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Residential Satisfaction in Public Core Housing in Abeokuta, Ogun State, Nigeria

Eziyi O. Ibem · Dolapo Amole

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Abstract This study investigated residential satisfaction of randomly selected 156 household heads in the OGD Workers' housing estate in Abeokuta, Ogun State, Nigeria. Data were collected through questionnaire survey and analysed using descriptive statistics, factor and categorical regression analyses. Respondents were generally satisfied with their housing conditions with 59 % of them expressing satisfaction, while 41 % were neither satisfied nor dissatisfied with their housing environment. They evaluated satisfaction based on four key dimensions of housing unit characteristics, neighbourhood facilities and environment, management and services; and these residential components contributed the most to predicting residential satisfaction. Respondents' educational background, employment sector, sex and age were also found to be predictors of satisfaction. A key implication of the findings is that Core housing can provide satisfactory living environment, and this can be enhanced through the adoption of good housing design and management practices, improved access to basic services and social infrastructure and rapid upgrading of the number of bedrooms in the housing units.

Keywords Core housing · Residential satisfaction · Housing conditions · Residents · Ogun State

1 Introduction

Over the years governments in many developing countries, including Nigeria, have come to terms with the reality that majority of urban residents who have critical housing challenges are in the low-income group. Hence, special social housing programmes have been

E. O. Ibem (✉)
Department of Architecture, Covenant University, Km 10 Idiroko, Road, Canaan Land, P.M.B 1023, Ota, Ogun State, Nigeria
e-mail: eziyioffia@yahoo.com

D. Amole
Department of Architecture, Obafemi Awolowo University (OAU), Ile-Ife, Osun State, Nigeria
e-mail: dolapoamole@yahoo.com

designed to provide decent and affordable housing for this category of citizens. Studies (Kowaltoski et al. 2005; Greene and Rojas 2008; Purewal 2009; Bredenoord and van Lindert 2010) have shown that different housing delivery strategies that are based on participatory and government aided self-help approaches have been used in addressing the housing need of low-income people in the developing countries. In Nigeria for instance, a concerted effort has been under way in the last few decades to improve the living conditions of low-income people through different social housing programmes (Awotona 1987; Ibem et al. 2011). One of the strategies used by the Ogun State Government in Southwest Nigeria in providing social housing for her employees in the low and middle-income categories in recent times is the Core Housing Strategy.

Generally speaking, the Core Housing strategy also known as incremental housing has been identified as one of the most common strategies in the enabling approach to housing low-income people (UN-HABITAT 2005; Greene and Rojas 2008; Bredenoord and van Lindert 2010). It entails the provision of a single bedroom apartment (Core house) which can later be upgraded by households by adding more rooms as their income improves (Hesselberg 1996). In Ogun State, Southwest Nigeria, the OGD Workers' Housing Estate, Laderin-Abeokuta, is one of the social housing schemes developed using the Core Housing Strategy. It involved land acquisition, provision of housing services and construction of 1-bedroom housing unit by the Ogun State Ministry of Housing (OSMOH) (see Fig. 1). In the first two phases of the scheme, a total of 270 housing units, and some basic housing services and infrastructure such as roads, health centre, electricity and borehole were provided. Although, over 1,000 workers applied for the housing units in this estate, 270 public-sector workers who had put in not less than 10 years in the public service and are subscribers of the National Housing Fund (NHF) were allocated housing units in the first two phases of the scheme. The NHF is a dedicated fund derived from a deduction of 2.5 % of the monthly salaries of workers and deposited with the Federal Mortgage Bank of Nigeria (FMBN). To further ensure transparency in the selection of beneficiaries and that the target population really benefited from the scheme, only workers on the pay roll of the different government ministries, agencies and parasatals and were able to pay an initial sum of N97, 500 (US $609.38) being 10 % of the total cost per housing unit were allocated housing units in this estate. The balance of ?975, 000 (US $6,093.75) is expected to be paid between 10 and 25 years, and within this period, households are free to upgrade the housing units to a maximum of 3-bedrooms according to their needs and economic status.

Ibem and Amole (2011) found out that housing provided by the Ogun State government through the various housing delivery strategies was perceived to be inadequate by the residents. However, that study did not focus on residents' satisfaction with their residences. Also most previous studies on residents' satisfaction with social housing (Galster 1985; Kaitilla 1993; Ukoha and Beamish 1997; Djebarni and Al-Abed 2000; Salleh 2008; Fatoye and Odusami 2009; Jiboye 2009; Ilesanmi 2010; Mohit et al. 2010; Teck-Hong 2011) focus on housing produced through other strategies such as Turnkey (build and sale) Strategy within and outside Nigeria. However, studies on satisfaction with Core Housing appear to be very few. Moreover, most of these few studies concentrated on households' socio-economic and demographic characteristics, dwelling units, neighbourhood and management variables in evaluating residential satisfaction and the factors influencing it. It is observed that none of these studies examined the key housing and personal attributes which contribute most or least to predicting residents' satisfaction with social housing provided using incremental construction approach. Given that the goal of Core Housing strategy is to encourage incremental housing construction by residents and the criticism levelled against this approach for providing poor quality housing as Greene and Rojas

(2008) pointed out; it is thought that studies on residents' satisfaction with Core Housing might bring out some vital issues which previous studies have not taken note of.

