THE SPATIAL VARIATION IN URBAN HOUSING QUALITY IN SABON-GARI LOCAL GOVERNMENT AREA, KADUNA STATE, NIGERIA

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ABSTRACT

Decent housing is one of the basic needs of every human. Good housing should satisfy the residents' needs at a given time. Such needs include shelter, economic stability, family life and access to facilities. The housing quality varies over space. The aim of this paper therefore, is to analyze the spatial variation of housing quality in Sabon-gari LGA, Kaduna State, Nigeria. A questionnaire survey was used to elicit data on the housing condition in the study area. a total of 308 copies of questionnaire were administered to households who were systematically sampled in the area. Frequency tables and cross-tabulation were used to analyze the data. ANOVA was used tp determine whether there was significant difference in housing quality in the area. The results revealed that there were significant differences in housing quality in the area. Palladan and Hanwa had better housing conditions in relation to other areas. Only Palladan and Hanwa appeared to meet the standard occupancy ratio of 2.0 persons per room. The bulk of the houses in Palladan and Hanwa had water closet type of toilet facility while pit toilet was common in Samaru. It is recommended that house owners should imbibe sound maintenance culture and constant upgrading of their houses in order to enhance good housing quality and keep pace with the current housing standard.

Keywords: Urbanization, Spatial variation, Tenement, Housing quality, Residential area

INTRODUCTION

The United States presidential committee on urban development and housing defines housing as the process of providing large number of residential building on permanent basis with adequate physical infrastructure and social services, planned, decent, safe and sanitary neighborhood to meet the basic needs of the people (UNCHS, 2007). Housing is therefore, much more than shelter as it affects nearly every aspect of human existence. It is a fundamental part of human settlement that fulfils basic needs and has a profound impact on the quality of life, health, welfare and productivity of man (Knox and Pinch, 2006).

Housing at its most basic level is shelter, however, it is much more than that; it is both a physical entity, a social artifact, an economic good, a capital stock and a status symbol; it the "built" environment (Bourne,1981). Onibokun (1985) asserts that as a unit of the environment, housing has profound impact on the general welfare of the community and it reflects the cultural, social and economic values of a society.

Housing quality is the totality of the state of the physical, environmental and the satisfaction level of a particular dwelling unit measured against some variables of livability at a particular time. Such variables include the age of dwellings, types of building, materials used for construction, variety and adequacy of facilities in the dwelling, and the mode of housing construction (Omole, 2000; Owoeye, 2010 in Owoeye and Omole, 2012). Indicators of poor housing conditions as outlined by Onibokun (1985) are overcrowding, poor and inadequate social amenities, unsatisfactory and unwholesome environmental conditions, absence of open space, inaccessibility within the residential areas and scarcity. Housing quality also tends to be differentiated with respect to distance from the city center, but the principal distinction is between sectors of different social status (Bourne, 1981). The quality of a residential area reflects the quality of life of the urbanites (Coker, Awokola, Olomolaiye and Booth, 2007).

About 10million people in the world die annually in densely populated areas due to sub-standard housing and poor sanitation (Knox and Marston, 2007); and these are mainly urban residents (Kissick, not dated in Habitat for Humanity, 2008). According to the United Nations estimate in 2004, more than 1.1 billion people in urban areas worldwide are living in inadequate housing conditions (Knox and Marston, 2007). As at 2003, about 32% of the global urban population lived in urban slums, and it was projected to double by the year 2033 if not adequately controlled (UN-Habitat, 2003 in Habitat for Humanity, 2008).

In Nigeria, the proportion of the population living in urban areas has increased rapidly from 7% in the 1930s, to 35% in 1990 (Okupe, 2002 in Olotuah and Bobadoye, 2009) and more than 40% by 2000s (Federal Government of Nigeria, 2004). This rapid urban growth has seriously aggravated the shortage of dwelling units and consequently, overcrowding, high rent, slums, as well as emergence of squatter settlements (Aina, 1998; Whenh, 2009); with adverse implications on health, safety and productivity of the people (Onu, 2009). Most Nigerians live in poor quality housing and unsanitary environments especially the low income groups (Okpala, 1985).

