Funmilayo Adedire

Dr Funmilayo M. Adedire (Corresponding author), Department of Architecture, Lead City University, Ibadan, Oyo State, Nigeria. Phone: 234-8080997437, email: <funmidire@gmail.com>

Michael Adegbile

Dr Michael B.O. Adegbile, Department of Architecture, University of Lagos, Nigeria. Phone: 234-8023892406, email: <mboadegbile@yahoo.com>

Assessment of housing quality in Ibeju-Lekki peri-urban settlement, Lagos State, Nigeria

Peer reviewed and revised

*The authors declared no conflict of interest for the article or title.

Abstract

This article assesses housing quality in Ibeju-Lekki, a peripheral settlement outside Lagos metropolitan region. Using purposive sampling, 370 housing units from clusters of 16 peri-urban settlements constituted the sample size. Primary data was sourced through structured questionnaires, interview (with local planning personnel) and observation schedules administered through a field survey. Using Statistical Package for Social Sciences, data analysis was done using descriptive analysis to generate frequencies and percentages on socio-economic profile, neighbourhood quality, locational quality, dwelling quality, and building materials used. Tests of correlation were conducted on the mean of variables of neighbourhood quality, locational quality and building materials, derived through recoding of variables by means of Transform statistical tool, to establish the factors influencing housing quality in the study area. The findings show a significant positive correlation between household income and housing quality. The latter is found to be influenced by respondents' socio-economic attributes, building materials, neighbourhood quality, and locational quality in the study area. It can be concluded that socio-economic characteristics, predominantly income of households, play a major role in the level of housing quality that can be accessed in the study area. It is, therefore, recommended that the state government and private developers should promote alternative building materials, in order to enhance housing affordability by the low-income group. This will reduce the spread of informal housing development. In addition, the state government should align urban policy to eliminate disparity in

infrastructural development which has impacted on poor neighbourhood and locational quality in Lagos peri-urban settlements.

Keywords: Dwelling quality, housing quality, locational quality, neighbourhood quality, peri-urban settlements

Abstrak

Hierdie artikel evalueer behuisingsgehalte in Ibeju-Lekki, 'n perifere nedersetting buite die Lagos Metropolitaanse streek. Met behulp van doelgerigte steek-proefneming, is 370 behuisingseenhede uit groepe van 16 stedelike nedersettings gekies om die steekproefgrootte te verteenwoordig. Primêre data is verkry deur gestruktureerde vraelyste, onderhoud (met plaaslike beplanning personeel) en waarnemingsskedules opgestel tydens veldwerk. Met behulp van die Statistiese Pakket vir Sosiale Wetenskappe SSPS 22 is data-analise gedoen met behulp van beskrywende analise om frekwensies en persentasies op sosio-ekonomiese profiel, buurtkwaliteit, liggingskwaliteit, woonkwaliteit en boumateriaal te genereer. Korrelasietoetse is gedoen op die gemiddeldes van veranderlikes van buurtkwaliteit, lokasiekwaliteit en boumateriaal, afgelei deur herkodering van hierdie veranderlikes deur die Transform statistiese instrument, om die faktore wat behuisingskwaliteit in die studiegebied beïnvloed, vas te stel. Die resultate toon 'n beduidende positiewe verband tussen huishoudelike inkomste en behuisingskwaliteit. Behuisingskwaliteit word ook beïnvloed deur die respondente se sosio-ekonomiese eienskappe, boumateriaal, buurtkwaliteit en liggingskwaliteit in die studiegebied. Daar kan afgelei word dat sosio-ekonomiese eienskappe, hoofsaaklik inkomste van huishoudings, 'n belangrike rol speel in die vlak van behuisingskwaliteit wat in die studiegebied verkry kan word. Daar word dus aanbeveel dat die staatsregering en private ontwikkelaars alternatiewe boumateriaal bevorder om die behuisings-bekostigbaarheid van die lae inkomstegroep te verbeter. Dit sal die verspreiding van informele behuisingsontwikkeling verminder. Ook moet die staatsregering die stedelike beleid in ooreenstemming bring om ongelykheid in infrastruktuurontwikkeling uit te skakel wat die swak omgewing en liggingskwaliteit in Lagos peri-stedelike nedersettings beïnvloed het.

Sleutelwoorde: Behuisingskwaliteit, buurtkwaliteit, liggingskwaliteit, wonings-kwaliteit, peri-stedelike nedersettings

1. Introduction

The interaction of different internal and external factors plays a role in the measurement of housing quality in peri-urban settlements (Allen, 2010; Chirisa, 2010). The geographical and ethnographic composition of the residents plays an important role in shaping housing quality in peri-urban settlements (Rapoport, 1998). Other factors such as neighbourhood quality, locational quality and regional response to patterns of development show that housing quality as a function is not limited to physical components of construction, but rather entails human satisfaction with urban attributes and facilities, environmental quality and locational advantages (El Din, Shalaby, Farouh & Elariane, 2013; Rapoport, 1998).

In African cities, in general, state or regional governments are respon-sible for the planning and infrastructure of peri-urban settlements

located outside the city (Allen, 2010). The governance of peri-urban settlements in Lagos is shared between local land owners and the state government, but less attention is paid to the infrastructure development of settlements outside state government's acquired land (Adedire & Adebamowo, 2018). Environmental quality, which has to do with good sanitation, security, parking space, light and drainage, and locational quality of housing, which is the spatial position relative to the central business district, are all external factors that create a gap in services delivery, giving room to infiltration of informal development and infrastructure inadequacy in peripheral towns (Chirisa, 2010; Allen, 2003).

Dwelling quality is internally controlled by the socio-economic and socio-cultural characteristics of the residents in peri-urban settlements; these determine the level of quality of housing they can access through their choice of building construction materials and methods of construction (Fiadzo, Houston & Godwin, 2001). In the majority of peri-urban settlements, there exists social differentiation and service inequality among the indigenous residents and the immigrants (Simon, 2008; Ibem & Aduwo, 2015).

