Factors Determining Housing Quality in Selected Neighbourhoods of the Bauchi Metropolis, Nigeria

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Abstract. Housing is one of the essential needs of man's survival which protects him against the weather and other harsh conditions. For housing to fulfil this basic need, it has to be qualitatively and quantitatively adequate. The factors which determine housing quality in selected residential neighbourhoods of the Bauchi metropolis were examined in this paper. Data for the study was collected from 300 households in the study area and was analysed using descriptive statistics and a non-parametric test (Independent-Samples Kruskal-Wallis Test). Housing quality in the study area is determined by the building design, roofing materials, wall materials, condition of buildings, age, internal and external facilities, etc. The quality of houses in the study area was significantly different across the neighbourhoods. However, there is no statistically significant difference across the three communities regarding the roofing materials used. This paper concludes that the government and related agencies should provide the essential services needed to improve the lives of households residing within the study area.

Keywords: factors; housing quality; neighbourhood; Bauchi.

INTRODUCTION

Housing is one of the essential needs of man's survival, protecting him against the weather and other harsh conditions. Author [18] posits that housing is universally acknowledged as one of the necessities of human life and is a significant economic asset in every nation. Housing is an issue that touches individuals' lives and the country [19]. According to [9, 11, 20], housing is one of the most critical conditions in human survival, welfare, and development, which tremendously affect human health and well-being. Author [4] asserted that housing constitutes goods and services that ease and improve good living and are essential to neighbourhood quality and preservation. Housing in its entire ramification is more than shelter as it embraces all social services and utilities that lead to worthy living [6]. It is expected that housing is provided with adequate physical infrastructure and social amenities (services) in planned, decent, safe and hygienic neighbourhoods to meet the essential and unique needs of the population [3]. While the importance of housing cannot be overemphasised, housing must be of good quality and habitable for its occupants. However, studies such as [12] have

shown that over the past decades, housing in most Nigerian cities (except the Federal Capital City of Abuja) have experienced decay, and this includes the physical infrastructural facilities, which they attributed to being likely due to the economic downturn experienced in the nation.

Nigerian cities are usually associated with housing problems such as poor housing conditions evidenced by overcrowding and inadequate dwelling units; high densities resulting from land market failure; inadequacy of essential public and infrastructural services; solid waste problems; increasing deterioration of the natural landscape; water, air and noise pollution [22]. According to [12] citing [14], the realisation of a decent home in a suitable living environment requires the availability of clean air, potable water, adequate shelter and other essential services and facilities.

Bauchi metropolis is a city that has, over the past two decades, witnessed the migration of people from the neighbouring states of Plateau, Borno and Yobe due to the conflicts and insurgency which have rendered them homeless. As a result, several settlements have cropped up, especially around the city's peripheral areas. Many of these

areas lack basic amenities such as electricity, drainages, potable water, waste disposal systems, roads, etc. Houses in these areas are usually substandard and very small, standing on plots of land ranging between 40 by 40 ft. and 50 by 50 ft., with little or no basic facilities such as drainages, water, waste disposal systems, and adequate facilities ventilation, lighting, to mention a few. The lack/inadequacy of which affects the quality of houses. Thus, this study seeks to examine the factors that determine housing quality in the selected neighbourhoods of the Bauchi metropolis.

Concept of Housing Quality. Housing quality has been defined as the totality of the state of the physical, environmental and satisfaction level of a particular dwelling unit measured against some variables of liveability in a specific time [28]. Housing is one of the basic needs of man as all humans need a place of abode which is very conducive and suitable for human habitation [27]. Author [5] opined that housing must be qualitatively and quantitatively adequate to fulfil this primary purpose. Similarly, it was reported by [8] that housing accounts for both quantitative and qualitative dimensions of residential units, their immediate surroundings, and the occupants' needs.

