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Effects of Levels of Residents' Participation in House Design on Residential Satisfaction in Public Housing Estates in Akure, Nigeria

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Abstract: The goal of housing projects is to provide satisfactory environments for its users, which could be regarded as an achievement on its own, if successful. Conversely, failed projects could result from unsatisfactory environments and such might lead to other problems such as abandonment. Residents' participation is a way of ensuring that housing environments are designed to suit the lifestyles of users in order to achieve residential satisfaction. This paper examined the relationship between the level of residents' participation and residential satisfaction in public housing estates in Akure, Nigeria. It also examined the relationships between their level of participation in house design and satisfaction with attributes of the house. Data were obtained through questionnaire, focus group discussions (FGD) and observations were used to elicit relevant data for this study. Data obtained were analysed using Single-Factor Descriptive Analysis, Spearman Rank Correlation and Weighted Mean. Findings showed a positive relationship (p=0.000) between residents' participation in the design of their houses and satisfaction with specific attributes of the house. The study also found that residents' participation have the most influence of satisfaction with the general plan of the house, size of bedrooms and rental/building cost. It recommends higher level of participation in house design in order to achieve higher level of satisfaction.

Keywords: design; house; public housing estates; residents' participation; satisfaction

1.0 Introduction

Lack of satisfactory housing is among the major problems bedevilling the housing sector in less developed countries like Nigeria (Amole, 2009; Ibem and Amole, 2011). Though it is one of the aspects of the housing problems in Nigeria, it is very critical because it mostly affects the standard of living and influences the psyche of the citizens (Ibem and Amole, 2011). This makes residential satisfaction to be very crucial to designers and the users of housing. It is crucial because satisfactory housing indicates happiness, well being, and a good quality of life (Elyes and Wilson, 2005).

Hitherto, in order to achieve satisfactory housing, it is important to understand the contextual and appropriate needs of those that will make use of it. This is in order to ensure that the house is designed according to their contextual needs; because 'one size does not fit all'. This is where users' participation in housing design comes in. To assume that users' needs are sufficiently catered for, once the space dimensionally accommodates them, is wrong if their behaviour in space is misunderstood (Fakere, Arayela and Folorunso, 2017). Rapoport (2005) averred that to ensure a suitable design of spaces for people, it is imperative to understand their activities and activity systems. Activities and activity systems are embodiments of behaviours in space, which are offshoots of their beliefs and values. There is therefore, the need for the involvement of the users in the design process of a particular residential environment, so that residential satisfaction can be achieved. The users of housing in this context are the people residing in the houses; therefore, users and residents will be used interchangeably in this study.

The roles and performances of housing design professionals, especially architects, in identifying the housing problems of the nation are of paramount concern (Olotuah and Ajenifujah, 2009). One of such problems is the identification of how participation leads to satisfaction, and which aspects of satisfaction with housing attributes are mostly influenced by participation in the design process. Most studies (Carrol and Rosson, 2007; Erinsel-Onder, Koseoglu, Bilen and Der, 2010; Ammar, Ali and Yusof, 2013) that examined this subject looked at the general relationship between participation and satisfaction, but not on how residents' participation in the design process influences satisfaction with the specific attributes of the house. Hence, more research is required in this light to identify the satisfaction attributes of the house most influenced by participation, and not only in a general sense.

Though, generally, users' participation in design usually leads to satisfaction, is it actually the case with every attribute of the house? Are there some aspects of the house where participation would not necessarily lead to satisfaction? What attribute of the house are users most likely to be satisfied with when they participate in the design of the house? In other words, how will participation predict satisfaction with specific attributes of the house? This study sets out to provide answers to these questions. Such evaluations of housing provides the basis for taking decisions regarding improvements in existing housing stock and concerning the design and development of future housing (Amole, 2009).

The aim of this paper, therefore, is to examine the relationship between the levels of participation in house design and residential satisfaction in public housing estates in Akure, Nigeria. It examines how satisfied residents are with specific attributes of the house based on their level of participation in the house design process. Therefore, the study identified the level of residents' participation in house design in the study area, as well as the level of residents' satisfaction with specific attributes of the houses in the study area. It also examined the relationship between the level of residents' participation in house design and satisfaction with the house in the study area.

2.0 Review of Related Literature

2.1 Overview of the Concepts of Participation and Residential Satisfaction

Current trend in housing research shows that, due to lower levels of residential satisfaction, there is a growing interest in the study of participation of residents in public house design. Jiboye (2012) stated that, in developing countries like Nigeria, majority of the public and private residential projects were unsuccessful mainly due to lack of consideration for residents' requirement or how their residential needs could be satisfied. For this reason, studies on residents' participation have become essential in housing studies.

