Investigating Waste Management Practice in Abua/Odual Local Government Area, Rivers State, Nigeria

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ABSTRACT

Waste management is a major challenge for environmental groups working in poor countries. In this research, we examine the methods used for and problems encountered with waste management in Abua/Odual LGA, Rivers State, Nigeria. The administration of Abua/waste Odual has several challenges as a result of inadequate resources, including financing, infrastructure, treatment facilities, and equipment for garbage collection. Both primary and secondary sources were utilised to compile the data for this analysis. In all, 100 questionnaires were sent to collect primary data. People living in the randomly selected houses were the intended participants. From among the sixty localities in the research region, ten were randomly selected to receive questionnaires representing the residential population. Ninety-five completed surveys were gathered for evaluation. Study findings revealed an absence of proper waste management procedures and a dearth of trash disposal facilities in the region under investigation. The empirical results of this research suggest that the waste management techniques used in the examined region, such as the use of dustbins, buckets, plastics, bags, and other containers, may be used in modern Nigerian cities. In order to reduce trash production, the research suggested promoting waste recycling. Increasing plastics use, for instance, calls for more petroleum, which has both economic and environmental consequences.

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INTRODUCTION

Waste is anything that needs to be disposed of once the user has benefited from it, even though the substance may still be quite useful for other things. The unsanitary state of the environment today poses one of the greatest risks to man. It is brought on by his routine actions, such as the generation of trash, and its makeup is significantly influenced by factors (Ayuba, Manaf, Sabrina

and Azmin, 2013). According to Okechukwu (1995), waste production is influenced by population growth and the corresponding rise in commercial, industrial, and agricultural activity. Additionally, he defines waste as substances, materials, or items that are wasted because they are unusable, undesirable, defective, or have lost their usefulness for enhancing human economic production, processes, or activities.

Waste was described that objects disposed of in accordance with national legislation. Wastes essentially come in three states: gaseous, liquid, and solid. Compared to other things, solid waste makes people more sensitive. This is because solid wastes have the ability to build up and harm the environment physically.

The advanced consequences of human activity in the past were dispersed over a broad area of land and sea. The garbage discharge has become concentrated at a few model points due to the recent recorded increase in pollution, urbanization, and rapid industrialisation. Ogunmakinde, Maund, and Sher (2019) elaborated on the importance of understanding waste definition and classification by noting that there is a growing need for comprehensive waste characteristics when legislation, actions, and services are adjusted to differentiate between different types of waste materials. In this context, "waste" refers to anything that has been deemed unusable since it was not produced with the intention of being reused, repurposed, reconditioned, or purified. In most cases, other factors outside the waste itself must be considered while sorting. Most categories see use in more than one context, whether it be collection, disposal, recovery, transport, or treatment (Lowe and Bowlby 2007). We classify garbage as either municipal solid waste (MSW), industrial waste, electronic waste, or medical waste for the purposes of this investigation. Each of these types of garbage has a major impact on both metropolitan and rural areas.

Researchers have also found that while waste management techniques are organized and designated collection places in metropolitan areas, it presents a significant challenge to local governments and the environment in rural areas (Hanet al 2018). According to Mihai and Taherzadeh, local governments' finances for waste management are constrained, and this is especially true in rural and distant locations like towns and villages. The collection of rubbish presents challenges in local government areas most of the time. They also struggle to access treatment facilities elsewhere and lack the necessary tools, infrastructure, and facilities (Hidalgo, Martn-Marroqun, and Corona 2017). Concerns include the uneven distribution of waste infrastructure between urban and rural areas, which is a result of historical political, social, and economic disparities. These roadblocks fuel other issues like littering and unlawful dumping (Niyobuhungiro and Schenck (2020).

It has also been demonstrated that good waste management practices are essential to nature's capacity to support life. It has turned into a persistent problem in many developing countries, particularly in cities (Zamorano, Molero, Grindlay, Rodriguez, Hurtado and Calvo 2009). Urbanization has a big impact on land use, and when it gets out of hand, it leads to the emergence of illegal structures and informal settlements, which are widespread throughout the country. In the end, this has an impact on the design of the city and services like waste collection, which leads to the careless disposal of trash (Ferronato and V. Torretta 2019). Waste is an unavoidable byproduct of human activity and is a critical environmental and developmental issue. Humans have been producing more garbage recently due to changes in consumption patterns, waste compositions, and social behavior, as well as population growth, according to

Mfon, David, Adeniran, Harrison, Samson, and Imhade (2018). According to Mc Allister (2015), there has to be a movement away from garbage deposition at the disposal site and toward waste minimization. Due to the expansion in population brought on by urban techno-economic development and the pattern of material production and consumption, waste output in Nigeria is increasing (Gutberlet 2018). Between 0.65 kg and 0.95 kg of garbage are estimated to be produced per capita in Nigeria each day, accounting for more than half of the rubbish produced in all of sub-Saharan Africa (Edet and Maduabuchi 2019).

The existing waste management procedures in the country, according to Ike, Ezeibe, Anijiofor, and Nik 2018, are rapidly turning into a national problem and are unsustainable, creating an apparent environmental concern. Furthermore, a number of studies have linked inefficient waste management techniques to adverse effects on the ecosystem, energy use, climate change, and environmental degradation (Kadafa 2017 and Afolalu, Oladipupo, Bose, Abioye, Adejuyigbe, Ajayi, Ongbali 2019).

As a result, academics have determined that poor waste management causes pollution, which therefore worsens the environment. Additionally, it includes compounds that have an impact on the environment and, due to their nature and amount, pose a threat to people's health and wellbeing as well as the wellbeing of society and the environment as a whole. Waste is defined as any substance or thing that the holder discards or intends to discard by the Environmental Act of the United Kingdom (Freeman, 1990). The alarming rate of trash generation in Nigeria has not been successfully and efficiently managed as a result of a number of issues, including inadequate disposal facilities, a lack of funding for waste management organizations due to theft, political inequality, and other issues (Wale,2016).

Poor waste management has been a serious issue for human life and health in both urban and rural regions. A healthy environment influences excellent health, which further influences human productivity. Therefore, it can be claimed that a healthy and clean environment always has an impact on the country's wealth and economic standing (Adeboye , 2001).

