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Spatial Structure of Housing Quality in Ilorin, Nigeria

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Abstract: The study examined the spatial structure of housing quality in Ilorin with a view to discovering the pattern of housing facilities in the city. Data were collected from the 20 wards of the city using simple random sampling. A total of 440 questionnaires were administered in the area. Factor Analytic technique was then used to analyse the data collected which resulted in the extraction of 5 structural components of housing quality in the study area. These are quality of basic facilities; energy and ownership; material quality; water quality and utility factors. The resulting factor scores were then mapped on the study area to depict the structural pattern of the identified factors. The results of the study show that the structural pattern will be relevant in urban renewal efforts for the city.

Key words: housing quality, housing facilities, building materials, factor analysis, urban renewal

INTRODUCTION

Urbanisation has been a common feature of cities of developing world since the last century. This has been in form of rapid population growth and physical expansion of cities. The sheer migration of able-bodied young men and women from rural areas to cities has had profound impact on the city. Thus cities are no more able to provide the basic services to sustain their teeming population.

Nigerian urban centres are perhaps some of the fastest growing centres in Africa. The country has many large urban centres with too few well-planned cities and towns. According to the 1991 census, there were at least 183 urban centres with population of 20,000 and above in 1953. The number of such cities rose to 210 by 1980; 235 by 1990 and 250 by the year 2000. The percentage of people who lived in urban centres of 20,000 and more increased from 11 per cent in 1953 to 35 per cent in 1991 and about 45 per cent in year 2002. In terms of share population of people, while the population of the country increased from 30.4 million to 81 million between 1953 and 1991, the population of urban centres of 20,000 people and above increased from 3.2 million to 32.2 million, that is more than 10 folds within the 40 year period. While the rural population grew at a rate of 1.7 per cent, that of urban population was about 5 per cent within the same period [13,26]. By 2000, Lagos and Kano had population above 7,000,000 each, while other 10 cities had 1 million each and 26 more cities had a population of 500,000 [11].

However, the increase in the rate of urbanisation and the growth in the number of cities are both alarming and scaring, while the situation in the cities are unsatisfactory. The major problem of the rapid growth of urban centres in Nigeria is the provision of basic facilities and services such as water, electricity, transportation, housing, sewage and drainage. When there is excessive pressure on urban services, the cities become inefficient, unworkable and unliveable. This poses a serious challenge to urban planning.

In particular, housing problem is prevalent in many of Nigerian urban centres. This is an enduring feature of urbanisation process. As a result of urbanisation, there is now tremendous pressure on housing so much so, that the gap between housing supply and demand in Nigeria continues to widen. According to Megbolugbe [12], the most outstanding of all urban problems, caused by the rapid expansion of urban population, is that of providing housing facilities for the teeming urban population in Nigeria.

The importance of housing to man cannot be overemphasised. Housing is one of the three basic needs of mankind and it is the most important for physical survival of man after provision of food. A deficiency in housing can profoundly affect the health, welfare and productivity of man. It is an indispensable necessity without which man's survival is impossible. Beyond the fabric, services and the contents of the dwelling, housing encompasses all that surround the dwelling to stimulate healthy living. Housing has to be adequate quantitatively and qualitatively in order to fulfil its basic purposes. The environment also has to be of good quality by providing a sense of well being and satisfaction to its occupants. This is manifested in

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the physical condition, landscaping, available facilities, friendliness of neigbours, racial or economic composition or symbolic characteristics (Awotona, 1982).

Internationally, housing problems have received a lot of attention. The United Nations has set aside every first Monday of October as the World Habitat Day. This is to enable people all over the world, especially in the developing countries know the importance of housing.