Therefore, the overall aim of this study was to evaluate residential satisfaction of the OGD Workers' Housing Estate, Laderin, Abeokuta, Ogun State. The specific objectives were to (i) examine the socio-economic characteristics of residents in this estate (ii) examine which residential attributes contribute the most and least to residents' satisfaction in the Core housing estate and (iii) to identify the predictors of satisfaction and their relative contributions to satisfaction. Findings of this study are expected to advance our understanding of residents' satisfaction with social housing constructed using the Core Housing strategy from the Nigerian perspective; and also contribute to housing policy formulation and programme design as well as housing design practice and management.

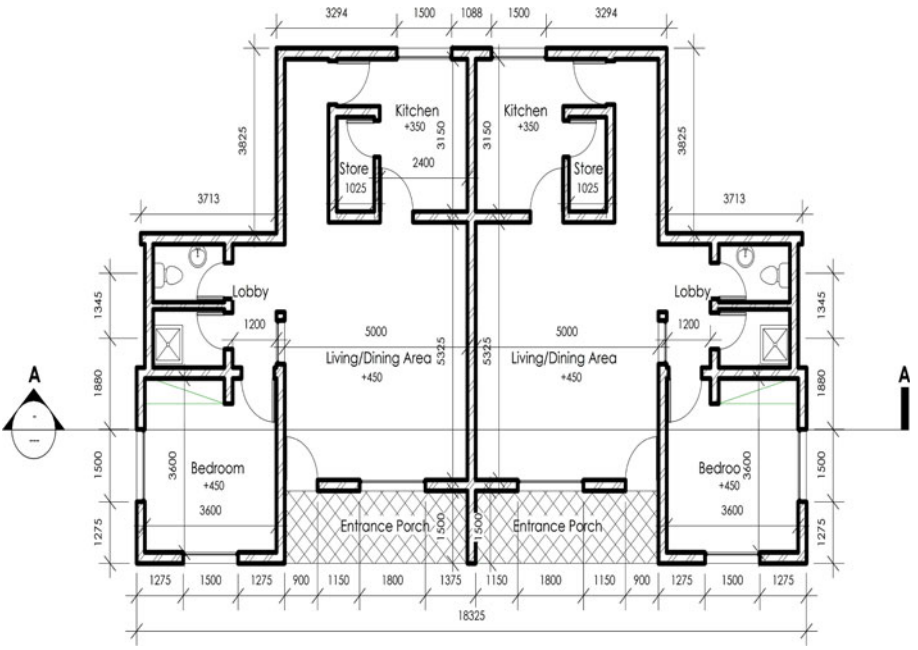

Fig. 1 Floor plan of semi-detached 1-bedroom core housing units

1.1 Review of Related Literature and Conceptual Issues

The review of literature shows that satisfaction studies cut across several disciplines and professions, and as a result, there are different definitions and conceptions of satisfaction (Hui and Zheng 2010). While some authors view satisfaction as consumer's judgment of the extent to which a product or service is providing a level of consumption-related fulfillment (Aga and Safakli 2007) others argue that satisfaction is an evaluation construct consumers use to compare the quality and performance of products or services in relation to their expectations (Parker and Mathews 2001; Jaafar et al. 2006; Ueltschy et al. 2007; Hanif et al. 2010). From the above views, it is clear that satisfaction is generally defined as an evaluation of the performance of goods and services in meeting consumers' needs,

expectations and aspirations. It can also be said to be a comparison between the expected and received values of goods and services by the consumers.

In housing research, satisfaction studies have been referred to as housing satisfaction (Kaitilla 1993; Karna et al. 2009; Jiboye 2010), occupants' satisfaction (Fatoye and Odusami 2009), residents' satisfaction (Ukoha and Beamish 1997) or residential satisfaction (Galster 1987; Salleh 2008; Mohit et al. 2010; Mohit and Nazyddah 2011). Kaitilla (1993), Hashim (2003) and Lee and Park (2010) specifically noted that residential satisfaction is an individual's satisfaction with both the house as a distinct physical product and the environment or neighbourhood; noting that residential satisfaction encompasses both housing and neighbourhood satisfaction. To this end, residential satisfaction as used in this study encompasses occupants' satisfaction with housing units, neighbourhood and associated services. Evidence in the literature suggests that the importance of studies on residential satisfaction cannot be overemphasized. First, such studies assess residents' present housing conditions and quality of life (Galster 1985; Djebarni and Al-Abed 2000; Salleh 2008; Lee and Park 2010; Caldieron 2011), predict residents' behavior such as residential mobility (Adriaanse 2007; Mohit et al. 2010) and housing modification (Lee and Park 2010) and measure the performance of housing projects (Onibokun 1974; Jaafar et al. 2006). Secondly, findings of residential satisfaction assessment serve as feed back to policy makers and professionals in the built environment, particularly, for improving social housing policy, housing design practice and the quality of residential environment (Formoso and Jobim 2006; Fatoye 2009; Buys and Miller 2012).

Although, satisfaction studies are generally based on different theoretical models and conceptual approaches as Parker and Mathews (2001) and Jaafar et al. (2006) pointed out; literature search however reveals that the concepts and models of residential satisfaction are linked with the framework of quality of life research (Galster and Hesser 1981; Galster 1987; Park 2006; Lee and Park 2010; Caldieron 2011). It has also been observed that studies on residential satisfaction have been approached from two basic empirical perspectives. First is the purposive approach, which views residential satisfaction as a measure of the extent to which the residential environment enhances or inhibits the goal of the users (Fatoye 2009). According to Amole (2009), the purposive approach places emphasis on goals or related activities, and helps researchers to understand the degree to which various facets and roles of individuals contribute to their satisfaction. The implication of this is that this approach helps to explain the degree to which an individual's housing conditions have influence on the attainment of his or her personal goals and aspirations. The second is the aspiration-gap approach. This approach draws a comparison between what users have and what they are expected to have (Djebarni and Al-Abed 2000; Amole 2009). Specifically, Galster (1987) noted that the aspiration-gap approach is very important in comparing individuals' previous and current housing with their desired housing situations. Consequently, most theories of residential satisfaction are based on the notion that residential satisfaction measures the difference between household's actual and desired residential situations (Galster and Hesser 1981; Mohit et al. 2010). This is particularly very insightful, when viewed from the perspective that housing is acquired with the expectations of meeting occupants' specific and diverse needs.