According to Isa and Jusan (2012), residents' participation is the involvement of the expected benefactor of a particular project in order to make their interest and desired contribution as part of the project quality. Residents' participation is a categorical term for resident's power (Arnstein, 1969). It is the redistribution of power that enables those usually excluded from programmes that affect their lives to be deliberately included in the future (Arnstein, 1969). Residents' participation in house design is the process, which enables communication, cooperation, and collaboration between the user and architect about the form, nature and character of a residential space in order to achieve residential satisfaction.

Users' participation creates an opportunity to meet the varied and changing needs of the users (Ettouney and Kader, 2003). Isa and Jusan (2012) stated that users' participation in the housing process allows beneficiaries make amendments right from the design thoughts according to their needs of spaces. In the participatory process, the architects contribute their knowledge about the built environment, and the users contribute their personal experiences from living in different places; a participatory process is therefore an educational process, not only in terms of giving and receiving but also of sharing knowledge (Rivera, 2011). This makes the process of participation to be unique because, it brings different experiences to bear on the product (house). This has been referred to as 'collective intelligence'. Collective intelligence, as described by Atlee (2003), is a shared insight that comes to be through the process of group interactions, especially where the result is more insightful and powerful than the sum of individual perspectives. Fischer, Giaccardi, Eden, Sugimoto and Ye (2005) stated that collective intelligence have been identified as a factor partly responsible for positive outcomes in participatory design

processes. By this approach, the synergy between the architect and the user would usually lead to a better outcome than when it is through individual perspectives.

Jones, Petrescu and Till (2005) observed that if people are to feel a sense of belonging to their place of abode, an involvement in design of such spaces is a good starting point. This shows that a sense of belonging can also lead to higher level of satisfaction. Ensuring that users participate in the design process of their houses is one of the major ways of ensuring that their housing needs are met in such houses. Moreover, if the house is designed to suit their lifestyles, it would likely lead to higher level of satisfaction.

The levels of participation in house design as used in this study are in line with Wandersman (1979) who highlighted types of design participation. These include: (a) the resident designs his own house without predetermined givens from the designer; (b) the resident develops several design options from components already available and selects the one he wants; (c) the resident chooses between several design options that were generated by the designer; (d) the resident gives information or feedback to the designer describing definite and required activities or feedbacks about the design, but has no actual control over the process; and (e) the resident has no choice or feedback about the house design. The first and the last ones are the most extreme of the types because they give total control of the process to the user and the designers respectively.

Furthermore, Wulz (1986) developed a design participation continuum, which includes seven stages namely: self-decision, co-design, alternative, dialogue, regionalism, questionnaire, representation. Wulz (1986) described the three stages of design participation. Representation, questionnaire and regionalism refer to situations where the architect does not have any form of contact with the would-be users and the designs are produced with respect to the architect's reflection on his personal and subjective interpretation of the users; the perceived general characteristics of anonymous users; and the historical and cultural heritages of the specific localities based on their symbols, forms, architectural expression and spatial behaviour respectively (Wulz, 1986). These three stages conform to the last type (e) of design participation based on Wandersman (1979). Dialogue refers to informal conversations between the architect and the users and conforms to type (d) in Wandersman (1979). Alternative refers to where the architect gives users a chance to choose among alternative designs prepared by him and it conforms to type (c) in Wandersman (1979). Co-decision refers to where the users do the design along with the architect throughout the design process and conforms to type (b) in Wandersman (1979). While, self-decision refers to where the users fully control the whole design and construction process (Wulz, 1986), and conforms to type (a) in Wandersman (1979). These were used to define the levels of participation in house design for this study.

A household's satisfaction with their home is a sign of quality of life as it suits their aspirations and needs (Waziri, Yusof and Salleh). It is the feeling of gratification when one has or achieves what one needs or desires in a house

(Mohit, Ibrahim and Rashid, 2010). Housing satisfaction is the degree of happiness experienced by a family with reference to the existing housing situation, and it is a non-economic and normative quality evaluation approach to assess the quality of the housing unit (Ogu, 2002). Likewise, it refers to the level to which the residents are happy with what their home offers to suit their natural lifestyles.

