International Journal of Social Science And Human Research

ISSN(print): 2644-0679, ISSN(online): 2644-0695

Volume 04 Issue 11 November 2021

DOI: 10.47191/ijsshr/v4-i11-19, Impact factor-5.586

Page No: 3208-3217

Assessment of Residential Buildings Condition in Government Built Housing Estates of Port Harcourt Municipality, Nigeria

Ikiriko Tamunoikuronibo Dawaye[1] and Anthony Donubari Enwin[2]

[1]Department of Urban and Regional Planning faculty of Environmental Sciences, Rivers State Rivers State University, Port Harcourt, Nigeria

[2]Department of Architecture, faculty of Environmental Sciences, Rivers State Rivers State University, Port Harcourt, Nigeria

ABSTRACTS: A major key indicator for assessing the quality of an urban residential neighbourhood is the building condition. A good building condition adds value to a neighbourhood in terms of aesthetics, safety, security and comfort. The Rivers State Government has in 1986 - 1998 built 12 residential estates for her staff members in the study area. The responsibility of maintenance of the buildings has been left to the owner occupiers of those houses. What is the state of those houses which has been built for over 30years? It is on this note that this study is poised to ascertain the physical condition of buildings within the public housing estates in Port Harcourt municipality. This study is a quantitative research that belongs to the class called "descriptive research design". Simple random sampling technique was used to select 108 respondents (household heads) from the six selected housing estates. Questionnaire, physical observation and digital camera were the tools used for data collection. Analysis of findings was presented descriptively in tables, charts and percentages. Among the twelve public housing estates identified within the study area, the simple random sampling method was used to select and study six of the estates which are: 1. Aggrey Housing Estate, 2. Marine Base Govt. Housing Estate, 3. Abuloma housing estate phase, 4. Ndoki Housing Estate, 5. Elekahia housing estate and, 6. Khana Street Housing Estate. The research findings show the physical condition of buildings within the public housing estates, 81.5% of the buildings has good foundation, 92.6% of the windows are in good condition, 95.4% of the buildings have water system. 65% of the respondents considered the overall housing condition of the estates as good (needs no repair) while 35% saw the housing condition as fairly good (needs minor repair).

KEYWORDS: Urban Infrastructure, Infrastructure Condition, Housing

1.0 BACKGROUND TO THE STUDY

Residential land use is a major and prevalent land use type that occupies reasonable proportion of available urban land space. This type of land use is dominated by residential buildings which currently in urban areas of Nigeria are of high demand and persistent challenges due to burgeon population explosion and urbanization. The result is poor state of residential settlements, particularly in low income and high density neighbourhoods (Ogunleye, 2013; and Owoeye & Ogundiran, 2014). Buildings otherwise called housing or houses are a type of urban infrastructure that is a basic human need. It is a type of urban infrastructure that is significant in sustaining and advancing city functionality, economic growth and residents quality of life (Asikhia and Uyoyoghene, 2011). Good quality and sufficient housing infrastructure are vital elements of prosperity of any nation (Saed, Kamariah, Mohammed, & Johani, 2015). A shortfall in this type of urban infrastructure can stamp a negative label on the actualization of overall urban development (Misgap, 2014). The World Health Organization in Toyobo, Muili, & Adetunji, (2014) defined residential housing infrastructure as a "residential environment which includes, in addition to the physical structure that man uses for shelter, all necessary services, facilities, equipment and devices needed or desired for the physical and mental health and social well-being of the family". This implies that housing infrastructure is a type of infrastructure that doubles as both soft and hard infrastructure (Spacey, 2017). This infrastructure encompasses the building and other internal and external facilities that makes the house functional such as sewage and sanitation facilities, roads, electricity, water, drainage, waste disposal and other systems. Adeoye, (2016) opines that housing infrastructure is more than shelter itself but a multidimensional package of goods and services that are essential for good quality residents' and community life. Ali, (2012) asserts that the key urban infrastructure that connects and contain other infrastructure is housing infrastructure and that housing infrastructure is the wheel that processes other economic inputs and thus providing the enabling environment for sustained economic growth and wealth creation. Housing infrastructure links all other land uses be it residential, commercial, industrial, recreational, institutional and even transportation uses.