Housing quality is a comprehensive concept that delineates whether or not housing is sufficient to meet recognised housing quality standards and specific household needs [13]. According to [27], housing quality refers to the physical conditions of the housing units in a particular area regarding their structural soundness, ventilation, natural and artificial lighting, including essential facilities such as water and electricity supply, toilet, bathroom, kitchen, among others. Significantly, good quality housing provides the foundation for stable communities and social inclusion [15].

Studies were undertaken in Nigeria reveal the poor state of housing. For instance, a study by [10] showed that building elements such as roofs, doors, windows, floors, ceilings and walls in the urban core of Ado-Ekiti are in deplorable conditions, thus making the buildings to be in a bad state, which in most cases are not suitable for human habitability. Similarly, [4] in a study in Ede, Akure indicated that most dwellings surveyed have significant defects and are overcrowded. According to [12], places in the high-density zone of Ibadan generally lack potable water, toilet and bathing facility, solid waste dispos-

al facility and electricity supply. Author [19] also noted in Oshogbo and Akure Town that the housing quality and infrastructure are generally poor, and an increasing shortage of urban services and infrastructure. Another study in Osogbo Local Government by [27] shows that many houses are substandard due to the low level of income of the inhabitants, and facilities such as toilets, bathrooms, and kitchens are inadequate.

A study conducted in the low-density areas of Birnin Kebbi by [17] revealed that residents of low-density residential areas of the study area live in inadequate housing that lacks some basic physical infrastructures for a good liveable and sanitary environment. A study by [26] revealed that the factors responsible for the deterioration of physical conditions of the Moniya community of Ibadan are mainly due to lack of infrastructural facilities, security of tenure, deterioration of building quality and overcrowding. According to [21], in the core city of Akure, households live in precarious and unsafe conditions. He further asserted that the absence or/and poor state of housing facilities is occasioned by the lack of public infrastructural services, including pipe-borne water, good road and drainage systems, and non-compliance with urban planning and environmental by-laws.

Determinants of Housing Quality. Aesthetics, sanitation, drainage, age of the building, access to basic housing facilities, burglary, spatial adequacy, noise level within the neighbourhood, sewage and waste disposal, air pollution and ease of movement, among others, are used as the relevant quality determinants in assessing the quality or suitability of housing [19]. A study by [1] cited in [29] identified the type of construction, materials used, the number of spaces available, services and facilities, burglary, condition of facilities within and outside dwelling functions and aesthetic, among others, as relevant indicators for quality evaluation. According to [2], housing quality in Lagos peri-urban settlements is affected by households' socio-economic attributes, building materials, dwelling quality, neighbourhood quality, and locational quality.

Authors [5, 22, 23] used the building design, materials for roofing and walls, condition of buildings, the age of the structures, internal and external facilities, the type of toilet and bathroom facilities available, and the source of lighting as the significant factors to describe housing quality in some Nigerian cities. While several studies have

been conducted in Nigeria on housing quality, none has focused on determining the factors influencing housing quality in Bauchi metropolis in North-Eastern Nigeria. The survey conducted by [22] in Bauchi focused mainly on housing quality in residentially segregated areas. [23] developed a framework of the existing patterns of residential segregation and housing quality in Nigeria. On the other hand, this study intends to determine the factors responsible for housing quality in Sabon Kaura, Kandahar and Zango neighbourhoods of Bauchi metropolis and determine if there is any significant difference in housing quality across the areas studied.

METHODOLOGY

The study area, Bauchi, is the headquarters of Bauchi Local Government and also the capital of Bauchi State, Nigeria. The metropolis has a total land area of 3,687 square kilometres [25] and a population of 493,730 [24]. For the study, three residential neighbourhoods were chosen in Bauchi metropolis: Sabon Kaura, Kandahar and Zango. These neighbourhoods are informal settlements with similar characteristics, and they are occupied mainly by the medium and low-income groups. The three communities were conveniently sampled as they are considered to be representative of other informal settlements in the study area. A total of 300 households in the study area were sampled and administered with semi-structured questionnaires (based on a 3 point Likert scale) using simple random sampling. The variables used in the study were adopted from [22], which are building design, wall materials, roofing materials, condition of the building, source of lighting etc. Descriptive statistics (cross-tabulation) and a non-parametric test, Independent-Samples Kruskal-Wallis Test was used to analyse the data using Statistical Package for Social Sciences (SPSS) version 21.