This problem is compounded in developing countries like Nigeria by poor waste management policies. According to Adeyemi et al., poor waste management methods are a serious concern in the vast majority of developing countries (2001). As Adeyemi sees it, waste management is one of the most complex problems confronting city planners and environmental groups today. Ogwueleka (2009) claims that trash management is the most pressing issue for environmental groups throughout the country. Due to the problems in administration, a breakdown in law and order was recorded by Adefemi and Awokunmi (2009) in the area of rubbish disposal. They noticed that the indiscriminate disposal of solid waste is causing urban centers to experience an elevated rate of environmental degradation. Nigeria, which has a population of more than 170 million and is still increasing, was one of Africa's top generators of urban trash.

According to a recent government prediction, 46% of Nigerians will reside in urban areas by the year 2020. The fact that many villages are already relocating to metropolitan areas as more people focus on them points strongly in this direction (Wale, 2016). In Nigeria's Rivers State, the local government of Abua/Odual is located. Due to the uncontrolled dumping of rubbish around its administrative offices and settlements, the area is today viewed as a garbage area. According to this report, Abua/waste Odual's management confronts a number of difficulties that are brought on by inadequate funding for waste management, inadequate equipment for garbage collection, inadequate waste infrastructure, and inadequate treatment facilities. The situation is

still predominantly defined by the indiscriminate dumping of wastes such food waste, paper, polythene, scrap metals, etc. due to a lack of waste management practices. Almost everything in the region has had issues with heap garbage, which can obstruct roads and trains, air pollution, open-air burning, and leachate, which has harmed the environment's overall visual appeal. Due to the prevalence of poor waste management techniques, this issue also contributes to health issues like cholera, typhoid, malaria, and diarrhea. All of these are examples of solid waste, and proper management will lessen the environmental risk in the research region by using precise methods for calculating the volume of garbage produced and disposed off.

Aim and Objectives of the Study

In order to determine the best approach for Abua/Odual LGA in Rivers State, this study will analyse the effects of current waste management practises. Effective waste management practise, including collection, transport, processing or disposal, management, and monitoring of different waste products in the research region, will be analysed.

Specific objectives are to:

1. Identify the types of waste generated in Abua central, Abua/ Odual.
2. Identify the waste management practices being adopted in the study area.
3. Determine the effectiveness of waste management practice in the study area
4. Recommend appropriate measures to comb indiscriminate dumping of waste in the study area.

The Study Area

Abua/odual is one of the 23 local government areas in rivers state with a total population of 282,988 (NPC 2006) It has an area of 704 sqm. Its headquarters is located in Ayama/Abua Central Abua.Abua consists of Otapha, Okpeden, OgboAbuan, and Emughan clans as in the map, figure 1 at page 8.

The monthly sanitation exercise in the state is only noticed in the local government headquarters Ayama where we have the motor pack and the market. The study is focused on the local government headquarters where solid waste is being generated from the motor park and the market. Furthermore, it is in the headquarters that there is a designated dumpsite being managed by the local government authority. Economic Activities in the Study Area AbuaOdual is known for fishing and subsistence farming while crude oil exploration in the area and neighboring regions contributes the most to the economy of AbuaOdual, and other activities include trading in the local government and teaching services. The dominat people of Abua/Odual LGA are the Abuans, Oduals and the Kugbos. The climate of the study area has an average temperature of 26 degrees centigrade while humidity is pegged at 83 percent.
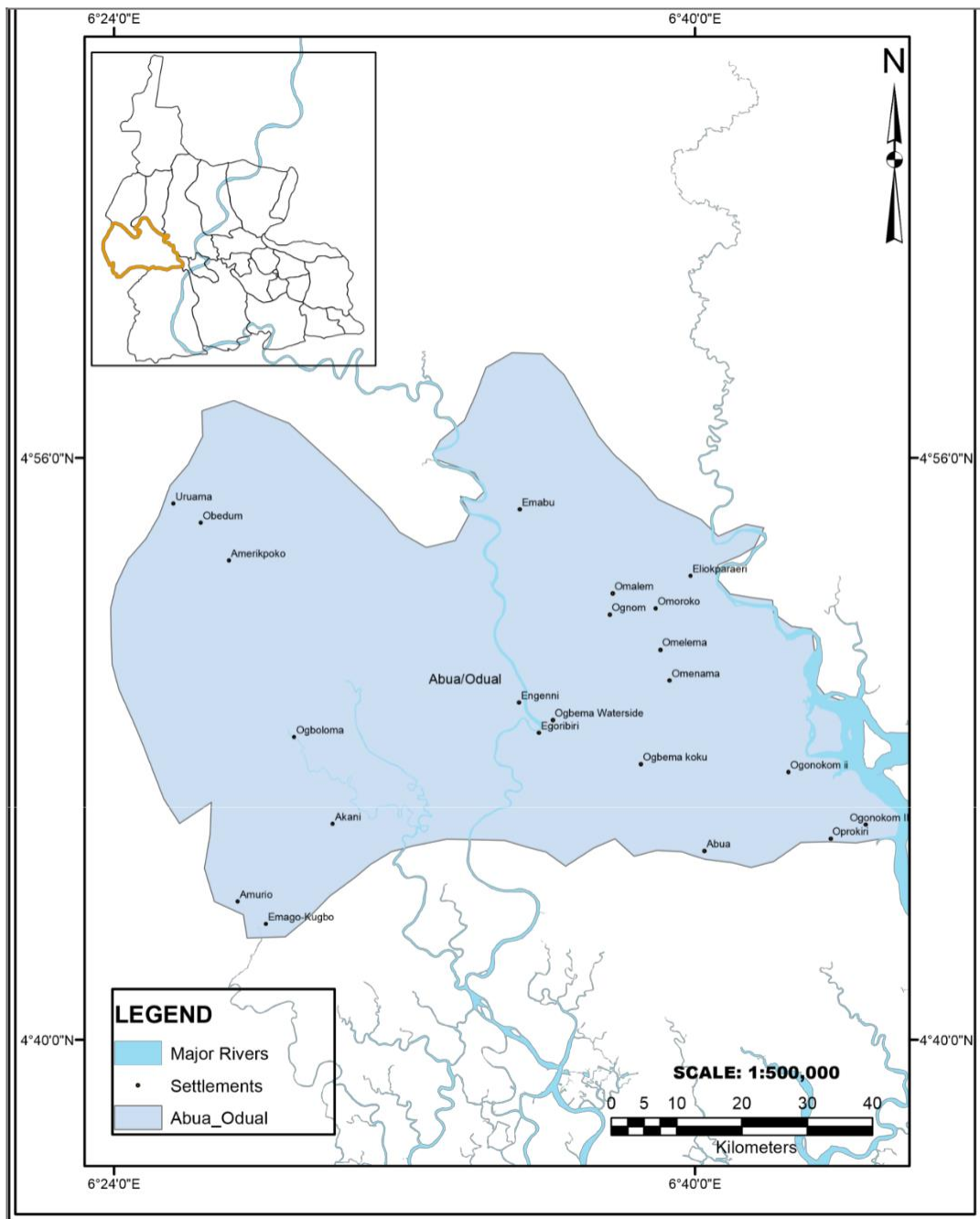
Figure 1.1: Map of Abua/Odual LGA showing the study area.
Source: GIS and Urabn Informatics Laboratory Rivers State University (2022).