Theories of Spatial Frameworks and Residential Development: There are a number of theories of spatial frameworks that are relevant to understanding of diverse nature of residence and their occupants in cities. The classical models of Burgess [5]; Hoyt [7] and Harris and Ullman [6], in spite of criticisms levied against them still provide, to a certain extent, a framework for differentiating the residential areas of the city as well as general land use. However, Schoner's [22] evolutionary model of urban residential patterns and Johnson's [8] attempt towards a more general model are more relevant to this study. According to Schoner [22], environment, technology and population affect the internal arrangement of cities by their joint effect upon their organisation and that with the onset of modernisation, an urban area's residential pattern changes.

Johnson [8] outlined three sequences of city development which are modernisation of a social economy and the concomitant changes in its social structure. These are that in the first stage prior to the onset of industrialisation and labour specialisation, the city comprised of two main classes, a small elite and a large artisan class. Each group lived in its own quarter of the small city and people clustered around the Central Business District (CBD) with the elite living very close to the centre. Class boundaries were clearly defined and there was virtually no movement across them. During this phase, the city's growth was very slow.

In the second stage/phase, which coincided with industrial take off period, population increased rapidly, division of labour increased and wealth became a major index of prestige in the large society. Class boundaries became porous and new class developed as occupational differentiation increased, residential patterning followed the social changes and a form emerged with the advent of transport which favoured the well to do. The upper class broke the workplace – residence tie and moved away from the ever more congested city centre to a more conducive and exclusive environment.

The general spatial pattern characteristic of the second stage is that the elite group resides in the exclusive and reserved part of the city, the middle class occupy the former homes of the elite and the poor make do with buildings in the interior, usually make shift, slums and squatter settlements.

The third stage is that of continuing modernisation, further division of labour results in relative as well as absolute growth of the intermediate class, comprising the experts who are mainly professionals, the articulators who organise the exchange and distribution of skills and commodities and the efficient producers who are skilled workers within the labour force. This third stage of continuing modernisation takes base from the mid – 1970s. This is a continuation of the second stage and many cities of the third world are at this stage of the model. The works of Schoner [22] and that of Johnson [8] could be said to have their roots in the three traditional models of urban land use as put forward by Burgess [5]; Hoyt [7]; Harris and Ullman [6]. The above models resulted in urban land use with the following types of uses – residential, industrial and commercial uses.

Many scholars have carried out studies recognising the existence of the various land use types and in particular, numerous works have been done in housing problems both of international and national levels. For example, Onibokun [16] in assessing people's satisfaction with housing in certain areas of Canada, reported that most of the negative attributes pertaining especially to the environment of public housing were interrelated and cumulative in their effects and impacts.

Sikod [24] in his assessment of living conditions of urban poor in Cameroon reported that Cameroon has no planned urban areas. Towns grow haphazardly, covering surrounding rural neighbourhoods which become urban informal settlements as the poor colonize them. Houses are built in any shape, style and sizes and face any direction. Also, Olumoh [15], quoting the work of Schuringa and Kado [23] reported that informal settlements in Nairobi, Kenya, houses over 50 per cent of the city's population although they only occupy 5.8 per cent of all the land area used for residential purpose. These informal settlements are characterised by very high densities (up to 63,000 per sq.km).

Mabogunje [10] listed the principal housing problems associated with urban areas to include: poor housing conditions manifested in overcrowding and inadequate dwelling units; high densities resulting from uncontrolled operations of the land market; inadequate supply of public services and infrastructural services; pollution of water and solid waste problems; increasing deterioration of the natural landscape; air and noise pollution. Potter [19] revealed that around 20 per cent of the world's total population was thought to be lacking decent housing with regards to residents of the developing world, it is estimated that at least one fifth

and perhaps over 50 per cent live in substandard housing, and this in a situation where national governments are either unwilling or unable to make housing of a higher standard available.

Suggestions have also been made by some scholars to reduce the housing problems facing developing countries. Alake [3] suggested that for a pragmatic step towards tackling urban housing problems in Nigeria, research should precede any decision-making exercise as this will not only bring into light, the dimension of the problems, but will also give alternative solutions to the identified problems through detailed evaluation. Olutuah [14] recommended that housing programmes should be based on genuine local participation in order to ensure sustainability in Nigeria because the local communities are in the best position to identify their needs and order their priorities. [25].