Housing quality tends to vary from one urban centre to the other and between settlements within the urban areas and this could bring about residential segregation within the Nigerian society which may be detrimental to the healthy development of the nation. The study by Coker, Awokola, Olomolaiye and Booth (2007) revealed considerable spatial variation in housing quality in Ibadan city, Nigeria.

Lanrewaju (2012) noted poor housing conditions in Akure town where the rooming housing type was the most common and the bathrooms and toilets were located outside the buildings in most houses. The average room occupancy ratio was high (4.42) and one quarter of the buildings in the town had no toilet facility (Olotuah, 2012). Similarly, Adekiya (2008) reported that the housing condition in Kano Municipal Local Government area was poor. About 65% of the selected housing units were constructed with mud bricks, poorly constructed and poorly maintained pit latrine was common and 85% of the households did not meet the United Nations minimum occupancy ratio standard of 2 persons per room. Also, Akpu and Daniel (2012) noted that corrugated iron sheet was the most common roofing material used in Badawa, Kano metropolis.

The situation is not different in Sabon Gari, Zaria where housing quality seems to be very poor and vary over space. The study by Shina (2008) in Samaru, Zaria shows that mud-block houses were predominant, while pit latrine was the most common toilet facility in the area and toilets and bath rooms were mostly shared. The occupancy ratio was higher than the minimum acceptable standard of 2 persons per room (Funice, 2001).

In order to address the housing issue in Nigerian cities, information regarding the housing quality and the extent to which it varies over space is paramount. In the light of this, the aim of this research is to analyze the spatial variation in urban housing quality in Sabon Gari Local Government Area (LGA), Kaduna State Nigeria. The null hypothesis which this work seeks to test is that there is no significant difference in housing quality between parts of urban Zaria. The objectives are to examine the housing quality in Sabon Gari LGA and compare the housing quality in the selected neighbourhoods in the area.

STUDY AREA

Sabon Gari Local Government Area (LGA) in Kaduna state is located on a plateau at a height of about 670.6 meter above sea level in the center of Northern Nigeria and more than 643.7km away from the sea (Hore, 1970). According to the author, the LGA, which is located between Latitudes 11° $6'$-11° $15'$ North of the Equator and Longitudes $7^{o}36'$-$7^{o}5'$ East of the Greenwich Meridian possesses a tropical continental climate with distinct wet and dry seasons (see Fig.1). The study area is mainly drained by Rivers Kubanni, Saye, Basawa and Shika which are the main tributaries of Galma river (Thorp,1970).