The saturation of the built-up area in metropolitan Lagos has gradually led to the conversion of agricultural land in the peri-urban settlements in Lagos for residential purposes to accommodate the multicultural and heterogeneous urban population (Nwokoro & Dekolo, 2012). The influx of low-income urban immigrants into Lagos peri-urban settlements is significantly impacting on housing quality. Lower income groups inhabit poor residential areas in peri-urban settlements associated with poor physical conditions, illegal development, limited or no access to water, and poor sanitation (Daramola & Ibem, 2010; Lawanson, Yadua & Salako, 2012). The assessment of housing quality in Lagos peri-urban settlements is significant to determine to what extent neighbourhood quality, location quality and the use of building materials contribute to the level of housing quality in these settlements. The findings might assist the state government to support the use of alternative building materials in the development of better quality housing for residents in these peri-urban areas.

2. Literature review

The differentiation of housing quality occurs on the basis of several dimensions: the structural or dwelling quality, neighbourhood quality, and locational quality (Bates, 2006: 25; Kain & Quigley, 1970). Each of these factors is influenced by elements such as, for example, income, family size, education and race of residents in settlements that control them (Goodman, 1978).

2.1   Structural or dwelling quality

Housing type, design, age of the building, aesthetics, lot size, window sizes, spatial arrangements, the number of rooms per household, tiled toilet, tiled bath, tiled kitchen, lights and water contribute to the measurement of dwelling quality (Aderamo & Ayobolu, 2010; Štreimikiene, 2014: 27; Amao, 2012). The methods of construction, building materials used and aesthetics are also indices for measuring dwelling quality (Bradley & Putnick, 2012).

2.2   Neighbourhood quality

Neighbourhood quality is defined by the effects that neighbourhood characteristics have on a residence as a result of the environment in which it is located (Clark & Huang, 2003). Characteristics such as neighbourhood deterioration, adequacy of services, safety and accessibility, and the overall assessment of the neighbourhood refer to the natural attributes of the neighbourhood (El Din *et al.*, 2013). The dynamic relationship that exists between the physical features of housing, streets, open spaces and general settings in the neighbourhood determines neighbourhood quality (Rapoport, 1998; El Din *et al.*, 2013) that is very poor in most of Lagos' peri-urban settlements.

The quality of the neighbourhood, particularly in terms of socio-economic attributes, has also been found to be an important determinant for housing quality (South & Crowder, 1997: 1040). Residents' socio-economic capacity influences the quality of housing they can enjoy (Boamah, 2015). Residential areas for low-income earners in metropolitan peripheral areas are generally known to have limited or no access to services, poor sanitation and are mostly informal developed settlements (Allen, 2010). In these poverty areas, wastes are indiscriminately disposed of into canals and drainage channels; toilet facilities are open defecation, unimproved, or shared improved toilets that include flush toilets, flush latrines, and ventilated improved pit (VIP) (Allen, 2003; Puttal & Ravadi, 2014). Depending on the income status of houses in the majority of peri-urban settlements, access to drinking water could be unimproved, improved and piped (Allen, 2003). Building materials in these poor areas include wood, reeds, grass for construction and roofing (Simon, 2008).

Neighbourhoods occupied by middle-income earners have better dwelling quality and are usually segregated from the indigenous residents and the immigrants (Simon, 2008; Ibem & Aduwo 2015). Predominantly in African peri-urban settlements, community participation is a means for securing improved neighbourhood quality (Lawanson *et al.*, 2012; Binns, Maconachie & Tanko, 2003). This

is encouraged in externally initiated projects such as government-led infrastructure development, developer-initiated or in projects initiated by an association of community residents (Obeng & Whittal, 2014; Binns *et al*., 2003).

2.3   Locational quality

The key measurement for locational quality involves residents' mobility and living convenience, including features such as access to place of work, accessibility to central business district, access to public services, closeness to the market, and availability of schools, hospitals and shopping places (Adebayo & Aliu, 2010). In African peri-urban settlements, commuting and daily travels are often slow, due to traffic congestion and the poor conditions of the access roads to and from the main arterial routes linking peri-urban settlements to amenities (Lawanson *et al.*, 2012; Acheampong & Anokye, 2013).

Housing quality in peri-urban settlements in Lagos suffer from neglect, due to the locational disadvantage of these settlements and the perception that it has no economic contribution to state development (Adedire, 2017). As a result, these settlements, in consonance with prior findings, suffer from poor sanitary conditions, increasing commuting time, traffic congestion, pollution, poor water supply and sanitation problems, solid waste disposal, and lack of open space (Dutta, 2012; Simon, 2008). In addition, housing quality in peri-urban settlements in Lagos is negatively affected by these poor environmental conditions, as they affect not only the sustainability of these places, but also people's health. The spread of epidemic diseases is common where environmental quality is poor (Boamah, 2015).

