

Influences of Refuse Management Activity on People and Their Surroundings in Some Selected Urban Areas of Owerri, Imo State, Nigeria, West Africa

Emeonye Okechukwu

Accepted 20 June 2025

Department of Urban and Regional Planning, Federal University of Technology Owerri. Email: okechukwuemeonye@gmail.com.
Tel. +234 - 07030343013

ABSTRACT

Refuse production has recently surged, leading to the accumulation of water along major important streets and roads in many Nigerian cities, as well as in other secondary and tertiary cities around the world. The responsibility of effectively managing this environmental challenge forms the central concern of the study. The research aimed to gather data to identify the key sources and types of refuse, their modes of disposal, and the associated ecological and environmental health implications. Data were collected using a questionnaire and structured interviews administered to 826 individuals in Owerri, and two urban communities- Amakohia and Orji- both in Owerri North Local Government Area. The data suggest that the primary components of trash, as putrescible, are obtained from commercial areas such as outdoor markets and shops. The principal administrative strategy is open refuse dumping. The vast majority of the respondents were aware of the detrimental effects of inefficient urban refuse management on public and environmental health. However, the administrative measures currently in place were found to be ineffective. Therefore, there is a pressing need to develop and promote a more effective waste management strategy.

Keywords: Environmental health, refuse administration, biodegradable refuse, environmental consequence, refuse transformation.

INTRODUCTION

Urban refuse is any unwanted resources that are no longer valuable or needed by consumers (Abdulrahman, 2024). It can manifest in either solid, liquid, or gaseous form. Solid waste is generated in urban areas across the globe, largely as a result of human consumption patterns. Daily, various types of waste are produced and indiscriminately discharged into different parts of the environment, including streets, highways, water bodies, drainage systems, open spaces, and farmlands.

With ongoing global advancements in science and technology, industrialization and technological innovation have led to the widespread use of sophisticated equipment and facilities across various sectors, including homes, hospitals, commercial establishments, industries, and recreational centers. These technological developments have significantly enhanced human efficiency, enabling the completion of large tasks within a shorter time frame. Despite these benefits, modern gadgets have increased waste output, both decomposable and non-decomposable. Similarly, the quantity and composition of organic refuse generated have exceeded the natural capacity of microbial degradation, leading to the accumulation of waste in urban corridors and activity zones such as streets, roads, drainage systems, marketplaces, and even rivers in many

developing countries. Imam et al (2022) expressed concern over the worrisome rate of urban population expansion, stating that while Nigeria's population rose by roughly 2.8% per year, urban growth can reach 5.5% per year. A growing population implies an increase in waste creation, which invariably leads to environmental contamination and, to varied degrees, health risks.

Smith (2022) emphasized that refuse disposal has become one of the most pressing urban challenges affecting many regions worldwide, particularly in developing countries and third-world cities. According to Buckle and Smith (2022), refuse management includes all land-use activities aimed at minimizing the health, environmental, and aesthetic impacts of waste. They also observed that many of the cities studied either lacked proper refuse processing infrastructure or operated inefficient systems, resulting in the widespread burning of waste. The accumulation of massive amounts of refuse contributes to adverse health effects and exacerbates global issues such as climate change and global warming. Environmental pollution, driven by the emission of greenhouse gases, has increased the prevalence of diseases such as diarrhea, malaria, respiratory tract infections, dysentery, and

cholera (Environment Canada, 2020; Nwankwo, 2023). Additionally, improper refuse disposal leads to a host of other urban problems, including flooding, clogged drainage systems, traffic congestion, land degradation, and road accidents caused by inundation.

As a result of the negative effects of refuse, proper refuse management is required to limit greenhouse gas emissions and their consequences, as well as chemicals, gases, and dangerous radiation. Brathwaite (2023) recognized the green economy as one of six activity sectors necessary for sustainable solid waste management. Furthermore, Iwuala (2024) stressed sustainable development as a strategy for achieving healthy and sustainable waste management in urban environments. Fighting malaria and other deadly diseases is one of the Sustainable Development Goals that aims to maintain environmental sustainability. One strategic approach to achieving the Sustainable Development Goals (SDGs) is through effective refuse management. This involves overseeing the entire waste management cycle—including storage, collection, transportation, processing, disposal, and utilization—in a systematic, acceptable, and efficient manner. A well-implemented waste management system helps maintain a clean and healthy environment by minimizing noise, unpleasant odors, toxic gases, pollutants, fumes, and other potentially hazardous substances (Nwankwo, 2023). This, in turn, promotes and supports green economic operations, leading to sustainable urban environmental and land use development.