Following these two perspectives described above, studies (Jaafar et al. 2006; Adriaanse 2007; Amole 2009) have described residential satisfaction as a multidimensional construct that can be measured in different ways. For instance, Mohit et al. (2010) pointed out that the objective measurement of residential satisfaction deals with the physical characteristics, facilities, services and environment, while Galster (1985)

and Amole (2009) identified the subjective measurement of satisfaction as being closely related to psychological aspect of human beings, and measures perception, emotions, attitudes and aspirations. Moreover, Amerigo and Aragones (1990) were of the view that objective attributes of residential environment when evaluated by residents become subjective. It is on this premise that studies (Kahana et al. 2003; Amole 2009; Mohit and Nazyddah 2011) have underscored the role of objective and subjective parameters in the measurement of residential satisfaction in different contexts. However, Amole (2009) noted that the subjective measurement appears to be more important than the objective measurement in residential satisfaction.

A number of objective attributes of housing which occupants respond to in relation to their satisfaction have been identified in the literature (Buys and Miller 2012). For instance, Onibokun (1974) conceived of residential satisfaction based on four key interacting objective components including, residents, dwelling units, surrounding environment and the management component. The residents, which are at the heart of satisfaction measurement act as the recipients of all the feedback from the dwelling units, surrounding environment and management components, while the dwelling unit forms part of the entire environment where the residents live in. Also the environment includes housing services and neighbourhood facilities, while the management aspect comprises the institutional arrangement under which housing is administered, managed and maintained. According to Onibokun, a combination of all the non-personal components of the residential environment produces situations that the residents judge as satisfactory or not satisfactory housing environment according to their needs and expectations. Varady and Carrozza (2000) also conceived of residential satisfaction as comprising four different aspects of satisfactions; namely, satisfaction with dwelling units; satisfaction with services provided; satisfaction with the whole housing package (dwelling and service inclusive) and satisfaction with the neighbourhood or environment. Most recently, Lee and Park (2010) viewed residential satisfaction as comprising mainly perception of housing and neighbourhood satisfaction, while Mohit and Nazyddah (2011) based their measurement of residential satisfaction on two housing components: dwelling unit features and housing unit support services as well as three non-housing components: public facilities; social environment and neighbourhood facilities. It is on the basis of the foregoing that residential satisfaction is viewed in this study as comprising satisfaction with housing unit characteristics, neighbourhood facilities and management of housing estates.

Previous empirical studies on residential satisfaction have focused on satisfaction with different residential components and factors influencing it. Kaitilla (1993) reported that residents expressed dissatisfaction with size of houses, number of bedrooms and living/dining area, storage, kitchen, toilets and bathrooms in Papua New Guinea. Other studies have revealed that residents were satisfied with spatial characteristics of their dwelling units in Malaysia (Salleh 2008) and in the USA (James 2007). Also in Bandar Baru Bangi, Malaysia, Oh (2000) cited in Mohit et al. (2010) indicated that middle-income households in public housing expressed satisfaction with the space and cost of housing, but were dissatisfied with plumbing and public facilities such as recreational areas, playground, taxi and bus services. Contrary to the preceding findings, Ha (2008) found that residents in social housing estates were satisfied with the provision of healthcare facilities, stores, banks and post offices, but they were highly dissatisfied with parking facilities and landscaping in South Korea. However, in newly constructed public low-income housing in Kuala Lumpur, Malaysia, residents were found to be

satisfied with dwelling unit support services than any other residential attributes (Mohit et al. 2010).

In Nigeria, there are very few studies on residential satisfaction. Among these few studies, it has been reported that residents in public housing in the Federal Capital Territory-Abuja were satisfied with neighbourhood facilities but were dissatisfied with building characteristics and conditions as well as management of the housing estates (Ukoha and Beamish 1997). Their counterparts in Lagos were however, most satisfied with housing unit characteristics, but were least satisfied with the layout and access to local facilities and city-wide services (Olatubara and Fatoye 2007; Fatoye and Odusami 2009; Ilesanmi 2010). As it was the case with the residents in Abuja, studies (Jiboye 2009, 2010) have also revealed that residents in public housing in Lagos were dissatisfied with management of the housing estates. One can deduced from the above cited studies that there are problems of inadequate access to basic services and infrastructural facilities as well as lack of adequate management culture in public housing estates in Nigerian cities. It is also obvious from the review of literature that residents have been satisfied or dissatisfied with various aspects of housing in different countries; suggesting that the results of most satisfaction studies are highly contextual and mostly useful for practice and local housing development. The implication of this is that contributions to studies of satisfaction are possible when research explores such issues as factors which predict satisfaction based on certain conceptual models and satisfaction in specific housing contexts or housing strategies such as Core Housing.