Also, Ayenigba [4] suggested that in order to solve housing problems in Ilorin, Nigeria, more residential estates should be provided with basic facilities such as electricity, water, bathroom, kitchen and toilet as they contribute significantly to occupants' satisfaction with housing quality. Salau [21] provided a broad picture of the environmental context of housing in Nigeria. Neighbourhood services required for housing and for the consumption of occupants include, transport, hospitals, schools, shopping and job facilities. He examined the availability and distribution of these facilities and noted the poor and megre existence and spatial disparity in their provision and location among and within cities. He recommended that housing agencies be strengthened to provide more and better services to be evenly distributed among residents and that the rich residents be charged for these services.

This study relates very strongly with the views and recommendations of these scholars and in particular the study examines the spatial pattern of housing quality in Ilorin, Nigeria. Such a study will assist in making recommendations for the improvement of housing quality in the city, in particular and Nigeria in general.

MATERIALS AND METHODS

The data used for the study are information on environmental quality of houses such as types of dwellings, number of rooms, nature of ownership, sources of water, sources of lighting and presence or absence of sewage facilities.

These data were collected from both primary and secondary sources. The primary data were collected using a structured questionnaire administered to each of the randomly selected household heads in the 20 wards of the city. These wards are Adewole, Balogun Alanamu, Balogun Fulani, Balogun Ajikobi, Magaji Oloje, Magaji Are, Magaji Badari, Magaji Baboko, Magaji Gari, Magaji Ibokun, Magaji Okaka, Balogun Gambari, Magagi Oju-ekun, Magaji Ogidi, Magaji Zarumi, Oke-Ogun, Uban Dawaki, Sabon-Gari 1, Sabon-Gari 2 and Zango [20]. The wards are as shown in figure 1. The spatial arrangement of buildings, the building materials used and the physical environment of buildings were also noted.

The secondary data were generated from government agencies such as Federal Ministry of Housing and Urban Development Office, National Population Commission and Federal office of Statistics.

In order to get a representative sample for the study area, the wards were classified into high, medium and low densities. This resulted in the identification of12 high, 4 medium and 4 low density wards [18] within which data were collected. Simple convenience sample of non-probability sampling method was adopted to allow for economy and convenience in the selection of the sample size. In all, 30 household heads were selected in each of the high-density wards, 20 in each of the medium density wards and 6 in each of the low density wards. A total number of 440 questionnaires were finally administered in all the 20 traditional wards in the study area using field assistants to collect information from the sampled household heads.

The analytical technique used for analyzing the data collected is Factor Analysis. The choice of Factor Analytic method is founded on its ability to reduce a large data set down to a smaller number of factors thereby identifying groups of interrelated variables. Furthermore, one of its outputs, factor scores, which provides a measure of the relationship between each observation and the new factors can be used in the analysis of spatial patterns. Factor analysis has been used in this work to identify the major structural components of housing condition in the study area.

The primary data set consisted of measures of 13 variables listed in table 1.0 below.

The variables listed in table 1.0 were used to carryout the Factor Analysis using SPSS (Statistical Package for the Social Sciences). This procedure was employed to extract smaller number of components of the condition of housing environment in Ilorin from the original data set.

RESULTS AND DISCUSSION

The Factor Analysis procedure on data collected from the 20 wards in the city first produced a 13 x 13 correlation matrix (table 2.0) which shows the degree of association between the 13 variables.