METHODOLOGY

This study approaches the matter through the use of the appropriate methodology for the fieldwork in primary data collection. Sections such as research design, population and sampling,

instrumentation and data collection, and analytical techniques will be discussed in this chapter. Before the construction and administration of the questionnaire, a reconnaissance study was carried out. This guided the selection of the study households and respondents, the organization of the questionnaire schedules, and the interviews held.

The reconnaissance survey.

The reconnaissance survey of the selected area was undertaken between January and February 2022. During the survey, the researcher observed and recorded the level of sanitation, the effectiveness, and household adherence to waste management regulations and guidelines, the number of refuse (waste) dump, use of the designated dump site when households disposed of their wastes, the quality of the environment in the area was noted.

Research Design

In this study, we will use a combination of exploratory research and a randomised survey to choose both the study population and the responders. Waste management in the Abua/Odual local government region is analysed for its efficacy and a better approach is proposed to get the best possible results.

The Sampling Technique and Population

Sampling provides a means of gaining information about the population without the need to examine the population entity. This aspect refers to the methods applied in the goal and objectives of the study. The sample random sampling will be applied. In random sampling, all items have some chance of selection that can be calculated. The random sampling technique ensures that bias is not introduced regarding who is included in the survey.

Sample Size and Procedure

Out of 60 communities in the study area, 10 communities are selected including the local government headquarters. Questionnaires will be administered, so to obtain detailed information, one hundred (100) households will be interviewed which is to say that 10 questionnaires will be administered in each community that is sampled.

Table 1

S/N	Name of Communities
1.	Ayama
2.	Amalam
3.	Okana
4.	Emilaghan
5.	Otari
6.	Egbolom
7.	Emeglan
8.	Omelema
9.	Odaga
10	Okana

Table 1: showed the communities that are sampled from the study area. To achieve this, the random sampling technique is employed in selecting the particular communities to be sampled in the survey.

Target Population

The study is targeted at household members of the sampled communities; a total number of 10 questionnaires shall be used in sampling 10 different households in each of the communities. This is will then give us a total of 100 households to be sampled in the study area.

Types of Data

Both secondary and primary data will be used. The secondary data would be extracted from documented facts such as textbooks, journals, maps, unpublished thesis, information from the national population census, and newspapers. The primary data would come from the use of structured questionnaires, oral interviews, and personal observations in the survey.

Method of Data Collection

Questionnaires will be administered to both male and female adult respondents in the study area. Trained enumerators will be used in administering the questionnaires. Oral interviews will also be administered to respondents in the study area.

Personal observations will also be used to gather information about the study area. The information to be gathered in this case would indicate the personal characteristics of respondents, and the following:

1. Educational status
2. Occupational background
3. Number of households
4. Type of household waste generation
5. Availability of dustbins in the household
6. Nature of the dustbins
7. Method or management practice. To mention a few.
8. Frequency of refuse collection
9. The method used in refuse collection
10. Management practices in refuse collection and disposal
11. Equipment or facilities at their disposal point used for collection, hauling, and disposing of household waste.
12. Problem militating against effective waste management practices, to mention a few.

The database of the case study area will be prepared based on the information collected from the primary and secondary sources.

i. **Primary Data Source:** Methods like interviews, questionnaires, etc., will be used to compile the data. Importantly, this information is exclusive to our study since it was gathered from firsthand accounts.

Methods used for the collection of primary data are:

- Questionnaires
- Focus group interviews, and
- Observation of factual survey
ii.   **Secondary Data Source:** the information gotten from the secondary data for research purposes is not first-hand. Secondary data is cheaper and more quickly available than primary data.

The secondary data in this research are collected from various sources, which include Books, online or websites, newspapers, documentaries, magazines, already published reports etc.

i.   **Advantages of Secondary Data:** Getting your hands on secondary data won't break the bank. It's not hard to get there at all. The product has already been released. It's a time- and energy-saver. In other words, it blends in well. It helps to prevent issues with data collecting and gives you a starting point for making comparisons.

ii.   Disadvantages of secondary data: This has to do with the reliability of the publication that the data came from, as well as the fact that some of the finer points may not mesh with the aims of the study.

iii.   Analytical Techniques

Descriptive analytical techniques will be used in the research. The research finding will be analyzed using overlay analysis, query analysis, buffering, spatial search, neighborhood analysis, and proximity analysis.

RESULTS AND DISCUSSION

Data Presentation Analysis

This section deals with the presentation of data for this research and statistical analysis of data was done using descriptive frequencies, percentages, tables, and other forms of statistical method suitable for nominal and ordinal data. The data was obtained through the administration of questionnaires on the impact of waste management practice in Abua/Odual local government area of Rivers State. Would be analyzed using illustrations such as figures and tables.

Formula for calculation $\frac{n}{x} X\ 100\ ...$

Where N = Number of Respondent

X = Number of questionnaires

Personal Characteristics of Respondents

Figure 1: Sex Distribution of Respondent

Source: Researcher's field Survey 2022

Figure 1 above represented the sex distribution of respondent of data collected, where males numbered up to 33 persons and females were 62 persons, representing 35% and 65% respectively.