Although several authors have defined housing infrastructure differently, Section 36 of the Government Infrastructure Concession Regulatory Commission (Establishment) Act, (2005) of Nigerias' definition which considered housing as mere shelter will make

the most meaning for this study. This study will look at housing as the structure, the building, the residential abode of the respondents. The study will involve systematic inspection, review, and reporting on the state of residential building's structure and systems (including the foundation, walls, floors, roofs, windows, doors, facial boards and ceilings.

In Port Harcourt municipality, the Rivers State Government (RSG) has expended multiples of millions of naira in residential social housing provision and has developed public housing estates for her staff members within the study area.

2.0 STATEMENT OF THE PROBLEM

The high rate of urbanization and population explosion has placed strong demand on housing infrastructure. The high cost of land for development, high cost of rent has made the government to intervene in social housing provision and delivery. Between 1986 – 1998, the Rivers State Government built 12 residential estates for her staff members in the study area. The responsibility of maintenance of the houses were left to the owner occupiers. What is the state of those houses which has been built for over 30years? Since the government provides the infrastructure but do not totally manage and maintain the infrastructure, it is believed that most of these public housing estates will be affected by building decay and deterioration. It is on this note that this study is poised to ascertain the physical condition of buildings within the public housing estates in Port Harcourt municipality.

3.0 LITERATURE REVIEW

Port Harcourt was a coastal port of about 30,000 acres and was discovered by the British colonial administration between 1912 and 1914 to fulfill the purpose of evacuation of agricultural produce and coal out of the Atlantic. The city as discovered, designed and built with an array of colorful flowers and trees was named after the then British Secretary of State for Colonies, Lewis Harcourt (Ede, Owei and Akarolo, 2008). But with the discovery of oil in 1955 in Olobiri, Port Harcourt expanded quickly beyond its original boundaries (presently about 470km2). Growth has been experienced in terms of population and physical space. The 1991 census fixed the population of Port Harcourt Local Government Areas at 440,399. Under the present 6.5 % growth rate for urban areas in Nigeria, the population as at 2020 has been lifted to 2735174 which translates to six times increase in population.

Spatially, Port Harcourt city has grown to cover much of the Upper Bonny River Basin. Originally the city covered a 25 km2 area between the UTC junction and the New Layout Market. In the land use and vegetation map of Nigeria (1975/76) the built-up area of Port Harcourt covered 17.4km^2. Twenty years later, a similar map showed the extent of the city as 89.4km^2. This is a five-fold increase. By the 1976 Local Government Reform, the Port Harcourt metropolis stretched from Choba and Rukpokwu in the north, Iriebe in the east and the main western channel of the Bonny River in the west. This is an area of over 239.6 km^2. Port Harcourt is still growing very fast and therefore the need, recently, for the establishment of the Greater Port Harcourt City (GPHC) by the Rivers State Government (GPHCDA, 2009).

According to the Rivers State Property Development Authority (RSPDA), (2018), there are twelve public housing estates that were provided by the Rivers State government in Port Harcourt municipality between 1986-1998. They are 1. Aggrey housing estate 2. Aggrey road housing estate 3. Ndoki housing estate 4. Marine base government housing estate 5. Aggrey road housing estate, 6. Civic servant quarters, Lagos Street 7. Bonny-creek road government Quarters 8. Khana street housing estate. 9. Benin-Uyo street housing estate (Mile 1 Diobu), 10. TMC housing estate, Abuloma 11. Senates housing estate Abuloma and 12. Elekahia housing estate.

Housing Shelter

Shelter forms part of the three basic needs of man. Therefore, the shortage of decent and comfortable accommodation in urban areas is one of the greatest problems confronting urban dwellers, especially in the low-income neighborhoods. This situation is factored by many contributors which are not limited to the high cost of housing development, problem of securing land, poverty, the difficulties associated with obtaining appropriate titles, over population and the resultant pressure on available accommodation and corruption in government land allocation systems.