A preliminary correlation analysis of the variables on table 2.0 shows that notable associations exist

between some pairs of variables. These are V_2 (houses with asbestos) and V_6 (houses with pipe borne water) with a correlation value of 0.528. This is a reflection of good housing standard. Also V_2 with V_8 (houses with inside bathroom), V_9 (houses with water closet), V_{11} (houses connected to (PHCN) electricity supply with correlation coefficients of 0.413, 0.418 and 0.307 respectively. This is a reflection of good housing quality. In addition V_8 (houses with inside bathroom) has correlation coefficient of 0.302 with V_3 (detached houses) while V_4 (houses with 2 - 4 rooms) has correlation coefficient of 0.395 with V_{10} (households who share toilet facilities). Also worthy of note are the correlation values of 0.306 and 0.454 respectively between V_7 (households that treat their water before drinking) and V_{13} (households that use kerosene to prepare domestic food); V_{12} households that use kerosene as a source of lighting) and V_8 (households with inside bathroom). The relationship between V_{12} (household that use kerosene as a source of lighting) and V_{13} (households that use kerosene to prepare domestic food) with a correlation value of 0.405 should also not go unnoticed. The results display associations of housing quality and they indeed can be used to assess housing quality environment in the city.

Pattern of Distribution of Housing Condition: The application of Factor Analysis with Varimax Rotation resulted in the extraction of five factors with eigenvalues greater than unity which together accounted for 65.59% of the total variance in the input matrix of the original 13 x 13 variables. These five factors are significant in the explanation of the variation in the 20 wards of the study area (table 3.0). They represent the five dimensions by which housing quality may be classified in Ilorin.

The first major dimension accounts for 20.485 of the percentage of total variance with eigenvalue of 2.665 and loads highly and positively on houses with inside bathroom (V_3), houses with water closet (V_9) and houses with toilet facilities (V_{10}). This factor represents a group of variables describing the quality of internal housing facilities and is therefore labelled 'quality of basic facilities' dimension.

The second dimension accounts for 15.68% of the total variance and has high positive loadings on tenant households (V_5); households using kerosene as a source of lighting (V_{12}) and households that use kerosene to prepare domestic food (V_{13}). This factor represents a group of variables describing the closeness of energy used for lighting, with the one in preparing domestic food and house ownership and is therefore labelled the 'energy and ownership' factor.

The third dimension accounts for 12.88% of the total variance with eigenvalue of 1.675 and high positive loadings on the type of walling material (V_1) and the materials used for the roof (V_2). The factor represents a set of variables describing the materials used for the external construction of the building and also the material used for roofing and is therefore labelled 'material quality' factor.

The fourth dimension accounts for 8.84% of the total variance with eigenvalue of 1.149 and loads heavily and positively on houses with pipe borne water (V_6) and houses with treated water (V_7). The factor represents a group of variables describing households that use treated water and is therefore termed 'water quality' factor.

The fifth dimension accounts for only 7.7% of the total variance with eigenvalue of 1.001 and loads highly and positively on only one variable – households who are connected to (PHCN) electricity supply. This factor replaces the variable describing households connected to electricity supply and is therefore labelled 'utility' factor.

Table 4.0 shows the scores on the five components. The component scores provide data for a set of maps representing the combination of variables, which make up the components. The component scores have been mapped to show important spatial variation in housing quality in the study area. It therefore serves as and aid to the understanding of the spatial structure of housing environment in Ilorin. Table 4.0 shows the factor scores for each component while figures 2 – 6 have been used to interprete the scores. [9,2].

The 'quality of basic facilities' component is shown on figure 2.0 and is prominent in Adewole and Zango wards. The other secondary wards on this component are Magaji Badari, Magaji Okaka, Sabon-Gari 1 and Sabon-Gari 2. The 'energy and ownership' component is shown on figure 3.0 and is prevalent in Balogun Ajikobi and Oloje wards. The other wards of secondary importance on this component are Balogun Alanamu, Magaji Are, Magaji Badari, Balogun Gambari, Balogun Ibagun, Magaji Oju-Ekun, Oke-Ogun, Zango and Sabon-Gari 2. The 'material quality' component is shown in figure 4.0 and towers in Magaji Badari, Magaji Gari and Sabon-Gari 2. The other secondary centres are Adewole, and Oke-Ogun wards. The 'water quality' component is shown in figure 5.0 and is of predominance in Magaji Are and Baboko wards. The other wards of secondary importance on this component are Magaji Badari, Balogun Fulani, Balogun Gambari, Magaji Gari, Uban-Dawaki and Sabon-Gari 2.