It has become necessary to understand the impacts of housing environments on its users in order to identify areas for improvements. In this wise, housing satisfaction is a very useful criterion in the evaluation of housing because it indicates the general levels of success, measures the users' affective and cognitive responses, points out the irksome aspects of dwelling environments and predicts user responses to future environments (Amole, 2009). Architects, planners, developers and policymakers have used housing satisfaction as a key indicator and predictor in judging the success of housing projects in several spheres (Mohit, Ibrahim and Rashid, 2010). Achieving residential satisfaction could lead to fulfilment of the cultural values of the residents, since people usually hold their cultural values in high esteem (Hadjiyanni, 2005). It could be used as a measure to assess the success or failure of public and private residential projects. Satisfaction with the living conditions indicates that there is little or no complaints about the housing units since the needs and aspirations of the residents are fulfilled in it (Abdul-Ghani, 2008). Usually, higher level of residents' participation in house design should lead to higher level of residential satisfaction, and vice versa.

The process of involving residents' in design projects can help reduce government expenses and the time wasted in ruminating about the possible users' characteristics and needs to be incorporated in housing projects (Isa and Jusan, 2012). If participation is lacking in a residential project, it manifests in creating a housing environment that is unsatisfactory to residents and hence, encourage non-occupancy because of low level of satisfaction (Isa and Jusan, 2012).

Rapoport (2005) averred that, it is necessary for housing environments to be supportive to the lifestyles of the people that will use it. Residents' participation has the potential to help building experts and housing agents to develop affordable and acceptable housing units (Isa and Jusan, 2012). One of the means to improve the overall performance of buildings is by studying and understanding users' needs, aspirations and expectations through constant performance evaluation of buildings (Fatoye and Odusami, 2009). The residents should be allowed to participate in the design of their houses through a collaborative means that seeks to identify the aspirations and needs of the homeowners (Adedayo, 2012).

3.0 The Study Area

Akure is the capital city of Ondo State in South-western Nigeria. It is an agrarian and educational centre situated in the central part of the State. Akure is a medium sized city with population of 360, 268 people according to the 2006 National Population and Housing Census (FRN Gazette, 2009). Due to the population increase, the challenges of housing have increased. It is located about 311km North-east of Lagos, about 370m above sea level. In addition, the State is an oil producing state, and has

been classified as a Millennium Development City. All these factors collectively influence population growth of the city.

The three housing estates are located within the city at different areas. Ijapo Housing Estate is located within the peripheral zone of the city in close proximity to Oke Ijebu roundabout. It is a mixture of prototype-housing design and site-and-services. Alagbaka Housing Estate Extension is also located in the peripheral zone of the city in close proximity to the Bishop's Court roundabout. It is a site-and-services estate where the residents purchased the land from the government in order to build by themselves while government provides the services. Conversely, Sunshine Gardens Housing Estate in located in a suburb of the Akure city called Oba-Ile. It is a prototype-housing estate built through Public-Private Partnership between the State government and a private developer, who built all the houses and provided the services, while the users purchased the already finished houses. Figure I shows the locations of the estates that make up the study area represented with large dots.

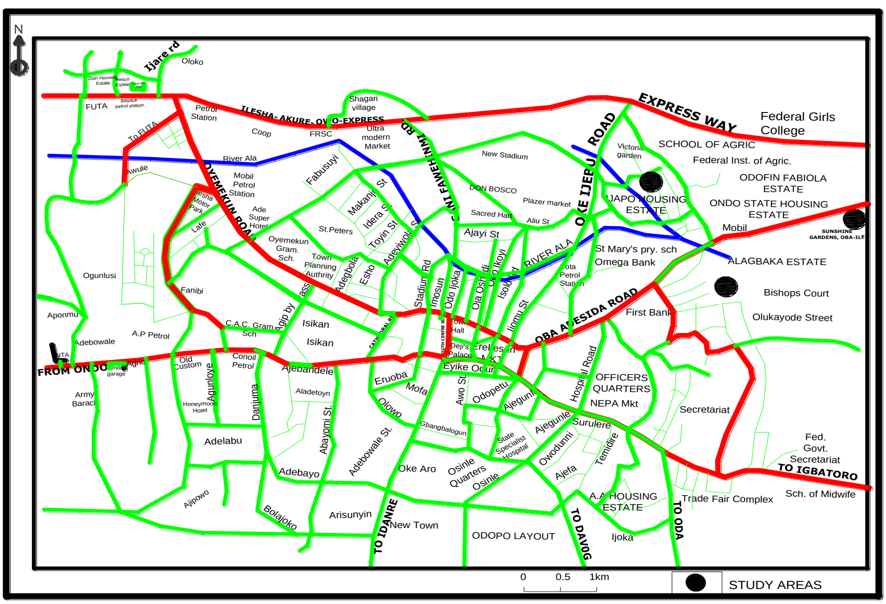

Figure I: The Street Map of Akure showing the Study Area
Source: Ministry of Housing and Urban Development Akure