Sustainable housing deficiency is a major problem that potentially affects economic development, education, land use, health, business, neighborhood vitality, the environment, transportation, and other aspects of the community (Enwin, & Dawaye, 2021). Iseh (2003) declared that the state of some urban infrastructure in Nigeria in discussion merely illustrates the problem but in reality, it is worse than as discussed. And so when authors discuss the state of housing in Nigeria and paints a picture of its shortfall, its poor quality and how it is not affordable but very expensive for the common man, without exaggeration, such assertions are actually the truth. The rapid population growth that cities in Nigeria experiences has not been adequately matched by a corresponding increase in housing demand. Olu-Sule (1990) and Akeju, (2007) affirmed that government investment in housing in the third world is limited and wasted on expensive projects designed to woo electorates rather than directed to meet real needs for housing. This scenario has resulted in the deplorable situation in most existing public housing schemes in Nigerian. While decent housing is regarded as the right of every individual, a great proportion of the Nigerian population lives in substandard, deplorable and unsanitary residential environments. (Anofojie, 2014)

Associated urban infrastructure that makes housing functional are electricity supply, water supply, road transportation, communication, drainage, sewage disposal, and housing. (Iseh 2003).

State of Infrastructural Development in Public Housing Estates in Port Harcourt L.G.A

The Rivers State government between 1986 to 1998 had built twelve residential housing estates in the study area. As the population continuous to grow with attendant growth in land value and rent for housing accommodation, there had not been serious effort on the part of the government in building new estates. Most of the estates that are been developed in emerging areas of the city are done by private developers at a price that only the rich can afford and so at the detriment of the common man; that is the low income and the no income earners. This development has resulted a situation where about 30% of Port Harcourt urban population are now living in inadequate housing (Azode, 2016). The lack of housing finance opportunities which is dominant is again contributing to housing deficit and infrastructural deficiencies (Azode, 2016) The Port Harcourt experience is not different from other cities in Nigeria because despite the provision and availability of some basic infrastructures like water, electricity and road networks in the estate, the level and condition of these facilities are still very inadequate and falls below the expected standard. (Amao, 2012)

Despite the enormous amount of money proposed for urban investment in the National Development Plan, very limited investment is made in her infrastructure (Olotuah, 2005). An increasing shortage of urban services and infrastructure characterize most of the public estate, and these are only accessible to a diminishing share of the population which in most cases are civil servants.

4.0 RESEARCH METHODOLOGY

Research Design

This study is a real life physical condition analysis and thus belongs to the pragmatic philosophical worldview (Kaushik and Walsh, 2019). Creswell (2011) noted that quantitative research is the process of collecting, analyzing, interpreting, and writing the results of a study. This study is a quantitative research. There are four main types of Quantitative research which are Descriptive, Correlational, Causal-Comparative/Quasi-Experimental, and Experimental Research. This quantitative research belongs to the class tagged 'Descriptive". Descriptive research is used to obtain information concerning the current status of the phenomena and to describe "what exists" with respect to variables or conditions in a situation (Mbugua, 2017). This research project is designed to provide systematic information about the phenomenon- condition of physical facilities in public housing estates in Port Harcourt.

In this study, the quantitative data were collected in the field and the data was used in establishing result descriptively and making recommendation (Cresswell, 2011).

Population and Sample Size

The population of the study comprises of all the twelve (12) public housing estates in Port Harcourt municipality. Six (6) among them making a percentage of 50% was the focus of this study and that includes Aggrey housing estates, Marine Base Government housing estates, Elekahia housing estates, Ndoki housing estates, Abuloma housing estate phase 1 and Khana street housing estates.

Sources of Data

Information was obtained both from primary and secondary sources. Primary sources include direct observation and administration of questionnaires. Secondary sources include journals, newspapers, government reports both online and hard book.

Sampling Technique

The sampling technique is the list of element from which the sample is actually drawn. Simple random sampling is used to ascertain the sample for this study (Cresswell, 2011). The sample for the study was 148 respondents drawn from the public housing estates in Port Harcourt municipality.

