

# AVAILABILITY ASSESSMENT OF HOUSING INFRASTRUCTURAL FACILITIES IN PUBLIC HOUSING ESTATES OF PORT HARCOURT MUNICIPALITY

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## Abstract:

The condition of physical infrastructure in public housing estates of Nigerian cities are observed to be suffering from persistent and challenging problems of inadequacy and deterioration. This study is poised to ascertain the availability and condition of housing facilities in public housing estates of 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 out of twelve public housing estates identified within the study areasix housing 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 respectively. A proportionate procedure was used to select 108 respondents (household heads) for the study. Questionnaire, physical observation, digital camera and Microsoft excel software were the tools used for data collection and analysis which was presented descriptively in tables, charts and percentages. The research findings show the available public utilities in the estates which are electricity, water (supply mostly private boreholes), drainage, street lights, access road and refuse disposal facilities. The study indicates that the hardware of water supply, electricity supply and access road were available but needs government rehabilitation intervention.

**KEYWORDS:** Urban Infrastructure, Housing Facilities, Availability Assessment

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## I INTRODUCTION

A persistent and challenging problem induced by population explosion and urbanization in Nigerian cities today is the inadequacy in the provision, development and management of urban infrastructure (Vincent, 2011). A shortfall in urban infrastructure makes overall urban development near impossibility (Misgap, 2014). Urban infrastructure is significant in sustaining and advancing city functionality, economic growth and residents quality of life (Asikhia and Uyoyoghene, 2011). Saed, Kamariah, Mohammed, & Johani, (2015) stated that good

quality and sufficient infrastructure are vital elements of prosperity of any nation. Housing is one type of urban infrastructure that is a basic human need and so the World Health Organization in Toyobo, Muili, & Adetunji, (2014) defined it 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. This to a level agrees with part of Section 36 of the Government Infrastructure Concession Regulatory Commission (Establishment) Act, (2005) of Nigeria which considered housing as mere shelter but involves the immediate environment, sanitation, drainage, recreation facilities and all other economic and social activities that make life worthwhile. In this regard, 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.

In Port Harcourt municipality, the Rivers State Government (RSG) has expended millions of naira in residential social housing provision and has developed public housing estates for her staff members. To ascertain the available facilities and assess the physical condition of these facilities in the estates is the interest and objectives of this paper.

## **II 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. This has benefited some staff in government service on having access to housing accommodation. 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 both building and other infrastructure deterioration. In Port Harcourt municipality, the Rivers State Government (RSG) has made frantic efforts to provide or improve the infrastructural state in public housing for her inhabitants. What are the facilities that are provided and available? And again, what is the physical condition of these infrastructural facilities in the study areas?

## **III 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 470km<sup>2</sup>). 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 km<sup>2</sup> 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<sup>2</sup>. Twenty years later, a similar map showed the extent of the city as 89.4km<sup>2</sup>. 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<sup>2</sup>. 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.

### **Associated Urban Infrastructure**

Associated urban infrastructure that makes residential housing estates functional cut across the basic amenities and ancillary facilities. Whether called amenities or ancillary facilities, it is known that they enhance the liveability and comfort of urban dwellers in residential areas (Ogunbajo, 2016). The role of these amenities or ancillary facilities is to enhance the value of the houses and the neighbourhood. The basic amenity class include electricity supply, water supply, road transportation, communication,

drainage and sanitation or waste management facilities and shelter (Iseh 2003; Das, Das, & Barman, 2021)). Basic amenities such as drinking water facility, sanitation facilities and drainage arrangement require special attention in both rural and urban areas (Kumar, 2014). Other estate neighbourhood infrastructural facilities include health centers, corner shops/ retail shops, neighbourhood schools, market. Religious center, police post etc

## **IV 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. 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 municipality.

