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Waste Management as an Antidote For Environmental Sustainability In Ogun State, Nigeria

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Abstract

The study examined waste management as an antidote for environmental sustainability in Ogun State. Two research questions guided the study. A descriptive survey design was adopted. The population comprised staff of Ogun State Ministry of Environment; Environmental Protection Agency and its subsidiaries across 20 local government areas of the state. A total of ninety-five staff were selected as sample size. A self-designed questionnaire tagged: Waste Management and Environmental Sustainability Questionnaire (WMESQ) was used for data collection with 0.96 as a reliability coefficient. Mean, standard deviation and pie-chart were used for analyzing and presenting research questions. The findings revealed that financial resources, shortage of manpower/staff, corruption, public inadequate awareness on waste management, inadequate infrastructure, improper disposal, ineffective recycling or composting were among the challenges facing waste management for environmental sustainability. Organize and manage waste disposal, collection and recycling waste, waste treatment and street cleaning operations, **reduces the total amount of waste that goes into landfill**, minimize

	the environmental burden were among the roles of waste management in the attainment of environmental sustainability in Ogun State, Nigeria. Government should strengthen the system for waste management by providing facilities such as waste bins at strategic places, human resources, vehicles, regular collection centres and use better disposal methods appropriately.

Introduction

Nowadays, it is the responsibilities of government and citizens to ensure the attainment of environmental sustainability. However, for a better understanding of this term, let's first define Sustainability which is closely linked to ecological issues. Historically, the term sustainability, as declared by Jenkins (2009) cited in Uzoagu and Eheazu (2022) literally means a capacity to maintain some entity, outcome, or process over time and carrying out activities that do not exhaust the resources on which that capacity depends; whereas Vezzoli and Manzini (2018) refers to environmental sustainability as systemic conditions where neither on a planetary or regional level do human activities disturb the natural cycles more than the natural resilience allows, and at the same time do not impoverish the natural capital that has to be shared with future generations.

The increasing environmental problems faced by the world are mostly in lineation with the increasing human activities (Uzoagu & Eheazu, 2022). Environmental sustainability is the responsibility to conserve natural resources and protect global ecosystems to support health and wellbeing, now and in the future. It is important because the Earth is a finite place, with limited land, water, and wildlife. Sustainable resource use is the only way to make sure future generations will have what they need to survive. The natural environment provides many resources people use in their everyday lives. The environment is used to grow crops, obtain water, harvest wood, mine for minerals and metals, and produce energy. However, overuse of these resources can cause them to become depleted, limiting our ability to use them in the future. When people talk about environmental sustainability, they are talking about responsibly managing natural resources so they will still be available in the future. This includes both limiting use of natural resources and protecting them from degradation. For example, freshwater can be sustained both by curbing excess water use and by preventing pollutants from entering the water supply through effective waste management (Uzoagu & Eheazu, 2022).

Waste management continues to dominate as a major societal and governance challenge, especially in urban areas overwhelmed by the high rate of population growth and garbage generation. The role of waste management in achieving sustainable development is emphasized in several international development agendas, charters, and visions (Ismaila, 2022). For example, sustainable waste management can help meet several United Nations' Sustainable Development Goals (SDG), such as ensuring clean water and sanitation (SDG6), creating sustainable cities and inclusive communities (SDG11), mitigating climate change (SDG13), protecting life on land (SDG15), and demonstrating sustainable consumption and production patterns (SDG12) (Ismaila, 2022). It also fosters a circular urban economy that promotes reductions in the consumption of finite resources materials reuse and

recycling for waste elimination, pollution reduction, cost saving, and green growth. In most developing countries like Nigeria, garbage collected from households is disposed of in landfills or dumpsites, the majority of which are projected to reach their capacities within a decade.

