

Appraisal of Housing Inequality and Its Effects on Environmental Quality in GRA Phase II and Diobu Mile II Harcourt City

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ABSTRACT

Inequality is the state of being unequal in rewards, status, rights and opportunities. Environmental inequality occurs when particular groups are unduly burdened by environmental hazards. The concern about inequalities in urban centres and its impact on environmental quality has led to an increasing interest on how to measure the urban inequalities that exists and its influence on environmental qualities in urban centres. This study appraised the effects of housing inequality on environmental quality in Diobu Mile II and GRA Phase II neighbourhoods in Port Harcourt city, Rivers state, Nigeria. The ex-post facto design was employed for this study. Through a household survey, 369 respondents were randomly sampled in each of the two neighbourhoods. T-test technique was used to test the significant difference that existed between the identified variables in the two neighbourhoods. Findings showed that the rate of basic amenities such as access to public water supply, good roads, level of natural lighting and ventilation and type of toilet facility revealed that GRA Phase II had better infrastructural facilities than Diobu Mile II with 28.4% of respondents in Diobu Mile II made use of public toilet while 48.8% of respondents in GRA Phase II made use of interior toilet with flush tank. For domestic waste management, respondents in Diobu Mile II (37.5%) stated that the waste was evacuated twice in a week while in GRA Phase II (82.9%) stated that waste was evacuated on a daily basis. The Levene's test for equal variances assumed is rejected, since its p-value (0.000) is greater than 0.05 and calculated absolute t for housing types (=14.553), sanitation and other practices (=4.007), and environmental attributes (=6.267) respectively were greater than the t-critical (1.645). The responsible agency for waste evacuation in Diobu Mile II (67.4%) was predominantly the government agency while in GRA Phase II (61.0%), waste evacuation was done by private agency. Government should help in the reduction of inequality by creating a more level playing field that is conducive to the adoption of more pro-environment policies and also to collaborate with public/private organizations to ensure that proper education and awareness programmes on how to manage solid waste is administered to residents in the two neighbourhoods.

KEYWORDS: Inequality, Housing Types, Sanitation, Environmental Quality

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I. INTRODUCTION

In recent times, there has been a steady rise in inequality in Nigeria, especially in Port Harcourt, Rivers State. Nigeria, with a population of over 180million people, have been reported to having about 62% of the population living in poverty (Aigbokhan, 2000). About 2,500 years ago, Plato wrote that 'any city, however small, is in fact divided into two, one city of the poor, the other of the rich' (Glaeser *et al.*, 2009) and this disparity between the two groups is still in existence.

Inequality is the state of being unequal (not equal) in rewards, status, rights and opportunities (Phan, 2016). From the definition it can be seen that there is deprivation of a section to certain outcomes, opportunities or services. It is wide spread and may be inevitable but if rising inequality goes unchecked it would lead to economic, political and social mayhem (Alvaredo *et al.*, 2018; UNDP, 2013). Although some have argued its desirability because of the trickle-down effect, which is the belief that as time progresses the economic gains would trickle down to the lower income group. This however has not been the reality in some countries like Nigeria where the Gini Coefficient was seen to rise from 0.41 to 0.49 in 1992 and 1996 respectively (Aigbokhan, 2017). The study concluded that the economic gains did not have the trickle-down effects as predicted.

Urban inequality is the unevenness in quality of life, social wellbeing, economic and infrastructural development of people living in different areas within a city, while one side lives in urban comfort, the other side lives in urban poverty. Urban inequality is the disparity in available resources and services provided for

different communities. While a part of the city is provided with facilities and infrastructures such as hospitals, good schools, good roads and police presence, the other part of the city lacks those basic amenities.

Inequality exists in different forms which can be due to differences in income, opportunities, social status, gender, race, environment or educational attainment. Ensuring environmental quality has to do with providing a safe and clean environment for people to live in. Regular collection and safe disposal of waste, provision of water, good drainage and sanitation is paramount to creating that living environment which supports our health (Wokekoro and Inyang, 2007). A quality environment greatly influences the psychological, physical and social wellbeing of people and communities at large (Folks, 2010).

Environmental inequality occurs when particular groups are unduly burdened by environmental hazards. According to Babanyara *et al.* (2010), forty to sixty percent of the people who reside in the urban areas in developing countries lack adequate sanitation and the slum dwellers are more exposed and therefore very vulnerable to sanitation related diseases. Education is also important because people need to know the negative effects of littering and dumping of waste in open spaces or open drainages. They also need to be taught about sanitation and how to keep their environment clean which could also contribute to the environmental inequality experienced in urban areas.

Port Harcourt is an oil rich city in the Niger Delta region of Nigeria. A city experiencing rapid growth and urbanization with a population of over 2 million as it is made up of two local government areas, which are the Port Harcourt City Local Government Area (PHALGA) and Obio/Akpor Local Government Area (Wokekoro, 2015; Igoniet *et al.*, 2007; Nna&Pabon, 2012). Unfortunately, such growth has been relegated to certain areas, with rising urban poverty. Some areas experience unsanitary physical conditions, poor infrastructural development and waste management. The specific objectives of this study are to appraise the housing types in the study areas as influenced by urban inequality and its effects on environmental quality.