### **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
<b>Total</b>		<b>721</b>

Source: Eyenghe& Enwin, 2018

Sample population = 721

$$\text{Using } 15\% = \frac{15}{100} \times 721 = 108$$

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
<b>Total</b>	<b>108</b>

Source: Field Survey, 2021

Therefore 108 questionnaires will be 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).

## V 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

Regularity of Electrical Supply	No	%
Constant all day (night/24hrs)	0	0
Available at night	7	6.5
Available during the day	7	6.5
Not regular	94	87
<b>Total</b>	<b>108</b>	<b>100</b>

Source: Field Survey, 2021

### Availability of Electricity

Table 4 shows the availability of electricity in the Estate and it deduced that 100% of the electricity is available/present.

TABLE 4  
AVAILABILITY OF ELECTRICITY

Questionnaire Distributed	Frequency (No.)	Percentage (%)
Returned	108	100
Not Returned	-	-
<b>Total</b>	<b>108</b>	<b>100</b>

y, 2021

### Source of Electricity Supply

Table 5 shows the source of electricity supply in the study area and it deduced that 91% the electricity supply is from PHCN/PHED while only 9% used private generator in the Estate.

TABLE 5  
SOURCE OF ELECTRICITY SUPPLY

Electricity	No	%
PHCN/PHED	98	91
Estate generator	0	0
Private generator	10	9
<b>Total</b>	<b>108</b>	<b>100</b>

Source: Field Survey, 2021

### Regularity of the Electrical Supply

Table 6 below shows the regularity of the power supply in the estates, 87% of the respondents said the power supply is not regular, the power distribution company (PHCN/PHED) decides how and when power is regulated in the study area while, 6.5% each said that the power supply is available during the night and day respectively.

TABLE 6  
REGULARITY OF THE ELECTRICAL SUPPLY

Electricity	No	%
Available/present	108	100
Not available/Not present	0	0
<b>TOTAL</b>	<b>108</b>	<b>100</b>

Source: Field Survey, 2021

### Availability of water supply

Fig 1 shows the percentage of water supply availability in the estates visited, 17% of estates have water provided and 83% do not have. The subscribers of estates without water supply provide alternative source of water for themselves by sinking boreholes. The main reason for the poor provision of water in the estates can be linked to government's inability to provide districts with water supply from the main truck line.

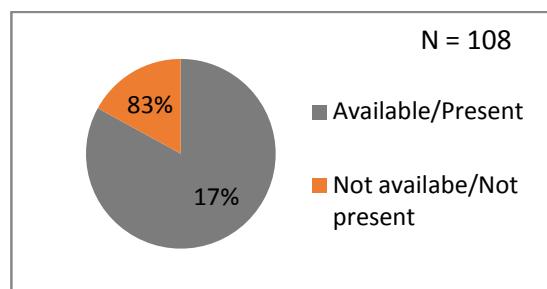


Fig 1: Availability of Water Supply

Source: Field Survey, 2021

### Sources of Water Supply

Table 7 shows the sources of water supply in the study area and it indicates that 83% of the respondents get their source of water supply

through private borehole while 17% get their source of water supply through private water vendor.

TABLE 7  
SOURCE OF WATER SUPPLY

Water supply	No	%
Public water main with stand pipes	0	0
Public boreholes (mono pumps)	0	0
Estate water supply via pipes	0	0
Government water tankers	0	0
Private water tankers	0	0
Private boreholes	90	83
Private water vendors	18	17
<b>Total</b>	<b>108</b>	<b>100</b>

Source: Field Survey, 2021

### Condition of the Road Infrastructure

Table 8 shows the condition of the road infrastructure and it deduced that 74% of the roads are tarred but with many bad spots, 17% of the road is tarred but needs rehabilitation while 9% of the road are tarred in parts.