Educational Status
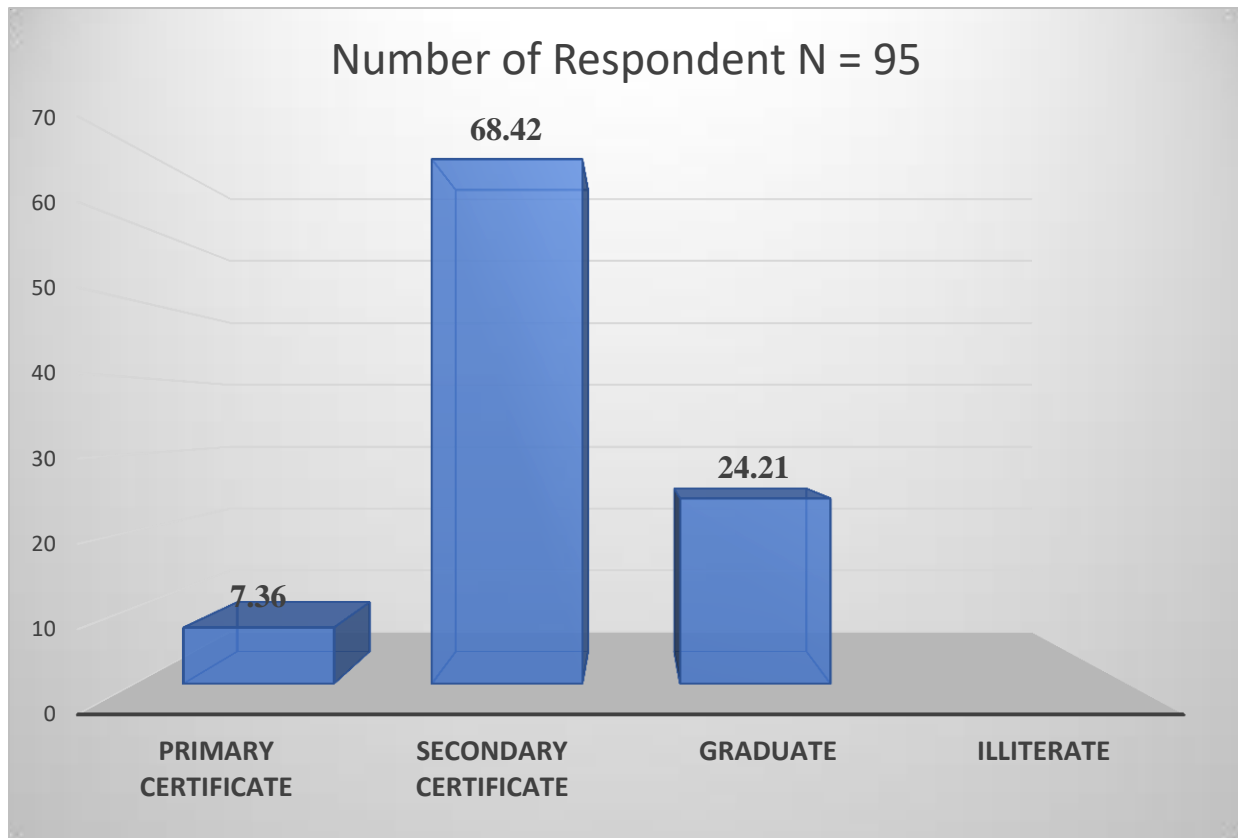
Source: Researcher's field Survey 2022

Figure 2. Above showed, the data on the educational distribution of their search, 68.42% of the respondents are secondary certificate holders while 24.21% are graduates and 7.36% are primary school certificate holders in the study area.
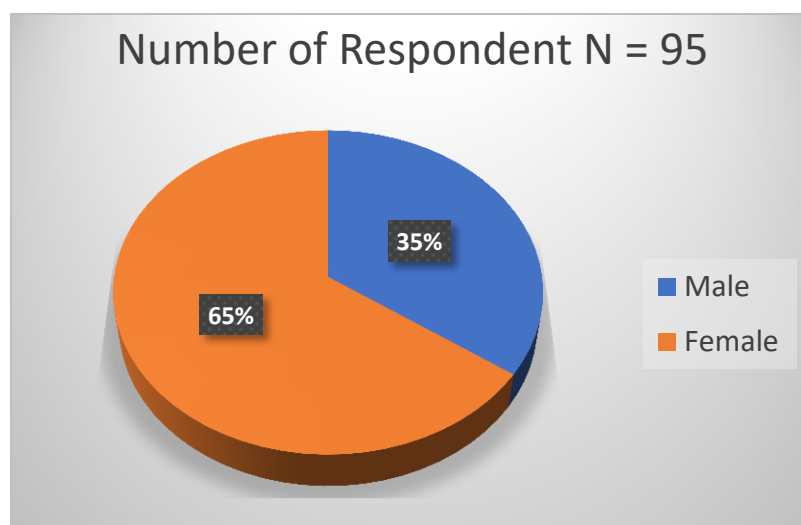
Table 1 Occupational background of the respondent

S/No.	Occupational back ground of the respondent	No	%
1	Civil Servant	11	11.57
2	Farmer	57	60.00
3	Trader	22	23.15
4	Others	5	5.26
	Total	**95**	**100**

Source: Researcher's field Survey 2022

Table 1. Above indicated that all the respondents in the area were engaged in either trading, civil servants, or farming, which has the highest proportion of 60% while 5.26% were engaged in other services.

Socio-Demographic Profile Of Respondents

Figure 3 Number of persons in the household
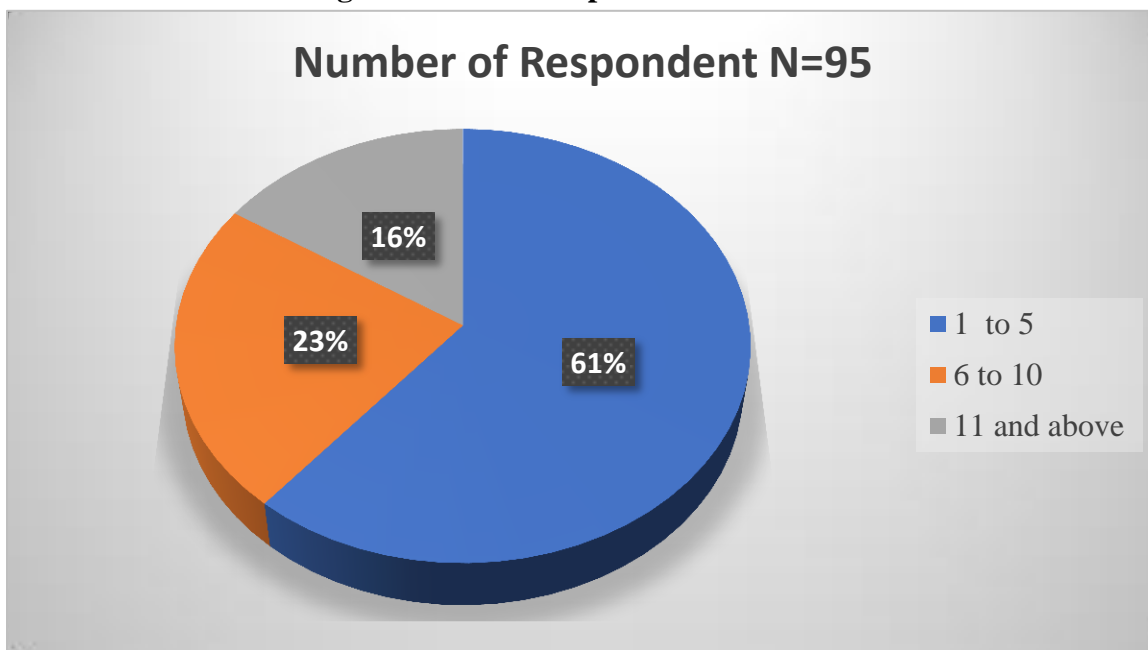
Source: Researcher's field Survey 2022