RESULTS AND DISCUSSION

Type of Building. The analysis of the data from the study revealed that the most common type of buildings is the tenement buildings. Table 1 shows that 58 % of the households in the Sabon Kaura neighbourhood live in tenement buildings, 36 % in the Kandahar neighbourhood and 51 % in the Zango neighbourhood of the study area. Another building standard in the communities under study is the room and parlour, accounting for 43 % in the Zango neighbourhood, 31 % in Kandahar and 20 % in Sabon Kaura. Bungalows were present in the study area with 38 % in Kandahar, 17 % in Sabon Kaura and 18 % in Zango. The table shows that duplexes and mud houses were very few in the study area. Thus, the tenement buildings and the room and parlour are predominantly in the study area. This confirms the findings of previous studies such as [21, 22], which reported that tenement buildings are the most common buildings used by households in Nigeria.

Table 1 – Type of Building

	Location								
	Sabon Kaura			Kandahar			Zango		
	SD	Neutral	SA	SD	Neutral	SA	SD	Neutral	SA
Your house is duplex	90	9	1	93	7	0	91	7	2
	90.0%	9.0%	1.0%	93.0%	7.0%	0.0%	91.0%	7.0%	2.0%
Your house is bungalow	69	14	17	51	11	38	76	6	18
	69.0%	14.0%	17.0%	51.0%	11.0%	38.0%	76.0%	6.0%	18.0%
Your house is tenement building (face me i face you)	31	11	58	50	14	36	45	4	51
	31.0%	11.0%	58.0%	50.0%	14.0%	36.0%	45.0%	4.0%	51.0%
Your house is a room and palour type	50	30	20	32	37	31	50	7	43
	50.0%	30.0%	20.0%	32.0%	37.0%	31.0%	50.0%	7.0%	43.0%
Your house is a mud hut	47	4	49	97	2	1	95	3	2
	47.0%	4.0%	49.0%	97.0%	2.0%	1.0%	95.0%	3.0%	2.0%

Type of Roofing Material. Corrugated Iron Sheets (CIS) are the dominant roofing materials used in the areas under study, as shown in Table 2. In the Sabon Kaura neighbourhood, 70 % of the houses have CIS roofs, 88 % in Kandahar and 87 % in the Zango neighbourhood of the study area. Few places have aluminium roofing sheets, 8 % in Kandahar, 7 % in Zango and 5 % in Sabon Kaura.

The use of thatch roofs accounted for 24 % of houses in the Sabon Kaura neighbourhood. During field observation, it was observed that the most common roofing material used in the study areas is CIS, but few houses have aluminium roofs. Studies [22, 26, 29] have reported that corrugated iron sheets are the most common roofing material used in places. The use of aluminium and asbestos is not every day in the areas studied.

Table 2 – Type of Roofing Material

| | Location | | | | | | | | |
| | Sabon Kaura | | | Kandahar | | | Zango | | |
	SD	Neutral	SA	SD	Neutral	SA	SD	Neutral	SA
You use CIS for your roof	19	11	70	8	4	88	10	3	87
	19.0%	11.0%	70.0%	8.0%	4.0%	88.0%	10.0%	3.0%	87.0%
You have an aluminium roof	92	3	5	77	15	8	83	10	7
	92.0%	3.0%	5.0%	77.0%	15.0%	8.0%	83.0%	10.0%	7.0%
You have an asbestos roof	100	0	0	98	1	1	95	3	2
	100.0%	0.0%	0.0%	98.0%	1.0%	1.0%	95.0%	3.0%	2.0%
You have a thatch roof	59	17	24	97	1	2	94	2	4
	59.0%	17.0%	24.0%	97.0%	1.0%	2.0%	94.0%	2.0%	4.0%