4.0 Methodology

This study relied on primary data collected through structured questionnaire and focus group discussions (FGD) and observations. The questionnaire was designed and administered on the three housing estates studied namely: Ijapo (IHE), Alagbaka Extension (AHEE) and Sunshine Gardens Housing Estates (SGHE). The number of housing units in IHE is 600, while for AHEE and SGHE are 308 and 176 respectively. This brings the total housing units for the study area to 1,084 buildings. The sample size for the study was 651. This

translated to sample sizes of 360, 185 and 106 for IHE, AHEE and SGHE respectively. Simple random sampling was used to select the houses that were studied and heads of households in each house were the focus of questionnaire administration and other research enquiries. The percentage return for the questionnaires across-board was 69.8%. These were used for analysis in this research and the results are presented below. Spearman Rank Correlation and Weighted Mean were used in the analysis for this research. Spearman Rank was used to analyze the relationship between the level of participation and the level of satisfaction. The formula for calculating Spearman rank correlation is:

$$\rho = 1 - \frac{6\sum d^2}{n(n^2-1)}$$

.....Equation 1

Where ρ is: rank coefficient
n is: the number of cases
d is: the difference in the ranks

Weighted mean is a kind of average; instead of each data point contributing equally to the final mean, some data points contribute more "weights" than others do (Theme Horse, 2016). Weighted mean was used to rank the attributes of satisfaction with the house by generating the mean satisfaction score (MSS). The attributes higher on the ranking suggest the ones that the respondents were more satisfied with, while the ones lower on the ranking suggests the ones they were less satisfaction. The formula used for calculating weighted mean is:

Weighted mean = $\sum wx / \sum w$ .....Equation 2

Where $\sum$ = the sum of all the points; w = the weights; x = the values

5.0 Results and Discussions

5.1 Level of Participation in House Design

It is pertinent to understand the level of residents' participation in house design in the study area. Table I reveals that, in the study area, 70.3% did not participate at all in the design of their residences, 17.1% discussed their needs with the architect who took the final decisions on the design, 6.8% chose the design from alternatives developed by the architect, 3.7% designed the plan from available components while making consultations with the architect, while 2% designed their houses without any restrictions from the architect. This means that, majority of the respondents did not participate in the design of their houses either as a result of being renters or because they bought the houses after the buildings were already completed. For IHE, the percentages are 74.6%, 14.2%, 7.5%, 2.1% and 1.7% respectively. For AHEE, the percentages are 46.3%, 31.6%, 9.6%, 8.8% and 3.7% respectively. However, in SGHE, the percentages are 98.7%, 1.3%, 0%, 0% and 0% respectively. These show that most residents in the study estates did not participate in the design of the houses of their abode. This result agrees

with Jiboye (2012) which found that in majority of the housing projects in developing countries like Nigeria, residents do not participate and this usually leads to lower levels of residential satisfaction. Because, the residents' abodes were not designed according to their lifestyles, they would have to adjust themselves to the houses or relocate.

Table I: Level of residents' participation in house design in the study area

Participation in House Design	IHE Freq. (%)	AHEE Freq. (%)	SGHE Freq. (%)	Total Freq. (%)
I did not participate in the house design	179 (74.6)	63 (46.3)	78 (98.7)	320 (70.3)
I discussed my needs with the architect who made the final decisions	34 (14.2)	43 (31.6)	1 (1.3)	78 (17.1)
I chose the design from alternatives developed by the architect	18 (7.5)	13 (9.6)	0 (0)	31 (6.8)
I designed the house from available components while making consultations with the architect	5 (2.1)	12 (8.8)	0 (0)	17 (3.7)
I designed the house without any restrictions from the architect	4 (1.7)	5 (3.7)	0 (0)	9 (2)

5.2 Level of Satisfaction with Several Attributes of the House at IHE

Table II to V shows the satisfaction ratings of respondents with house design in the study area. The satisfaction levels of the respondents are measured with Likert scale: VD = Very Dissatisfied; D = Dissatisfied; N = Neutral; S = Satisfied; VS = Very Satisfied. These were used to generate the mean satisfaction scores as presented in the tables.

Table II shows the respondents' responses to satisfaction with the attributes of the house for IHE. The attributes are ranked according to their positions as determined by the MSS. The highest in the ranking is satisfaction with quietness in the neighbourhood and it had the highest MSS of 4.03. The lowest ranked variable in the table is satisfaction with landscaping of the plot with MSS of 3.42. This implies that the respondents at IHE were most satisfied with quietness in the neighbourhood, and were least satisfied with landscaping of the plot.