2.4   Ibeju-Lekki local government area

Ibeju-Lekki Local Government Area is located outside the metro-politan region of Lagos State in Nigeria. Ibeju-Lekki represents one of the rapidly urbanising peri-urban settlements in Lagos in terms of residential development and population growth (Obiefuna, Nwilo, Atagbaza & Okolie, 2013). Ibeju-Lekki serves the housing needs of migrants from Lagos Island and its environs. It is approximately 75 kilometres long and roughly 20 kilometres wide, with a land area of approximately 646 kilometres square, which equals one quarter of the total land mass of Lagos state (Aluko, 2010). It is situated at approximately latitude 40 15' north latitude 40 17' north and longitude 13015' east and 13020' east. According to the National Population Commission (2006) census, Ibeju-Lekki had a population of 117,481 out of Lagos State's total of 9,113,605.
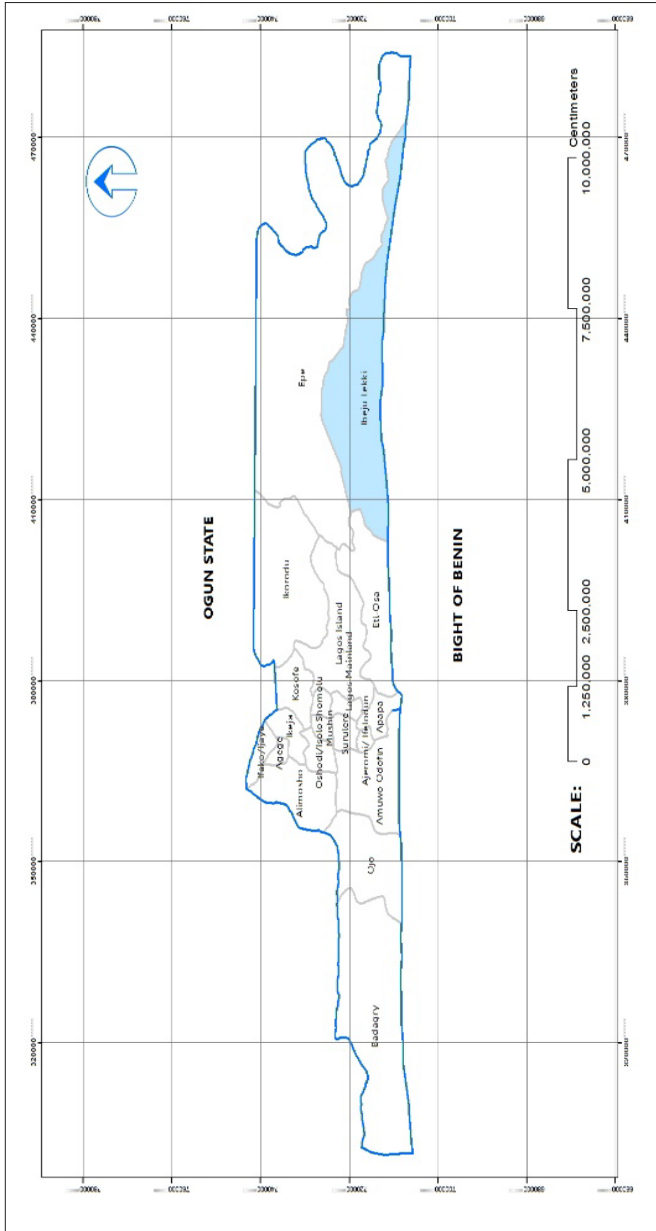
Figure 1:   Map of Lagos State showing Ibeju-Lekki peri-urban settlements
Source: Adapted from the Report on the Review of the Lagos State Regional Plan
          (2002), LASG Ministry of Physical Planning & Urban Development

3.   Research methodology

The purpose of this research was to assess housing quality in Ibeju-Lekki, a peripheral settlement outside Lagos metropolitan region. A quantitative research design was adopted, as this type of design allows for the use of structured questionnaire surveys that enable researchers to generalise their findings from a sample of a population (Creswell, 1994). Descriptive analysis was used to analyse the interview and field survey data on socio-economic profile, neighbourhood quality, locational quality, dwelling quality, and building materials used in the study area. This technique summarises data in an understandable way, by using frequencies and percentages (numerical) to reduce the number of responses to a mean score (Satake, 2016: 663). From these numerical data (mean scores), the variables to measure dwelling quality, neighbourhood quality and locational quality could be determined and set. Regression analysis was used to test these variables for correlation, by examining relationships among these quantitative variables (Rossoni, Engelbert & Bellegard, 2016: 200). Several regression analysis methods are available, but correlation analysis was used, because the coefficient and P-values could be extracted, which explains the strength of the relationship between a pair of variables (Bewick, Cheek & Ball, 2003: 452).

3.1   Sampling method and size

Statistics from the Lagos State Government Digest of Statistics (2016) shows that, in 2016, Ibeju-Lekki had a total of 11,749 housing units and a population of 179,187 (LSG, 2016: 27). For adequate representation of the target population, the sample size was taken from the population of the residents and the housing units. A two-stage cluster sampling technique was adopted, because the population could be subdivided into clusters, and random samples could be collected from each cluster (Alvi, 2016: 22). In the first stage, 16 peri-urban clusters were purposively selected from all LCDAs/wards in the peri-urban settlements of Ibeju-Lekki. In the second stage, purposive sampling was used to select units based on the uniqueness of each peri-urban settlement. The samples chosen represent housing initiatives in the clusters; that is, self-built housing, government housing, and private developer housing. From the cluster sample, random sampling was used to select 370 housing units to represent the population. With a margin error of 5% and a confidence level of 95%, the Krejcie & Morgan's (1970: 608) sample size table recommends a sample size for a population of 10,000 as 370. This recommendation validates the sample size of 370 as efficient for the population of 11,749.

3.2   Response rate

From the 370 original questionnaires, 366 completed ones were retrieved, resulting in a high response rate of 99%. According to Moyo & Crafford (2010: 68), contemporary built-environment survey response rates range from 7% to 40%, in general.

3.3   Data collection

A questionnaire survey was done on 370 selected household heads in Ibeju-Lekki housing settlement, using the spot collection method during non-working days and hours from 14 January to 25 March 2017. Topics on different housing development initiatives used in the survey were extracted from reviews of the literature, resulting in the formulation of a questionnaire divided into two sections. Section one, on respondents' profile, obtained personal information on gender, occupation, literacy level, tribe, monthly income, household size, and tenure of the household head. Section two sets questions grouped by the various variables that define building materials used, dwelling quality, neighbourhood quality, locational quality and informality as determinants to establish which of these factors influence housing quality in the study area.