TABLE 8  
ROAD INFRASTRUCTURAL CONDITION

Road condition	No	%
Tarred	0	0
Not tarred	0	0
Tarred but with many bad spots	80	74
Tarred in parts	10	9
Tarred but needs rehabilitation	18	17
<b>Total</b>	<b>108</b>	<b>100</b>

Source: Field Survey, 2021

### Condition of Road Network

Fig 2 shows the condition of the road network in the study area and it shows that 83% of the road networks are in good condition while 17% of the road networks are in bad condition.

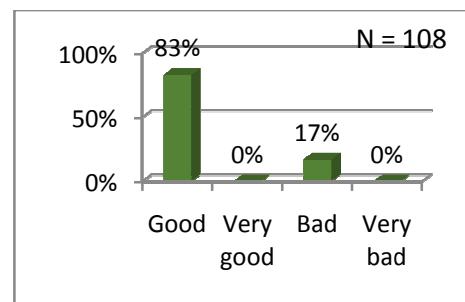


Fig 2: General Road Condition  
Source: Field Survey, 2021

### Availability of Drainage System

Fig 3 shows the availability of drainage system in the study area, 93% of the respondents said yes there is availability of drainage system in the study area while only 7% said no.

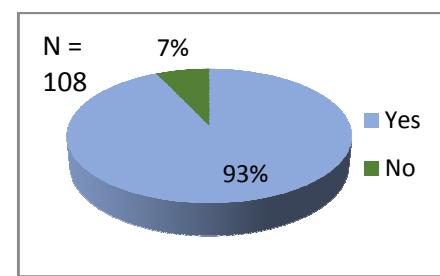


Fig 3: Drainage System in the Estate  
Source: Field Survey, 2021

### Drainage flowing

Table 9 shows whether the drainage are flowing well, 75% said No the drainage are not flowing well while 25% said Yes the drainage are flowing well in the study area.

TABLE 9  
DRAINAGE FLOWING

Drainage flowing	No	%
Yes	28	25
No	80	75
<b>Total</b>	<b>108</b>	<b>100</b>

Source: Field Survey, 2021

### Drainage Blocked

Fig 4 shows whether the drainage is blocked, 75% said No the drainage are not blocked while 25% said Yes the drainage are blocked.

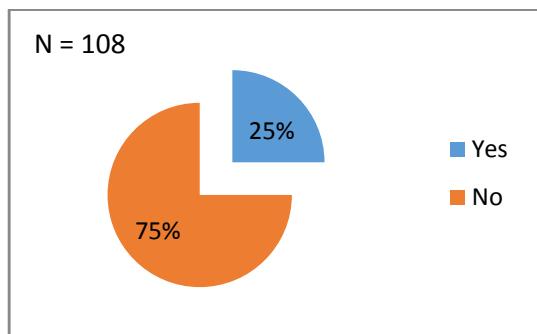


Fig 4: Drainage Blocked  
Source: Field Survey, 2021

### Availability of Street Light

Fig 5 shows the availability of street light in the study area, 9% of the respondents said that availability of street light is present while 91% said that availability of street light is not present.

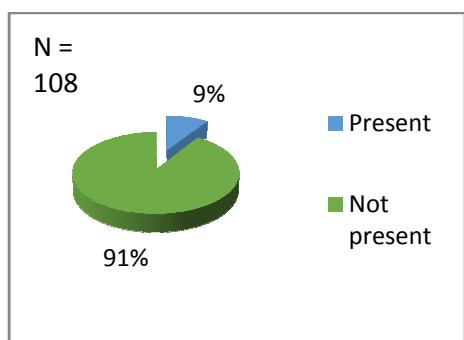


Fig 5: Street Light  
Source: Field Survey, 2021

### Regularity of Street Light Supply

Table 10 shows the regularity of street light supply, 28% of the respondents said that the regularity of street light supply is based on availability of power while 72% did not answer anything.