The other satisfaction variables according to their MSS are: level of privacy (4.01), adequacy of natural ventilation (3.94), adequacy of natural day lighting (3.94), size of bedrooms (3.85), overall size of the house (3.82), size of the living room (3.81), number of bedrooms in the house (3.81), toilets (3.75), general plan of the house (3.70), size of the kitchen (3.70), building materials (3.55), and aesthetics (3.47). The reason that respondents in this estate were mostly satisfied with quietness in the neighbourhood is because most estates in Nigeria are usually where the high-income group of the society live which usually are very quiet environments. Respondents were also highly satisfied with adequacy of natural ventilation and day lighting. This is because since there is development control in the estate, there is adequate spacing between the buildings, which enhances ventilation, and day lighting.

Table II: Residents' responses to satisfaction with housing design and mean satisfaction level for IHE

Satisfaction Variables	VD	D	N	S	VS	MSS N=240	Position
Quietness in the neighbourhood	8	15	16	124	77	4.03	1
Level of privacy	12	132	72	10	14	4.01	2
Adequacy of natural ventilation	8	18	16	136	62	3.94	3
Adequacy of natural day lighting	8	23	20	134	55	3.94	3
Sizes of bedrooms	8	32	5	139	56	3.85	5
Overall size of the house	8	21	20	148	43	3.82	6
Size of the living room	8	35	5	138	54	3.81	7
Number of bedrooms in the house	6	32	9	148	45	3.81	7
Toilets	13	21	16	152	38	3.75	9
General plan / design of the house	10	31	13	154	32	3.70	10
Size of kitchen	14	32	14	133	47	3.70	10
Building materials	14	43	17	129	37	3.55	12
Beauty of the house (aesthetics)	9	53	32	108	38	3.47	13
Landscaping of the plot	13	59	24	102	42	3.42	14

VD = Very Dissatisfied; D = Dissatisfied; N = Neutral; S = Satisfied; VS = Very Satisfied

5.3 Level of Satisfaction with Several Attributes of the House at AHEE

Table III shows the respondents' responses to satisfaction with the attributes of the house and infrastructure for AHEE. The attributes are arranged according to their positions as determined by the MSS. Most of the respondents were satisfied with quietness in the neighbourhood and it had the highest weighted mean rating of 4.20, and therefore was highest on the ranking (1). The lowest ranked house attribute in the table was landscaping of the plot with MSS of 3.63, and therefore was lowest in the ranking (14). This implies that the respondents at IHE were most satisfied with quietness in the neighbourhood, and were least satisfied with landscaping of their plots.

The other satisfaction variables ranked according to their MSS are: number of bedrooms in the house (4.10), level of privacy adequacy (4.03), adequacy of natural ventilation (3.95), size of bedrooms (3.93), size of the living room (3.86), toilets (3.85), overall size of the house (3.82), adequacy of natural day lighting (3.79), general plan of the house (3.78), size of the kitchen (3.73), aesthetics (3.73), and building materials (3.67). Just like for IHE, the highest ranked satisfaction variable is quietness in the neighbourhood and this is because residential estates in Nigeria are usually very quiet environments due to the category of residents. The level of privacy in this estate is also very high which means that the design of the houses allows them to have their privacy.

Table III: Residents' responses to satisfaction with housing design and mean satisfaction level for AHEE

Satisfaction Variables	VD	D	N	S	VS	MSS N=136	Position
Quietness in the neighbourhood	3	8	2	69	54	4.20	1
Number of bedroom in the house	3	9	0	84	40	4.10	2
Level of privacy	5	9	5	75	42	4.03	3
Adequacy of natural ventilation	6	7	11	76	36	3.95	4
Size of bedroom	3	19	2	73	39	3.93	5
Size of the living room	4	20	2	75	35	3.86	6
Toilets	4	17	5	80	30	3.85	7
Overall size of the house	5	17	4	81	29	3.82	8
Adequacy of natural day lighting	6	12	16	73	29	3.79	9
General plan / design of the house	7	15	3	87	24	3.78	10
Size of kitchen	6	23	3	74	30	3.73	11
Beauty of the house (aesthetics)	3	19	9	86	19	3.73	11
Building materials	9	18	1	89	19	3.67	13
Landscaping of the plot	7	23	4	81	21	3.63	14

VD = Very Dissatisfied; D = Dissatisfied; N = Neutral; S = Satisfied; VS = Very Satisfied