3.4   Data analysis and interpretation of findings

Version 22 of the Statistical Package for Social Science (SPSS) was used to process and analyse data (Pallant, 2013). For analysis of the socio-economic profile of household heads, as well as the rating of neighbourhood quality, locational quality, dwelling quality, informality and building materials used in the study area, the percentages and frequencies of responses were generated, but only the % frequencies of the variables were reported. To measure the existence of (P-value) and how strong (R-value) the relationships were between the set variables, the Pearson's *R* test was used (Asuero, Sayago & González, 2006: 43). To do the correlation, the mean scores of variables tested in the survey were used to recode these variables with Transform statistical tool. The newly labelled variables regarded as the Mean Variable defining neighbourhood quality, locational quality, dwelling quality and building materials were correlated to show if there were any relationships between these variables. The correlation coefficient adopted R values between -1 and 1, where: 1 indicates a strong positive relationship; -1 indicates a strong negative relationship, and 0 indicates no relationship at all. The further away R is from 0, the stronger the relationship. To test if the correlations were significant, the significance value (P value) was set at 5% ($p < .05$) (Dahiru, 2008: 22).

3.5 Limitation(s) of the study

It is important to note that the study was conducted only on the peri-urban settlements of Ibeju-Lekki; hence, the findings cannot be generalized for Lagos metropolitan region.

4. Findings and discussion

4.1 Socio-economic characteristics of the respondents

Analysis of the research questionnaires presented in Table 1 shows that male-headed households are higher than female-headed households in Ibeju-Lekki peri-urban settlements. Of the population, 36.6% is involved in informal trading and commercial enterprises, making it the predominant occupation in the study area. In addition to other unknown occupations, farming is the least engaged among all the occupations considered. Civil service, skilled work and professional practices are well represented, with 19.1%, 15.3%, and 16.7%, respectively. Only 9% of the respondents had primary school education and below, thus constituting the illiterates in the study area. The Yoruba ethnic group constitutes the largest portion (71.9%) of the population, while the Hausa tribe is the least represented in the study area. The predominant income group in the study area was the high-income group earning above N150,000 ($420) monthly. This income group constitutes 44.6% of the entire population. This runs contrary to the belief that the majority of peri-urban settlements is mainly dominated by the low- and the middle-income groups. In the low-income group, 36.3% earn N25,000 ($70)-N50,000 ($140) and live mostly in informal buildings and self-built housing. In the middle-income group, 19.1% earn N50,000 ($140)-N150,000 ($420) monthly and is the least represented in the study area. Household sizes of 3-5 persons are the commonest, with 55.2% of the respondents' population. Household sizes of 10-12 persons are the least represented, with 2.2%. People have lived in the study area for over ten years, signifying the longest tenure as shown by 31.7% of the population.

Table 1:   Socio-economic profile of the household head

Variables		Ibeju-Lekki	
		N=366	%
Gender of household head	Male	223	60.9
	Female	143	39.1

Variables		Ibeju-Lekki	
		N=366	%
Occupation of household head	Civil service	70	19.1
	Informal trading	134	36.6
	Professional practice	61	16.7
	Skilled work (artisan)	56	15.3
	Farming	1	0.3
	Others	44	11.9
Literacy level of household head	Postgraduate	56	15.3
	First degree/Higher diploma	105	28.7
	National diploma	62	16.9
	Secondary	110	30.1
	Primary/Below	33	9.0
Respondent's tribe	Yoruba	263	71.9
	Hausa	6	1.6
	Ibo	70	19.1
	Others	27	7.4
Monthly income of household head	Low income N25,000-N50,000 ($70-$140)	133	36.3
	Middle income N50,001-N150,000 ($140-$420)	70	19.1
	High income N150,001 and above ($420)	163	44.6
Household size	1-2 persons	48	13.1
	3-5 persons	202	55.2
	6-9 persons	96	26.2
	10-12 persons	8	2.2
	More than 13 persons	12	3.3
Tenure	Less than 5 years	114	31.1
	5-10 years	116	31.7
	More than 10 years	134	36.6
	Others	2	0.5

Field survey (2017)

* Salary grouping is culled from the Federal Republic of Nigeria's Federal Civil Service Commissions

4.2 Assessment of building materials

The observation schedule and the analysis of the structured ques-
tionnaires presented in Table 2 show diverse building materials used
in the study area. The commonest wall materials were mainly block
wall (93.4%), but thatch wall was used in areas belonging to the
local natives in the fishing occupation; this is interspersed with thatch
(1.9%) and mud wall (3.55%). Aluminium roofing is predominantly
used by 75.7% of the respondents. The major type of windows used
were aluminium (68.7%). The following types of windows are also
used, namely wooden windows (12.8%), louvre windows (10.1%),
and casement windows (8.5%). Wooden doors and steel iron doors
were the commonest in the peri-urban, with roughly 62.6% and
35.5%, respectively. Observation (Appendix 3) shows that most of
the secondary roads in the peri-urban area were either graded
earth or ungraded earth roads. This corroborates the findings of
early researchers on peri-urban study (Chirisa, 2010; Lawanson *et al.*,
2012; Acheampong & Anokye, 2013). The majority of the housing
developments were constructed with conventional building materials
such as cement sandcrete blocks, aluminium burglar-proof windows,
mostly wooden panel internal doors, and steel external doors. There
is a limited use of louvre and wooden windows in the study area.
Aluminium roofing is the commonest in Ibeju-Lekki peripheral area.
Thatch roof was sparingly used in Ibeju-Lekki by the natives in the
fishing and coconut farming. Only some of the secondary roads
in both locations are tarred. However, few buildings among self-
help housing were built with traditional building materials such as
mud block, thatch roofing sparingly in the peri-urban area. Both
government-led housing and developer-led housing rely a great
deal on the use of conventional building materials. The findings show
no trace of alternative building materials for the mentioned housing
initiatives in the peri-urban settlement.