Research Questions

Based on the objectives, the following research questions were formed:

- i. Are there differences in housing types as it affects urban inequality and environmental quality?
- ii. How is sanitation and other practices regarding domestic waste disposal, collection and management and its correlation to environmental quality?

Hypothesis

Based on the research questions, the following hypotheses were formed:

H₀: There is no significant difference in housing types as it affects urban inequality and environmental quality

H₀: There is no significant difference in sanitation and other practices regarding the collection and disposal of domestic waste and its correlation to urban inequality in the study areas.

Study Area Description

The study area which covers GRA Phase II and Diobu Mile II as part of the Port Harcourt City Local Government Area (PHALGA) of Rivers State. The new GRA according to Wikipedia (2017) is an upper-middle class neighbourhood divided into five (5) phases. To the south it is bordered by Diobu and D-Line, to the north by Rumuola, to the east by Elekahia and to the west by Rumueme. The geographical coordinates of the neighborhood lies on latitude 4°45'0"N, 4°55'0"N and longitude 6°55'0"E, 7°10'0"E (Figure 1).

Diobu is a densely populated area mostly regarded as a low-income neighbourhood according to Wokekoro & Inyang (2007). It has three main extensions of Mile I, 2 and 3. It is home to numerous market places and the major roads which used to be in bad condition according to Kio-Lawson & Dekor (2014), have been repaired and are in good condition at the time of this study. It had an estimated population of 303,946 and a waste generation rate of 384,130kg/day in 1997 (Ayotamuno & Gobo, 2004).

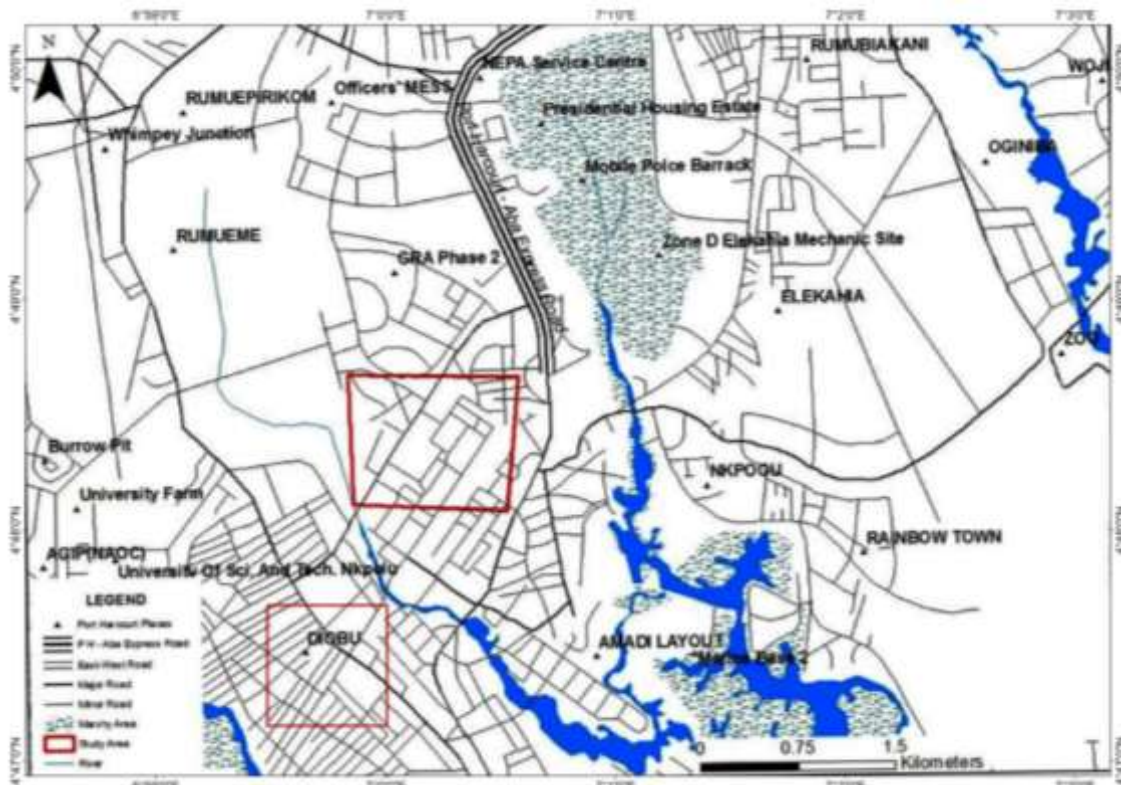


Figure 1: Study Area: Port Harcourt

II. RESEARCH METHODOLOGY

The *ex-post facto* design was employed to carry out this research. This method was considered because the *ex-post facto* design is ideal for conducting social researches and this research falls under that category since it tries to examine environmental settings such as housing types, adequate basic utilities, and domestic waste management. This method also studied these environmental attributes that have already occurred or are in existence as these facts cannot be manipulated by the researcher because it involves the physical character display of these residents. Finally, this design looked at GRA Phase II and Diobu Mile II areas knowing their different terrains, and why observable disparities have occurred over time.