With respect to factors that influence residential satisfaction, demographic and socio-economic characteristics (Lee and Park 2010) such as sex, income (Varady and Carrozza 2000), age (Galster 1987), marital status, income, education background (Jaafar et al. 2006; Salleh 2008), length of stay in the residence and tenure status (Ogu 2002) have been identified as key factors influencing residential satisfaction. Objective housing attributes, neighbourhood characteristics, and environmental conditions (Kahana et al. 2003; Jiboye 2010; Teck-Hong 2011; Buys and Miller 2012), housing delivery strategies (Teck-Hong 2011) and housing location (Jaafar et al. 2006) have also been found to influence residential satisfaction. However, Mohit et al. (2010) observed that the effects of these variables as determinants of residential satisfaction vary by countries and cultures; suggesting that determinants of residential satisfaction need to be examined across cultural and housing contexts. This is particularly important as most previous studies have focused on residents' satisfaction with housing produced through the Turnkey strategy and very little research attention appears to have been given to satisfaction with housing provided through the Core Housing strategy. This study has attempted to bridge this research gap from the Nigerian context.

The conceptual framework of the paper is based on the notion that residential satisfaction is influenced by residents characteristics (such as sex, age, income, education, employment, tenure status, marital status, length of stay and household size) as well as the composite construct of respondents' perception of the level of housing adequacy (which refers to adequacy of *housing unit characteristics, adequacy of neighbourhood facilities and environment; and adequacy of management*). Since the notion of adequacy has rarely been used in satisfaction literature; it is hypothesized that residents' evaluate various aspects of housing based on how adequate or inadequate they are in relation to their needs. The graphical illustration of the conceptual framework is shown in Fig. 2.

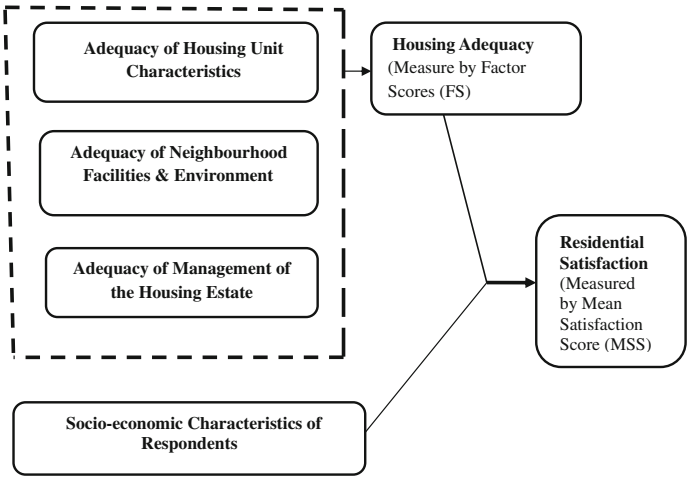

Fig. 2 Conceptual framework of the study

1.2 Research Method

This paper draws on a study conducted to evaluate public housing strategies in Ogun State Southwest Nigeria. The approach to the study was quantitative and the survey method was adopted. The survey was conducted between December, 2009 and February, 2010. At the time of the survey, there were 270 housing units in the housing estate; however a sample of 250 housing units representing about 92.6 % of the total number of housing units was randomly selected for the survey. This was to ensure adequate representation of the different households in the estate. Respondents from a total of 156 housing units representing about 62.4 % of the selected number of housing units actually participated in the survey.

Structured questionnaire was used to collect data from household heads through personal visits to the housing units. The questionnaire consisted of four sections. Section-1 focused on the respondents' socio-economic characteristics (e.g. sex, age, marital status, income, education, employment, household size, tenure status, length of stay). Section-2 was on housing characteristics (e.g. number of bedrooms, sources of power and water supply, refuse disposal methods). Section-3 and Section-4 comprised questions on respondents' perception of adequacy of, and satisfaction with 31 residential attributes. The attributes were grouped into three key residential components; namely, Housing Unit Characteristics (HUC); Neighbourhood Facilities and Environment (NFE) and Management of the housing estate (MAN). Table 2 shows the distribution of the 31 residential attributes into these three key components. In Section-3 of the questionnaire, respondents were specifically asked to rate their perception of adequacy levels of the 31 residential attributes based on a five-point Likert Scale ranging from '1' for Very Inadequate; '2' for Inadequate; '3' for Neutral, '4' for Adequate to '5' for Very Adequate, while '0' for None response. Similarly, in Section-4, respondents were also asked to rate their satisfaction with these attributes using a five-point Likert Scale: '1' = Very Dissatisfied; '2' = Dissatisfied; '3' = Neutral; '4' = Satisfied; '5' = Very Satisfied and '0' = None response.

Data were subjected to three types of analyses, including descriptive statistics, factor and categorical regression analyses. First, the descriptive analysis was used to compute

frequencies and percentages of the socio-economic characteristics of respondents, mean satisfaction and mean attribute scores. The mean satisfaction score was used to understand how satisfied the 156 respondents were with their housing conditions, while the mean attribute score was used to examine how satisfied the respondents were with each of the 31 attributes used in assessing their housing environment. Second, factor analysis with principal component and Varimax rotation method was used to reduce the responses on the 31 attributes used in measuring housing adequacy to a smaller number of factors, and to explore the key dimensions of housing to which residents responded to in their assessment of satisfaction in the estate. The factors scores were later used in the regression analysis. Finally, Categorical Regression Analysis (CRA) was performed on the data to identify the predictors of satisfaction and their relative contributions. The use of categorical regression analysis was based on the fact that it could deal with categorical data. In carrying out the CRA, mean satisfaction scores was the dependent variable while the independent variables were the respondents' socio-economic characteristics and the factor scores obtained in the factor analysis.