Sabon Gari LGA is made up of both urban and rural neighbourhoods; however, only the urban settlements were considered in this study. This is because urban areas are mostly hit by housing problems due to rapid urbanization. The settlements studied include: Palladan, Samaru, Hanwa, and Sabon Gari. These areas were chosen because of their level of development and importance. The population of the entire LGA as at 2006 census was 286,871 with 149,004 males and 137,867 females (Federal Republic of Nigeria Official Gazette, 2007). However, since the 2006 census results for localities have not been released, that of 1991 was used for this work. The 1991 population census put the human population of the study areas at 41,900 (23,124 males and 18,776 females) (National Population Commission, 1991). The projected population using exponential method, (based on 2.9% growth rate) shows that the population had almost doubled in 2011 (74,220 with 38,917 males and 35,303 females). Aigbe (2010) observed that the average household size in the area was 7. The large household size in the area could be attributed to the cultural and religious background of the people which encourage polygamy. Based on the 2011 population size and the average household size, the estimated total number of households in the area as at 2011 was 10,602. The establishment of several educational institutions played a great role in giving the area a cosmopolitan outlook. The increase in population and number of households exerts a lot of pressure on existing housing facilities thereby degrading them and some of the newly constructed ones were sub-standard.
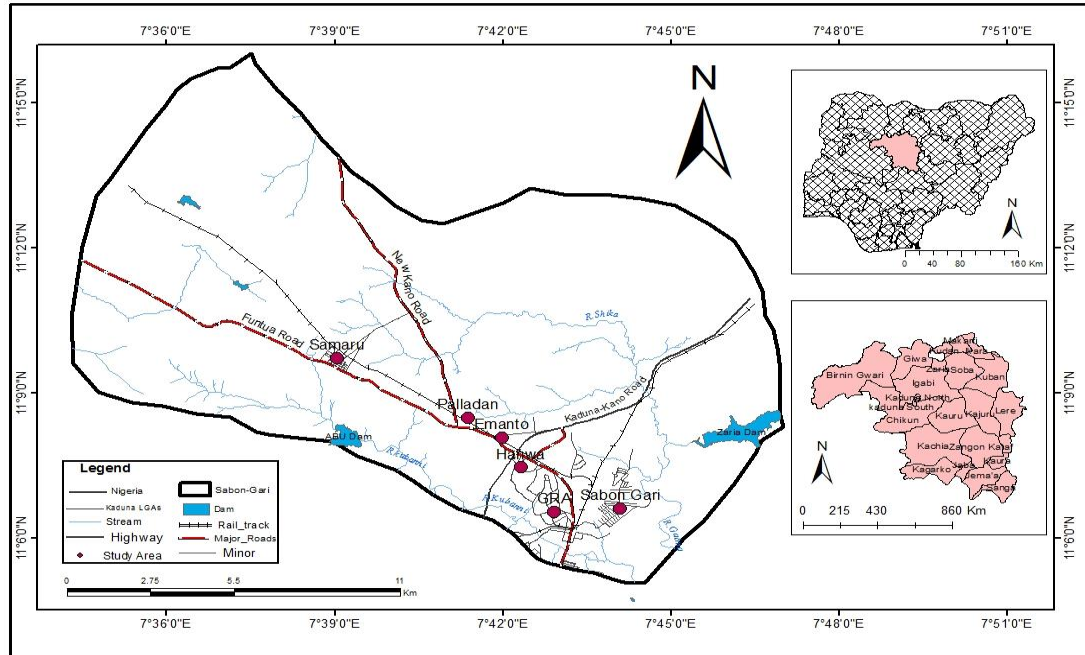
Fig. 1: Sabon-Gari Local Government Area
Source: Administrative map of Kaduna State

MATERIALS AND METHODS

Questionnaire survey was the main source of data used for this work and it was designed to elicit data on the housing characteristics in the study area. Based on the estimated number of households (10,602) in the area, using Krejcie and Morgan (1970) formula at 95% confidence level, 308 households were sampled from the settlements for the questionnaire survey. The systematic sampling technique was adopted in order to obtain a fair representation of the population since the streets in the area were well laid out. The sampling procedure involved the selection of the first house on the streets while the subsequent ones were selected at an interval of 5. In other words, the first house was selected followed by the 5th, 10th etc. until the required number of respondents was achieved. Only the residential houses were considered. The households were identified and one person (preferably, the head of household) was selected for administration of the questionnaire. However, in an event where the fifth house was not a residential apartment; the next was selected.

The data were analyzed using simple descriptive statistics. Frequency tables and cross tabulations were used to analyze the data. Analysis Of Variance (ANOVA) was used to test the stated hypothesis. Data on Room occupancy ratio, major source of domestic water supply and type of toilet facility which are important components of housing quality were subjected to ANOVA test. This was to determine whether there was significant difference in the quality of housing between the selected settlements.

RESULTS AND DISCUSSION

Three hundred and eight (308) respondents were sampled for the questionnaire survey. Out of the total administered questionnaire, 298 constituting about 97% were returned and used for the analysis.