2.1 Methods of Data Collection

Primary and secondary data were collected. The secondary data was extracted from records, journals, seminar papers and through the internet. While the primary data was gotten by questionnaire method and on the spot determination of housing types, environmental quality sensitivity, basic utilities and sanitary practices with regards to the disposal and management of domestic waste within the study areas. The questionnaire was administered randomly face-to-face to various occupants of the two residential areas (Ngbundukwu (Diobu Mile II) and Oromerezimbu (GRA Phase II)). The questionnaires were structured in order to gather the following information: Types/rates of housing infrastructures – type of settlement (private and commercial structures), rent bracket etc. and also domestic waste management practices – presence and number of waste bins provided, frequency of waste collection, waste facility facilities etc. This formed the major part of this study.

2.2 Data Analysis

Results obtained were subjected to statistical analysis using descriptive statistical methods and data were presented using tables, charts and graphs with the aid of a computer-based program – SPSS (version 22) statistical software. T-test analysis was employed to determine the significant difference between the dependent and independent variables.

III. RESULTS AND DISCUSSION

From the total number of questionnaires administered (400 copies) and retrieved (369 copies) in the two neighbourhoods, Ngbundukwu (Diobu Mile II) had 328 respondents representing 88.9% while Oromerezimbu (GRA Phase II) had 41 respondents representing 11.1% (Figure 2).

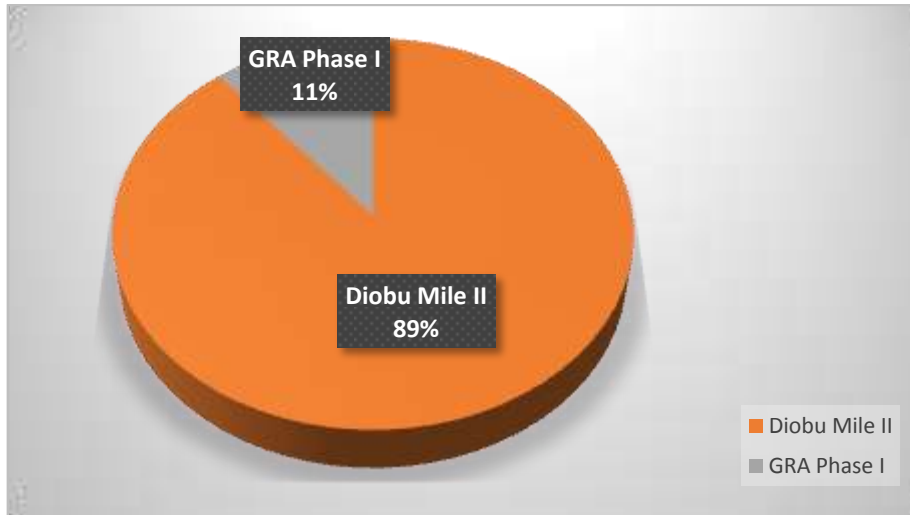


Figure 2: Percentage Distribution of Questionnaire Administered in the Study Areas

3.1 Research Question 1

Are there differences in housing types as it affects urban inequality and environmental quality?

The presence of different housing types and access to natural ventilation and lightning in Diobu Mile II and GRA Phase II shows that in Diobu Mile II, 69 respondents representing 21% said they were not at all satisfied, 67 respondents representing 20% said they were not satisfied, 67 respondents representing 20% said they were less satisfied, 67 respondents representing 20% said they were more satisfied and 67 respondents representing 20% said they were satisfied with the natural ventilation and lightning. In GRA Phase II, 1 respondent representing 2% said not at all satisfied, 1 respondent representing 2% said less satisfied, 16 respondents representing 39% said they were more satisfied and 23 respondents representing 56% said they were very satisfied (Figure 3).