In the first stage, the study identified and listed Twelve (12) developed public housing estates in the study area. The identified estates available in the study area are namely;

Aggrey housing estate, Aggrey road housing estate1, Ndoki housing estate, Marine base government housing estate, Aggrey road housing estate2, Civic servant quarters, Lagos street, Bonny-creek road govt. Quarters, Khana street housing estate, Benin-Uyo street housing estate (Mile 1 Diobu), TMC housing estate Abuloma, Senates housing estate Abuloma, Elekahia housing estate.

In the second stage, the study randomly selected a total of six (6) public housing estates namely: Aggrey housing estates, Marine Base Government housing estates, Ndokihousing estates (Port Harcourt township), Abuloma housing estates phase 1 (Abuloma), Khana street housing estates (D-line), Elekahia housing estate (Elekahia). In the third stage, simple random sampling technique was used to select 108 respondents (Household heads) from the six selected housing estates.

Table 1: Randomly selected existing estates in the study area and year of development.

Estates selected	Year of Development	No. of Housing Units
Aggrey Housing Estate	1998-1990	119
Marine-base Housing Estate	1998-1990	121
Ndoki Housing Estate	1986-1998	159
Khana street housing estate	1992-1993	30
Elekahia housing estate	1986-1988	251
Abuloma housing estate, phase1	1990-1992	41
Total		721

Source: Tari & Anthony, 2018

Sample population = 721

Using 15% = $\frac{15}{100}$×721= 108

Table 2: Number of questionnaires distributed per estate

Selected Estates	Percentage (%) of Questionnaires Administered
Aggrey housing estate	17
Marine base housing estate	18
Ndoki housing estate	24
Khana street housing estate	5
Elekahia housing estate	38
Abuloma housing estate, phase1	6
Total	108

Therefore 108 questionnaires were administered

Analytical Techniques

Descriptive statistics was used with graphical approach (data were presented in bar charts, pie charts, histogram etc) and numerical approach (data were presented to derive quantitative measures that characterize given set of variables with the use of tables and mode).

5.0 DATA PRESENTATION AND ANALYSIS

Questionnaire Response from Public Estate Dwellers

A total of 108 questionnaires were distributed and 108 were properly completed and returned, representing a percentage of 100%. This response rate is considered to be adequate.

Table 3: Questionnaire Administered to Public Estate Dwellers

Questionnaire Distributed	Frequency (No.)	Percentage (%)
Returned	108	100
Not Returned	-	-
Total	108	100

Source: Field Survey, 2021

Age of Buildings

Table 4 shows the age of the building in the Estate, 61% of the buildings are 21 – 30 years old and 39% of the buildings are 11 – 20 years.

Table 4. Age of the Building

Age of Building	No	%
Less than 5 years	0	0
5 – 10 years	0	0
11 – 20 years	42	39
21 – 30 years	66	61
31 years +	0	0
Total	108	100

Source: Field Survey, 2021

Type of Building (Dwelling Unit)

Table 5 shows the type of building (dwelling unit) in the Estate, 61% of the building are semidetached house while 39% of the building are apartment/flats (Storey Building).

Table 5: Type of Building (Dwelling Unit)

Type of Building	No	%
Duplex	0	0
Terrace house	0	0
Semidetached house	66	61
Detached house	0	0
Apartment/flats (storey building)	42	39
Total	108	100

Source: Field Survey, 2021

Other Type of Building Usage within the Estate

Table 6 shows other types of uses of building in the estate .65% of the respondents said that there are corner shops in the estate, 19% said there is religious center, 12% said there is health center/clinic while 4% said that there is bakery in the estate.

Table 6: Other Type of Building Usage in the Estate

Available Facilities	No	%
Market	0	0
Health center/clinic	13	12
Corner shop	70	65
Religious center	21	19
Skill acquisition center	0	0
Bakery	4	4
Police station	0	0
Private security station	0	0
Telecom mast	0	0
CCTV Camera	0	0
Total	108	100

Source: Field Survey, 2021

Physical Condition of the Building

Table 7 below shows the physical condition of the building and it indicated that 9.3% of the respondents said No there is no foundation, 15% said Yes the foundation is good while 5.2% said No the foundation is good, 8.0% said No the foundation is faulty,4.6% said No the walls are not cracked, while 0.3% said Yes the walls are creaked.