5.4 Level of Satisfaction with Several Attributes of the House at SGHE

Table IV shows the respondents' responses to satisfaction with the attributes of the house for SGHE. Most of the respondents were satisfied with adequacy of natural ventilation and it had the highest MSS of 3.92, and therefore had the highest ranking (1). The lowest ranked house attribute was building materials with MSS of 2.19, and therefore had the lowest ranking (14). This implied that the respondents at SGHE were most satisfied with adequacy of natural ventilation, and were least satisfied with the building materials used. Generally, the respondents were not satisfied with the house attributes in this estate. This could be attributed to the very low level of participation (98.7%) in the design of their houses.

The other satisfaction variables according to their MSS are: number of bedrooms in the house (3.82), quietness in the neighbourhood (3.76), adequacy of natural day lighting (3.76), level of privacy (3.47), aesthetics (3.35), toilets (3.19), landscaping of the plot (3.15), size of the living room (3.14), general plan of the house (3.05), overall size of the house (3.03), size of bedrooms (2.67), and size of kitchen (2.52).

This conforms to information from the FGD where the respondents stated that their bedrooms and kitchen were too small for them. In addition, they stated that the cost of the houses were too expensive compared to the size of the houses, building materials used and the quality of construction. Several of them stated that they do not intend living in the estate in the long term, and that they intended to acquire land, and build to their own taste. They stated that they would move into their new houses as soon as they are completed. In addition, they expressed their displeasure in being left out of the process of developing the estate.

The situation in SGHE appears to be peculiarly different from the other two estates. In IHE and AHEE, there were higher levels of satisfaction with the specific attributes of the house, than in SGHE. Majority of the respondents in SGHE were not satisfied with building

materials used in construction, size of bedrooms, overall size of the house, and size of the kitchen: four out of the fourteen attributes of the house used in this research. The reason for low level of satisfaction with houses in this estate could be attributed to non-involvement of the residents in the design of the houses. The developers designed, constructed and sold the houses to the residents without involving them at any level in the process of its development. This is very common in government-built housing programmes in Nigeria and the reason is that there is no genuine policy framework to carry prospective users along in the housing development process.

Table IV: Residents' responses to satisfaction with housing design and mean satisfaction level for SGHE

Satisfaction Variables	VD	D	N	S	VS	MSS N=79	Position
Adequacy of natural ventilation	1	2	7	61	8	3.92	1
Number of bedrooms in the house	0	8	5	59	7	3.82	2
Quietness in the neighbourhood	3	8	7	48	13	3.76	3
Adequacy of natural day lighting	2	3	11	59	4	3.76	3
Level of privacy	6	14	10	35	14	3.47	5
Beauty of the house (aesthetics)	6	11	13	47	2	3.35	6
Toilets	8	15	15	36	5	3.19	7
Landscaping of the plot	12	14	8	40	5	3.15	8
Size of the living room	8	22	4	41	4	3.14	9
General plan / design of the house	9	21	7	41	1	3.05	10
Overall size of the house	5	21	21	31	1	3.03	11
Size of bedroom	16	27	5	29	2	2.67	12
Size of kitchen	16	32	5	26	0	2.52	13
Building materials	34	22	5	17	1	2.19	14

VD = Very Dissatisfied; D = Dissatisfied; N = Neutral; S = Satisfied; VS = Very Satisfied

5.5 Level of Satisfaction with the Attributes of the House in the Study Area (Total)

Table V shows the respondents' responses to satisfaction with the attributes of the house in the study area. Most of the respondents were satisfied with quietness in the neighbourhood and it had the highest MSS of 4.03, and therefore had the highest ranking (1). The lowest ranked house attribute was building materials with MSS of 3.33, and therefore had the lowest ranking (14).

The other satisfaction variables according to their MSS were adequacy of natural ventilation (3.94), level of privacy (3.92), number of bedrooms in the house (3.90), adequacy of natural day lighting (3.82), size of the living room (3.71), overall size of the house (3.68), toilets (3.68), size of bedroom (3.67), general plan/design of the house (3.61), aesthetics (3.53), size of kitchen (3.50), and landscaping of the plot (3.44). This means that people are most satisfied with quietness in the neighbourhood in the study area; it also means that quietness is important to the residents. As shown in the table, it is one of the main attributes that ranks highly in each of the estates and as a whole, while the other highly ranked housing attribute common in each of the estates is adequacy of natural ventilation. Satisfaction with the building material is the least ranked attribute in the study area and this can

be attributed to the quality of building materials in the country. It is common in Nigeria for manufacturers of several building materials to reduce the quality of their products in order to maximize profit. Moreover, this has a negative effect of the durability of such materials.