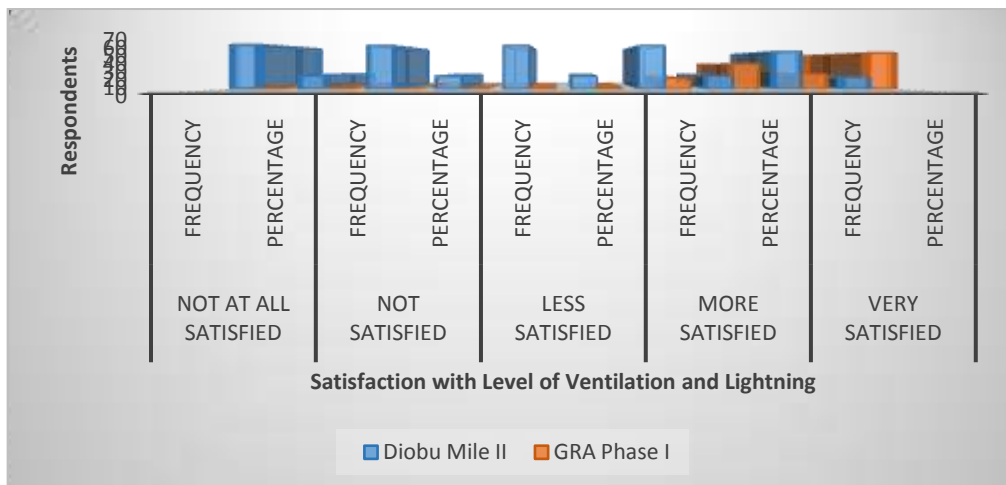


Figure 3: Satisfaction with Level of Ventilation and Lightning in the Study Area

The different housing types in terms of various types of toilet facility in Diobu Mile II and GRA Phase II revealed that in Diobu, 40 respondents representing 12% said other types of toilet, 45 respondents representing 14% said there was none, 45 respondents representing 14% said pit latrine, 93 respondents representing 28% said public toilet, 45 respondents representing 14% said interior toilet without flush tank and 60 respondents representing 18% said interior toilet with flush tank. In GRA Phase II, 2 respondents representing 5% said other types of toilet, 1 respondent representing 2% said there was none, 1 respondent representing 2% said pit latrine, 2 respondents representing 5% said public toilet, 15 respondents representing 37% said interior toilet without flush tank and 20 respondents representing 49% said interior toilet with flush tank (Figure 4).

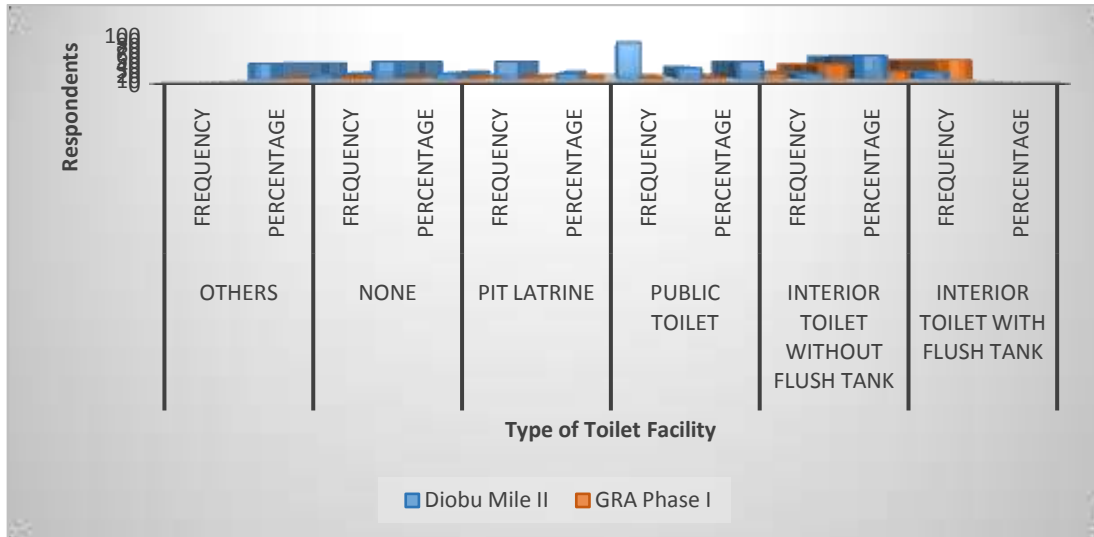


Figure4: Type of Toilet Facility in the Study Area

Analysis of the different housing types in terms of state of current public water service in Diobu Mile II and GRA Phase II showed that in Diobu Mile II, 119 respondents representing 36% said it was very bad, 84 respondents representing 26% said it was poor, 73 respondents representing 22% said it was good, 36 respondents representing 11% said it was very good and 16 respondents representing 5% said it was excellent. In GRA Phase II, 2 respondents representing 5% said it was good and 39 respondents representing 95% said it was very good (Figure 5).

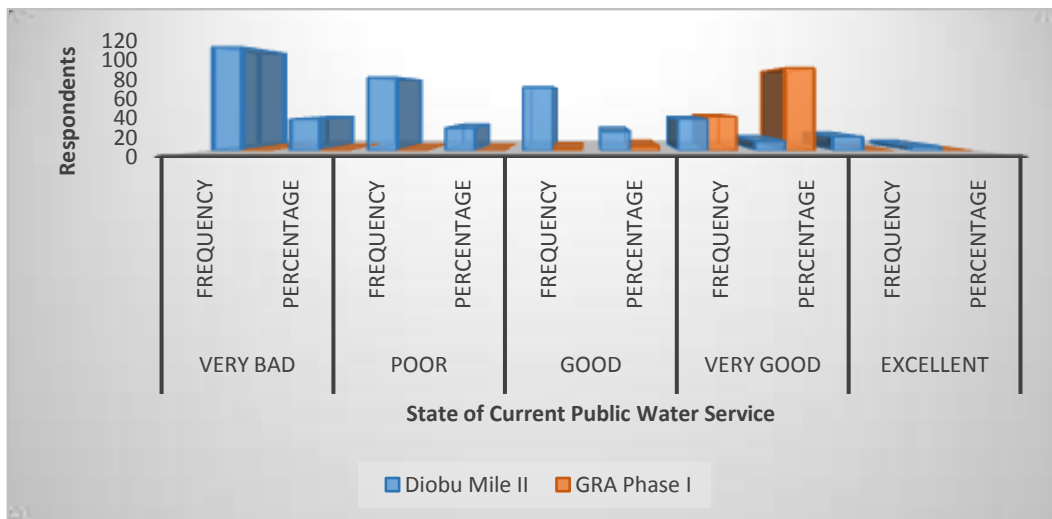


Figure5: State of Current Public Water Service

3.2 Research Question 2

How is sanitation and other practices regarding disposal, collection and management of domestic waste and its correlation to environmental quality?