The unsustainable approach of dumping or burning waste in an open space, usually near poor communities on the city edge, or throwing garbage into water bodies was unacceptable garbage disposal strategy (Wernstedt, Kihila & Kaseva, 2020). Similarly, several cities still use old-generation or poorly managed facilities and informal uncontrolled dumping or open-air waste burning. Often, these practices affect marginalized social groups near the disposal sites (Villalba, 2020). Moreover, this approach poses several sustainability problems, including resource depletion, environmental pollution, and public health problems, such as the spread of communicable diseases (Juarez-Hernández, 2021). A more sustainable waste management approach prioritizes practices such as reduced production, waste classifications, reuse, recycling, and energy recovery over the common practices of landfilling, open dumps, and open incineration (Kabera & Nishimwe, 2019; Zafar, 2021). This approach, which is still at an early stage but getting increased attention is more inclusive and environment-friendly and has less negative impact on human health and the environment than the common practices (Zafar, 2021).

Waste generation and its likely effects on both human, environmental health, and the urban landscape have become recurring dismal in Nigeria (Olukanni, 2014); at the same time noting the dangerous and acute nature of waste management in economically developing countries, where financial, human, and other critical resources generally are scarce. The collection, transport, treatment, and disposal of solid wastes, particularly wastes generated in medium and large urban cities have become a relatively difficult problem to solve for those responsible for their management (Uzoagu & Eheazu, 2022). The authors further stated that the Nigerian cities are witnessing high rate of environmental deterioration and are rated among urban areas with the lowest livability index in the world. The collection, transport, treatment, and disposal of solid wastes, particularly wastes generated in medium and large urban centres have become a relatively difficult problem to solve for those responsible for their management (Singh, Saxena, Bharti & Singh, 2018). The problem is even more acute in economically developing countries, where financial, human, and other critical resources are generally scarce (United Nations Environment Programme (UNEP), 2005).

Nigeria, as one of the developing countries is not left out. Waste management is a by-product of most human activities, which is tremendously unavoidable in human existence. Several years past, human beings have been craving to improve the environment they live; the attempt to develop the environment for decades have negatively affected the environment we inhabit today and subsequently endangering the survival of the earth and the future generations. The efforts to develop the environment have giving rise to increasingly unfavourable climate changes and natural disasters, also aided by wars, political and socioeconomic instability (Klarin, 2018). The attempts to advance the environment have caused some changes in the behaviour aiming towards more rational and efficient management of all resources that will allow less pressure and environmental impact (Villalba, 2020). Hence, such responsible behaviour continued will ensure the long-term exploitation of resources, without jeopardizing the

future generations is considered within unauthenticated concept of sustainable development (Villalba, 2020). For Joseph, Ndukwe and Nwuzor (2016), the factors that hinder waste management are varied and can be political, socio-cultural, economic and environmental. On the political aspect, they argued that the relationship between the levels of government (federal, state and local) over power decentralization, affect the way and manner in which citizens can contribute to waste management. Socio-culturally, they submitted that waste management systems are influenced by the attitudes of the urban population which to them is that of "I don't care" attitude. Until urban waste management plan incorporates the served population, such effort will continue to be a wasted one. On the economic context, they observed that the willingness and ability to pay for a particular level of waste management service is dependent on the economy of the area in question as economic development determines the volume and composition of wastes generated (Joseph et al., 2016).

The structure of the environment can also influence waste management needs. This is because, the topography, conditions of roads, density and width to a large extent, will influence the selecting and/or designing waste collection procedures and equipment such as containers and vehicles (Adejobi & Olorunimbe, 2022). The manpower requirement, finance, population and equipment are some of the factors that can challenge any waste management effort. Adejobi and Olorunimbe (2022) further summarized the challenges of waste management thus: Solid waste management has been intractable problems beyond the capacity of most municipal/state government in developing countries especially with rapid and often haphazard urbanization, population explosion, the weak and inadequate infrastructure for waste management resulting in refuse heaps that is left to burning method and exposure on open landfills. Attitudinal problem of the public to waste as material to be thrown away is a social challenge, this coupled with lack of infrastructures for waste management (including roads, facility for waste collection, disposal and treatment, indiscriminate waste disposal on land, farms, surface waters, wetland) constitute technical challenges. Limited knowledge and understanding of the operational and managerial/maintenance aspects of waste management infrastructure in a conducive environment (management challenge) is also a problem. Lack of and/or inadequate legal and institutional/administrative framework for the environmentally sound management of waste, non-domestication of multilateral environmental agreements on wastes and chemical, i.e. based Stockholm, Cofferdam conventions legal) is another problem (Adejobi & Olorunimbe, 2022).