Table 7: Physical Condition of the Building

Physical Condition	Yes		No	
	No.	%	No.	%
Roof is leaking	0	0	108	100
Cracked walls	20	18.5	88	81.5
No foundation	0	0	108	100
Foundation is faulty	20	18.5	88	81.5
Foundation is good	88	81.5	20	18.5
There are no ceilings	20	18.5	88	81.5
There are ceilings but in bad condition	75	69.4	33	30.6
No facial boards	0	0	108	100
There are facial boards but in bad condition	91	84.3	17	15.7
Facial boards in good condition	17	15.7	91	84.3
Good windows	100	92.6	8	7.4
Bad windows	8	7.4	100	92.6
Doors in good conditions	90	83.3	18	16.7
Doors in bad conditions	18	16.7	90	83.3
Buildings needs painting	77	71.3	31	28.7
Buildings do not need painting	31	28.7	77	71.3
Buildings needs renovations	75	69.4	33	30.6
Buildings do not have water system	5	4.6	103	95.4
Building have water system	103	95.4	5	4.6
Building is connected with modified water system (pour and flush)	5	4.6	103	95.4
Building has pit latrine	0	0	108	100
Building is connected to estate water supply	0	0	108	100
Building is not connected to estate water supply	108	100	0	0
Building is not connected to estate electrical supply	0	0	108	100
Building is not connected to estate drainage supply	20	18.5	88	81.5
Kitchen is inside the building	100	92.6	8	7.4
Kitchen is outside the building	8	7.4	100	92.6
Bathroom is inside the building	100	92.6	8	7.4
Bathroom is outside the building	8	7.4	100	92.6-
Others, specify	0	0	0	0

Source: Field Survey, 2021

Type of Roofing Sheets

Table 8 show the type of roof material used in the Estate, 61% of the building are roof with corrugated iron sheet (zinc), 39% of the building are roof with aluminum roof (long span).

Table 8: Type of Roof Sheets

Roof Type	No	%
Corrugated iron sheet (zinc)	66	61
Aluminum roof (long span)	42	39
Cameroon roof (short span)	0	0
Tiles (slates)	0	0
Asbestos	0	0
Plastic	0	0
Total	108	100

Source: Field Survey, 2021

Type of Wall

Table 9 shows the type of wall material used in the Estate and it indicates that 100% of wall of the buildings are used with block (sandcrete).

Table 9: Type of Wall

Wall Type	No	%
Block (sandcrete)	108	100
Plywood	0	0
Corrugated iron sheet	0	0
Plywood/Aluminum/Block	0	0
Burnt Brick	0	0
Others, specify	0	0
Total	108	100

Source: Field Survey, 2021

Type of window

Fig 1 shows the type of window material used in the Estate, 78% of the window are used with GMP which is the highest proportion, followed by window used with wood, while there was no window used with luvres, steel and glass, wood and glass.

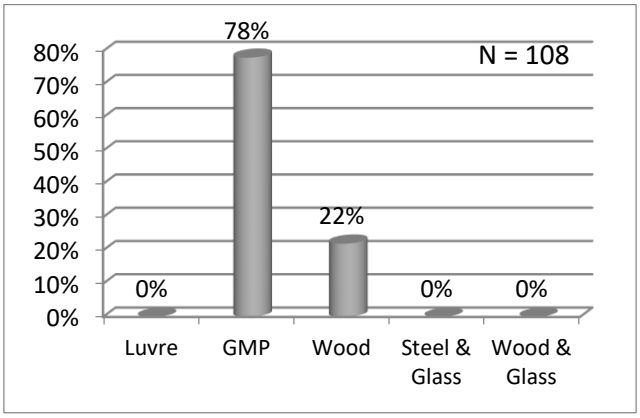

Fig 1: Type of Window

Source: Field Survey, 2021

Type of Doors

Table 10 describe the types of door materials used in the Estate and it shows that 63% of the buildings were used with steel and glass while 37% used wood only.