The changes in sanitation and other practices in terms of frequency of waste evacuation in Diobu Mile II and GRA Phase II showed that in Diobu, 63 respondents representing 19% said waste evacuation was done daily, 103 respondents representing 13% said waste evacuation was done weekly, 123 respondents representing 38% said waste evacuation was done bi-weekly and 39 respondents representing 12% were undecided. In GRA Phase II, 37 respondents representing 83% said daily and 7 respondents representing 17% were undecided (Figure 6).

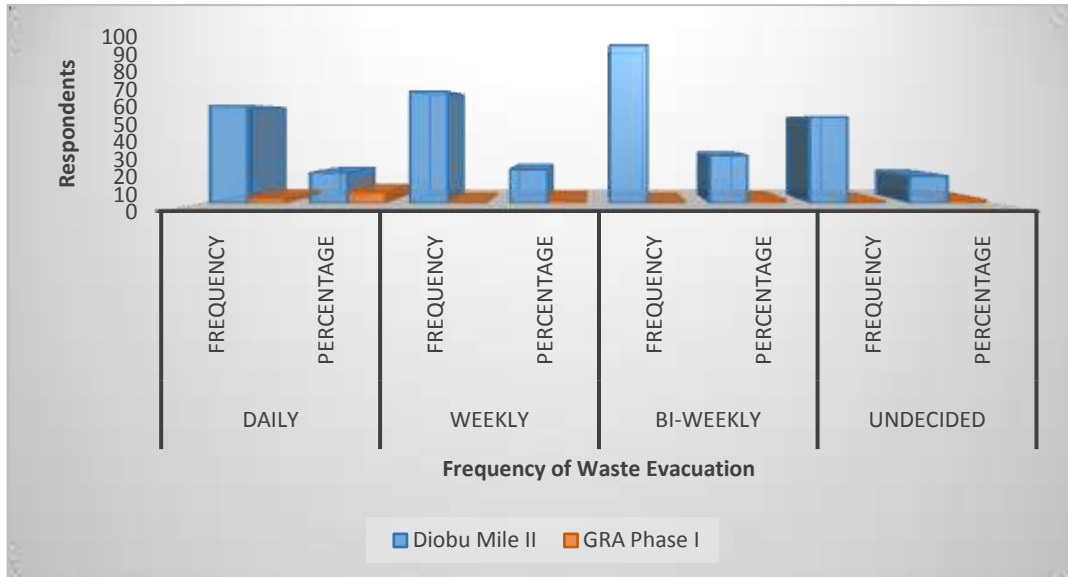


Figure6: Frequency of Waste Evacuation

Analysis of changes in sanitation and other practices in terms of agency responsible for waste evacuation in Diobu Mile II and GRA Phase II showed that in Diobu, 221 respondents representing 67% said waste evacuation was done by the government, 64 respondents representing 20% said waste evacuation was done by private agency, 5 respondents representing 2% said waste evacuation was done by NGOs, 23 respondents representing 7% said waste evacuation was done by communities and 15 respondents representing 5% were undecided. In GRA Phase II, 16 respondents representing 39% said waste evacuation was done by government and 25 respondents representing 61% said it was done by private agency (Figure 7).

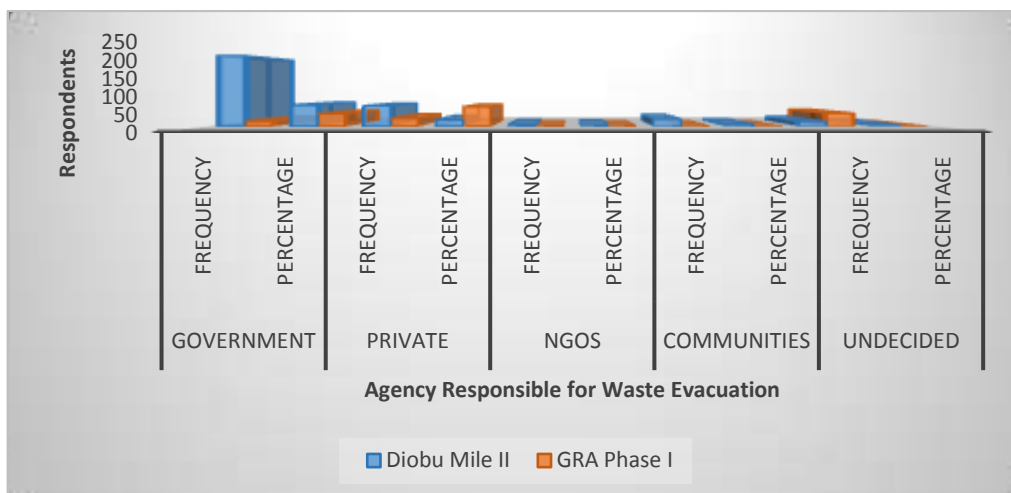


Figure7: Agency Responsible for Waste Evacuation

3.3 Research Question 3

Are there disparities in the supply of basic utilities such as water supply, electricity and social amenities that affects urban inequality in the study areas?