Socio- demographic Characteristics of Respondents

The analysis as presented in Table 1 shows that majority of the respondents fall under the youth category of between 15 and 45 years of age. This clearly manifests the youthful age structure of developing countries like Nigeria and this implies more pressure on the housing facilities. Tertiary education was the most common educational qualification of the selected respondents accounting for 75.1% of the total respondents. This could be attributed to the fact that Zaria is an educational town with several Institutions of higher learning, like Ahmadu Bello University, National College of Aviation Technology, National Institute of Transport Technology and Federal College of Education.

Table 1: Socio-Demographic Characteristics of the Respondents

Age Range	Frequency	Percentage (%)
15-25	66	22.14
26-35	148	49.7
36-45	54	18.1
46-55	26	8.72
56 and above	04	1.34
Total	298	100.0
Educational Level		
No formal education	08	2.68
Primary/Koranic	08	2.68
Secondary	58	19.47
Tertiary	224	75.17
Total	298	100
Occupation		
Farming	0	0
Trading	102	34.23
Civil Service	114	38.25
Artisan	14	4.70
Others (students, house wife etc)	68	22.82
Total	298	100.0

Source: Field Survey, 2011

However, 2.68% still had no formal education of any sort. Civil service and trading were the major occupations among the respondents (38.25% and 34.23% respectively). Farming was not the main occupation of any respondent though some of them engaged in farming, but it was not their major source of livelihood.

Residential Status and Types of Housing Unit

The residential or tenancy status of the respondents and the common types of housing unit. The analysis as shown in Table 2 reveals that about 83.0% of the respondents were living in rented apartments as at the time of the survey. Only 11.41% of the respondents were living in their private houses. Though there was slight spatial variation, most of the respondents in all the neighborhoods resided in rented apartment. This may determine the quality of the housing to a great extent as rented houses are mostly poorly maintained and substandard.

Table 2: Tenancy and Common Types of Housing Unit

Tenancy Status	Palladan		Hanwa		Sabon gari		Samaru		Total	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
Personal house	14	19.4	10	13.5	08	11.4	02	2.4	34	11.41
Rented	58	80.6	60	81.1	54	77.2	76	92.7	248	83.22
Family holding	-	-	04	5.4	08	11.4	04	4.9	16	5.37
Total	72	100	74	100	70	100	82	100	298	100
Types of Housing Unit										
Block of flats	44	61.1	58	78.4	22	31.4	28	34.2	152	51.00
Single room	12	16.7	02	2.7	40	57.1	48	58.5	102	34.23
House on separate stand	16	22.2	14	18.9	08	11.5	06	7.3	44	14.77
Total	72	100.0	74	100.0	70	100.0	82	100.0	298	100.0

Source: Field survey, 2011

Block of flats (tenement) was predominant among the sampled respondents as more than a half (51.0%) of them occupied such dwelling units. Single rooms or the rooming type of dwelling was also common. The types of dwelling unit vary considerably over space. The Block of flat type of dwelling was predominant in Palladan (61.1%) and Hanwa (78.4%) areas and the proportion of House on a Separate Stand type was also relatively high in these areas. However, the situation is different in Sabon-gari and Samaru where the single room type was predominant while House on Separate Stand dwelling unit was rare. This could be explained by the fact that these areas are high density residential neighbourhoods unlike Palladan and Hanwa where the density is low.

The number of persons per sleeping room (room occupancy) shows the extent of crowdedness in the house. The analysis presented in Table 3 reveals that 1-2 persons per sleeping room was most common accounting for 75.84% of the respondents. However, about one quarter of the respondents still had between 3 and above 8 persons in a sleeping room. This is similar to the situation in Akure where Olotuah (2005) in Lanrewaju (2012) stated that the average room occupancy was 4.42. Also in Kano Municipal Local Government Area where 46.5% of the houses had 5 or more persons in a room (Adekiya, 2008). This falls below the United Nations

Standard of 2.20 for Nigeria; the WHO's standard of 1.8 - 3.1 and the Nigerian Government's standard (2.0 persons per room) (Okoko, 2001).