The 'utility' component is shown in figure 6.0 and is prominent in only Magaji Are ward. The other wards of secondary significance on this component are Baboko, Magaji Badari, Balogun Fulani, Balogun Gambari, Magaji Gari, Magaji Oju-Ekun and Sabon-Gari 1.

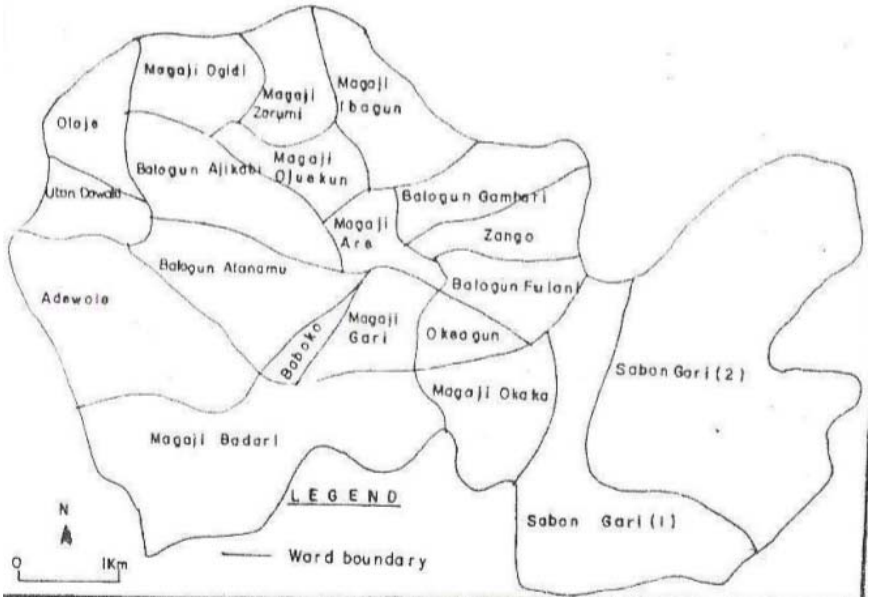

Fig. 1: IIorin traditional wards

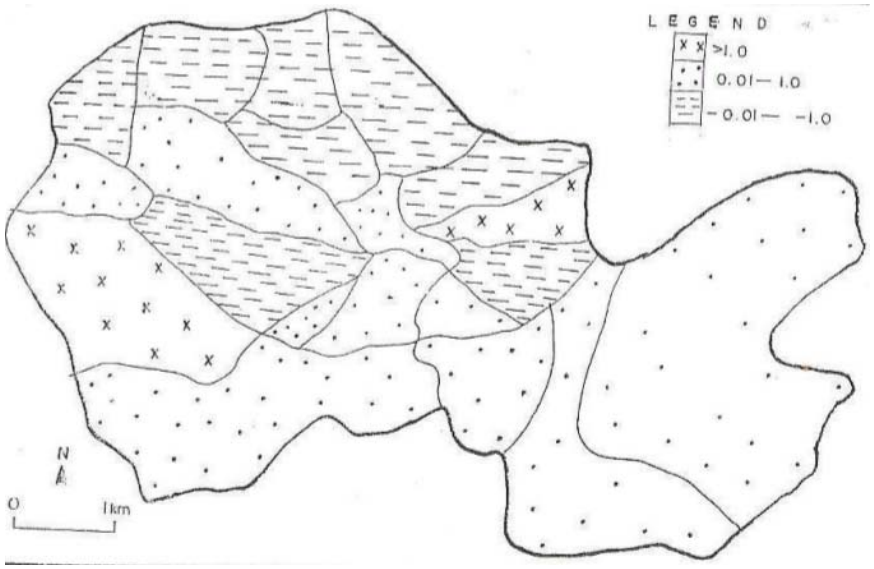

Fig. 2: IIorin ward map showing quality of basic facilities factoor.