Ogun State government in her efforts towards the attainment of environmental sustainability in the state, has assured of proactive measures in the management of chemicals and wastes, towards an excellent environmental governance, as well as a sustainable oriented economy (Odiana & Olorunfemi, 2021). Odiana & Olorunfemi (2021) warned that, henceforth, every industry, individual or facility domiciled in the state, with the capacity to use and store chemicals are expected to submit inventory for monitoring, tracking, evaluation and waste management to the Ogun State Environmental Protection Agency (OGEPA). He asserted that OGEPA in monitoring, enforcement, research and developing alternative uses of wastes, adding that government would encourage robust cooperation between the public and private sector, to ensure a framework for efficient environmental management. Corroborating this view, Minister of State for Environment, Salako (2024), noted that as the global community navigates through the challenges of chemicals utilization and their harmful effects on

people's health, proactive measures must be made to checkmate the environmental ills brought about by industrialization. prioritized initiatives and programmes to promote circular management of wastes in Ogun State. Salako (2024) further urged people to maximize opportunities that waste management have to offer to build a healthy population and economy, tasking all to adopt best practices that would ensure that production and use of chemicals have no adverse effects on human health and the environment.

Statement of the Problem

It is a common knowledge that the activities of the state environmental agencies have been hampered by a lot of factors. These include: poor funding/mismanagement, insufficient resources (facilities and human), inappropriate technology, inequitable taxation formula, and inadequate environmentally stimulated among others. These inadequacies might among the factors eroding the attainment of environmental sustainability in Ogun State. Personal observations revealed an unstable environment and lack of sustainability in Ogun State. A situation where there were heavy waste and dumping sites in the cities are not a welcome situation. These wastes pose serious environmental and health problems, promote insect vectors like mosquitoes and flies, rats and mice, cause fire hazards, flooding of streams, odor problems, nuisance in the state owing to the lack of awareness and proper planning in the selection of dump sites by authorities. If not properly manage can be disastrous. This study was an attempt to examine waste management as an antidote for environmental sustainability in Ogun State, Nigeria.

Objective of the Study

The main objective of the study was to examine waste management as an antidote for environmental sustainability in Ogun State, Nigeria. Specifically, the study sought to:

1. Identify challenges facing waste management for environmental sustainability in Ogun State, Nigeria.
2. Itemize roles of waste management in the attainment of environmental sustainability in Ogun State, Nigeria.

Research Questions

The following research questions were answered in this study:

1. What are the challenges facing waste management for environmental sustainability in Ogun State, Nigeria?
2. What are the roles of waste management in the attainment of environmental sustainability in Ogun State, Nigeria?

Methodology

A descriptive survey design was adopted for this study. The reason for using a descriptive survey design is to collect the opinions of the respondents towards achieving research objectives and questions. The population for this study comprised staff from the Ogun State Ministry of Environment and Ogun State Environmental Protection Agency and its subsidiaries across the 20 local government areas of the state. A purposive sampling technique was employed to select relevant staff with direct roles in waste management. Stratified sampling was also applied to ensure gender balance, with participants

proportionately distributed across various units. This resulted in a total sample size of 95 participants. The use of a purposive and stratified sampling approach allowed for comprehensive representation of expertise within the population. A self-designed questionnaire tagged: Waste Management and Environmental Sustainability Questionnaire (WMESQ) was used for data collection. The questionnaire requests responses on a four (4) – point scale format which was a modification of 5-point Likert scale. The questionnaire was designed in such a way that it requested responses on a four (4) – point scale format which was a modification of 5-point Likert scale. The questionnaire contained two sections of A and B. Section A focused on demographic characteristics of the respondents and section B examined items on the challenges facing waste management for environmental sustainability and roles of waste management in the attainment of environmental sustainability. The initial draft of the instrument (WMESQ) was subjected to face and contents validity by the three experts from the Department of Sociological Studies, TASUED. All the issues raised were duly attended to, in order to ensure its content, construct, and criterion validity. A pilot test study was carried out among ten staff of Lagos State Ministry of Environment, Lagos State, Nigeria. The data collected were subjected to Cronbach Alpha and it yielded 0.96 as a reliability coefficient for the instrument (WMESQ). The designed instrument (WMESQ) for the study was adopted through primary method of data collection for this study to collect the needed data for the study. However, the researcher with the help of seven trained research assistants involved in distributing the questionnaires to the respondents which took five weeks for the completion. However, a total of ninety-five questionnaires were distributed for administration and only ninety-two were retrieved. Retrieval rate was 97%. Descriptive statistics of mean, standard deviation and pie-chart were used for analyzing and presenting research questions.