Table 3: Room Occupancy Ratio

No. per Sleeping Room	Palladan		Hanwa		Sabongari		Samaru		Total	
	Freq	**%**	**Freq**	**%**	**Freq**	**%**	**Freq**	**%**	**Freq**	**%**
1-2	66	91.7	66	89.2	38	54.3	56	68.3	226	75.84
3-4	06	8.3	08	10.8	26	37.0	22	26.9	62	20.81
5-6	0	0	0	0	02	2.9	02	2.4	04	1.34
7-8	0	0	0	0	02	2.9	-	0	02	0.67
Above 8	0	0	0	0	02	2.9	02	2.4	04	1.34
Total	72	100.0	74	100.0	70	100.0	82	100.0	298	100.0

Source: Field Survey,2011

On the average, the room occupancy in Palladan and Hanwa seemed to meet the stipulated standard since about 92.0% of the respondents in Palladan and 89.2% in Hanwa had between 1 and 2 persons per sleeping room. On the other hand, Sabon-Gari recorded the highest proportion (45.7%) of those with 3 persons and above in a sleeping room and hence falls short of the standard room occupancy ratio. The low room occupancy ratio in Palladan and Hanwa areas could be due to the fact that the houses were mostly block of flats and houses on separate stand which have enough rooms that would adequately accommodate the households and only the middle or high income earners can afford it. But in areas like Sabon-gari where the rooming type of housing unit dominated, and the occupants cannot afford adequate rooms for their households, high room occupancy is inevitable.

The ANOVA test revealed significant difference in room occupancy ratio between the settlements in the area. The calculated F- ratio was 41.86 while the tabulated value as shown by the F- distribution table was 3.06 at 0.5% significant level. Since the calculated value (41.86) was higher than the table value (3.06), the null hypothesis was rejected. This implies that there is significant difference in room occupancy ratio between the settlements in Sabon- Gari LGA.

Available Sanitary Facilities

The types of sanitary facilities in the house are also important determinants of housing quality. The type of toilet facility used is presented in Table 4.

The results of the survey show that all the sampled respondents had either pit latrine or water closet type of toilet facility in their residence. Though water closet was more common, about 26.85% of the respondents were still using pit latrine which could have serious health implications on the residents. Worse situation was found in Akure by Olotuah (2010) who reported that one quarter of the buildings in the area had no toilet facility, only 35.38% had water closet and pit latrines were commonly used in the area.

Table 4: Sanitary Facilities

	Palladan		Hanwa		Sabongari		Samaru		Total	
Toilet Facilities	**Freq**	**%**	**Freq**	**%**	**Freq**	**%**	**Freq**	**%**	**Freq**	**%**
Water closet	62	86.1	74	100	42	60.0	40	48.8	218	73.15
Pit latrine	10	13.9	0	0	28	40.0	42	51.2	80	26.85
None	0	0	0	0	0	0	0	0	0	0
Total	72	100.0	74	100.0	70	100.0	82	100.0	298	100.0
No. of Persons Per Toilet										
1-2	32	44.4	46	62.2	18	25.7	28	34.1	124	41.61
3-4	28	38.9	24	32.4	12	17.1	08	9.8	72	24.16
5-6	02	2.8	04	5.4	12	17.1	04	4.9	22	7.38
7-8	0	0	0	0	14	20.0	14	17.1	28	9.40
9-10	0	0	0	0	04	5.7	02	2.4	06	2.01
Above 10	10	13.9	0	0	10	14.3	26	31.7	46	15.44
Total	72	100.0	74	100.0	70	100.0	82	100.0	298	100.0

Source: Field Survey, 2011

About 86.0% and100.0% of the respondents in Palladan and Hanwa respectively, had the water closet type of toilet facility in their houses. On the contrary,51. 2% of the respondents in Samaru had pit latrine in their houses. The common use of pit latrine and other unsanitary disposal of excreta promote the transmission of diseases like cholera, dysentery, diarrhea and typhoid fever (WHO, 1987).