Figure 3. Above showed the number of persons per household61% indicates that 1- 5 persons are in one household while 16% indicates that 11 persons and above are in the household.

Waste Generation and Management

Table 2 Frequency distribution of the types of waste generated

S/No.	Type of waste generated	No	%
1	Garbage	58	30.05
2	Polythene, paper & plastic	79	40.93
3	Metals and cans	15	7.77
4	Ash and dust	2	1.03
5	All of the above	39	20.20
	Total	**193**	**100**

Source: Researcher's field Survey 2022

Table 2 presented the data on the types of waste generated in the study area. This indicates that the respondent generates waste in which the proportion of Polythene, paper & plastic waste has the highest proportion of 40.93%. In this regard, waste-to-wealth practices should be encouraged in the study area.

Figure 4 Frequency distribution on the use of refuse bin(s) in a household
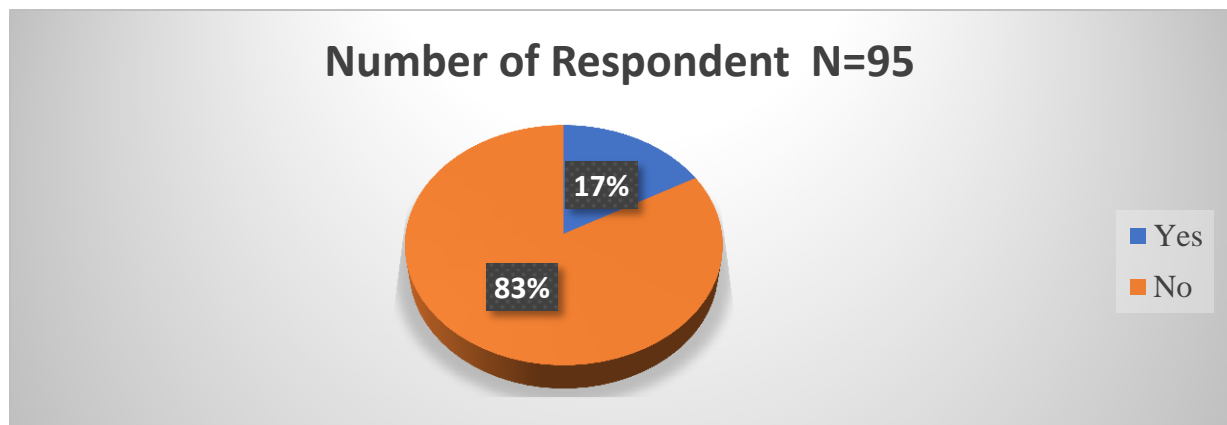
Source: Researcher's field Survey 2022

Figure 4 Showed that 83% of the respondents do not use refuse bin and they reported that they drop their waste on plantains hashes which equally help in the growth of the plantain in the study area while 17% of them reported that they use refuse bin and dump their waste directly on illegal dumpsite and on the street as shown in plate 1, 2, and 3 respectively.

Table 3 Frequency Distribution on the nature of Refuse Bin

S/No.	Nature of Refuse Bin	No	%
1	Refuse bin with a lid	16	13.11
2	Without a lid	25	20.49
3	Drums and buckets	55	45.08
4	Others	26	21.31
	Total	**122**	**100**

Source: Researcher's field Survey 2022

Table 3 indicated the nature of the refuse bin as against figure 4 of those who said they use refuse bin and the result which shows that a large percentage of respondent used drums, polythene bags, and buckets with the proportion of (45.08%) as their refuse bins in the study area, while about 20.49% of the respondent used refused with or without a lid. The government should enforce the use of proper solid wastes storage containers in the household in settlements such as the area under study. Also waste management agencies should draw put their structure plans with adequate provisions for solid wastes dumpsites.

Table 4 Frequency distribution on how often refuse bins are emptied in the study area
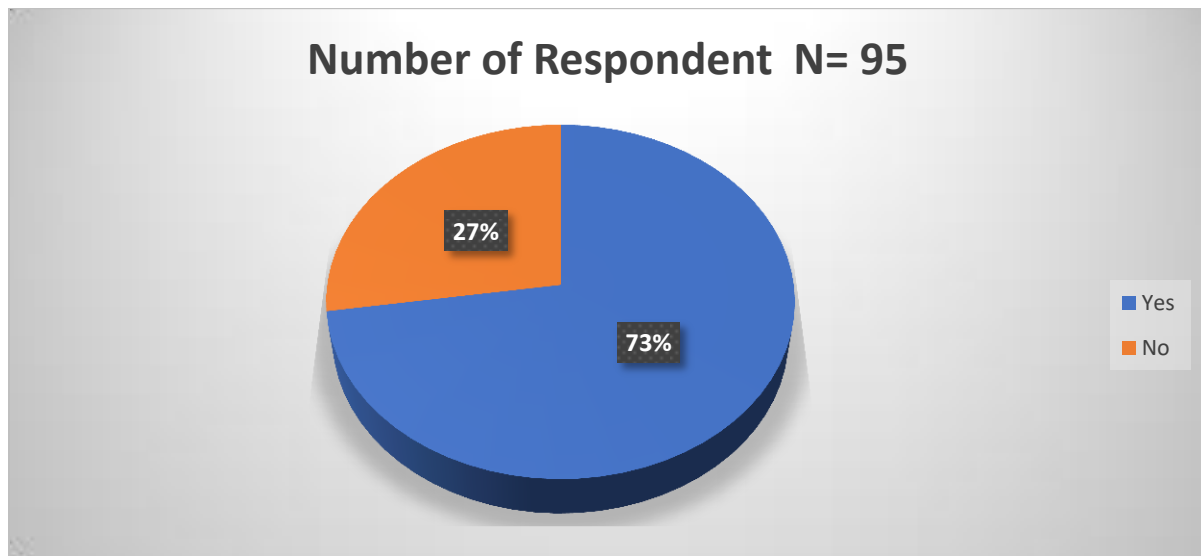
emptied in the study area		
Variable	**Frequency**	**Percentage (%)**
Daily	72	75.78
Once a week	17	17.89
Once in two weeks	3	3.15