This analysis represents the spatial pattern of the Environmental Quality of Housing in Ilorin and can be used by both the State and Local Government to guide urban renewal efforts.

Conclusion: This study has examined the spatial pattern of housing quality in Ilorin, Nigeria. The problems of housing in Nigeria in terms of demand and supply have attracted the attention of many scholars in the country. However, sufficient attention has not been accorded assessment of housing quality. According to Omole [17], housing is far more than mere shelter, rather it is a residential environment which man uses for shelter and the environs of structure needed or designed for his physical and mental health as well as social well being. Also, Adedibu [1] asserts that the concept of shelter as a simple dwelling which can only prevent people from some weather elements like rain, excessive heat and cold is changing in recent years, housing is now being regarded as a place to dwell with comfort. Thus studies on housing problems should go beyond estimation of housing supply and demand.

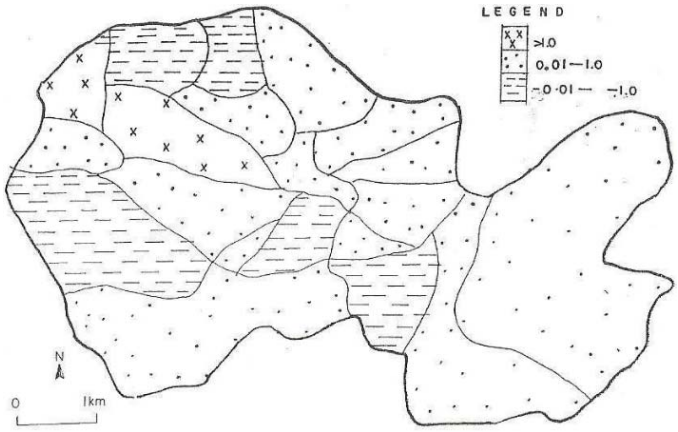

Fig. 3: IIorin ward map showing energy and ownership factor.

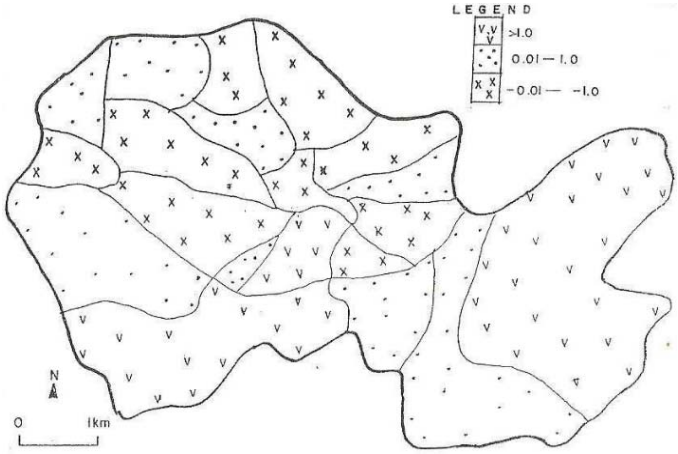

Fig. 4: IIorin ward map showing material quality factoor.