Table 2:   Building materials used in the study area

Variables		Ibeju-Lekki	
		N=366	%
Wall	Block wall	342	93.4
	Mud wall	13	3.55
	Thatch/others	7	1.9

Variables		Ibeju-Lekki	
		N=366	%
Roof	Aluminium	277	75.7
	Thatch	20	5.5
	Concrete slab	23	6.3
	Other	46	12.6
Window	Aluminium	251	68.6
	Louvre	37	10.1
	Wooden	47	12.8
	Casement	31	8.5
Door	Steel/iron	130	35.5
	Flush/panel/wooden	229	62.6
	Glass	2	0.5
	Others	5	1.4

Field survey (2017)

4.3   Dwelling quality

In the study area, the variables under consideration for dwelling quality include state of disrepair, lot size, state of painting, building design, good openings (window sizes), burglary installation, number of rooms per family, toilet type, windows per room (cross ventilation), tiled bathroom, tiled kitchen, source of water, and electricity supply.

4.3.1   Internal dwelling quality

The analysis presented in Table 3 shows good natural ventilation, as most of the buildings have cross ventilation aided by the appropriate window sizes. Of the buildings, 85.8% have burglary installation, and 13.9% do not; 52.7% of the buildings have 1-2 rooms, and 47% have 3-4 rooms per household; 71.0% of the respondents' kitchens are tiled, and 29.0% are not tiled in sampled houses; 72.1% of the toilets are tiled, and 27.9% are not tiled. This also affects the level of sanitary quality in Ibeju-Lekki peri-urban settlement. The vast majority (roughly 74.3%) of the peri-urban residents rely on a borehole water system. Of the population, 25.7% are serviced by well and other sources of water. The quality of the water in the study area is poor, due to the water table and the type of vegetation in the area. There was a

sparse distribution of electricity in Ibeju-lekki. Electricity is generated by different means in different households. In-depth intervies revealed that most of the households, though connected to the power supply grid, do not have a regular supply of electricity. Self-generated electricity constitutes 69.9%, while approximately 30.1% do not have a supply of electricity.

Table 3:   Households' internal dwelling quality

Variables		Ibeju-Lekki	
		N=366	%
Good opening	Yes	339	92.6
	No	27	7.4
	Neutral	0	0
Burglary installation	Yes	314	85.8
	No	51	13.9
	Neutral	1	0.3
Number of rooms/ household	1-2 rooms	193	52.7
	3-4 rooms	172	47
Windows/room	1	146	39.9
	2	220	60.1
Toilet type	Flush	297	81.1
	Pit toilet	69	18.9
	System	0	0
Tiled bathroom	Yes	264	72.1
	No	102	27.9
Tiled kitchen	Yes	260	71
	No	106	29
Source of water	Tap/borehole	272	74.3
	Well/others	94	25.7
Electricity supply	Yes	256	69.9
	No	110	30.1

Field survey (2017)

4.3.2 External dwelling quality

Findings show the high state of disrepair in most of the buildings. Of the observed buildings, 62.6% had one or more wear and tear. Although most of the disrepair is due to dampness in most of the areas, causing the paint to wear off, some of the disrepair is also caused by poor maintenance, especially among the low-income group. The saline water in the area contributes to change in colour of the external finishing. Other states of disrepair include broken windows, doors and a leaking roof. A large percentage (74.3%) of the buildings observed have good painting, and 25.7% have bad external painting. Of the houses, 83.9% are built on standard full plots, and 15.8% occupy partial plots. Of the buildings observed, 70.2% have an innovative design, and 29.8% have the traditional tenement house design.

Table 4:   Observation on households' external dwelling quality

Variables		Ibeju-Lekki	
		N=366	%
State of disrepair	Low	137	37.4
	High	229	62.6
State of painting	Good	272	74.3
	Bad	94	25.7
Lot size	Full	307	83.9
	Not full	58	15.8
	Others	1	0.3
Building design	Modern family house	257	70.2
	Tenement house	109	29.8

Observation survey (2017)

4.4 Neighbourhood quality

The variables considered for measuring neighbourhood quality in this study include noise pollution, a good drainage system, appropriate waste disposal system, good roads, and environmental security. Analysis of the field survey (Table 5) shows that 30.6% of the respondents were affected by noise pollution, while 68.3% were not affected. Of the respondents, 66.4% showed a lack of suitable drainage, thus making most of the areas prone to flooding and environmental

pollution. Appropriate drainage systems can be observed in the government-serviced housing development in the study area, contrary to what is obtainable in self-help housing schemes. The lack of a suitable drainage system contributes greatly to vehicular congestion during the rainy season, causing high commuting time and reduced productivity. Waste disposal management is a huge burden for peri-urban residents in Ibeju-lekki. Of the respondents, 33.1% are affected by lack of an appropriate waste disposal system. The private developer residential developments are well managed in terms of waste disposal. Observation showed that the greater proportion of the residential areas lacked good roads; sandy untarred roads are common in most of the secondary ring roads in Ibeju-Lekki, and some areas have ungraded earth roads, resulting in delays in linking the primary highways daily. Environmental security is an issue, as indicated by 28.1% of the respondents.

Table 5:   Respondents' assessment of neighbourhood quality

Variables		Ibeju-Lekki	
		N=366	%
Noise pollution	Yes	112	30.6
	No	250	68.3
	Neutral	4	1.1
Good drainage system	Yes	119	32.5
	No	243	66.4
	Neutral	4	1.1
Good waste disposal	Yes	245	66.9
	No	121	33.1
Environmental security	Yes	260	71
	No	103	28.1

Field survey (2017)

Figure 2:   Well-serviced drainage system in government-led housing and flooded road, due to lack of drainage in self-help housing development area

Source: (Field survey, 2017)

4.5   Locational quality

The variables considered for locational quality in this study include closeness to work, closeness to market/CBD, availability of public transport, availability of children's school, and availability of health facility. A greater percentage of the sampled population (85.8%) had good locational proximity to their places of work, as indicated by the analysis (Table 6); 14.2% were affected by their residential location in relation to proximity to work. Locational proximity to the Central Business District is an advantage to 86.1% of households in the peri-urban area. Only 13.9% were not close to the Business District Area, thus increasing their frequency of visit to the city centre for basic needs. Public health facilities are made available in the peri-urban area; 10.4% of the settlements further away from the city centre lacked medical facilities, due to the cost implication of locating such facilities in areas where housing density is low. Over 88.5% have access to good health facilities. Of the households, 94.3% showed satisfaction with the provision of children's schools, and only 5.7% indicated their dissatisfaction. Both government and private schools are evenly distributed in the peri-urban settlements. Approximately 22.1% of households showed a lack of public transport as a locational deficiency in Ibeju-Lekki peri-urban area, while 77.6% are not affected by the lack of public transport.