The ANOVA test revealed significant difference in the type of available toilet facility between the settlements. Since the calculated F- value (14.78) was greater than the tabulated (4.26) at 0.5% significant level, the null hypothesis was rejected. This implied significant difference in the type of toilet facility between the settlements.

Like most cities in Nigeria there was no proper planning for waste management in the area. Solid waste could be seen littered around blocking drainages, and obstructing free flow of traffic. About 48% of the respondents dump their refuse in unauthorized dumpsites while the rest either burn or throw their waste into drainages. Majority of the dumpsites were unprotected thereby constituting health hazard in the area.

Amenities and their Condition

The major sources of potable water supply and source of lighting energy and their state as well as their variation over space are presented in tables 5 and 6 respectively.

The analysis as presented in Table 5 shows that about 45.6% of the respondents had pipe-borne water supply within their dwellings. This implies that more than a half of the respondents depended on other sources like well, pipe-borne water outside dwelling, borehole and water vendor for their domestic water supply. Some of these sources are not safe for human

consumption. In Hanwa and Sabon-Gari about 89.0% and 69.0% respectively of the respondents had pipe-borne water supply inside their houses while well was most common in Palladan (55.6%) and Samaru (36.6%).

The results further show that only about 38. 46% of the respondents who had pipe-borne water supply within their dwellings had regular (daily) supply. However, Samaru area recorded the highest proportion (71.4%) of daily supply of piped water. A more worrisome situation existed in Akure where only 19.6% of the population obtain water from taps within or outside their buildings while others relied on hand-dug wells or tankers (Olotuah, 2010). On the contrary, Adekiya (2008) noted that tap was the most common source of potable water supply in Kano Municipal Local Government Area.

Table 5: Available Amenities in House

Sources of Water Supply	Palladan		Hanwa		Sabongari		Samaru		Total	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
Well	40	55.6	04	5.4	06	8.6	30	36.6	80	26.85
Pipe-born water within dwelling	18	25.0	66	89.2	48	68.6	04	4.9	136	45.64
Pipe-born water outside dwelling	02	2.8	02	2.7	08	11.4	08	9.7	20	6.71
Bore hole	10	13.8	02	2.7	-	-	20	24.4	32	10.74
Water vendor	-	-	-	-	08	11.4	18	22.0	26	8.72
No response	02	2.8	-	-	-	-	02	2.4	04	1.34
Total	72	100.0	74	100.0	70	100.0	82	100.0	298	100.0
Duration of Pipe-borne Water Supply										
Daily	06	27.2	26	38.2	18	34.6	10	71.4	60	38.46
Twice a week	08	36.4	20	29.3	28	53.9	04	28.6	60	38.46
Once a week	08	36.4	22	32.5	04	7.7	0	0.0	34	21.80
Once a month	0	0.0	0	0.0	02	3.8	0	0.0	02	1.28
Total	22	100.0	68	100.0	52	100.0	14	100.0	156	100.0

Source: Field Survey, 2011

The large proportion of respondents who depended on hand- dug wells and other alternative sources of water supply in the area depicts the inadequate access to safe potable water supply which could have negative implication on the health of the people. Victoria, Smith and Vaughan (1988) discovered that infants from households who get water from public pipes or hand-dug wells were 4.8 times more likely to die of diarrhea than those from households who had pipe water within their houses.

The ANOVA result recorded significant variation in the major sources of domestic water supply. The calculated F- ratio was 2.87 while the table value was 2.77 at 0.5% significant level. Since the calculated value was higher than the tabulated, the null hypothesis was also rejected. This

means that there is significant difference in sources of domestic water supply among the settlements.

