	1.806	0.03349	1.059	25.779	
Size of the living room (SLR)	2.8515	1.924	0.03129	0.98955	55.876	

Source: Field survey (2018).

Table 3 shows the factor analysis results useful for the compression and classification of data. It is well known that there exist significant statistical redundancies in survey data. For a limited class of objects that are normalized with respect to scale, and translation, the redundancy is even greater. The factor loadings of the items are also presented in the table showing how the items loads into the factors reveals which items are most important in creating the factor score. Factor loadings and percentage % variance of each item under Estate design are as follows; Toilet condition (TC) = {.959, 0.321}, Ventilation (VT) = {.969, 9.169}, Bathroom size (BS) = {.958, 2.183}, Kitchen Size (KS)= {.967, 1.458}, Adequacy of room (AR)= {.601, .769}, Room size (RM)={.970, .672}, Suitability of foundation (SF) = {.966, 85.229 }, Size of the living room{.934,.198}. From the analysis of the statistics, all items load significantly into the factor as their loading values are greater than 0.5 and this suggest that all items describe quite strongly. However, suitability of foundation appears to account for the highest % variance and this suggest that this factor is considered very highly in terms of the design of estates.

Table 3: Factor Analysis of Variables

	Factor loading	Eigen value	% variance	Cum%	KMO	Bartlett Sphericity
ESTATE DESIGN					0.985	0.843
Suitability of foundation (SF)	.959	6.818	85.229	85.229		
Ventilation (VT)	.969	.734	9.169	94.398		
Bathroom size (BS)	.958	.175	2.183	96.581		
Kitchen Size (KS)	.967	.117	1.458	98.039		
Adequacy of room (AR)	.601	.062	.769	98.808		
Room size (RM)	.970	.054	.672	99.481		
Toilet condition (TC)	.966	.026	.321	99.802		
Size of the living room	.934	.016	.198	100.000		

Source: Field Survey (2018)

Table 4 shows the Kruskal-Wallis test which are used to test for differences between more than two independent groups. This test is the non-parametric alternative of the T-test and it converts the scores on the continuous variable to ranks across the groups. The statistics is used to examine if significant differences exist in satisfaction levels across the estates. The Kruskal-Wallis test statistics shows that significant differences do not exist across the estates.

Table 4: Kruskal-Wallis Test of Differences in Resident's Satisfaction

Estate Architectural Design	
Kruskal Wallis Test	
Kruskal Wallis Test	11.121
Df	4
Asymp. Sig.	.075

Source: SPSS 20.0

Table 5 shows the categorical Regression Analysis (CATREG) used to investigate if significant causal relationship exist between estate architectural design and the residents satisfaction levels. As observed, the coefficient of determination (R^2) = 0.622, Adj R^2 = 0.620. These values suggest that the regression model explains about 62.2% of residual variations in Resident satisfaction with an adjusted value of 62% after controlling for degrees of freedom. The beta of 0.0032 reveals that architectural design of the estate has a positive outcome on residents' satisfaction and this is significant at 5% (p=0.000) which means enhancement in estate architectural design results in higher satisfaction levels. Therefore, the architectural design in the housing units significantly affects the level of residents' satisfaction. This finding is in tandem with Onibokun (1974), Ukoha & Beamish (1997) and Olotuah (2000).

Table 5: Categorical Regression Analysis (CATREG)

Multiple R		R Square	Adjusted R Square
0.784		.622	.620
Independent Variable	Coefficient	Standard error	Sig
Estate Planning	0.0032	0.001	0.00

Source: Field study, 2018. Dependent Variable: RSI, Predictor: Estate architectural design

6. Conclusion and Recommendations

The study was designed to assess the level of residents' satisfaction with architectural design sub-system in the selected housing estates. The study revealed that, architectural design of buildings in the estates was found to be a significant factor. Components such as size of rooms, adequacy of lighting and ventilation, circulation and functionality of spaces influence residents' housing satisfaction. These are very important components; as the resultant effect of dissatisfaction on residents could be stress, poor health, delinquency and pathological conditions. Government policy should specify space standards and ensure that they are complied with. Arising from the discussions, it is recommended as follows:

There is the need to consider economic means of occupants. From architectural design perspective, it is obvious that any building design that does not consider the way of life, the economic means and affordability of the low-income worker will not achieve the desired aim. The consequence is that such a design will be bogus, expensive and cost ineffective thereby pushing the development out of the reach of the target user. Virtually all designs that have been conceived for low income persons in Nigeria have followed the flat-pattern concept. The result is that, because of their ultimate price they are bought over by the higher income person; and where they got occupied by the low income person, they are further partitioned and let out in room units while the service units are put into uses other than what they are designed for.

There is the need to consider the functionality of design. It is sad that in the name of modernity, most designs of housing estates have failed to adopt functional designs that are based on the concept of users' needs to develop estates that will functionally be within the reach of the low-income worker and the poor. Such designs will not only turn out to be within the reach of the low-income worker but will not achieve the desired objective. Therefore, it is recommended that the

design for future low cost housing must consider the family sizes of average Nigerian family, kitchen design that can use cooking gas, kerosene and possibly outdoor kitchen.