2 Study Findings

2.1 Respondents' Socio-economic Characteristics

The socio-economic characteristics of respondents are presented in Table 1. From this result, it is evident that more than one-half of the respondents were male, while the remaining were female household heads. Also, almost all (96 %) of the respondents were between ages 31 and 59 years and three-quarter (76 %) had a minimum of University degree or its equivalent. The result also shows that most of the respondents were owner occupiers while very few were renters. Although, 1-bedroom core housing unit was acquired by each household, the result (Table 1) however reveals that 16 % lived in 2-bedrooms and 37.1 % lived in 3-bedrooms; suggesting that 53 % of the respondents have expanded or upgraded their dwelling units to at least 2-bedrooms with 3 years or so. Also, the respondents were mostly low-and middle-income public sector workers who had lived in the dwelling units for between one and 3 years, and 73 % of them had household size of more than three persons. This result suggests that the different categories of households in the estates were sampled in the survey.

2.2 Residential Satisfaction

The study investigated respondents' satisfaction with their housing conditions in this estate. From the result, respondents were generally satisfied with their housing conditions in the Core Housing estate with mean satisfaction score of 3.13. The result further shows that the majority (56 %) of the respondents were satisfied with their current housing situation, 3 % were very satisfied, 41.0 % were neither satisfied nor dissatisfied with their housing conditions, while less than 1 % (0.6 %) felt dissatisfied with their housing situation. The result also revealed that 28 % of those who were satisfied lived in 1-bedroom, 24.4 % lived in 3-bedrooms and 6.4 % lived in 2-bedroom dwelling units. Table 2 shows the mean satisfaction score for the three key residential components and 31 residential attributes. It can also be seen from the result that HUC has the highest mean score of 3.40, followed by MAN (3.28) and NFE (2.60), respectively; suggesting that residents were most satisfied with housing unit characteristics (HUC), followed by management of the housing

Table 1 Socio-economic characteristics of respondents

	Frequency (n = 156)	Percentage
Respondent's sex		
Male	86	55.13
Female	70	44.87
Age group in years		
No response	3	1.92
31–45	100	64.10
46–59	49	31.41
60 and above	4	2.56
Marital status		
No response	4	2.56
Single	6	3.85
Divorced	3	1.92
Married	140	89.74
Widowed	3	1.92
Highest educational qualifications		
No response	5	3.2
O' level school certificate and below	6	3.85
National diploma and national certificate of education	22	14.10
Bachelor degree or its equivalent	92	59.00
Postgraduate degree/diploma	26	16.70
Others	5	3.20
Employment sector		
No response	3	1.90
Public sector	131	83.97
Private sector	20	12.82
Retired	2	1.06
*Average monthly income (Naira)**		
No response	16	10.03
Below N38,000 (low-income)	67	42.90
N38,000–N71,000 (middle low-income)	58	37.20
N72,000-N145,000 (middle high-income)	10	6.40
N145,000 and above (high-income)	5	3.20
Length of residency		
No response	2	1.3
Less than 1 year	17	10.90
1–3 years	134	85.9
4–5 years	3	1.90
Tenure status		
No response	2	1.30
Privately rented	19	12.2
Owner occupied	135	85.50
Household size		
No response	2	1.30

Table 1 continued

	Frequency (n = 156)	Percentage
Not more than 2 persons	15	9.60
3 persons	25	16.00
4 persons+	114	73.1
Number of bedrooms in dwelling units		
**1-bedroom	73	46.81
2-bedrooms	25	16.00
3-bedrooms	58	37.1

* 1 US $ = N160 as at December 2011; Monetised Federal Public Sector Salary Scale, 2009

** Yet to upgrade dwelling units

estate(MAN) and neighbourhood facilities and environment (NFE). Specifically, respondents were most satisfied with privacy in their residences and least satisfied with the distance of their dwelling units to shopping facilities.

The study also examined the dimensions of housing to which occupants of the Workers Housing Estate responded to. To this end, factor analysis with principal component and Varimax rotation methods was conducted. The Kaiser–Meyer–Olkin measure of sampling adequacy for the measurement is higher than recommended index of 0.60. The analysis of the data resulted in the extraction of six factors with Eigen values greater than 1. The six factors accounted for 51.81 % of total variance across 31 items (see Table 3). The first and most important dimension of housing to which the residents responded to, was Lighting, Ventilation and Sizes of housing units, explaining 11.75 % of the total variance across all 31 variables. Based on the factor loadings, items of this factor are related to adequacy of natural light, fresh air and sizes of main activity areas of the dwelling units such as living/dining, cooking and sleeping areas. The second most important dimension was the neighbourhood facilities and environment. This dimension is related to adequacy of social infrastructure such as recreational, shopping, educational, and healthcare facilities. The third most important dimension was management of the housing estate. Attributes under this dimension are related to the adequacy of public transport services, management and maintenance of common facilities, provision of parking spaces, street lights, good road network and promotion of communal activities in the housing estate. Another dimension was Safety and Security of housing unit characteristics, which is related to adequacy of protection of occupants against insects and dangerous animals, noise pollution and dampness. The result also showed that the fifth dimension was housing services, and attributes of this dimension are related to adequacy of water supply, sanitary/drainage facilities and refuse disposal. The least important dimension was the level of privacy and thermal comfort in the housing units. It can be inferred from this result that three main dimensions of housing to which residents responded to in the evaluation of satisfaction with their housing conditions in the Core Housing estate are adequacy of natural light, ventilation and sizes of the main activity areas of housing units, social infrastructure in the neighbourhood and management of the housing estate. This means that these are the most important residential attributes that influenced residents' satisfaction in Core Housing.