Table 6:   Respondents' assessment of locational quality

Variables		Ibeju-Lekki	
		N=366	%
Closeness to work	Yes	314	85.8
	No	52	14.2
Closeness to CBD	Yes	315	86.1
	No	51	13.9
Availability of public transport	Yes	284	77.6
	No	81	22.1
Availability of children's school	Yes	345	94.3
	No	21	5.7
Availability of health facility	Yes	324	88.5
	No	38	10.4
	Neutral	4	1.1

Field survey (2017)

Figure 3:   Public schools in Ibeju-Lekki peri-urban settlement
Source: Field survey, 2017

4.6   Assessment of informality

Different variables such as plot size for building, set-back around the building, set-back from the road, availability of building permit, and basic building regularisation documents were considered in the measurement of informality in the selected peri-urban settlements. Analysis of interview (Appendix 2) with the planning personnel in the local building regulatory office, presented in Table 7, shows the extent of informal housing development in the study area. Of the sampled houses, 75.7% were built on the standard plot size, while 24.3% were not. Of the houses observed, 35% have the standard

setback around the house, while 65% did not. Of the household heads observed, 53% have standard setback from the gate, while 47% default. A larger percentage (67.5%) of the buildings were built with a building permit, while 32.5% were built without one. The mostly obtained land regularisation document among the household heads was the receipt of land purchase (73.8%), a deed of assignment (8.5%), and a survey plan (6.8%). It can be deduced from the analysis of the building regularisation documents that the major building regularisation documents obtained by people were the receipt of land purchase. A reasonable number of household heads in Ibeju-Lekki peri-urban settlements are regulation inclined by virtue of the availability of additional building regulation documents.

Table 7:   Measurement of informality

Variables		Ibeju-Lekki	
		N=366	%
Standard plot size	Yes	277	75.7
	No	89	24.3
	Neither	0	0
Standard setback	Yes	128	35
	No	238	65
	Nil	0	0
Gate setback	Yes	194	53
	No	172	47
Building permit	Yes	247	67.5
	No	119	32.5
	Neither	0	0
Regularisation document	Receipt of land purchase	270	73.8
	Deed of assignment	31	8.5
	Survey plan	25	6.8
	Stamp duty receipt	2	0.5
	Building plans	6	1.6
	Building permit and approval	9	2.5
	Certificate of occupancy/ governor consent	5	1.4
	Unapproved documents	18	5
	No document at all	0	0

Field survey, 2017

Figure 4:   Untarred sandy road in Ibeju-Lekki; Block and plank walls; Thatch roofing and aluminium roofing in Ibeju-Lekki peri-urban area

FSource: ield survey, 2017

4.7   Correlation analysis findings

To determine the factors that influence housing quality in the study area, the mean of building materials, dwelling quality, neighbourhood quality and locational quality was found by using the statistical tool Transform to recode the variables. The new variables regarded as the Mean Variable were correlated to show if there was any relationship.

4.7.1   Test of correlation between building materials and dwelling quality

The correlation analysis presented in Table 8 shows that there is a significant relationship between building materials and dwelling quality (0.556** P < 0.01). Therefore, building materials influence dwelling quality.

Table 8:   Test of correlation between building materials and dwelling quality

Test variables	Pearson correlation	P-value	Inference
Mean of building materials vs mean of dwelling quality	0.556**	0.000	There is a significant correlation between the two variables

**. Correlation is significant at the 0.01 level (2-tailed). List wise N=366

Source: Field survey, 2017

4.7.2 Statistical test of correlation between mean neighbourhood quality, mean locational quality and dwelling quality

Correlation between mean neighbourhood quality and mean dwelling quality (see Table 9) shows that there is a significant relationship between the two variables (0.239** P < 0.01) in Ibeju-Lekki. There is also a significant relationship between locational quality and dwelling quality (0.192** P < 0.01). Therefore, findings show that both locational and neighbourhood quality influence dwelling quality.

Table 9: Test of correlation between neighbourhood, locational quality and dwelling quality

Test variables	Pearson correlation	P-value	Inference
Total mean of neighbourhood and locational quality vs dwelling quality	0.236**	0.000	There is a significant correlation between the two variables
Mean neighbourhood quality vs dwelling quality	0.239**	0.000	There is a significant positive linear relationship between the two variables
Mean locational quality vs dwelling quality	0.192**	0.000	There is a significant correlation between the two variables

**. Correlation is significant at the 0.01 level (2-tailed). List wise N=366.

4.7.3 Test of correlation between housing typologies and respondents' socio-economic attributes

The test of correlation between housing typologies and respondents' socio-economic attributes (see Table 10) shows that income is the only attribute that has a significant relationship with housing typologies in Ibeju-Lekki (-0.205** P < 0.000). This connotes that the lower the respondents' income, the lower the quality of housing they can access. Therefore, the respondents' socio-economic attributes influence the housing typologies that are related to dwelling quality.