Table V: Residents' responses to satisfaction with housing design and mean satisfaction level in the study area (Total)

Satisfaction Variables	VD	D	N	S	VS	MSS N=455	Position
Quietness in the neighbourhood	14	31	25	241	144	4.03	1
Adequacy of natural ventilation	15	27	34	273	106	3.94	2
Level of privacy	23	3	29	242	128	3.92	3
Number of bedrooms in the house	9	49	14	291	92	3.90	4
Adequacy of natural day lighting	16	38	47	266	88	3.82	5
Size of the living room	20	77	111	254	93	3.71	6
Overall size of the house	18	59	45	260	73	3.68	7
Toilets	25	53	36	268	73	3.68	7
Size of bedrooms	27	78	12	241	97	3.67	9
General plan / design of the house	26	67	23	282	57	3.61	10
Beauty of the house (Aesthetics)	18	83	54	241	59	3.53	11
Size of kitchen	36	87	22	233	77	3.50	12
Landscaping of the plot	32	96	36	223	68	3.44	13
Building materials	57	83	23	235	56	3.33	14

VD = Very Dissatisfied; D = Dissatisfied; N = Neutral; S = Satisfied; VS = Very Satisfied

5.6 Relationship between Residents' Participation in House Design and Residential Satisfaction in the Study Area

The research investigated the relationship between the level of residents' participation in house design and several satisfaction attributes of the house. This was necessary in order to identify the satisfaction attributes of the house that are significantly correlated with the level of participation and those that do not. It was also necessary to identify the ones that have a higher relationship with the level of participation compared with others.

Table VI shows the result of the Spearman Rank correlation between the level of residents' participation in house design and the individual attributes of satisfaction with the houses in the study area. It shows that the correlation coefficient of participation in house design with satisfaction with general plan of the house is 0.37; satisfaction with number of bedrooms (0.34); satisfaction with aesthetics (0.318); satisfaction with building materials (0.334); satisfaction with size of living room (0.273); satisfaction with size of bedroom (0.37); satisfaction with size of kitchen (0.333); satisfaction with overall size of house (0.303); satisfaction with toilets (0.331); satisfaction with natural day-lighting (0.236); satisfaction with natural ventilation (0.266); satisfaction with privacy (0.287); satisfaction with quietness in the neighbourhood (0.222); and satisfaction with landscaping (0.267).

Satisfaction with general plan of the house and satisfaction with the size of the bedroom (0.370) recorded the highest correlation values with level of participation with house design. This means that the level of participation had the most predictive effect on these two satisfaction attributes for this study. The

lowest was with satisfaction with quietness in the neighbourhood (0.222), and it means that the level of participation in house design had the least predictive effect on this satisfaction attribute. The analysis was carried out at an alpha level of 95% confidence and 0.05-significance level, but all were also significant at 0.000; meaning that there is absolute correlation between all the satisfaction attributes of the house and the level of participation in house design. This means that participation in the design of the house correlates significantly with all the satisfaction attributes of the house in the study area, though the relationship is moderately weak. Therefore, higher levels of participation in house design would lead to higher levels of satisfaction with the house.

In addition, the highest correlation in the table (0.726) was between satisfaction with size of bedroom and satisfaction with size of living room, and the lowest correlation (0.206) was between satisfaction with adequacy of natural day lighting and satisfaction with landscaping of the plot. This means that the in the study area, residents are most likely to be satisfied with size of their living room when they are satisfied with the size of their bedrooms and vice versa.

Table VI: Matrix of Participation in House Design and Satisfaction with the Attributes of the House

	PD	GP	NB	AE	BM	SL	SB	SK	OS	TL	ND	NV	LP	QH	LS
PD	1														
GP	.370*	1													
NB	.340*	.453*	1												
AE	.318*	.483*	.401*	1											
BM	.334*	.537*	.425*	.516*	1										
SL	.273*	.407*	.433*	.440*	.514*	1									
SB	.370*	.461*	.445*	.401*	.509*	.726*	1								
SK	.333*	.438*	.402*	.416*	.519*	.587*	.659*	1							
OS	.303*	.467*	.518*	.438*	.546*	.622*	.623*	.598*	1						
TL	.331*	.462*	.446*	.412*	.465*	.433*	.508*	.482*	.554*	1					
ND	.236*	.368*	.369*	.243*	.293*	.315*	.323*	.304*	.345*	.465*	1				
NV	.266*	.320*	.298*	.245*	.242*	.284*	.325*	.257*	.309*	.384*	.623*	1			
LP	.287*	.342*	.274*	.245*	.318*	.268*	.369*	.289*	.288*	.312*	.306*	.398*	1		
QH	.222*	.285*	.358*	.263*	.247*	.227*	.296*	.307*	.262*	.295*	.243*	.339*	.560*	1	
LS	.267*	.393*	.319*	.416*	.364*	.313*	.364*	.295*	.316*	.294*	.206*	.253*	.364*	.295*	1