The noticeable difference in terms of provision of basic utilities in Diobu Mile II and GRA Phase II showed that in Diobu Mile II, 212 respondents representing 65% said provision was done by the government, 9 respondents representing 3% said provision was done by community effort, 68 respondents representing 21% said provision was done by public/private partnership, 2 respondents representing 1% said provision was done by corporate organization and 37 respondents representing 11% said others. In GRA Phase II, 24 respondents representing 59% said provision was done by government, 13 respondents representing 32% said provision was done by public/private partnership, 2 respondents representing 5% said provision was done by corporate organization and 2 respondents representing 5% said provision was done by other groups (Figure 8).

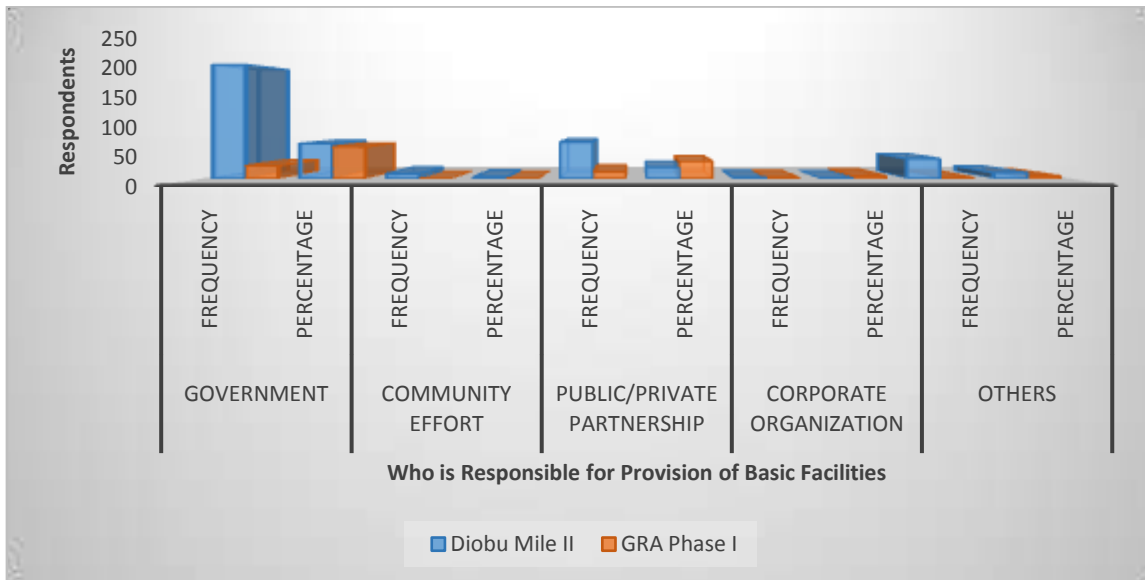


Figure 8: Who is Responsible for Provision of Basic Utilities

The difference experienced in the supply of utilities in terms of state of electricity supply in Diobu Mile II and GRA Phase II shows that in Diobu Mile II, 34 respondents representing 10% said very bad, 25 respondents representing 8% said bad, 77 respondents representing 24% said not good, 165 respondents representing 50% said good and 27 respondents representing 8% said very good. In GRA Phase II, 2 respondents representing 5% said very bad and 39 respondents representing 95% said very good (Figure 9).