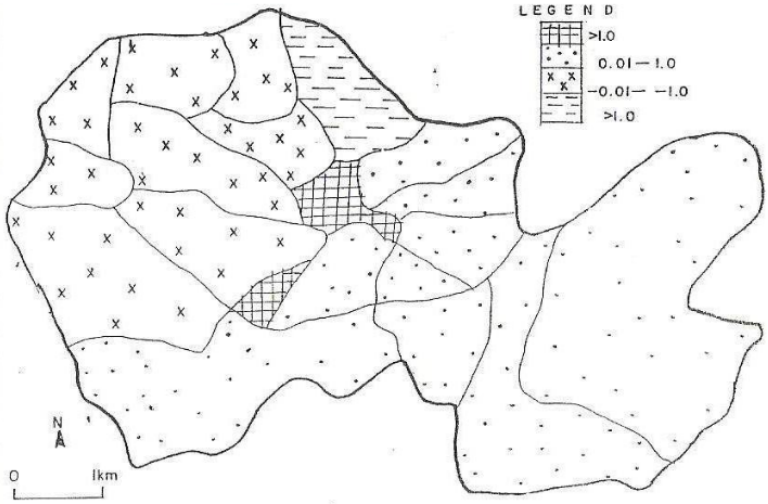

Fig. 5: IIorin ward map showing water quality factoor.

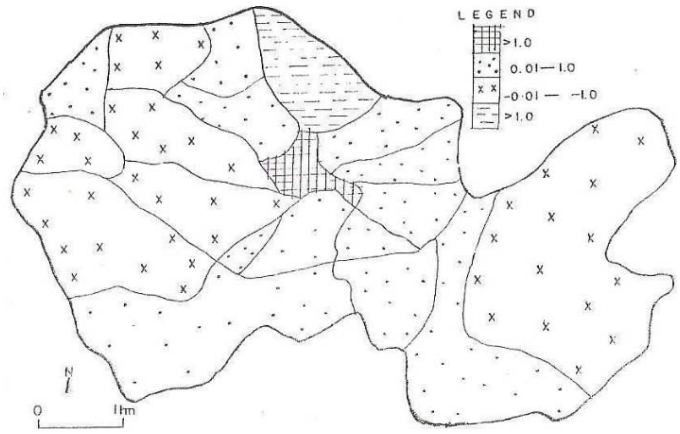

Fig. 6: IIorin ward map showing utility factoor.

Table 1.0: Housing Condition Variables in Ilorin

S/No.	Variables
1.	% of mud wall houses
2.	% of houses with asbestos
3.	% detached houses
4.	% of houses with 2 – 4 rooms
5.	% of respondents who are tenants
6.	% of houses with pipe borne water
7.	% of respondents that treat their water before drinking
8.	% of houses with inside bathroom
9.	% of houses with water closet
10.	% of households who share toilet facilities
11.	% of households who are connected to (PHCN) electricity supply
12.	% of households that use kerosene as a source of lighting
13.	% of households that use kerosene to prepare domestic food

Source: The Authors 2008

Table 2.0: Correlation Matrix of Housing Variables in Ilorin

	V_1	V_2	V_3	V_4	V_5	V_6	V_7	V_8	V_9	V_{10}	V_{11}	V_{12}	V_{13}
V_1	1.000												
V_2	0.109	1.000											
V_3	0.155	0.287	1.00										
V_4	0.006	-0.066	-0.071	1.000									
V_5	0.006	-0.138	-0.132	0.066	1.000								
V_6	0.064	0.528	-0.106	-0.106	-0.116	1.000							
V_7	-0.065	-0.139	-0.106	-0.191	-0.024	0.119	1.000						
V_8	0.220	0.413	0.302	-0.181	0.047	0.081	0.030	1.000					

Table 2.0: Continue

V_9	0.074	0.418	0.140	-0.012	0.248	0.095	-0.032	0.019	1.000				
V_{10}	0.092	0.158	0.069	0.395	0.136	-0.098	-0.055	0.115	0.290	1.000			
V_{11}	0.070	0.307	0.216	-0.150	-0.072	-0.010	0.097	0.070	0.116	0.164	1.000		
V_{12}	0.103	-0.077	0.039	-0.150	0.294	-0.237	0.184	0.454	0.070	0.009	-0.842	1.000	
V_{13}	0.005	-0.162	-0.109	-0.171	0.106	-0.092	0.306	0.272	0.001	-0.259	-0.291	0.405	1.000