Wall Material. The survey indicated that the most commonly used wall materials in the study area are cement blocks accounting for 85 % in Kandahar and 97 % in Zango (Table 3). The use of cement blocks in most Nigerian towns was also reported in studies by [2, 21, 22, 29]. At the same time, clay/mud blocks were found to be the wall material primarily used in the Sabon Kaura neighbourhood, with 52 % responses. Authors [26], [22], [29] and [27] have reported that mud blocks are used in construction of houses in communities across Nigeria. Burnt bricks were found to be uncommon in the study area. The study further revealed that the walls in most places were finished internally and externally with cement. Zango and Kandahar neighbourhoods have over 90 % responses. This finding was also confirmed during the field observation.

Table 3 – Wall Material

| | Location | | | | | | | | |
| | Sabon Kaura | | | Kandahar | | | Zango | | |
	SD	Neutral	SA	SD	Neutral	SA	SD	Neutral	SA
Your internal and external walls are made of cement blocks	46	8	46	12	3	85	2	1	97
	46.0%	8.0%	46.0%	12.0%	3.0%	85.0%	2.0%	1.0%	97.0%
Your internal and external walls are made of burnt bricks	99	1	0	92	7	1	89	9	2
	99.0%	1.0%	0.0%	92.0%	7.0%	1.0%	89.0%	9.0%	2.0%
Your internal and external walls are made of clay/mud blocks	44	4	52	84	6	10	85	11	4
	44.0%	4.0%	52.0%	84.0%	6.0%	10.0%	85.0%	11.0%	4.0%
Both internal and external walls are finished with cement	28	17	55	2	2	96	5	0	95
	28.0%	17.0%	55.0%	2.0%	2.0%	96.0%	5.0%	0.0%	95.0%

Condition of Building. The state of houses in the neighbourhoods studied are in good condition. The walls (both internal and external) were reported by 69 % of respondents in Kandahar and 51 % in Zango to be in good condition. Table 4 reveals that most houses have no roof leakage, with 57 % of responses from Kandahar and 47 % from the Sabon Kaura neighbourhood. This implies that the roofs are in good condition. This finding coincides with that of [10] which reported that roofs in the urban-core of Ado-Ekiti are good. Similarly, [22] said that the condition of roofs in houses within some segregated neighbourhoods in the Bauchi metropolis is good. Generally, the structural condition of buildings in the study area.

Table 4 – Condition of Building

	Location								
	Sabon Kaura			Kandahar			Zango		
	SD	Neutral	SA	SD	Neutral	SA	SD	Neutral	SA
Both internal and external walls are in good condition	32	24	44	11	20	69	12	37	51
	32.0%	24.0%	44.0%	11.0%	20.0%	69.0%	12.0%	37.0%	51.0%
The roof of your house does not leak	39	14	47	25	18	57	24	30	46
	39.0%	14.0%	47.0%	25.0%	18.0%	57.0%	24.0%	30.0%	46.0%
The building structure is in good condition	38	20	42	20	12	68	29	25	46
	38.0%	20.0%	42.0%	20.0%	12.0%	68.0%	29.0%	25.0%	46.0%

Age of Building. The findings on the age of buildings in the study area revealed that the majority of the houses are below ten years, with Kandahar having 83 % responses, 82 % in Zango and 66 % in Sabon Kaura (Table 5). This finding corresponds with that of [22]. Houses between the ages of 10–20 years account for 24 % of the Sabon Kaura neighbourhood responses. The analysis shows that places in these neighbourhoods are not very old, implying that the communities are relatively new.