Table 10: Test of correlation between housing typologies and respondents' socio-economic attributes

Test variables	Sub-variables	Pearson correlation	P-value	Inference
Housing typologies vs respondents' socio-economic attributes	Income Literacy Ethnic group	-0.205** 0.043 0.061	0.000 0.410 0.242	There is a significant negative linear relationship between the two variables There is no significant correlation between the two variables There is no significant correlation between the two variables

**. Correlation is significant at the 0.01 level (2-tailed). List wise N=366.

5. Conclusion

Dwelling quality is affected by households' income in Ibeju-Lekki peri-urban settlements. Housing development in Ibeju-Lekki attracts fairly good quality because of the socio-economic class of the migrants, predominantly high income and middle income. Findings in this article have shown the interrelationship among the variables and how the complex interactions have impacted on the quality of housing in the study area. Among the variables considered for neighbourhood quality, poor road and lack of suitable drainage constituted the major environmental challenges. In addition, waste disposal, to some extent in certain areas, especially the isolated settlements, is a challenge, though not with the magnitude of major challenges. Although, in the majority of government housing, more attention was paid to dwelling and neighbourhood quality, in general, the study area has good locational quality, from the residents' perception, based on the availability of basic services such as health facilities, children's schools, and public transport. The external dwelling quality is generally fair, except in areas of disrepair which, by observation, are caused primarily by dampness and poor maintenance. In terms of internal dwelling quality, the major area of concern is the supply of water and electricity. There is no good supply of water; a greater percentage of households in Ibeju-Lekki relies on a borehole water system. Observation shows that the quality of water from boreholes is very poor, due to the nature of the soil in Ibeju-Lekki. More houses conform to standard plot sizes in Ibeju-Lekki, but attention needs to be paid to the level of informality. The correlation test shows the factors affecting dwelling quality include building materials,

neighbourhood quality, and locational quality. In addition, socio-economic attributes of households, notably income, affect the building types. These, in turn, influence the quality of housing. The correlation test shows a negative correlation between housing types and socio-economic attributes: the less the income, the lower the quality of housing a household can access. In addition, the presence of gated exclusive residential developments in certain parts of the study area helps improve the housing quality. This is made possible because of the socio-economic class of the migrants, predominantly high-income group. The areas occupied by the low-income group lack good neighbourhood quality. It can, therefore, be concluded that housing quality in Lagos peri-urban settlements is affected by households' socio-economic attributes, building materials, dwelling quality, neighbourhood quality, and locational quality.

6.   Recommendation

With the understanding of the factors influencing housing quality in the Ibeju-Lekki peri-urban settlements, stakeholders should advocate for participatory efforts toward a sustainable development of the peripheral settlements. The state government should advocate for housing policy that promotes the use of alternative building materials by both government and private developers. This would aid housing affordability in the Lagos peri-urban settlements and ultimately reduce the spread of informal housing development. Government disparity in infrastructure development, which has impacted on poor neighbourhood and locational quality of most of the peri-urban housing developments, should be discouraged and, if possible, eliminated. The state government should regularly update the area of inadequacy and make the basic provisions available where community participation cannot achieve capital-intensive projects. This will improve both the environment and the locational quality that influence housing quality.

References

Acheampong, R.A. & Anokye, P.A. 2013. Understanding households' residential location choice in Kumasi's peri-urban settlements and the implications for sustainable urban growth. *Research on Humanities and Social Sciences,* 3(9), pp. 60-70.

Adebayo, I. & Aliu, A. 2010. Evaluating the influence of housing quality on urban residents' wellbeing: The case of Lagos Nigeria. *International Journal of Academic Research,* 2(6), pp. 401-410.

Adedire, F.M. 2017. Differentials in metropolitanisation trends in Lagos suburbia. *Journal of Sustainable Development,* 10(6), pp. 14-27. https://doi.org/10.5539/jsd.v10n6p14

Adedire, F.M. & Adebamowo, M.A. 2018. Lagos peri-urban housing development and management: Challenges and planning interventions. *Built Environment Journal (BEJ),* 15(1), pp 13-22.

Aderamo, A. & Ayobolu, D. 2010. Spatial structure of housing quality in Ilorin, Nigeria. *Research Journal of Social Sciences,* 1(5), pp. 12-21.

Allen, A. 2003. Environmental planning and management of the peri-urban interface: Perspectives on an emerging field. *Journal of Environment & Urbanization,* 15(1), pp. 135-147. https://doi.org/10.1177/095624780301500103

Allen, A. 2010. *Neither rural nor urban: Service delivery options that work for the peri-urban poor.* London: University College London.

Aluko, O. 2010. The impact of urbanization on housing development: The Lagos experience, Nigeria. *Ethiopian Journal of Environmental Studies and Management,* 3(3), pp. 64-74.

Alvi, A.M. 2016. *Manual for selecting sampling techniques in research.* University of Karachi, Iqra University, Karachi, Sindh, Pakistan.

Amao, F.L. 2012. Urbanization, housing quality and environmental degeneration in Nigeria. *Journal of Geography and Regional Planning,* 5(16), pp. 422-429. https://doi.org/10.5897/JGRP12.060

Asuero, A.G., Sayago, A. & González, A.G. 2006. The correlation coefficient: An overview. *Critical Reviews in Analytical Chemistry*, 36(1), pp. 41-59. https://doi.org/10.1080/10408340500526766

Bates, L.K. 2006. A housing submarket approach to neighborhood revitalization planning: Theoretical considerations and empirical justifications. Unpublished PhD thesis. University of North Carolina, Department of City and Regional Planning.

Bewick, V., Cheek, L. & Ball, J. 2003. Statistics review 7: Correlation and regression. *Critical Care*, 7(6), pp. 451-459. https://doi.org/10.1186/cc2401

Binns, J., Maconachie, R. & Tanko, A. 2003. Water, land and health in urban and peri-urban food production: The case of Kano, Nigeria. *KANO Water LDD Revised,* 14(5), pp. 431-444. https://doi.org/10.1002/ldr.571

Boamah, N. 2015. The impact of households characteristics on the state of housing in the Offinso South Municipality (OSM),Ghana.