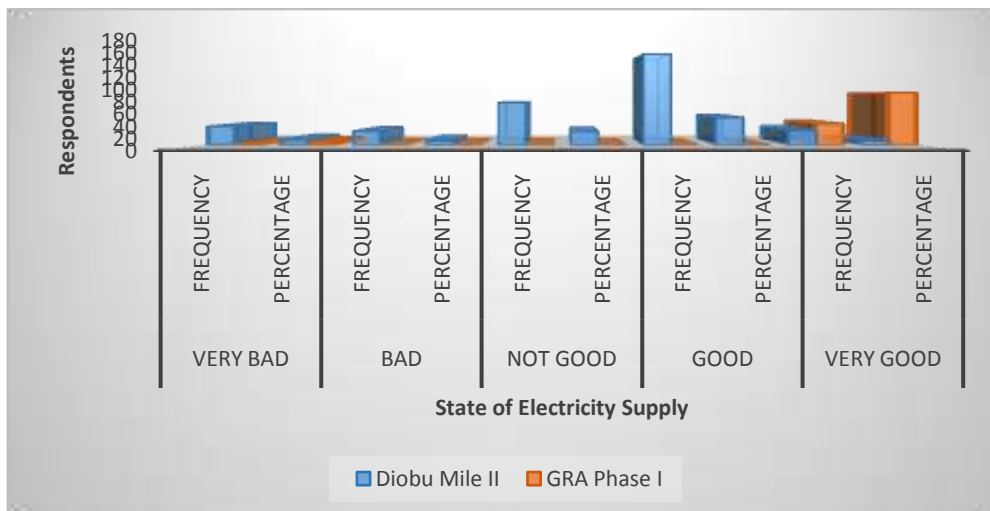


Figure 9: State of Electricity Supply in the Neighbourhood

The disparities in infrastructural distribution in terms of condition of roads in Diobu Mile II and GRA Phase II showed that in Diobu Mile II, 19 respondents representing 6% said very bad, 17 respondents representing 5% said bad, 36 respondents representing 11% said not good, 224 respondents representing 68% said good and 32 respondents representing 10% said very good. In GRA Phase II, 8 respondents representing 20% said good and 33 respondents representing 80% said very good (Figure 10).

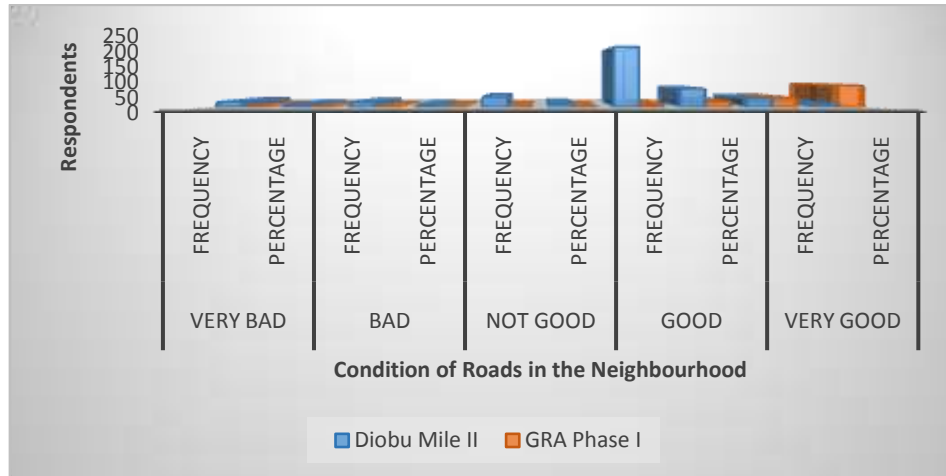


Figure10: Condition of Roads in the Study Areas

Hypothesis 1:

H₀: There is no significant difference in the rate of housing types and its effects on urban inequality and environmental quality.

The Levene’s test for equal variances assumed is NOT rejected, since its p-value is greater than 0.05, therefore subsequent interpretations will be based on Equal variances assumed. The critical value of t obtained at d.f. 367 is given 1.645. Since the p-value (= 0.000) is less than α (= 0.05), also calculated absolute t (= 14.553) is greater than the t-crit (= 1.645), we therefore do not reject the null hypothesis which states that there is no significant difference in the rate of housing types as it affects urban inequality and environmental quality.

Hypothesis 2:

H₀: There is no significant difference in sanitation and other practices with regards to the collection and disposal of domestic waste and its correlation to urban inequality in the study areas.

The Levene’s test for equal variances assumed is NOT rejected, since its p-value is greater than 0.05, therefore subsequent interpretations will be based on Equal variances assumed. The critical value of t obtained at d.f. 367 is given as 1.645. Since the p-value (= 0.000) is less than α (= 0.05), also calculated absolute t (= 4.007) is greater than the t-crit (= 1.645), we therefore reject the null hypothesis which states that there is no significant difference in the sanitary practices with regards to the collection and disposal of domestic waste and its correlation to urban inequality in the study areas.

Hypothesis 3:

H₀: There is no significant disparity in the provision of basic utilities such as water supply and power and social amenities that affects urban inequality in the study areas.

The Levene’s test for equal variances assumed is NOT rejected, since its p-value is greater than 0.05, therefore subsequent interpretations will be based on Equal variances assumed. The critical value of t obtained at d.f. 367 is given 1.645. Since the p-value (= 0.004) is less than α (= 0.05), also calculated absolute t (= 2.906) is greater than the t-crit (= 1.645), we therefore do reject the null hypothesis which states that there is no significant disparity in the environmental attributes such as available basic utilities that affects urban inequality in the study areas.

An Appraisal of the Housing Types as It Affects Urban Inequality and Environmental Quality in Diobu Mile II and GRA Phase II

From the findings from the differences in housing types as it affects urban inequality and environmental quality, 21.0% which represented majority of respondents in Diobu Mile II were not at all satisfied with the level of natural lighting and ventilation in their housing units while 56.1% representing majority of respondents in GRA Phase II were very satisfied with the level of lighting and ventilation. Majority of respondents in Diobu Mile II (28.4%) made use of public toilet while 48.8% representing majority of respondents in GRA Phase I made use of interior toilet with flush tank. This made respondents in Diobu Mile II (23.2%) to be not at all satisfied with the type of toilet facility while majority of respondents in GRA Phase II (39.0%) were very satisfied with the type of toilet facility. This finding was in line with the study by Poku-Boansi&Amoako (2015) on inequality in six cities, where it was found that certain areas in the cities had no toilet facilities while the others had access to water closets and therefore improved toilet facilities. Majority of

respondents in Diobu Mile II also gave their assessment on the state of public water service in their neighbourhood as being very bad while those in GRA Phase II said that it was very good.

