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Towards Sustainable Solid Waste Management in Selected Urban Areas of South-East Nigeria: Issues and Strategies

¹ Kelechi Friday Nkwocha, ² Philip O Phil-Eze, ³ Samuel Oji Iheukwumere, ⁴ Mohammed Kaka Shettima, ⁵ Umara Zulum

^{1,4} Department of Geography, University of Maiduguri, Borno State, Nigeria

² Department of Geography, University of Nigeria, Nsukka, Enugu State, Nigeria

^{3,5} Department of Geography & Meteorology, Nnamdi Azikiwe University, Awka, Anambra State, Nigeria

Corresponding Author: **Kelechi Friday Nkwocha**

Abstract

This research focuses on sustainable solid waste management in selected urban areas of Southeast Nigeria, with Aba, Nnewi and Onitsha as its case study. The study aims to bring to the front burner the challenges hindering proper municipal solid waste management in the region. The study employed a mixed method approach, which includes observation method as well as key informant interviews to aggregate the challenges discussed in the body of the work. The interviews was conducted with stakeholders, including

waste management companies, residents, and government agencies responsible for waste management. The study findings indicate that solid waste management in Southeast Nigeria is inadequate, with inadequate infrastructure, poor waste disposal practices, and low public awareness. Government face challenges in funding waste management operations, and waste collectors struggle to make a living due to low fees and insufficient resources.

Keywords: Sustainability, Sustainable Development, Southeast, Solid Waste, Urban Solid Waste Management

Introduction

Solid waste management is a significant challenge in many parts of the world, and Southeast Nigeria is no exception. The region faces several problems in collecting and disposing of solid waste, which has resulted in environmental degradation, health hazards, and economic losses. In this study, we will discuss the problems of solid waste collection and disposal in some selected urban areas of Southeast Nigeria. The selected urban areas include; Aba, Nnewi and Onitsha. The justification for the selection of these urban areas is because the aforementioned serve as both the industrial and economic power houses of the Southeast region. It is a popular opinion that industrialization and commerce lead to increase in population. Since these three key urban areas serve as the both economic and industrial hubs of the region, the population of these cities will be high. Also, since increase in human population is directly proportional to increase in waste generation, inadvertently, these cities will generate more wastes than others.

Background

Sustainable urban solid waste management is a crucial topic for modern cities. It is defined as the process of collecting, treating, and disposing of waste in an environmentally friendly, socially responsible, and economically viable manner, (Moktadir and Rahman 2022, Kayanan, Basnayake and Ariyawansa, 2023 and Puntilo, 2023) ^[4, 3, 8]. The increasing urbanization and population growth have resulted in an exponential increase in the amount of waste generated by cities worldwide. This has led to environmental, health, and social challenges, such as air pollution, soil degradation, water contamination, and public health issues. Therefore, sustainable urban solid waste management has become a critical issue for city planners, policymakers, and researchers.

According to Nwosu and Chukwueloka (2020) ^[6], Radwan, Khan and Elmanfaloty, (2021) ^[9] and Ezeudu, Agunwamba, Ugochukwu and Ezeudu, (2021) ^[2], sustainable urban solid waste management is an essential aspect of urban development, particularly in a country like Nigeria, where rapid urbanization and population growth have put enormous pressure on the waste management infrastructure. Nigeria is the most populous country in Africa, with a population of over 200 million people. With the rapid urbanization and economic development in the country, the generation of solid waste has also increased dramatically.

Southeast Nigeria is a densely populated region with a high level of economic activities. The rapid urbanization and industrialization of the region have led to an increase in the amount of waste generated. The lack of proper waste management infrastructure, inadequate waste disposal sites, and insufficient waste collection services have resulted in environmental pollution and health hazards for the residents. Traditionally, solid waste management in urban areas of Nigeria's Southeast region, has remained the responsibility of State Governments, (Nwankpa and Scandrett, 2020, Oluwafemi, Olukanni and Justin, 2021 and Serge, Matika and Magha, 2022) [5, 7, 10]. However, over the years, successive governments have failed to provide adequate waste management infrastructure and services. As a result, solid waste management has become a significant environmental challenge in Nigeria's urban centers, where uncollected waste is dumped indiscriminately on the streets, drainage channels, rivers, and other public places, leading to a host of environmental problems and health hazards, which is further compounded by the lack of awareness and education on proper waste management practices.

The lack of a proper solid waste management system in urban areas of the Southeast region, has also created opportunities for informal waste pickers, who collect recyclable materials from the waste and sell them to recycling companies. However, the informal waste picking sector is poorly regulated, and workers often face health risks and exploitation. It is against this backdrop that this research intends to investigate the issues hindering sustainable solid waste management in the three selected urban areas of Southeast Nigeria.