Environment, Development and Sustainability, 17(6), pp. 1251-1266. https://doi.org/10.1007/s10668-014-9603-0

Bradley, R.H. & Putnick, D.L. 2012. Housing quality and access to material and learning resources within the home environment in developing countries. *Child Development,* 83(1), pp. 76-91. https://doi.org/10.1111/j.1467-8624.2011.01674.x

Chirisa, I. 2010. Peri-urban dynamics and regional planning in Africa: Implications for building healthy cities. *Journal of African Studies and Development,* 2(2), pp. 15-26.

Clark, W.A.V. & Huang, Y. 2003. The life course and residential mobility in British housing markets. *Environment and Planning A*, 35, pp. 323-339. https://doi.org/10.1068/a3542

Creswell, J.W. 1994. *Research design, qualitative and quantitative approaches*. London: Sage Publications.

Dahiru*, T. 2008. P*-value, a true test of statistical significance? A cautionary note. *Annals of Ibadan Postgraduate Medicine*, 6(1), pp. 21-26.

Daramola, A. & Ibem, E.O. 2010. Urban environmental problems in Nigeria: Implications for sustainable development. *Journal of Sustainable Development in Africa,* 12(1), pp. 124-145.

Dutta, V. 2012. Land use dynamics and peri-urban growth characteristics: Reflections on master plan and urban suitability from a sprawling North Indian City. *Journal of Environment and Urbanization ASIA,* 3(2), pp. 277-301. https://doi.org/10.1177/0975425312473226

El Din, H.S., Shalaby, A., Farouh, H.E. & Elariane, S.A. 2013. Principles of urban quality of life for a neighborhood. *Housing and Building National Research Center,* 9(1), pp. 86-92.

Fiadzo, E.D., Houston, J.E. & Godwin, D.D. 2001. Estimating housing quality for poverty and development policy analysis. CWIQ in Ghana. *Social Indicators Research,* 53(2), pp. 137-162. https://doi.org/10.1023/A:1026764711406

Goodman, J.L.J. 1978. Causes and indicators of housing quality. *Social Indicators Research,* 5(2), pp. 195-210. https://doi.org/10.1007/BF00352929

Ibem, E.O. & Aduwo, E.B. 2015. Assessment of the sustainability of public housing projects in Ogun State, Nigeria: A post-occupancy evaluation approach. *Mediterranean Journal of Social Sciences,* 6(2), pp. 523-536. https://doi.org/10.5901/mjss.2015.v6n4s2p523

Kain, J.F. & Quigley, J.M. 1970. Measuring the value of housing quality. *Journal of the American Statistical Association,* 65(330), pp. 532-548. https://doi.org/10.1080/01621459.1970.10481102

Krejcie, R.V. & Morgan, D.W. 1970. Determining sample size for research activities. *Educational and Psychological Measurement*, 30(3), pp. 607-610. https://doi.org/10.1177/001316447003000308

Lawanson, T., Yadua, O. & Salako, I. 2012. An investigation of rural-urban linkages of the Lagos megacity, Nigeria. *Journal of Construction Project Management and Innovation.* 2(2), pp. 464-581.

LSG *(Lagos State* Government). 2016. Ministry of Economic Planning and Budget, Vital Data: Digest of Statistics.

Moyo, A. & Crafford, G.J. 2010. The impact of hyperinflation on Zimbabwean construction industry. *Acta Structilia*, 17(2), pp. 53-83.

Nwokoro, I.I. & Dekolo, S.O. 2012. Land use change and environmental sustainability: The case of Lagos Metropolis. *WIT Transactions on Ecology and the Environment*, 155(1), pp. 157–167. https://doi.org/10.2495/SC120141

Obeng, W. & Whittal, J. 2014. Peri-urban infrastructure development through community participation: A case study of Yasore, Ghana. *Research Gate*, pp. 1-13.

Obiefuna, J., Nwilo, P., Atagbaza, A. & Okolie, C. 2013. Spatial changes in the wetlands of Lagos/Lekki lagoons of Lagos, Nigeria. *Journal of Sustainable Development*, 6(7), pp. 123-133. https://doi.org/10.5539/jsd.v6n7p123

Pallant, J. 2013. *SPSS survival manual: A step-by-step guide to data analysis using IBM SPSS*. 5th edition. Crows Nest, Australia: Allen and Unwin.

Puttal, V. & Ravadi, N. 2014. Role of urban planning as tool to mitigate the environmental repercussions due to peri-urbanisation. *Journal of Civil Engineering and Environmental Technology,* 1(3), pp. 96-102.

Rapoport, A. 1998. Using 'culture' in housing design. *Journal of Housing and Society,* 25(1&2), pp. 1-20. https://doi.org/10.1080/08882746.1998.11430282

Rossoni, L., Engelbert, R. & Bellegard, N.L. 2016. Normal science and its tools: Reviewing the effects of exploratory factor analysis in management. *Revista de Administração*, 51(2), pp. 198-211. https://doi.org/10.5700/rausp1234

Satake, E.B. 2016. Basic statistical tools in research and data analysis. *Indian Journal of Anesthesia*, 60(9), pp. 662-669. https://doi.org/10.4103/0019-5049.190623

Simon, D. 2008. Urban environments: Issues on the peri-urban fringe. *Annual Review Environmental Resources,* 33, pp. 167-185. https://doi.org/10.1146/annurev.environ.33.021407.093240

South, S.J. & Crowder, K.D. 1997. Escaping distressed neighborhoods: Individual, community and metropolitan influences. *American Journal of Sociology*, 102(4), pp. 1040-1084. https://doi.org/10.1086/231039

Štreimikiene, D. 2014. Housing indicators for assessing quality of life in Lithuania. *Intellectual Economics,* 8(1), pp. 25-41. https://doi.org/10.13165/IE-14-8-1-02