TABLE 10  
REGULARITY OF STREET LIGHT SUPPLY

Street light supply	No	%
Street lights on all night	0	0
Street lights not on all night	0	0
Based on availability of power	30	28
No answer	78	72
<b>Total</b>	<b>108</b>	<b>100</b>

Source: Field Survey, 2021

### Type of Street light supply

Table 11 shows the type of street light supply, 9% of the respondents said that they get street light supply from solar energy, 19% from PHCN/PHED powered while 72% did not answer anything.

TABLE 11  
TYPE OF STREET LIGHT SUPPLY

Type of Street light	No	%
Solar powered	10	9
PHCN/PHED powered	20	19
Estate generator powered	0	0
No answer	78	72
<b>Total</b>	<b>108</b>	<b>100</b>

Source: Field Survey, 2021

### Generator that Powers the Estate

Table 12 shows whether there is any private generator that power the Estate and the below table indicates that 100% of the respondents said No there is no private generator that power the Estate.

TABLE 12  
PRIVATE GENERATOR THAT POWERS THE ESTATE

Private Generator Availability	No	%
Yes	0	0
No	108	100
<b>Total</b>	<b>108</b>	<b>100</b>

Source: Field Survey, 2021

### Availability of Recreational Area

Table 13 shows the availability of recreational area, 82% of the respondents recreate in a special estate playground while 17% recreate in an open space attached to building.

TABLE 13  
AVAILABILITY OF RECREATIONAL AREA

Recreation	No	%
Open space attached to building	18	17
Special estate playground	90	83
Estate recreation clubs	0	0
Estate hall	0	0
Others	0	0
<b>Total</b>	<b>108</b>	<b>100</b>

Source: Field Survey, 2021

### Availability of Septic Tank and Soak away

Table 14 shows the availability of septic tank and soak away. 100% of the respondents said there is availability of septic tank and soak away in the study area.

TABLE 14  
AVAILABILITY OF SEPTIC TANK AND SOAK AWAY

Septic Tank	No	%
Present	108	100
Not present	0	0
<b>Total</b>	<b>108</b>	<b>100</b>

Source: Field Survey, 2021

### Condition of Septic Tank and Soak away

Table 15 shows the condition of septic tank and soak away. 83% of the respondents said that the condition of septic tank and soak away are in good condition while 17% were not in good condition.

TABLE 15  
THE CONDITION OF SEPTIC TANK AND SOAK AWAY

Condition	No	%
Very good	0	0
Good	90	83
Very bad	0	0
Bad	18	17
Not ascertained	0	0
<b>Total</b>	<b>108</b>	<b>100</b>

Source: Field Survey, 2021

### Availability of Refuse Disposal Site

Fig 6 shows the availability of refuse disposal site, 17% of the respondents agreed that the availability of refuse disposal site is present while 83% said no.

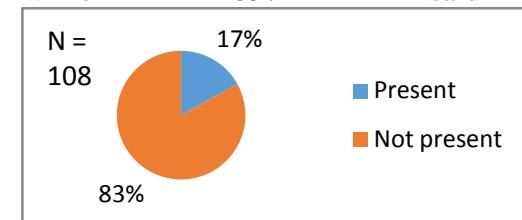


Fig 6: The Availability of Refuse Disposal Site  
Source: Field Survey, 2021

### Type of Refuse Disposal Present

Table 16 show the type of refuse disposal present; 81% agreed that there are sanitary landfills while 19% agreed that there are other means of refuse disposal.

TABLE 16  
THE TYPE OF REFUSE DISPOSAL PRESENT

Refuse Disposal	No	%
Estate silo bins	0	0
Incinerators	0	0
Sanitary landfills	88	81
Others	20	19
<b>Total</b>	<b>108</b>	<b>100</b>

Source: Field Survey, 2021

### **Other Facilities Available in the Estate**

Table 17 shows the other types of facilities available in the Estate and it indicates that 65% of the respondents said that there is corner shop 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 17  
OTHER FACILITIES AVAILABLE 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
<b>Total</b>	<b>108</b>	<b>100</b>