Table 5 – Age of Building

	Location								
	Sabon Kaura			Kandahar			Zango		
	SD	Neutral	SA	SD	Neutral	SA	SD	Neutral	SA
Age of building below is 10 years	18	16	66	12	5	83	18	0	82
	18.0%	16.0%	66.0%	12.0%	5.0%	83.0%	18.0%	0.0%	82.0%
Age of building is between 10-20 yrs	48	28	24	75	13	12	47	34	19
	48.0%	28.0%	24.0%	75.0%	13.0%	12.0%	47.0%	34.0%	19.0%
Age of building is between 20-30 yrs	70	25	5	90	9	1	73	22	5
	70.0%	25.0%	5.0%	90.0%	9.0%	1.0%	73.0%	22.0%	5.0%
Age of building is between 30-40 yrs	92	5	3	98	2	0	93	4	3
	92.0%	5.0%	3.0%	98.0%	2.0%	0.0%	93.0%	4.0%	3.0%
Age of building is between 40 and above years	96	3	1	100	0	0	96	3	1
	96.0%	3.0%	1.0%	100.0%	0.0%	0.0%	96.0%	3.0%	1.0%

Internal and External Facilities. The data analysis for internal facilities in the study area reveals that kitchens are not equipped with modern fittings. This is evidenced by 13 % responses from Sabon Kaura and 24 % from Zango. A similar report was made by [22, 28]. There is an inadequate water supply in the Sabon Kaura neighbourhood. Likewise, waste disposal facilities are scarce in all the communities studied. Electricity supply was insufficient in Sabon Kaura (10 %) and Kandahar (21 %) neighbourhoods. However, this is a general problem in most cities in Nigeria.

Table 6 – Internal and External Facilities

	Location								
	Sabon Kaura			Kandahar			Zango		
	SD	Neutral	SA	SD	Neutral	SA	SD	Neutral	SA
You have well equipped kitchen with modern facilities	73	14	13	43	20	37	57	19	24
	73.0%	14.0%	13.0%	43.0%	20.0%	37.0%	57.0%	19.0%	24.0%
You have adequate water supply	69	16	15	43	23	34	27	16	57
	69.0%	16.0%	15.0%	43.0%	23.0%	34.0%	27.0%	16.0%	57.0%
You have adequate waste disposal facilities	70	16	14	45	31	24	53	31	16
	70.0%	16.0%	14.0%	45.0%	31.0%	24.0%	53.0%	31.0%	16.0%
You have adequate electricity supply	71	19	10	40	39	21	22	33	45
	71.0%	19.0%	10.0%	40.0%	39.0%	21.0%	22.0%	33.0%	45.0%
You have good toilet and bathroom facilities	63	13	24	16	22	62	21	26	53
	63.0%	13.0%	24.0%	16.0%	22.0%	62.0%	21.0%	26.0%	53.0%

Type of Toilet. The predominant type of toilet used in the Kandahar neighbourhood is water closet (WC), with 61 % responses, 55 % in Zango, and only 26 % of households in Sabon Kaura

(Table 7). Pit toilets are also used in the study areas, 80 % in Sabon Kaura, 64 % in Zango, and 54 % in Kandahar. Authors [22, 26, 28] have reported similar findings.

Table 7 − Type of Toilet

	Location								
	Sabon Kaura			Kandahar			Zango		
	SD	Neutral	SA	SD	Neutral	SA	SD	Neutral	SA
You have a WC toilet/bathroom in your house	69	5	26	23	16	61	24	21	55
	69.0%	5.0%	26.0%	23.0%	16.0%	61.0%	24.0%	21.0%	55.0%
You use a pit toilet in your house	13	7	80	35	11	54	30	6	64
	13.0%	7.0%	80.0%	35.0%	11.0%	54.0%	30.0%	6.0%	64.0%
You do not have a toilet/bathroom in your house	97	2	1	95	2	3	97	1	2
	97.0%	2.0%	1.0%	95.0%	2.0%	3.0%	97.0%	1.0%	2.0%