Results

Research Question 1: What are the challenges facing waste management for environmental sustainability in Ogun State, Nigeria?

Table 1: Descriptive analysis on the challenges facing waste management for environmental sustainability in Ogun State, Nigeria

Items	Mean	SD	Decisions
Inadequate financial resources	2.89	.873	Agreed
Shortage of manpower/staff.	3.10	.602	Agreed
Corruption.	2.67	.793	Agreed
Public inadequate awareness on waste management.	2.92	.799	Agreed
Inadequate infrastructure	2.85	.893	Agreed
Improper disposal.	2.79	.847	Agreed
Ineffective recycling or composting.	3.25	.621	Agreed
Lopsided government attitude towards investing in technology.	2.80	.953	Agreed
Cluster Mean	**2.89**		

Source: Field Survey, 2024

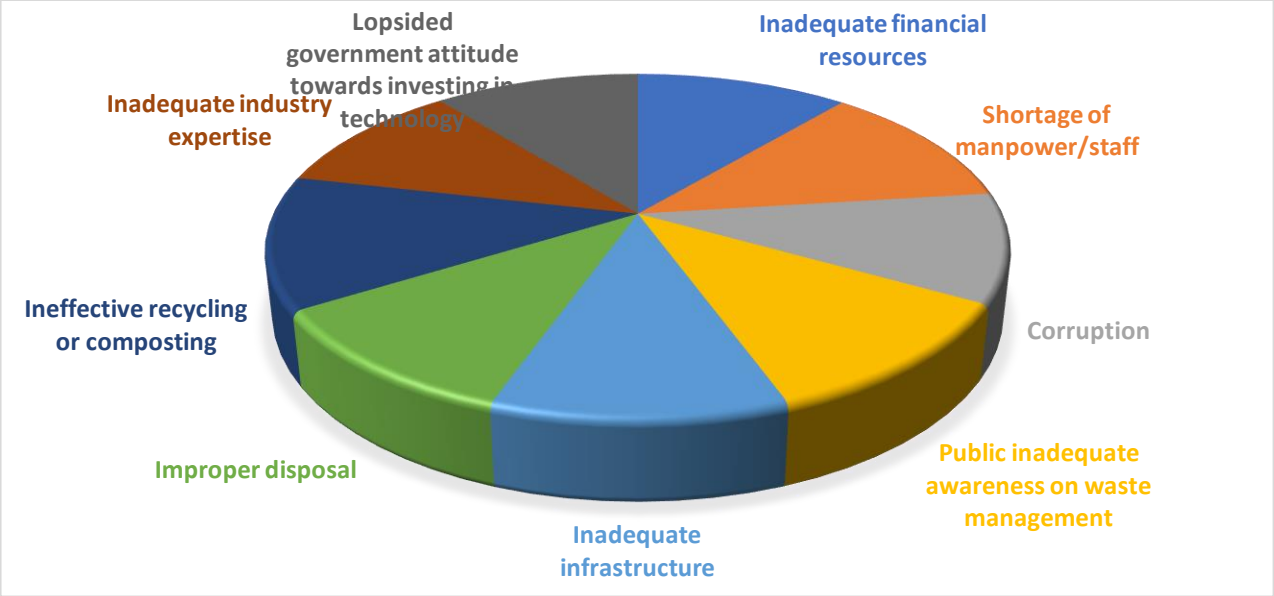

Figure 1: Pie-chart showing challenges facing waste management for environmental sustainability in Ogun State, Nigeria