Source: Computer output, 2008

Table 3.0: Rotated Component Loadings of measures of Housing Conditions in Ilorin

Variables	Component 1	Component 2	Component 3	Component 4	Component 5
Mud wall houses	0.036	-0.086	0.837	0.176	0.072
Houses with asbestos	0.184	-0.074	0.781	0.057	0.098
Detached houses	0.080	-0.036	0.110	-0.680	-0.208
Houses with 2-4 rooms	-0.248	-0.248	-0.417	-0.459	-0.251
Tenant respondents	0.078	0.567	0.022	0.124	-0.251
Houses with pipe-borne water	0.035	0.084	0.324	0.592	-0.220
Respondent that treat their water	0.088	-0.121	0.161	0.799	0.912
Houses with inside bathroom	0.775	0.140	0.248	0.138	-0.024
Houses with water closet	0.878	0.295	0.168	-0.179	0.063
Households that share toilets	0.680	-0.42	-0.331	0.062	-0.91
Households connected to (PHCN) electricity	-0.034	-0.055	0.102	0.092	0.506
Households that use kerosene for lighting	0.244	0.739	0.146	-0.231	0.177
Households that use kerosene to prepare domestic food	0.092	0.813	-0.293	0.004	-0.70
Eigen values	2.663	2.038	1.675	1.149	1.001
Percentage of variance	20.48	15.68	12.88	8.84	7.70
Cumulative percentage	20.48	36.16	49.05	57.90	65.59

Source: The Authors, 2008.

Table 4.0: Rotated Component Scores on measures of Housing quality in Ilorin

Wards	Component 1	Component 2	Component 3	Component 4	Component 5
Adewole	1.04	-0.13	0.64	-0.13	-0.86
Balogun Ajikobi	0.15	1.24	-0.07	-0.07	-0.16
Balogun Alanamu	-0.18	0.95	-0.18	-0.05	-0.04
Magaji Are	0.13	0.74	-0.03	1.04	1.02
Magaji Baboko	0.38	-0.81	0.12	1.18	0.94
Magaji Badari	0.87	0.56	1.06	0.08	0.84
Balogun Fulani	-0.11	0.04	-0.14	0.76	0.68
Balogun Gambari	-0.24	0.74	-0.04	0.98	0.64
Magaji Gari	0.01	-0.65	1.06	0.53	0.68
Magaji Ibagun	-0.12	0.86	-0.21	-1.03	-1.06

Table 4.0: Continue

Magaji Ogidi	-0.84	-0.73	0.12	-1.02	-0.86
Magaji Oju-ekun	-0.05	0.98	-0.07	-0.69	0.96
Magaji Okaka	0.94	-0.82	-0.67	0.16	0.1
Oke-Ogun	0.61	0.76	0.98	0.45	0.45
Oloje	-0.04	1.06	0.15	-0.43	0.33
Sabon-Geri 1	0.58	0.08	0.4	0.76	0.94
Uban Dawaki	0.16	0.49	-0.17	-0.19	-0.16
Zango	1.06	0.71	0.48	0.13	0.49
Magaji Zarumi	-0.78	-0.42	-0.18	-0.35	0.17
Sabon-Geri 2	0.78	0.5	1.03	0.88	-0.98

Source: The Authors, 2008.

The study has identified five most important factors that can be used to describe housing quality in Ilorin. These are internal facilities; major materials for roofing and materials for external walls; the type of toilet and bathroom facilities available; the source of lighting in the house when centrally provided electricity by the Power Holding Company of Nigeria (PHCN) is not available. Efforts should therefore be directed towards improving housing condition in the city generally by addressing improvement in the provision of facilities in areas where they have been found to be deficient.

The clamour for habitable housing in the country should be warmly welcomed by the federal, state and local governments including private housing estate providers by embarking on various public housing programmes for the populace. The condition of the facilities of these houses should also be adequately addressed.

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