Electricity was the major source of lighting energy in the study area. However, as high as 23.49% of the respondents still depended on power generating sets for their lighting energy. About 47.4% of the respondents had between 1 and 6 hours power supply daily while just 0.88% could boast of 13-18 hours daily supply. Hanwa and Samaru areas were most favored as 7-12 hours supply was common with 60% and 70.6% respectively. Hanwa was the only area where a proportion of the respondents had as much as 13-18 hours supply daily. This clearly depicts the erratic nature of electric power supply in the area and the Nigerian nation at large.

Infrastructural Facilities

The results reveal that about 62.0% of the houses in the area lacked drainage facilities while some of the ones available were not wide and deep enough to contain storm water and others were partially blocked. This could contribute to the event of urban flooding that has become very common in Nigeria. Accessibility was generally poor as about 55.0% of the houses were not connected to any access road. However, the situation was good in Hanwa as most (94.6%) of the houses were connected by road network. This is the Government Reserved Area (GRA) which is a well planned area is part of Hanwa.

Building Materials

The type of construction material used for the house also determines the quality of the building. The materials used for constructing the walls and roofing of the houses and how they vary over space are presented in Table 7.

Table 7: Construction Materials

Materials used for Wall Construction	Palladan		Hanwa		Sabongari		Samaru		Total	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
Cement	68	94.4	74	100	56	80.0	46	56.1	244	81.88
Mud block	0	0	0	0	10	14.3	0	0	10	3.36
Mud and cement	04	5.6	0	0	04	5.7	36	43.9	44	14.76
Total	72	100.0	74	100.0	70	100.0	82	100.0	298	100.0
Roofing Material										
Asbestos	02	2.8	02	2.7	06	8.6	02	2.4	12	4.03
Aluminum	08	11.1	72	97.3	04	5.7	10	12.2	94	31.54
Zinc	62	86.1	0	0	60	85.7	70	85.4	192	64.43
Total	72	100.0	74	100.0	70	100.0	82	100.0	298	100.0

Source: Field Survey, 2011

Cement was used for constructing the wall of most houses in the area since 81.88% of the respondents' houses were built with this material. Mud block was the least favoured material

with only 3.36%. Cement was most common in all the neighborhoods however, the proportion was lower in Samaru area where as much as 43.9% of the buildings were built with mud and cement. Sabon- Gari was the only area with mud block houses. The high proportion of mud buildings in Sabon-Gari, could be explained by the fact that this was one of the earliest settlements in Zaria occupied by migrants (Urquhart, 1970) and majority of the houses were traditionally built with mud.

Corrugated iron sheet was mostly used for the roofing of houses in the area with about 64% of the respondents in this class. Corrugated iron sheet was common in all the settlements except Hanwa where aluminum was popular with a proportion of 97. 3%. The high proportion of aluminum roofing material in this area could be attributed to the fact that most of the buildings were recent.

CONCLUSION

The survey shows that the Block of flats (tenement) type of dwelling was predominant in Palladan and Hanwa while the single room type was common in Sabon Gari and Samaru areas. Only Palladan and Hanwa met the standard room occupancy ratio of 2.0 persons per room. Hand dug wells, pipe-borne water outside dwelling, borehole and water vendor were common sources of domestic water supply in the area. The housing condition in the area was generally poor. However, significant variations in the housing quality existed amongst the settlements in the LGA. Hanwa and Palladan areas had better housing conditions in relation to other settlements in the area.

Based on the findings of this paper, the following are recommended: i) The government should develop low cost housing for low and moderate income earners through Public Private Partnership (PPP) arrangement. This would help to a great extent in reducing overcrowding in houses. ii) The government should engage in upgrading of slums through urban renewal programs. This would help in mitigating poor housing conditions and consequently improve the general standard of the housing stock. iii) Almost all the settlements in the area lacked adequate sanitary and infrastructural facilities like drainages, access roads, electric power supply and domestic water supply. All the agencies responsible for the provision of these facilities should therefore, work assiduously in providing them especially in the areas where they are most needed. iv) The house owners should imbibe a sound maintenance culture and constant upgrading of their houses in order to maintain good housing quality and keep pace with the current housing standard.

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