Table 10: Type of Doors

Door Type	No	%
Wood only	40	37
Aluminum and glass	0	0
Steel and glass	68	63
Corrugated iron sheet	0	0
Wood and glass	0	0
Others	0	0
Total	**108**	**100**

Source: Field Survey, 2021

Types of Ceiling

Table 11 shows the types of ceiling used in the Estate, 65% of the buildings were used with asbestos, 28% used paper celling (cardboard) while 7% used PVC sheet.

Table 11: Type of Ceiling

Ceiling Type	No	%
PVC sheet	8	7
Asbestos	70	65
paper ceiling (cardboard)	30	28
Others	0	0
Total	**108**	**100**

Source: Field Survey, 2021

Type of Flooring

Table 12 shows the types of flooring materials used in the building, 72% of the floor material were used with ceramic tiles, 28% of the building in the Estate were plastered floor.

Table 12: Type of Flooring

Floor Type	No	%
Ceramic tiles	78	72
Plastered floor	30	28
Others	0	0
Total	**108**	**100**

Source: Field Survey, 2021

Type of Facial Board

Table 13 shows the type of facial board materials used in the building, 93% of buildings were used by wood material while only 7% of the building were used by aluminum material.

Table 13: Type of Facial Board

Type of Facial	No	%
Wood	100	93
Aluminum	8	7
Others	0	0
Total	**108**	**100**

Source: Field Survey, 2021

Overall Housing Conditions

Table 14 indicates that 65% of the overall housing condition is good (needs no repair) while 35% of the overall housing condition is fairly good (needs minor repair).

Table 14: Rating of the Overall Housing Condition

	No	%
Good (needs no	70	65
Fairly good (needs minor repair)	38	35
Bad (needs major repair)	0	0
Very bad (beyond repair)	0	0
Total	**108**	**100**

Source: Field Survey, 2021

6.0 DISCUSSION OF FINDINGS

Physical Conditions of Buildings within the Public Housing Estate

The data in Table 7 shows the physical condition of the buildings and it indicated that 81.5% of the respondents said the foundation is good, 18.5% said the foundation is not good, 18.5% said the foundation is faulty, 81.5% said the walls are not cracked, while 18.5% said the walls are creaked.

In the aspect of the building materials, the types of roofing materials used in the study area were Aluminum roof (long spam) corrugated iron sheet; materials used for the wallwas basically block (Sandcrete) material; materials used for the window were GMP material and wooden material. This implies that, a lot of the respondents in this estate cannot afford the expensive kind of windows but would rather prefer to use the wooden material base of the cost of building materials. The materials used for the ceiling were mostly Asbestos ceiling, paper (cardboard) ceiling with few using PVC ceiling. More of the paper ceilings could be found in the Aggrey housing estates and the Khana street housing estates at D-line. The materials used for flooring were mostly ceramic tiles and ordinary plastered floor. Facial board in the estates are more of wooden materials and few of Aluminum materials. The overall housing condition as indicated by Table 14 is good (needs no repair) 65% while 35% of the overall housing condition is fairly good (needs minor repair).

Plate 1: Marine Base Civic Servant Quarters showing the Physical Condition of the Buildings
Source: Field Survey, 2021

Summary of Findings

The study revealed some important outcomes.

1. The Building condition of most of the buildings are good while others fairly good and thus need rehabilitation.
2. The estate is managed by the landlords' association and not the government. There are a lot of weaknesses towards this strategy.

7.0 CONCLUSION AND RECOMMENDATION

Good building condition, availability and adequacy of infrastructural facilities in any residential estate or settlement is a pointer to a safe, clean, healthy and good quality environment and also a positive determinant of quality of life of the residents.

The study revealed that the overall condition of buildings in the estates are good as very few need prompt attention. It is therefore recommended that Government should not overlook the provision and management of public housing estates in the study area to only landlords' association but should function effectively in terms of planning, monitoring and supervision of the estates and facilities through her ministries.

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