The Issues

After comprehensive field observations and interview with various waste management agencies as well as residents of Aba, Nnewi and Onitsha, several factors were observed to constantly inhibit regular evacuation and disposal of solid waste in these urban areas. The waste management authorities in the selected urban areas were subjected to an in-depth interview to ascertain what they felt were the factors hindering them from functioning at full capacity. The following factors summarizes their responses:

Accessibility

Accessibility is vital to effective waste management system in any given area. According to David, John and Hussain (2020) [1] and Serge and Simatele (2020) [11], solid waste collection, transportation and disposal, generally, require proper planning of infrastructure for accessibility, and where this is not available, the system collapses. Field observations revealed that some quarters in the selected urban areas, are not easily accessible and as such pose serious threat to the effective management of solid wastes in such cities. Most roads in the city centers are single-carriage and narrow, this is more pronounced in Aba and Nnewi. The few roads which are dual-carriage are still narrow on each side. Similarly, most streets leading to residential areas are untarred. These streets are footpaths, whose paths has been widened by residents of the area who have cars, motorbikes, etc. These paths are usually bumpy, while the road width is mostly just enough to accommodate one car at a time. The issue gets messier during rainy season. Owing to lack of drainage, most streets suffer from flash floods, which may not permit compactor trucks, easy entry and exit. The

implication of this is that waste collection vehicles will only evacuate wastes along the major roads where the trucks can make an easy U-turn. This according to the waste managers leads to heaps of wastes in the hard-to-reach areas of these cities.

Limited Number of Collection Trucks

Limited collection trucks rank amongst the foremost problems identified by interviewed waste managers in Aba and Onitsha. Findings from this study revealed that there are only four functional waste collection vehicles in Aba, while in Onitsha, despite the involvement of private investors, waste collection trucks are still insufficient to promptly evacuate the quantum of wastes generated in the city. Owing to insufficient evacuation trucks in Onitsha, various waste agencies have resorted to hiring trucks with open backs popularly known as "911" to evacuate wastes. The story is completely different in Nnewi. In the course of field observation in Nnewi city, this researcher counted about 15 waste disposal trucks of different sizes and functions, disposing wastes at the landfill site. A closer observation of these trucks revealed that all the waste evacuation trucks in Nnewi are brand new, and manufactured in Umudim, Nnewi, by Innoson Vehicle Manufacturing (IVM) Company, who incidentally doubles as the waste contractor handling wastes in the city and its environs.

Weak Legislation and Implementation of Environmental Laws

Non-implementation and poor enforcement of sanitation legislation in the study area undermines successful prosecution of those who violate sanitation laws. Field observation suggested that waste management authorities in the study area pay lip service to environmental/sanitation law enforcement. Owing to weak enforcement, some residents act irresponsibly by disposing wastes indiscriminately. In Aba for instance, a resident of World Bank housing estate, converted his eroded plot to a refuse dumping ground. This flagrant abuse of environmental laws has remained unchecked for years, despite complaints and protest letters by residents of the estate to the government. This non-challant attitude by waste actors has left the city besieged with heaps of wastes indiscriminately dumped in drainage channels, along the roads and on open plots.



Fig 1: Private plot converted to place for refuse disposal in World Bank Estate, Aba

Absence of Other Waste Management Alternatives

Landfill which is more of open dumping is the only final

waste disposal method practiced in the study area with no option for other waste management practices. As at present, there is no functional incineration plant(s) to manage the ever-growing waste in the study area. Similarly, recycling as a preferred alternative, which is vital in reducing the ever-increasing waste stream is yet to be fully practiced in the study area.

Poor Environmental Awareness/Attitude of Residents

There seems to be poor awareness and public enlightenment on inherent dangers associated with indiscriminate refuse dumping in the study area. Field observations found heaps of refuse dumped in uncompleted buildings, road divides, drainage channels and so on. Consequent upon this, the public has turned the aforementioned places into unofficial

dumping ground. Again, waste management authorities especially in Aba and Onitsha complained about the negative attitude of residents towards them. They complained that some residents after bringing their wastes to the waste bins, instead of disposing the waste inside the waste bins, they will deliberately empty the wastes on the floor just to spite them. They also complained that the residents denigrate and insult them at will and always blame them for the city’s lack of aesthetics. Waste managers in Aba, complained that some indigenes of Aba have over the years, exempted themselves from paying certain taxes, with sanitation tax inclusive. This claim corroborated the observations of the researcher, that some signposts, residences and shops in the city have the word “Native Compound” written on them.