Monthly		
Irregularly	3	3.15
Total	**95**	**100**

Source: Researcher's field Survey 2022

Table 4 has shown that residents emptied their refuse bins daily. This is because most of them dispose of their waste at their plantain farm.
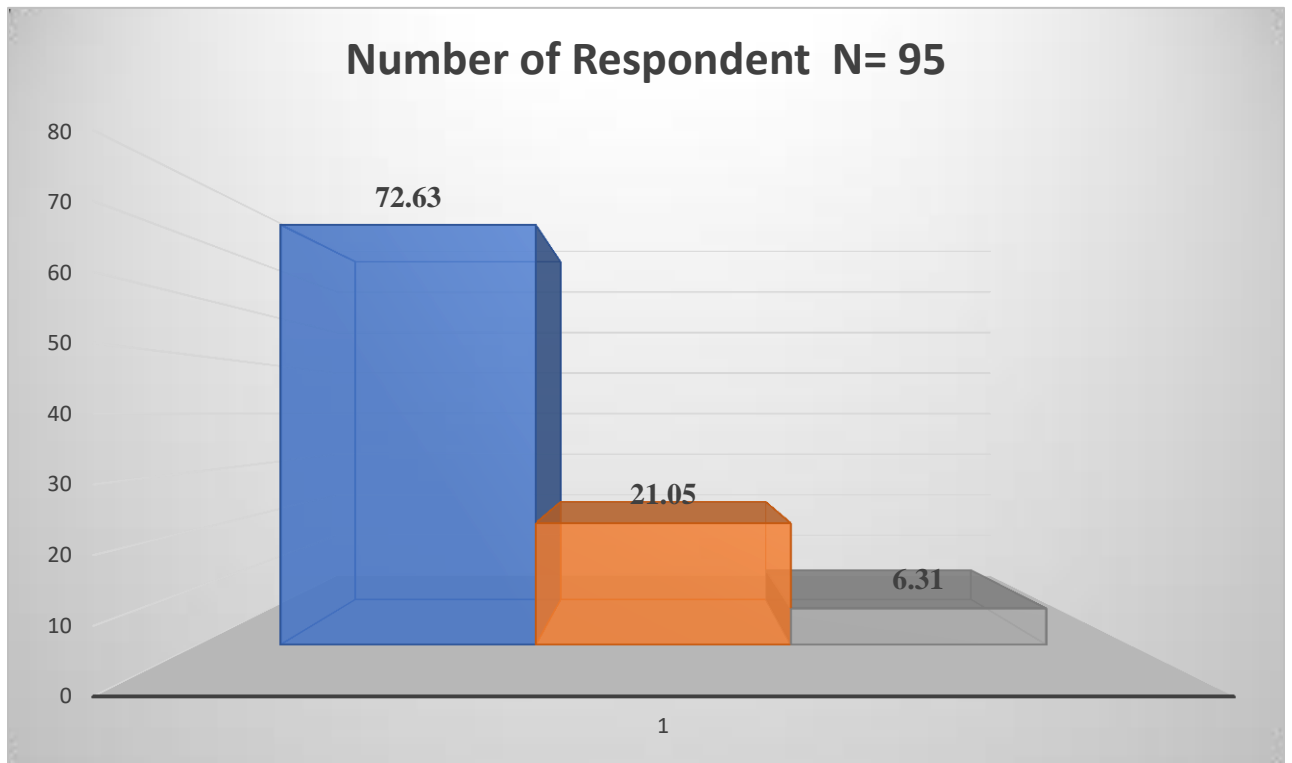
Figure 5 Availability of waste dumpsites in the study area

Source: Researcher's field Survey 2022

Figure 5 has shown that 75 % of the respondent indicates that there is the availability of dumpsite in the study area while 27 % says there is none available. This is because the approved dumpsites are not easily accessible.

Figure 6 Proximity Of Dumpsite

Source: Researcher's field Survey 2022

Figure 6 has shown that 72.63 % of the respondent indicates that there is the availability of dumpsite in the study area but it is far from their house while 6.31% has indicated that the dumpsite is closer to their house.

Table 5 method of waste disposal

S/No.	Method of waste disposal	No	%
1	Packing and Burning	16	11.94
2	In pits outside the house		
3	Open dumping	65	48.50
4	Dumping in streets/gutters	26	19.40
	Collection (point)	2	1.49
	Others	25	18.65
	Total	**134**	**100**

Source: Researcher's field Survey 2022

Table 5 indicated that the majority of the respondent disposes of their waste via open dumping which has the highest proportion of 48.50%. While 19.40% dump theirs in streets/gutters, for example, see plates 4, 5, and 6 respectively, 18.65% disposes of theirs using other methods such as dumping on water bodies, etc.

Table 6 Authorities Responsible For Household Waste Collection

S/No.	Authorities Responsible For Household Waste Collection	No	%
1	Individual Households arrangement	85	89.47
2	Private Organization		
3	Boys using wheelbarrows		
4	Local Government Authority	10	10.52
	Scavengers		
	Total	**95**	**100**

Source: Researcher's field Survey 2022

Table 6   has shown that individuals dispose of their waste by themselves which is the highest proportion of 89.47% in the study area, while 10.52% is collected by the local government authority. The rest could not be ascertained. This is to show that the local government authority is not putting more effort into the collection of waste in the study area, to fill in the gap, there is a need for the government to partner with a non-governmental organization (NGOs) community and private sector to manage waste in the study area. Residents should be encouraged to learn how to start combustion and incineration of waste to reduce the volume of household waste through the local government and private sectors. This can covert water to a stream which can, in turn, be converted to electricity.