Source: Field Survey, 2021

## **VI DISCUSSION OF FINDINGS**

### **Availability and Condition of Infrastructure within the Public Housing Estates**

There are several available infrastructures in the study area which include the following; electricity, water supply, drainage, street light, sewer lines, recreational facility, access roads, refuse disposal. The findings of the study indicate that all the respondents agreed that there is electricity supply in the study area. The main source of electrical supply was PHCN/PHED while some of the respondent attested that they use private generators are their alternate source of electrical supply. Respondents said that they use private generator because of the inconsistency and irregularity from the power distribution (PHCN/PHED) to give light regularly. Power shortage is really a challenge

residents complained. The use of private generator happens to be a source of noise pollution in the estate. For water supply, residents rely on their private borehole as there are no public water supply in the estate. Some of the residents said that their apartment is connected to the water main but that there is no water at all and so they get water from private water vendors. This could lead to the spread of water borne diseases as most of the water tanks are not properly washed, water treated and borehole may not be on acceptable limits.



Plate 1 Showing the Private Borehole as a Source of Water Supply  
Source: Field Survey, 2021

For access road, most of the roads are tarred but with many bad spots and thus needs rehabilitation.



Plate 2: Showing the Road Infrastructural Condition at Aggrey Housing Estate

Source: Field Survey, 2021

Major parts of all the estates are reticulated with drainage system although, some of these drainages are not flowing due to some factors like the flatness of the area and residents indiscriminate dumping of refuse in the drainage system thus blocking the drainage system.



Plate 3: Indiscriminate Dumping of Refuse in the Drainage in Aggrey Housing Estate

Source: Field Survey, 2021

There is the availability of street light in the estates but most of them are not working due to the unavailability of steady electricity and non-replacement of dead bulbs. For Elekahia housing estate, there is the availability of solar street lights which were installed by the estate community effort. The research finding indicates that there is the availability of recreational area in the estate and 83% of the respondents said that there is a special estate playground available while 17% said that open spaces are attached to the building. The condition of the available recreational facilities is good but needs minor rehabilitation, most of the open spaces for recreational activities are reconverted for other purposes especially in Aggrey housing estate,

where the only available recreational facility is being converted to a place of worship, most open spaces in Ndoki housing estate have been used up for commercial purposes.

Concerning the availability of refuse disposal site in the estates, the research finding deduced that 83% of the respondents said that there is no available disposal site while, 17% said there is a center designated for refuse disposal. The prevalent method is sanitary landfill and this is the type of refuse disposal that is available at the Ndoki housing estate and some part of the Elekahia housing estate. Others resorted to the use of private vendors and most residents walk outside the estate to government designated waste center to throw their waste. In those estate located near the wetland like the Ndoki and Aggrey housing estate, the refuse is thrown into the waterway or most times thrown inside the drain.

### **Summary of Findings**

The study revealed some important outcomes.

1. Infrastructural facilities which were publicly provided are no longer operating fully. Mostly electricity supply and potable water supply have become unreliable thus making residents resort to private alternatives.
2. Access roads are another important facility in the study area that needs serious attention. Generally, the estates roads need rehabilitation.
3. Refuse disposal strategy is a major challenge as there is no organized refuse disposal in the estate. Occupants in the housing estate disposes their refuse indiscriminately leading to dirty environment and blockage of drainage channels. This hampers the free flow of run-off and constitutes comfortable

breeding grounds for flies, mosquitoes and other health-infected animals that could contribute to the spreading of diseases.

## VII CONCLUSION

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 the availability of the prerequisite facilities in the study area. The study also found out the challenge with the available facilities as most of them happens to be in a state of decline thus leading to residents' dependency on alternate sources. The study concludes that, in order to ascertain effective functionality of physical infrastructure in the public estates, government attention is needed. It is therefore recommended that the government should intervene in the maintenance of public utilities within the public housing estates (like roads, drainage, electric poles, water and waste management) and not to leave this functions to the landlord association

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