There is also the need to consider the characteristics and attributes of end-users. Closer looks of demographic status of average Nigerian family reveals that a household is occupied by six individuals made up of husband, wife and four children or more. In some instances, the number is more invariably among the low-income group. However, a closer look at most of public low-cost housing estates in Nigeria indicates preponderance of two bedroom flats. This calls for innovative approaches of reconciling the issues of affordability and users needs and type of housing appropriate for these categories of residents. It is recommended that incremental housing may offer better solutions especially in owner occupier housing schemes were the owner could have an option to adjust the dwelling unit if need be. Incremental housing is often described as core housing and is adjudged a key mechanism for growing housing stock, principally for low-income groups, for the reason that it permits families to start off with a "core" dwelling which can be enlarged or improved as resources increase and its size grow up. The architectural design concept is based on the concept of organic architecture or piecemeal development and aims at helping the low and middle income achieve their dreams of owning a house. It allows the owner the ability add rooms as the family grows but the addition should follow a logical sense.

References

Adegboyega, M. (2006). The Role of Physical Planning in Enhancing Sustainable Urban Environment (A Case Study of Benin City). *An Unpublished PD.* Dissertation. Department of Urban and Regional Planning, Auchi Polytechnic, Auchi.

Adriaanse, C. C. M, 2007. Measuring residential satisfaction: a residential environmental satisfaction scale (RESS)*. Journal of Housing Built Environment, 22, pp.287-304.*

Aiworo, B. A. (2016). An Impact Analysis of Road Transport Network on Socio-Economic Activities in the Benin Metropolis, Edo State, Nigeria. *An Unpublished Ph.D. Thesis* Department of Geography and Regional Planning, Ambrose Alli University, Ekpoma.

Ajanlekoko, K.S. (2001).Sustainable Housing Development in Nigeria-The Financial and Infrastructural Implication. Paper Presented at the International Conference on Spatial Information for Sustainable Development in Nairobi, Kenya, 2-5 October 2001. Available online http://www.fig.net/pub/proceeding/nairobi/ajanlekoko. Retrieved on July 13, 2007.

Akinbode A. (2000*).* Provision of adequate housing in developing countries: a theoretical consideration in Osuide S. O. (Ed.) *Proceedings of the National Seminar on Population Growth Architecture and the Environment 21st – 22nd February, 2000. 109 – 118*.

Akinmoladun, O.I., & Oluwoye, J., (2007). An assessment of why the problems of housing shortages persist in developing countries: a case of study of Lagos Metropolis, Nigeria. *Pakistan Journal of Social Science* 4(4) 589-598.

Apparicio, P. & Seguin, A. (2006). Measuring the accessibility of services and facilities for residents of public housing in Montreal. *Urban Studies* 43(1) 187-211.

Bonnefoy, X. (2007*).* Inadequate housing and health: and overview. *International Journal Environment and Pollution* 30(3/4): 411-429

Dimuna, K.O. (2017). A study of residents' satisfaction with public low-cost housing estates in Benin City, Edo State, Nigeria. Unpublished PhD Thesis submitted to School of Postgraduates Studies, Ambros Alli University, Ekpoma, Edo State, Nigeria.

Djebarni, R. and Al-Abed, A. (2000). Satisfaction level with neighbourhoods in low-income public housing in Yemen. *Property Management, 18(4): 230-239.*

Doxiadis Associates. (1973). Nigerian development problems and future needs for major urban centers: Benin City, A report Prepared for the Federal Government of Nigeria.

Egunjobi L. (2000). The link between housing and health. In Amole B. (ed.), habitat studies in Nigeria. Ibadan: Shaneson C.L. Ltd. Pp 92-102.

Fatoye, E.O & Olatubara, C.O.,(2006). An evaluation of students' satisfaction with on campus housing in Nigeria tertiary institution. A case study of University of Ibadan student hostel *Journal of Nigeria Institution of Quantity Surveyor 54 (4):14-21.*

Galster .G. (1987).Identifying the correlates of dwelling satisfaction: *An empirical critique. Environment and Behaviour 19(5):735-568*

Gbakeji, J.O. (2006): Neighbourhood Satisfaction, the perception of places and intra-urban residential mobility: An example from the Warri Metropolis, Delta State, Nigeria, *The Built Environmental Journal, 2(3) 32-36.*

Gbakeji, J.O. (2014): *Analysis of residential Satisfaction in some residential neighbourhood in Benin City, Nigeria*. *Journal of Civil and Environmental Engineering*, 2(1) 1-10

Ha, S-K (2008). Social housing estates and sustainable community development in South Korea, Habitat International, (32): 349-363.

Ibem, E.O. & Aduwa E. B (2013). Assessment of residential satisfaction in public housing in Ogun State, Nigeria. *Habitat International,* 40: 163-175.

Jiboye, A, (2010). Evaluating users' household-size and housing quality in Osogbo, Nigeria *Ethiopian Journal of Environmental Studies and Management. 3 (2)*:77.