Table 2 Satisfaction with residential components in the core housing estate

	Residential attributes	Mean attribute scores
	Housing unit characteristics	3.40
1	Privacy in the residences	3.81
2	Sizes of bedrooms in the residence	3.77
3	Sizes of living and dining spaces	3.65
4	Location of residence in the housing estate	3.58
5	Natural lighting and air circulation in living and bed rooms	3.55
6	Type of residence	3.45
7	External appearance of residence	3.33
8	Bath and toilet facilities in the residence	3.32
9	Sizes of cooking and storage spaces	3.05
10	Type of building materials used	2.99
11	Number of bedrooms in the residence	2.96
	Neighbourhood facilities and environment	2.60
12	Distance to place of work	3.56
13	Noise in the housing estate	3.55
14	Suitability of residence to natural way of life	3.46
15	Crime and anti-social activities in the housing estate	3.33
16	Communal activities in the housing estates	3.21
17	Nearness of house to public infrastructure and urban services	2.94
18	Distance to children's school	2.49
19	Distance to market	2.45
20	Prices of goods and services in the housing estate	2.42
21	Distance to nearest medical/health care facility	2.39
22	Business/job opportunities within and around the estate	2.36
23	Distance to recreation/sporting facilities	2.30
24	Distance to shopping facilities	2.17
	Management of housing estate	3.28
25	Rules and regulations regarding residency in the housing estates	3.53
26	Security of life and property in the housing estates	3.47
27	Cleanliness of the housing estate	3.44
28	Management and maintenance of facilities the in housing estates	3.21
29	Water supply	2.95
30	Cost of housing in the estates	2.95
31	Electrical services and street lighting	2.83

2.3 Predictors of Residential Satisfaction

The identification of predictors of residential satisfaction and their relative contribution was also examined in this study. Consequently, the categorical regression analysis (CRA) was conducted using the optimal scaling method with the criteria for convergence set at 0.00001. With mean satisfaction scores as the dependent variable and factor scores derived from the factor analysis as well as respondents' socio-economic characteristics as the independent variables; the result shows that the independent variables significantly predicted residential satisfaction in the survey, with $F(14, 155) = 11.138$, $P < 0.000$. The

Table 3 Dimensions of evaluation of satisfaction by residents in core housing

Residential attributes	Factor loadings	Eigenvalue	% of variance	Cum %
Factor 1: lighting, ventilation and size of housing units		3.877	11.748	11.748
Natural lighting in living/dining spaces	.834			
Natural lighting in kitchen	.818			
Natural lighting in bedrooms	.740			
Circulation of fresh air in living/dining rooms	.634			
Circulation of fresh air in bedrooms	.553			
Size of cooking and storage spaces	.468			
Number of bedrooms	.428			
Factor 2: neighbourhood facilities		3.378	10.237	21.985
Recreation/sporting facilities	.847			
Educational facilities	.737			
Playground for children	.731			
Shopping facilities	.547			
Open spaces and green areas	.526			
Medical/healthcare facilities	.484			
Factor 3: management of housing estate		3.087	9.354	31.339
Public transport service	.726			
Management and maintenance of facilities	.649			
Road network in the estate	.649			
Communal activities	.509			
Parking spaces in	.504			
Electrical services and street lighting	.484			
Factor 4: safety and security of residence		2.753	8.344	39.682
Protection against insects and dangerous animals	.738			
Protection against noise pollution	.669			
Protection against dampness in the building	.644			
Security measure in the residence	.631			
Factor 5: housing services		2.237	6.779	46.462
Potable water supply	.646			
Sanitary/drainage facilities	.626			
Refuse collection and disposal	.601			
Factor 6: privacy and thermal comfort		1.764	5.346	51.808
Privacy in residence	.582			
Thermal comfort in residence	.514			

adjusted R^2 value (0.810) of the regression model indicates that 81.0 % of the variance in residential satisfaction is explained by the model.

The result as presented in Table 4 suggests that 12 of the 15 variables significantly contributed in predicting residential satisfaction. Six of these variables are related to respondents' perception of adequacy of housing unit characteristics, neighbourhood facilities and environment and management of the housing estate. The remaining seven variables are related to respondents' socio-economic characteristics. Of all the predictors in

Table 4 Predictors of residential satisfaction in core housing

	Standardized coefficients				
	Beta	SE	df	f	Sig.
Factor 1: lighting, ventilation and size of housing units	.400	.037	6	119.780	.000*
Factor 2: neighbourhood facilities	.249	.036	6	47.497	.000*
Factor 3: management	.539	.038	6	205.361	.000*
Factor 4: safety and security of residence	.271	.038	6	51.022	.000*
Factor 5: services	.293	.038	6	60.215	.000*
Factor 6: privacy and thermal comfort	.148	.036	6	16.612	.000*
Sex	.131	.038	1	12.016	.001*
Age	−.127	.036	2	12.241	.000*
Marital status	−.087	.038	2	5.128	.008*
Education	.213	.040	4	28.883	.000*
Employment sector	−.192	.042	3	20.907	.000*
Income group	.103	.039	4	7.045	.000*
Length of stay in the dwelling unit	−.016	.039	2	.176	.839
Household size	.069	.038	3	3.361	.022
Tenure	−.059	.038	2	2.398	.097

* significant predictors

the regression model, the beta weights show that the strongest predictor was adequacy of management of housing estate, followed by adequacy of natural light, ventilation and sizes of main activities areas of dwelling units, housing services, and adequacy of safety and security of the dwelling units in protecting occupants from adverse ambient environmental conditions, respectively. Among the socio-economic characteristics of respondents, the result suggests that educational qualification was the strongest predictor of residential satisfaction, followed by employment sector, sex and age, respectively. This result generally shows that users' subjective perception of objective attributes of residential environment contributed more than respondents' personal characteristics in the measurement of residential satisfaction in this housing estate.