From Table and Pie-chart 1, it was revealed that cluster mean was 2.89. Bench mark mean for questionnaire with four scales is 2.50. since 2.89 > 2.50, this implied that respondents agreed inadequate financial resources, shortage of manpower/staff, corruption, public inadequate awareness on waste management, inadequate infrastructure, improper disposal, ineffective recycling or composting, inadequate industry expertise and lopsided government attitude towards investing in technology were among the challenges facing waste management for environmental sustainability in Ogun State, Nigeria.

Research Question 2: What are the roles of waste management in the attainment of environmental sustainability in Ogun State, Nigeria?

Table 2: Descriptive analysis on the roles of waste management in the attainment of environmental sustainability in Ogun State, Nigeria

Items	Mean	SD	Decisions
Organize and manage waste disposal	3.03	.716	Agreed
Organize and manage waste disposal.	3.16	.675	Agreed
Waste treatment and street cleaning operations.	3.05	.727	Agreed
Reduces the total amount of waste that goes into landfill	3.08	.704	Agreed
Minimize the environmental burden.	3.11	.694	Agreed
Recreate a valuable resource through responsible disposal of rubbish	3.08	.666	Agreed
Environmental protection and pollution reduction.	2.99	.704	Agreed
Resource conservation	2.94	.639	Agreed

Reducing waste and optimizing resource use	3.22	.516	Agreed
Enabling a circular economy	3.00	.599	Agreed
Cluster Mean	**3.07**		

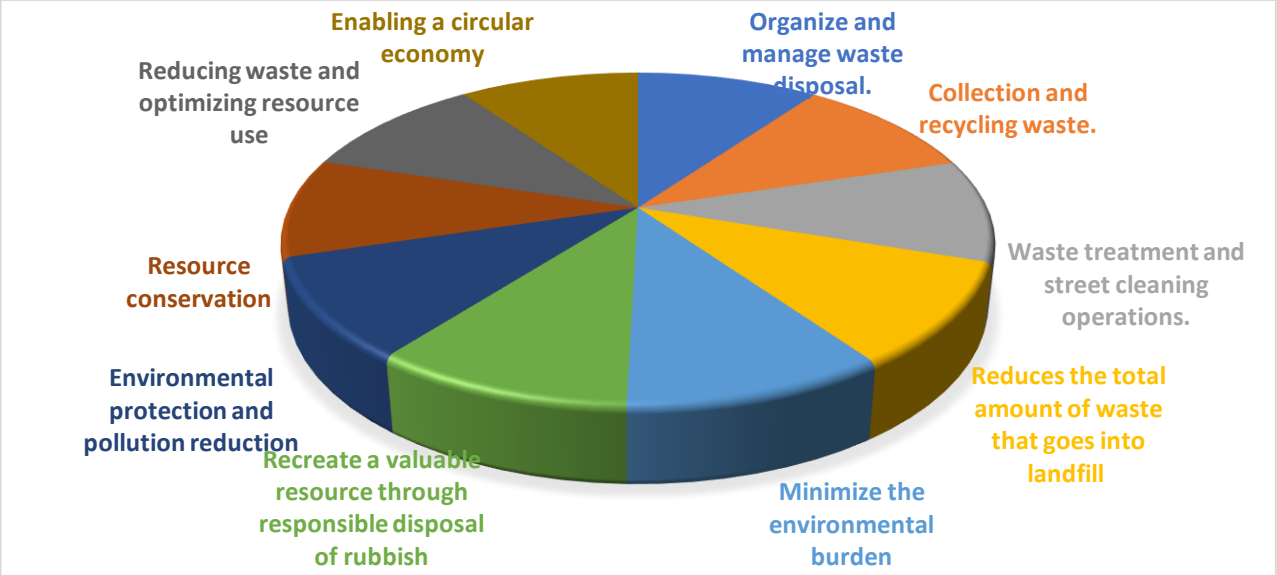

Figure 2: Pie-chart showing roles of waste management in the attainment of environmental sustainability in Ogun State, Nigeria