An Evaluation of Sanitation and Other Practices Regarding the Disposal and Management of Domestic Waste and Its Correlation to Urban Inequality in Diobu Mile II and GRA Phase II

An evaluation of sanitation and other practices was carried out with regards to the disposal and management of domestic waste and its correlation to urban inequality in Diobu Mile II and GRA Phase II. Findings revealed that majority of respondents in Diobu Mile II (37.5%) stated that the waste was evacuated on a twice in a week while in GRA Phase II (82.9%) stated that waste was evacuated on a daily basis. The responsible agency for waste evacuation in Diobu Mile II (67.4%) was predominantly the government agency while in GRA Phase II (61.0%), waste evacuation was done by private agency. Majority of respondents in Diobu Mile II (20.7%) were not satisfied with the level of waste evacuation while in GRA Phase II (29.3%) which represents majority of respondents were satisfied with the level of waste evacuation in their neighbourhood. This finding is in line with Adama (2012), who used Abuja as a case study and argued that spatial inequality in service delivery such as solid waste management exists in Nigeria and blamed this inequality on the urban government policies like privatization, a strategy which was used to regulate and produce spatial inequality in the delivery of waste management services. While privatization has improved service delivery, it has created a gap in the quality of service rendered to the different areas of the city.

Identification of Availability of Basic Utilities and Infrastructure as Determinants of Urban Inequality in Diobu Mile II and GRA Phase II

Finally, the presence and availability of basic utilities and infrastructure as determinants of urban inequality in Diobu Mile II and GRA Phase II was conducted and findings show that majority of respondents stated that government was responsible for the provision of facilities such as pipe borne water, drainage, hospitals and market in Diobu Mile II and GRA Phase II. In terms of satisfaction with drainage facilities, majority of respondents in Diobu Mile II (29.0%) were satisfied with the level of drainage in their neighbourhood to a low extent while in GRA Phase II (36.6%) were satisfied with the level of their drainage facilities to a high extent. Observation on the drainage facility in Diobu Mile II show that even though government has provided drainage to the neighbourhood, they sometime use it as waste disposal point as a result of their poor sanitary habits and they wait for government to clear the drains because they see it as government responsibility. These clogged drains within the neighbourhood creates dissatisfaction on the type of drainage facility among respondents in Diobu mile II but in GRA Phase II, drains provided by government are cleared by individual creating a free flowing drains within the neighbourhood (Plate 5). Thus creating satisfaction in the neighbourhood on the type of drains. The electricity supply in Diobu Mile II was good as stated by majority of respondents (56.3) while that of GRA Phase II was very good as stated by majority of respondents (95.1%). Based on the road conditions in Diobu Mile II majority of respondents (68.3) stated that it was good while that of GRA Phase II was very good as stated by majority of respondents (80.5%). Pipe borne water was assessed in the two study areas and it was discovered that majority of respondents in Diobu Mile II (35.7%) were not satisfied with the state of pipe borne water in their neighbourhood while in GRA Phase II majority of respondents (65.9%) were more satisfied with the state of pipe borne water in their neighbourhood.

IV. CONCLUSION

The presence of basic amenities such as access to public water supply, good roads, level of natural lighting and ventilation and type of toilet facility, were also assessed in this study and it was discovered that GRA Phase II had better basic amenities than Diobu Mile II in terms of good public water supply, good road conditions, better level of natural lighting and ventilation and the toilet facility was mainly interior toilet with flush tanks than that of Diobu Mile II which was mainly public toilet. Sanitation, hygiene and other practices found in GRA Phase II was better than that of Diobu Mile II with GRA Phase II having consistent daily evacuation of waste by private agency than of Diobu Mile II which was done twice in a week by government agency.

Finally, in terms of allocation and availability of basic utilities as it affects environmental quality in GRA Phase II and Diobu Mile II, GRA Phase II had very good drainage conditions, electricity supply, road conditions, pipe borne water, drainage facilities and hospitals than that of Diobu Mile II. It was also discovered that government was responsible for the provision and allocation of these basic utilities in the study areas.

Recommendations

The following recommendations were drawn from the study:

1. Government should help in the reduction of inequality by creating a more level playing field that is conducive to the adoption of more pro-environment policies.

2. Government in collaboration with public/private organizations should ensure that proper education and awareness programmes on how to manage solid waste is administered to residents in Diobu Mile II and GRA Phase II.
3. In relation to allocation and availability of basic utilities, government should also ensure the provision of basic utilities in Diobu Mile II such as adequate electricity supply, adequate drainages, adequate pipe bone water which are important in determining the quality of a neighbourhood.

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