3 Discussion

Findings of this study have shown that residents in the Core housing estate sampled were mostly educated, middle-aged, low and middle-income public sector workers as well as owner occupiers. This was to be expected going by the method and criteria adopted in the selection of beneficiaries of the scheme. However, very few (13 %) and 12 % of the respondents were private sector workers and renters, respectively. This is against all expectations given that the housing scheme was targeted at public sector workers and the houses were allocated to selected applicants on owner-occupier basis. A possible explanation for this result could be that some beneficiaries of this scheme rented out their housing units to persons who are not public sector workers for reasons best known to them. Arguably, this result is an indication that very few beneficiaries of the scheme are not in need of housing, and as such can afford to rent out housing units allocated to them. This goes to suggest that not all those who applied for houses in this scheme were really in need

of accommodation as would be expected. In any case, the result generally shows that the targeted population benefited very well from the housing scheme. Although, this finding may appear to be inconsistent with the general notion in literature (Awotona 1987; Mba 1992) suggesting that due to corruption, previous public housing schemes targeted at low- and middle-income earners in Nigeria ended up benefiting mainly high-income earners; however, this study suggests a departure from this tradition. The result tends to suggest that there was little or no corruption in the selection of beneficiaries and in the process of allocating completed housing units to them. It may be argued that the use of staff list of the different government Ministries, Agencies and Parasatals in the selection of beneficiaries contributed to ensuring transparency in the process, and that only qualified applicants in the targeted income groups benefitted from this housing scheme.

We found from the result that respondents were generally satisfied with their housing conditions. This is affirmed by the observation that 58 and 3 % of the respondents were satisfied and dissatisfied with their housing conditions, respectively, while the remaining felt neither satisfied nor dissatisfied with their residences. This goes to suggest that there is a narrow gap between what the residents aspire to have in housing and what they eventually obtained in the Core Housing estate. This result is to be expected because respondents were satisfied with 18 of the 31 residential attributes used in assessing their satisfaction. Specifically, respondents were satisfied with nine of the eleven housing unit attributes; four of the seven attributes related to management of the housing estate and five of the thirteen attributes related to neighbourhood facilities and environment. This suggests that residents were more satisfied with most of the attributes related to HUC and MAN, but were less satisfied with attributes related to NFE. This finding indicates that there is a gap between what the residents aspire to have in the neighbourhood and what they eventually obtained; suggesting failure on the part of housing providers to provide residents with access to key neighbourhood facilities in the housing estate or possibly locate the estate closer to where these facilities can easily be accessible within the city of Abeokuta. These results provide support to findings of studies conducted by Olatubara and Fatoye (2007); Fatoye and Odusami (2009) and Ilesanmi (2010) which indicate that residents in Turnkey-constructed public housing in Lagos, Nigeria, were satisfied with housing unit characteristics. They are however not in agreement with findings of studies by Ukoha and Beamish (1997) showing that residents in public housing in Abuja were most satisfied with neighbourhood facilities but were dissatisfied with building characteristics and that by Jiboye (2009) suggesting that residents in public housing in Lagos were dissatisfied with management of the housing.

Interestingly, it was also observed that 53 % of the respondents have upgraded their dwelling units from the initial 1-bedroom to at least 2-bedrooms; suggesting that their income status has improved within 3 years or so of acquiring the houses. This appears to be in line with the objective of the scheme in providing beneficiaries with a nucleus of habitable housing unit which they can upgrade over time as their income improves. Similarly, it was observed that 39 % of those who were satisfied lived in the dwelling units that have been upgraded from 1-bedroom to either 2-bedrooms or 3-bedrooms. This indicates that despite the fact that the core housing units are constructed incrementally; larger proportion of the residents who were satisfied lived in dwelling units that have been upgraded. To further confirm this, the result (Table 2) shows that the mean attribute score of number of bedrooms in dwelling unit is 2.96; indicating that it was the least satisfactory residential attribute related to HUC. One possible reason for this result is that 73 % of the respondents had household size of over four persons; suggesting that 1-bedroom unit could not have been adequate for households of this size. As a result, the respondents were least

satisfied with the number of rooms in the dwelling units; suggesting that there is need for upgrading (modification) of their dwelling units in line with their household needs.