From Table and Pie-chart 2, it was revealed that cluster mean was 2.89. Bench mark mean for questionnaire with four scales is 2.50. since 2.89 > 2.50, this implied that organize and manage waste disposal, collection and recycling waste, waste treatment and street cleaning operations, reduces the total amount of waste that goes into landfill**,** minimize the environmental burden, recreate a valuable resource through responsible disposal of rubbish, environmental protection and pollution reduction, resource conservation and reducing waste and optimizing resource use were among the roles of waste management in the attainment of environmental sustainability in Ogun State, Nigeria.

Discussion of Findings

The findings revealed that financial resources, shortage of manpower/staff, corruption, public inadequate awareness on waste management, inadequate infrastructure, improper disposal, ineffective recycling or composting, inadequate industry expertise and lopsided government attitude towards investing in technology were among the challenges facing waste management for environmental sustainability in Ogun State, Nigeria. These findings were in support to Odiana and Olorunfemi (2021) who examined solid waste in Nigeria, its challenges and management and they found that improper waste disposal, insufficient finance and lack of technology deployment were among the challenges facing waste management in Nigeria. Mukhtar and Akan (2018) who assessed the challenges facing solid waste management in Maisandari Neighbourhood of Maiduguri Metropolis, Borno State, Nigeria indicated that lack of financial resources, inadequate personnel, corruption, poor rate of awareness

among the citizens and not engagement of experts in the environmental sector were among the problems eroding waste management for environmental sustainability in Nigeria.

The findings further revealed that organize and manage waste disposal, collection and recycling waste, waste treatment and street cleaning operations, reduces the total amount of waste that goes into landfill, minimize the environmental burden, recreate a valuable resource through responsible disposal of rubbish, environmental protection and pollution reduction, resource conservation and reducing waste and optimizing resource use were among the roles of waste management in the attainment of environmental sustainability in Ogun State, Nigeria. These findings were in support to Adogu, Uwakwe, Egenty, Okwuoha and Nwocha (2019) who examined the role and practices of waste management practices among residents of Owerri municipal Imo state Nigeria. Their findings indicated that waste management has help Nigeria in resource conservation as well as reduction in the environmental burden. Their findings further showed that waste management has reduced quantity of waste disposal and provided opportunity for recreation.

Conclusion

Having examined waste management as an antidote for environmental sustainability in Ogun State, the study concludes that effective waste management plays a crucial role in achieving environmental sustainability. The research identified significant challenges, such as inadequate financial and infrastructural resources, insufficient public awareness, and ineffective recycling systems. However, the study highlighted the transformative potential of waste management practices, including waste reduction, recycling, and resource optimization, to mitigate environmental challenges. Strengthening institutional frameworks, increasing public awareness, and leveraging technology are essential to enhancing waste management and fostering environmental sustainability in Ogun State.

Recommendations

Based on the findings and objectives of the study, the following recommendations were made for this study

1. **Improve Waste Management Infrastructure:** The government should allocate adequate financial resources to establish waste bins at strategic locations, provide waste collection vehicles, and develop advanced waste treatment and disposal facilities.
2. **Public Awareness Campaigns:** Comprehensive public education initiatives should be implemented to improve awareness about the importance of proper waste management. Campaigns should focus on reducing, reusing, and recycling waste and should leverage social media platforms for widespread engagement.
3. **Enhance Workforce Capacity:** Recruit and train additional personnel to address manpower shortages in waste management operations. Staff training programs should emphasize modern waste management practices and environmental sustainability.
4. **Invest in Recycling Technologies:** Promote and incentivize recycling initiatives by providing grants and loans to businesses and communities engaged in waste recycling and composting.
5. **Strengthen Government Frameworks:** Develop robust policies to ensure compliance with waste management regulations. Introduce measures to prevent corruption and mismanagement in the waste management sector.

6. **Community-Based Initiatives:** Encourage local community involvement in waste segregation and management through partnerships with environmental organizations and local leaders. Community recycling hubs and educational workshops can foster grassroots participation.

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