*: significant at 0.000

PD: Level of Participation in House Design GP: Satisfaction with general house plan

NB: Satisfaction with number of bedrooms AE: Satisfaction with aesthetics

BM: Satisfaction with building materials SL: Satisfaction with size of living room

SB: Satisfaction with size of bedroom SK: Satisfaction with size of kitchen

OS: Satisfaction with overall size of the house TL: Satisfaction with toilets

ND: Satisfaction with natural day lighting NV: Satisfaction with natural ventilation

LP: Satisfaction with level of privacy QH: Satisfaction with quietness in the house

LS: Satisfaction with landscaping of plot

There was also a need to examine the relationship between the level of participation in house design and satisfaction with the house generally. The result is shown in Table VII. It tests for significant relationship between the level of residents' participation in housing design and their level of satisfaction with the house in the study area. Table VII shows the Spearman Rank Correlation results for relationship between level of participation in house design and satisfaction with the house. It indicated that the level of participation of residents in house design significantly (p = 0.000) associates with their level of satisfaction with the house in the study area and the Spearman Rank value is 0.479. Once again, it shows an absolute relationship between the level of participation in house design and the level of satisfaction. The test was carried out at an alpha level of 95% confidence and 0.05-significance level. It implies that the level of participation in house design has significant correlation with satisfaction with the house in the study area. Therefore, a significant relationship was found between the two variables. In other words, generally people living in the estates of study are likely to be more satisfied with their houses if they participate in the design of their house. This is in consonance with Isa and Jusan (2012), and Carrol and Rosson (2007), which stated that there is a relationship between residents' satisfaction and participation in house design. This also explains the very low level of residential satisfaction found in SGHE.

Table VII: Spearman Rho Correlation between level of participation in house design and satisfaction with the house in the study area

		Spearman's rho Correlation	**Significance, p-value**	**Remark**
Total	Level of participation in house design Satisfaction with the house	0.479	0.000	Significant

6.0 Conclusion

This paper examined the relationship between the level of residents' participation in house design and the level of residential satisfaction in public housing estates in Akure. It took a close look at how participation of residents' in house design influences their level of satisfaction with several attributes of the house. Then, it examined the relationship between the level of residents' participation and satisfaction with the house generally. These were done to understand how the level of participation predicts the level of satisfaction in specific attributes of the house. Majority of the respondents (70.3%) did not participate in the design of the houses of their abode. In addition, quietness in the house (MSS=4.03) was the attribute of the house that respondents were most satisfied with in the study area and therefore had the highest ranking. On the other hand, rental/building cost (MSS=3.25) was the attribute of the house with that they

were least satisfied with and therefore had the lowest ranking.

The study also showed that there is indeed a significant relationship between the level of participation and the level of residential satisfaction in public housing estates in the study area. The correlation coefficient of the relationship is 0.479. In other words, a higher level of participation would to lead to higher levels of residential satisfaction. This is in consonance with the findings of previous authors but in a general sense. The study also showed that there is a significant relationship between the level of participation and the level of satisfaction with individual attributes of the house. There was little or no research in this aspect and this study has assisted in providing an answer for that. It found a significant and absolute relationship between the level of participation and satisfaction with all fifteen attributes of the house used in this study. The residential satisfaction attribute with the highest correlation coefficients (0.370) with participation were general plan of the house, size of the bedrooms and rental/building cost. This implies that participation in house design influenced these three aspects the most in this study. It also influenced other attributes; however, the strength of the relationship was found to be lower. It also found a significant relationship (p= 0.000) between the level of participation in house design and satisfaction with the house generally.

The result of this study implies that, increasing the level of participation will influence all the aspects of satisfaction used in this study especially satisfaction with general design of the house, and size of the bedrooms. Therefore, residents' participation in the house design process is crucial to enhance the level of residential satisfaction in housing estates in Akure. Such information is required because it is the kind required by designers and policy makers for future housing developments. Therefore, Policy makers should ensure that people participate in the design of houses in public housing programmes.

7.0 References

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