Kellekc, O. L.& Berkoz, L, (2006). Mass housing: Users satisfaction in housing and its environment in istanbul. *European Journal of Housing Policy, 6(1), pp.77-99.*

Mabogunje, A.L, (2003). The new mass housing and urban development policy: social and economic impact in aribigbola, A. (2008). Being text of a public service lecture delivered to the top echelons of the federal civil service, Abuja Nigeria.

Moughalu, L. N. (1984). Subject indices of housing satisfaction as social indicators for planning public housing in Nigeria. *Social Indicators Research (15): 145-164*

Moughalu, L.N. (1986). A comparative evaluation of residents' satisfaction with public and private rental housing in Benin City. Unpublished Ph.D Thesis submitted to the Department of Geography and Regional Planning. University of Benin.

National Population Commission (NPC) 1991.

National Population Commission, NPC (2006). *Report of Nigerian's National Population Commission on 2006 Census. National Bureau of Statistics, Nigeria.*

Ndubueze O. O. (2007). Measuring housing affordability: A Composite Approach, *ENHR 2007 International Conference 'Sustainable Urban Areas'25-28 June 2007.*

Nunnally, L. (1979). Cronbach alpha statistics: retrieved from www.ssrn.com on 31st May, 2018.

Nwaka, G.I. (2005). The urban Informal sector in Nigeria: towards economic development, environmental health and social Harmony. *Global Urban Development Magazine, 1(1). Available Online at http://www.globalurban.org/issue 1PImag05/Nwakaarticle.htm. Accessed on March 26,*

Ogu, V. I, (2002). Urban residential satisfaction and the planning implications in a developing world context: the example of Benin City, Nigeria. *International. Planning Studies, (7):37-53.*

Olatubara, C.O. & Fatoye, E.O. (2007). Evaluation of the satisfaction of occupants of the Abesan public low-cost housing estate in Lagos State, Nigeria. *The Nigerian journal of Economic and Social Studies 49 (1).*

Oliveira, I.A.S.J; Carayannis E.G; Ferreira F.A.F; Jalali M.S; Carlucci D. & Ferreira J.J.M. (2018). "Constructing home safety indices for strategic planning in residential real estate: A socio-technical approach", Technological Forecasting and Social Change.

Olotuah,A.O. (2000):"Evaluation of Suburbia Housing Conditions in Akure, Nigeria" *African Journal of Development Studies* 2 (1&2) 165-173

Olotuah, A. O. (2016): An Appraisal of Housing and Neighbourhood Quality in Residential Estates in Akure, Nigeria, *Mediterranean Journal of Social Sciences, 7 (3S1)*,424 – 430 DOI:10.5901/mjss.2016.v7n3s1p424 *http://www.mcser.org/journal/index.php/mjss/article/view/9131/8817*

Olotuah, A. O. (2007): 'Strategies of Public Sector Intervention in Housing in Nigeria" In Proceedings of XXXV IAHS (International Association of Housing Science) World Congress on Housing Science, Melbourne, Australia, 4-7 September, CD ROM

Omole, F.K. (2001). Basic issues in housing development. FemoBless Publications, Ondo, PP.25-131.

Osuide S. O. (2004). Strategies for affordable housing stock delivery in Nigeria. 18th Inaugural Lecture Series, Ambrose Alli University, Ekpoma. February 2004, P.1.

Ozo, A. O. (1982). Open space planning and development. A paper presented at a Department Seminar, Centre for Social, Cultural and Environment Research, University of Benin.

Ozo, A. O. (1990). Low cost urban housing strategies in Nigeria. *Habitat International 14(1):51-54*

Sada, P. O. (1976). Population structure and household characteristics in Benin City, Research Bulletin No. 1. Human Resources Unit. University of Lagos, Lagos.

Sada, P. O. (1984). Migrants in Nigerian cities with special reference to Benin, Warri and Auchi in Sada and Osirike A. B. (Eds) Case studies in migration and urbanization in Nigeria: Perspectives in policy issues, Benin City. Department of Geography and Regional Planning, University of Benin, 1-15.

Spector, P.E. (1992). Summated rating scale construction: An Introduction. Sage University Paper Series No.82.

The Columbia Encyclopedia, Sixth Edition, 2005. Columbia University Press. Retrieved 18th February, 2007.

Ukoha, O.M. and Beamish, J.O (1997) Assessment of residents' satisfaction with public housing in Abuja, Nigeria. *Habitat International* 21(4) 445-460.

UNCHS (2001). An urbanizing world: global report on human settlement 2001. Oxford: *Oxford University Press.*

Van Wky K & Van Wky R (2001): The management of housing process. *Paper presented at the 2001 HSA Conference Petersburg. 10th October 2001. PP 3-4.*

Vrbka, S. J. & Combs, E. R. (1991). Predictors of neighbourhood and community satisfaction in   Rural Communities. Referred papers of the American Association of Housing Educators Annual Conference, Durham, NH.

Weidermann, S., Anderson, J. R., Butterfield, D. I and O'Donnell, P.A. (1982). Residents' perceptions of satisfaction and safety. *A basis in multifamily housing Environment and Behaviour 14(6):695-724.*