Figure 7 Routine Inspection By Environmental Health Officers
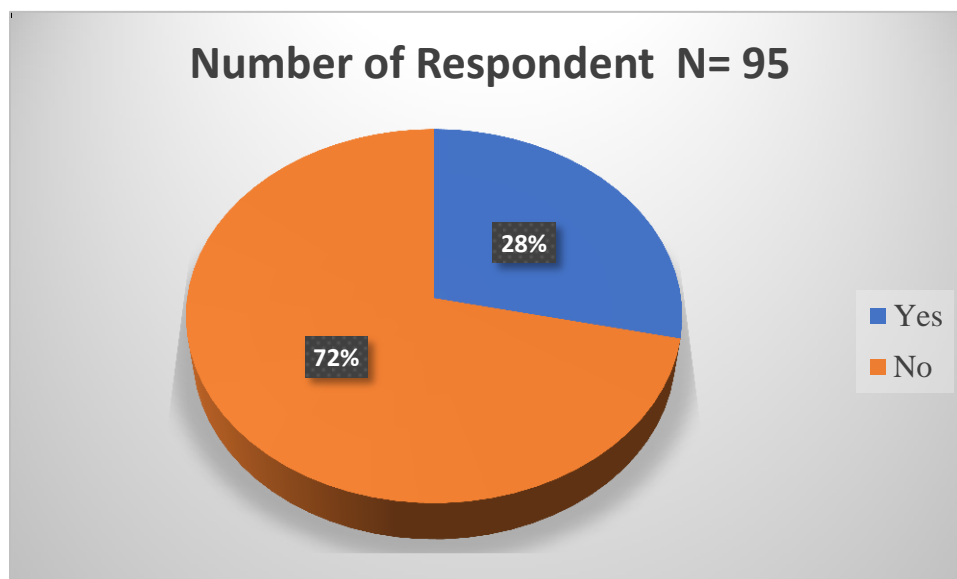
Source: Researcher's field Survey 2022

Figure 7 revealed that the environmental health officials do not come for routine inspection with a large proportion of 72% while 28% ascertain that environmental officers do come for a routine checkup in the study area regularly.

Table 7 Routine Checks By Environmental Officers

S/No.		No	%
1	Daily		
2	Weekly		
3	Monthly	29	30.52
4	Others	66	69.47
	TOTAL	95	100

Source: Researcher's field Survey 2022

Table 7 revealed that the number of the respondent that said environmental officers do come for a routine checkup in figure 7 most of them ascertained that the environmental officers do not come regularly which also has a large proportion of 69.47% while the rest of respondents said they come monthly which is 30.52%.

Figure 8 Frequency Distribution on Count Cases About Environmental Sanitation
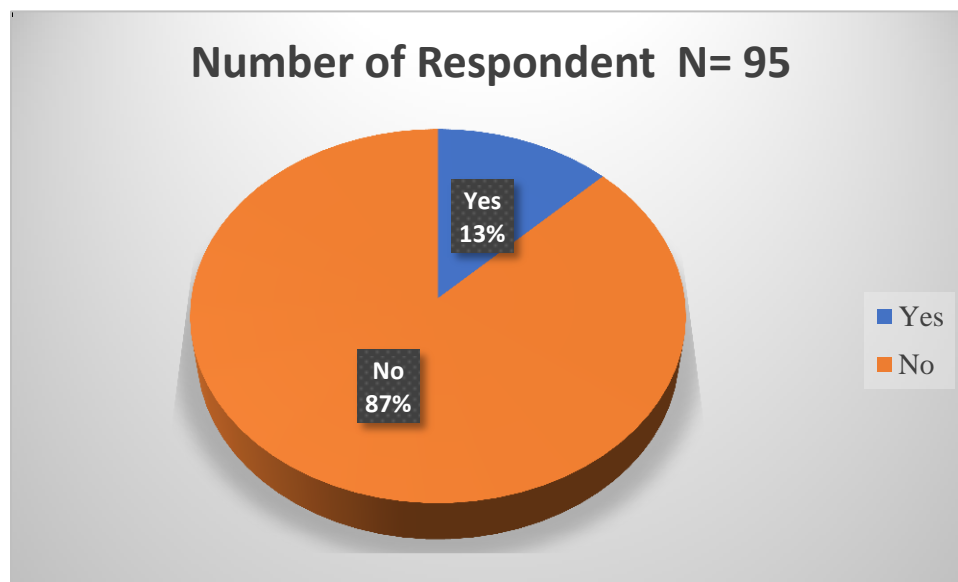
Source: Researcher's field Survey 2022

Figure 8 revealed that 87% of respondents in the study area have not been convicted by anybody to count for indiscriminate dumping of waste or by keeping their environment dirty. Only 13% have been convicted by indiscrimination dumping of waste in the study area.

Table 8 Frequency Distribution about Sources of Awareness On Waste Management

Variation	Frequency	Percentage (%)
Radio	80	26.0
Television	64	22.7
Newspaper	56	18.0
Community leader	48	16.0
Posters	52	17.3
Total	300	100

Source: Researcher's field Survey 2022

Table 8 has indicated that the majority of respondents in the study area are aware of issues relating to waste management, the fact that the majority are enlightened.

Table 9 Factors Responsible For the Indiscriminate Dumping Of Waste

S/No.	Factors Responsible For The Indiscriminate Dumping Of Waste	No	%
1	Large population size	16	9.87
2	Lack of Disposal Facilities	65	40.12
3	Inadequate knowledge about the effects on health and the environment	55	33.95
4	Carelessness of inhabitants	26	16.04
5	Others		
	Total	**162**	**100**

Source: Researcher's field Survey 2022

Table 9 revealed that 40.12% of the respondents concerning factors responsible for the dumping of waste include the lack of disposal facilities and the people altitudes toward waste dumping.

This is because the local government and its agencies responsible for evacuation wastes have failed to provide adequate disposal facilities and also the carelessness by inhabitants in the study area. While 33.95% of the respondents had shown that large population size and Inadequate knowledge about the effect on health and the environment has caused a lot of health and environmental problems in the study area.

The tabulation and summation of waste generation, management, and disposal at the household level in an area, as well as the distinguishing features of the household, were the levels at which the data set amassed for this study was analyzed.

The current chapter reviews the findings, offers inferences from the talks, and identifies areas of the subject that could benefit from more research.