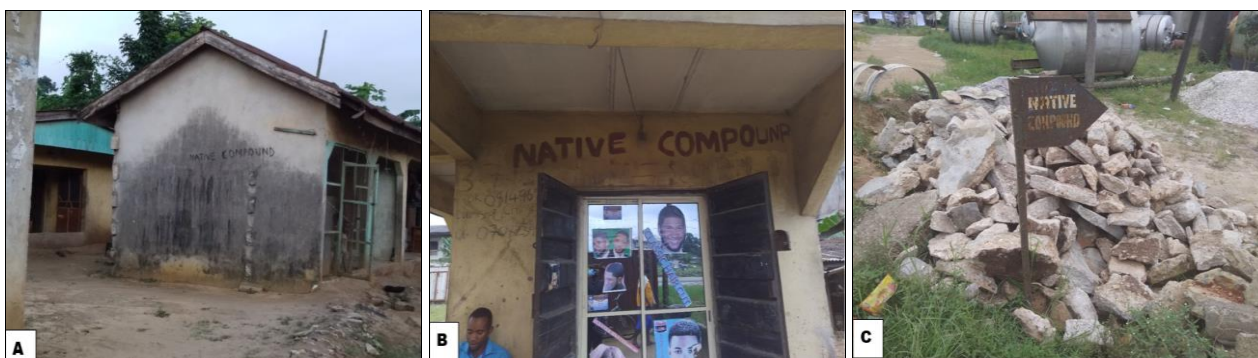


Fig 2 A and B and C: Indigene residence, Shop and signpost in Aba.

Further enquiries revealed that such residences and shops (Fig 2), belong to indigenes of the city, and as such do not pay sanitation or waste handling taxes. Despite several complaints by the waste management authorities, the situation has remained the same.

Underfunding

Underfunding is one of the major issues affecting waste management agencies in the study area. It is worthy to note that solid waste management is a task that requires huge capital so as to function effectively. The underfunding of waste management agencies by authorities in charge, is

evident in the paucity of their general facilities as well as poor nature of equipment’s they use for waste evacuation (See Fig 3). In most cases, the field workers walk on heaps of refuse without safety shoes. Interaction with field workers in Onitsha revealed that despite their poor welfare conditions, they still buy hand gloves and other cheap personal protection equipment’s from their pockets. Some of their colleagues who cannot afford it will be forced to climb heaps of refuse with broken shoes or bathroom slippers, or even pack wastes with their bare hands, or devise any other means to get the job done (see Fig 3 and 4).



Fig 3: Use of crude equipment’s for waste evacuation **Fig 4:** Fieldworkers using nylon bags in place of hand gloves in Onitsha

Similarly, staff salaries are delayed and waste evacuation trucks have all broken down due to lack of funds on one hand and corruption on the other. Interviewed fieldworkers revealed that even when the monies to fix the vehicles and purchase new waste bins is released, most of the monies find their ways into private pockets.

The Strategies

Overall, sustainable solid waste management in Southeast Nigeria requires a multi-pronged approach that involves a combination of some strategies to ensure that waste is managed in an environmentally sound and socially responsible manner. Some of the identified strategies include:

1. **Source Reduction:** This involves reducing the amount of waste generated at the source by encouraging practices such as recycling, composting, and the use of reusable materials.
2. **Recycling:** Recycling involves the collection, separation, and processing of materials that would otherwise be thrown away as waste. This can include materials such as plastics, paper, glass, and metals.
3. **Composting:** Composting involves the decomposition of organic materials such as food waste and yard waste to create a nutrient-rich soil amendment that can be used in gardening and farming.
4. **Waste-to-Energy:** Waste-to-energy technologies involve converting waste into energy through processes such as incineration or gasification.
5. **Landfill Management:** Proper landfill management includes designing and constructing landfills to prevent environmental pollution and ensuring that they are properly maintained and monitored.
6. **Public Education and Awareness:** Educating the public about the importance of proper waste management practices can help to promote responsible behavior and reduce waste generation.
7. **Enforcement of Regulations:** Enforcing regulations and laws relating to waste management can help to ensure that waste is properly managed and disposed of in a sustainable manner.

Conclusion

This study concludes by stating that sustainable urban solid waste management is a critical issue in Southeast Nigeria. The region is experiencing rapid urbanization and population growth, leading to an increase in solid waste generation. Effective solid waste management practices are essential to protect public health and the environment. The current waste management system in Southeast Nigeria faces numerous challenges, including inadequate funding, inadequate infrastructure, and poor public participation. However, there is hope for improvement through the adoption of sustainable solid waste management practices that prioritize the reduction of waste at the source, reuse and recycling, and safe disposal of residual waste. Implementing these practices will require a concerted effort from all stakeholders, including the government, private sector, and citizens. By working together, Southeast Nigeria can achieve sustainable urban solid waste management, leading to a cleaner, healthier, and more sustainable future for all.

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