Source of Electricity in the absence of Jos Electricity Distribution Company (JED). Investigation into the lighting source in the absence of electricity from the mains supply revealed that few houses use generator sets with 26 % in Sabon Kaura and Zango (Table 8). However, the generator set was higher in the Kandahar neighbourhood with

50 % responses. Kerosene lamps are also used in all the communities 62 % responses in Sabon Kaura, 42 % in Zango and 21 % in Kandahar. The use of candles accounted for 31 % of responses from Sabon Kaura, 25 % from Kandahar and 47 % from the Zango neighbourhood. This finding is similar to [26, 28, 22].

Table 8 − Source of Electricity in the absence of JED

	Location								
	Sabon Kaura			Kandahar			Zango		
	SD	Neutral	SA	SD	Neutral	SA	SD	Neutral	SA
You use a generator when there is no light from JED	73	1	26	35	15	50	52	22	26
	73.0%	1.0%	26.0%	35.0%	15.0%	50.0%	52.0%	22.0%	26.0%
You use kerosene lamp when there is no light from JED	15	23	62	49	30	21	35	23	42
	15.0%	23.0%	62.0%	49.0%	30.0%	21.0%	35.0%	23.0%	42.0%
You use candles when there is no light from JED	34	35	31	50	25	25	27	26	47
	34.0%	35.0%	31.0%	50.0%	25.0%	25.0%	27.0%	26.0%	47.0%

To establish whether the three locations significantly differ in terms of the various components of housing quality, a non-parametric test, the Independent-Samples Kruskal-Wallis Test, was conducted to test the difference. Table 9 shows the result of the analysis. The result shows that housing quality significantly differs across the three neighbourhoods. Specifically, the three neighbourhoods are significantly different with regard to design of buildings (Chi^2=31.734; df=2; p=.000); wall materials (Chi^2=31.735; df=2; p=.000); building condition (Chi^2=11.510; df=2; p=.003); age of building (Chi^2=11.709; df=2;

p=.003); internal facilities (Chi^2=51.580; df=2; p=.003); type of toilet and bathroom facilities (Chi^2=13.892; df=2; p=.001) and source of lighting (Chi^2=11.514; df=2; p=.003). This implies that housing quality in the three neighbourhoods is different based on the analysis conducted. However, the result shows no statistically significant difference across the three neighbourhoods to the type of roofing materials used (Chi^2=3.525; df=2; p=.172). The result suggests that the roofing material used in the three neighbourhoods studied are similar.

Table 9 – Difference in Housing Quality across the Neighbourhoods

	Building design	The material used for roofing	The material used for internal and external walls	Condition of building	Age of building	Internal facilities	Types of toilet and bathroom facilities	Source of Lighting
Chi^2	31.734	3.525	31.735	11.510	11.709	51.580	13.892	11.514
df	2	2	2	2	2	2	2	2
Asymp. Sig.	.000	.172	.000	.003	.003	.000	.001	.003

Test Statistics [a,b]

Notes: a) Kruskal Wallis Test; b) Grouping Variable: Location

CONCLUSIONS

It is revealed in this study that the determinants of housing quality are building design, roofing materials, wall materials, condition of buildings, age of the buildings, internal and external facilities, among others. All the structures studied are provided with basic internal facilities which differ in quality within the neighbourhoods. It is also evidenced from the areas studied that poor electricity and water supply and waste disposal facilities are lacking. The study concludes that the three communities are significantly different regarding the design of buildings, wall materials, building condition, age of the building, internal facilities, type of toilet and bathroom facilities and source of lighting. However, there is no statistically significant difference across the three neighbourhoods regarding the roofing materials used. This study recommends that the government and related agencies take adequate steps towards providing the essential services needed to improve the lives of households residing within the study area.

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