Summary of Major Finding

Waste generation and management are two big issues in Nigerian cities, especially in the rural areas, although little attention has been paid to these issues. Household waste is the smallest unit of waste production in any human settlement. The socio-economic conditions and demographic makeup of individual homes have an impact on the generation and management of solid trash.

Personal Characteristics

The study of the results in Abua/Odual LGA reveals that the gender distribution of the respondents clearly distinguishes between male and female respondents; 35% of the respondents were male, and 65% were female. This is due to the fact that ladies were accessible when the questionnaire was given out.

According to the information on the educational distribution of their search, as shown in figure 2, 68.42% of the respondents are in possession of a secondary certificate, while 24.21% are graduates and 7.36% are in possession of a primary school certificate in the study field. This is due to the fact that the respondents from the qualification categories were the ones who were available when the questionnaire was distributed.

Table 1. Analysis indicates that all the respondents in the area are engaged in either trading, civil servants, or farming, which has the highest proportion of 60% while 5.26% are engaged in other services.

Respondents' Socio-Demographic Profile

Plate 3, according to the data above, there are 61% of households with between one and five occupants, while 16% of households have eleven occupants or various wastes produced.

The information on the different trash types produced in the research area is shown in Table 2. This shows that the respondent produces waste, with polythene, paper, and plastic garbage having the highest percentage (40.93%). In this approach, waste-to-wealth techniques ought to be promoted in the research region. The amount of waste that is actually present in the research region would decrease as a result. view plate 7

Figure 4 showed that 83% of the respondents do not use refuse bin and they reported that they drop their waste on plantains hashes which equally help in the growth of the plantain in the study area while 17% of them reported that they use refuse bin and dump their waste directly on illegal dumpsite and on the street as shown in plate 1,2, and 3 respectively.

From Table 3 it indicates the nature of the refuse bin as against figure 4 of those who said they use refuse bin and the result which shows that a large percentage of respondents used drums, polythene bags, and buckets with the proportion of (45.08%) as their refuse bins in the study area, while about 20.49% of the respondent used refused with or without a lid. The government should enforce the use of proper solid wastes storage containers in the household in settlements such as the area under study. Also, waste management agencies should draw put their structure plans with adequate provisions for solid wastes dumpsites.

Table 4 also showed that residents emptied their refuse bins daily. This is because most of them dispose of their waste at their plantain farm. See plate 1, 2 and 3

Figure 5 also showed that 75 % of the respondent indicates that there is the availability of dumpsite in the study area while 27 % says there is none available. This is because the approved dumpsites are not easily accessible.

Figure 6 has shown that 72.63 % of the respondent indicates that there is the availability of dumpsite in the study area but it is far from their house while 6.31% has indicated that the dumpsite is closer to their house.

Method of Waste Disposal

Table 4.5 indicates that the majority of the respondent disposes of their waste via open dumping which has the highest proportion of 48.50%, While 19.40% dump their waste in the streets/gutters, for example, see plates 4, 5 and 6, respectively, 18.65% disposes of theirs using other methods such as dumping on water bodies, etc.

Table 6 has shown that individuals dispose of their waste by themselves which is the highest proportion of 89.47% in the study area, while 10.52% is collected by the local government authority. The rest could not be ascertained. This is to show that the local government authority is not putting more effort into the collection of waste in the study area, to fill in the gap, there is a need for the government to partner with a non-governmental organization (NGOs) community and private sector to manage waste in the study area. Residents should be encouraged to learn how to start combustion and incineration of waste to reduce the volume of household waste through the local government and private sectors. This can covert water to a stream which can, in turn, is converted to electricity.

Figure 7 also revealed that the environmental health officials do not come for routine inspection with a large proportion of 72% while 28% ascertain that environmental officers do come for a routine checkup in the study area regularly.

Table 7 revealed that the number of the respondent that said environmental officers do come for a routine checkup in figure 7 most of them ascertained that the environmental officers do not come regularly which also has a large proportion of 69.47% while the rest of respondents said they come monthly which is 30.52%.

Figure 8 also revealed that 87% of respondents in the study area have not been convicted by anybody to count for indiscriminate dumping of waste or by keeping their environment dirty. Only 13% have been convicted by indiscrimination dumping of waste in the study area.

 Awareness of Waste Management

From table 8 it was deduced that the majority of respondents in the study area are aware of issues relating to waste management, the fact that the majority are enlightened.

Table 9 also revealed that 40.12% of the respondents concerning factors responsible for the dumping of waste include the lack of disposal facilities and the people altitudes toward waste dumping.

This is because the local government and its agencies responsible for evacuation wastes have failed to provide adequate disposal facilities and also the carelessness by inhabitants in the study

area. While 33.95% of the respondents had shown that large population size and inadequate knowledge about the waste effect on health and the environment has caused a lot of health and environmental problems in the study area.

CONCLUSION

Using dustbins, buckets, plastics, bags, and other containers, the study's empirical findings on waste management techniques in the study region are reproducible by the practices currently in use in Nigerian cities. As a result, waste management needs to keep up with the rising trash quantities brought on by urbanization, population expansion, and changing waste attitudes. Based on the results, it is fervently desired that implementing the most sane and practical waste management procedures will enable Nigeria and Abua/Odual LGA to improve the quality of their environment. Therefore, it is everyone's business, both the government and the populace, to manage trash ineffectively in line with sustainable development. The law need to be adequate to capture the vibrant character of the Nigerian town of Abua/Odual LGA in Rivers State.

RECOMMENDATION

To manage garbage in the study region, the government must work in collaboration with non-governmental organizations (NGOs), the local community, and the corporate sector. To reduce the amount of home waste, local government and the business sector should encourage and teach residents how to begin burning and incineration of waste. This has the ability to transform water into a stream, which in turn can transform electricity.

We must invest in waste management as though it were a basic social service. Remember that without enough sensitization, proper fiduciary conduct, and accountability, spending on waste control will not improve results.

The importance of trash management and the public's involvement in ensuring it is properly handled is brought to light via various educational initiatives. Little things, like avoiding throwing trash on the ground in public places, may have a big impact on keeping the world cleaner. Improving solid waste management will need the gradual implementation of more tangible activities, such as garbage sorting at the place of generation.

It's not true that all garbage is worthless. The adoption of recycling habits should be encouraged. Through recycling, we can reduce our need to mine for raw materials and cut down on garbage. Example: increased plastics use results in greater petroleum usage, which has both monetary and ecological costs.

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