Residents in the Core housing evaluated their satisfaction based on dwelling units, neighbourhood facilities and services, as well as management of the housing estate. This is in line findings of previous studies (Onibokun 1974; Salleh 2008; Jiboye 2009). Indeed, the result of the factor analysis revealed that the six dimensions of housing to which occupants responded to were related to housing unit characteristics, management of housing estate, neighbourhood environment and housing services. The first of the three dimension of housing was related to lighting, ventilation and sizes of main activity areas such as living, dining, cooking and sleeping in the housing units. The second dimension was related to access to social infrastructure such as children's' schools open spaces and green areas, recreational, shopping and healthcare facilities. The third dimension as identified in the factor analysis was management aspect which is related to provision of access to public transport services, management and maintenance of common facilities, provision of access to public transport services parking spaces, street lights, good road network and promotion of communal activities in the housing estate. Others were related protection and security, thermal and visual comfort of occupants as well as adequacy of services (e.g. water, electricity, and refuse disposal) in the dwelling units. The key inference that can be drawn from this finding is that housing constructed using the Core Housing strategy are evaluated the same way as that constructed using the Turnkey strategy by residents. It can also be deduced that the specific areas programme designers and professionals need to pay close attention to when conceiving housing schemes for public sector workers are the adoption of good management framework, dwelling unit characteristics and provision of basic amenities and social infrastructure.

In support of previous studies (Galster 1987; Amole 2009; Mohit et al. 2010; Jiboye 2010), the result also showed that the variables which most strongly predicted residential satisfaction in Core Housing were the subjective variables. From the findings, it thus appears that most variables that predicted satisfaction in other types of housing also emerged as predictors in Core housing in this study. For instance, the study found that the first three strongest predictors of satisfaction in Core Housing were related to respondents' perception of adequacy of management aspect of the housing estate; characteristics of living, dining, cooking and sleeping (main activity) areas as well as security and protective features of dwelling units. Notably, the result of CRA provides support to that obtained in the factor analysis in confirming that the first three most important dimensions of housing which occupants responded to, in their evaluation of satisfaction are also among the strongest predictors of residential satisfaction. In fact, it was observed that the variables which predicted residential satisfaction were related to management of the housing estate and the physical characteristics of housing units and surrounding environment. Particularly, the result for management of the housing estate was to be expected; this is because evidence in the literature (Ukoha and Beamish 1997; Jiboye 2009) suggests that there is poor management framework in public housing estates in Nigeria, and thus residents most often expressed dissatisfaction with management of public housing estates in this country. In any case, findings of this study generally suggest that the overall quality of the residential attributes investigated is very important in determining residents' satisfaction with Core housing.

Furthermore, previous studies have shown that the socio-economic characteristics of respondents such as sex, income (Varady and Carrozza 2000), age (Galster 1987), marital status, and education background (Jaafar et al. 2006; Salleh 2008) are all predictors of residential satisfaction. These findings were also corroborated by this study. However,

unlike the previous study conducted by Ogu (2002), length of stay in the residence and tenure status of respondents did not feature as predictors of satisfaction. This is probably because most of the residents were owner-occupiers and have stayed in the housing estate for less than 4 years; suggesting that the length of stay is short to have any significant influence on residents' satisfaction. Relating the findings to the assumption in the conceptual framework of the study which suggests that respondents' perception of adequacy of the three key residential components and socio-economic characteristics are predicts of residential satisfaction; we can say that our result is in support of this assumption. This study also provides support to findings of previous studies (Amole 2009; Salleh 2008; Mohit et al. 2010) indicating that subjective assessment of residential attributes are more important than the users' characteristics in predicting residential satisfaction.

It is also noteworthy that the majority of respondents were satisfied with the physical and spatial characteristics of the core housing units, especially in providing adequate living/dining, cooking and sleeping areas that ensure the safety and security of occupants. This suggests that core (incremental) housing can provide quality housing units just like the Turnkey and other housing delivery strategies. Although, this is inconsistent with the criticism leveled against incremental housing for failing to meet the construction standards that ensures the safety and sanitation of houses as pointed out by Greene and Rojas (2008); however, the findings here appear to corroborate John Turner's argument (Harris 1999, 2003) that housing upgraded over a period of time ensures that the quality of the physical characteristics of houses improve.

4 Conclusions

This study examined residential satisfaction in public housing estate constructed for public sector workers using the Core Housing Strategy. The findings appear to provide support to findings of prior studies on residential satisfaction and factors affecting this in public housing. At least, the study has shown the satisfaction of residents of Core Housing and performance of this Housing Scheme in Ogun State, Nigeria. The study has revealed that housing provided by government for its workers in the low-and middle-income categories in the study area performed above average form the occupants' perspective; implying that housing provided in this estate matched users' need and aspirations to a large extent. The study also identified the dimensions of housing to which occupants responded to and the predictor of residential satisfaction in the estate. The results are not too different from that obtained from studies on Turkey-constructed housing within and outside Nigeria.

Findings of this study have a number of implications that are noteworthy. First, the study has shown that like Turnkey constructed houses, Core housing units can also provide low and middle-income residents access to quality and satisfactory housing units despite the incremental construction strategy used and the challenges associate with this. Therefore, policy action is needed for the adoption of Core housing strategy as a compulsory component of the public housing delivery system in urban areas in Nigeria. The second implication is that satisfaction with Core housing can be enhanced through improved management practices, provision of adequately ventilated, lighted and spacious living/dining, cooking and sleeping areas and sanitary services in the housing units as well as adoption of measures that would facilitate rapid upgrading of the housing units. Therefore, architects and other professionals involved the design and development of Core housing for public sector workers (civil servants) should take note of these areas in designing, planning and implementing this type of housing schemes. Another implication is that since some of

the residents of the housing estate were not civil servants as would be expected, there is need for similar housing scheme for private sector employees. This is in view of the fact that this category of people constitutes greater proportion of urban population in Nigeria. Finally, findings of this study also imply that the conceptual model used in this research which views residential satisfaction as construct of residents' perception of the adequacy of three key residential components and residents' socio-economic characteristics is useful for understanding satisfaction with Core housing in the study area.

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