The study area comprises Owerri Urban and its surrounding communities, including Amakohia and Orji—both located within the Owerri North Local Government Area. Amakohia and Orji are satellite towns bordering the Owerri Metropolis and do not have clearly defined boundaries. Owerri's three designated urban districts are densely populated and host a wide range of institutions, including schools, religious centers, recreational and entertainment facilities, hospitals and clinics, as well as various commercial establishments such as open markets, shopping malls, and trade centers. These activities generate waste in varying quantities.

The significance of this research lies in the fact that, although many scholars have explored various aspects of waste, there remains a noticeable gap in the literature concerning the impact of refuse management activities on people and their environment. This study, therefore, seeks to address that gap.

MATERIALS AND METHODS

The study adopted a survey research approach, utilizing tables to generate statistical inferences and compare quantifiable variables across groups. A combination of field tours, formal and informal interviews, administration of both closed- and open-ended questionnaires, direct observations, and ground-truthing techniques were employed to clarify complex issues observed on-site.

To achieve the study's objectives, several research questions were formulated, including: What are the key types and sources of waste generated in Owerri? What impact does waste have on the local environment? What refuse management methods are currently in use or are potentially viable? What are the major consequences of poor waste

disposal for both people and the environment? These questions guided the data collection and analysis.

The target population consisted of adults knowledgeable about refuse generation and disposal practices. A stratified sampling technique was employed, using a sampling frame based on the street names in Owerri Urban as provided by the city council's assessment unit. A validated open-ended questionnaire was developed and administered to the selected respondents.

The survey questionnaire was administered directly to the respondents. Out of the 250 copies distributed, 233 copies were returned. Of these, 15 were incomplete and 9 were left blank, leaving 209 properly completed questionnaires, which were subsequently used for analysis.

Data from the survey population were sorted, processed, and analyzed in tabular format, using simple percentages. Simple percentages were selected as statistical tools because they display unambiguous differences between observed and anticipated values, allowing for a significance test that was utilized to draw inferential conclusions.

RESULTS AND DISCUSSION

According to the data obtained from the surveyed population (Table 1), the study region is a literate community, with 52.6% of respondents holding qualifications such as OND, HND, B.Ed., or B.Sc. The majority of respondents were public or civil servants (47.8%) and married (49.3%). The findings revealed that residents of Owerri Urban and its surrounding areas are well-acquainted with the concept of waste generation and management. This awareness positions them to actively participate in effective refuse management initiatives and to support others particularly younger individuals in understanding and adopting sound waste management practices.

Table 2 shows that the majority of the refuse generated in the study area was biodegradable (68.9%), while non-biodegradable waste accounted for 26.7%. These findings align with those of Oil Resources and Allied Investment Limited (2023), which reported a composition of 54% biodegradable and 46% non-biodegradable waste. The results are also consistent with data on waste types from selected African cities, as compiled by Asomani-Boateng and Haight (2023), which indicated the following percentages of organic waste: Kumasi (83%), Accra (85%), Ibadan (55.8%), Kampala (75%), and Kigali (94%).

Owerri, being an administrative city with a high concentration of civil and public servants (47.8%) and students (27.3%), generates a significant amount of biodegradable waste. This is largely attributed to the city's socio-economic profile. Markets were identified as the primary source of refuse generation, based on the investigation of major waste sources.

Furthermore, the reason for most refuse being biodegradable is due to the high consumption of food items, both in the residential and commercial sectors. For instance, in the residential sector, residents consume food and staple items like corn, cassava, fruits, and other food items, even with leftovers, which were found littered all over the place within the sample urban environment. Similarly, commercial areas such as open markets, shopping centers, eateries, and abattoirs generate similar types of waste, often producing offensive odors. These

Table 1: Personal Profile of the Surveyed Population.

Variables	No of Respondents	Percentages
Age		
20-29	50	23.9
30-39	36	17.2
40-49	103	49.3
50 and above	20	9.6
Sex		
Male	96	45.9
Female	113	54.1
Marital status		
Single	101	48.3
Married	103	49.3
Non-response	5	2.4
Educational qualification		
FSLC	4	1.9
WASC/GCE	75	35.9
OND/HND/B. Ed/B.Sc.	110	52.6
M.Sc./Ph.D.	12	5.7
Non-response	9	4.4
Occupation		
Civil/public servant	100	47.8
Self employed	25	12.0
Private sector	19	9.1
Student	57	27.3
Non-response	4	1.9

Note: **FSLC**-First School Leaving Certificate; **WASC**-West African School Certificate, **GCE**-General Certificate of Education; **OND**-Ordinary National Diploma; **HND**-Higher National Diploma; **Ph.D**-Doctor in Philosophy. **M.Sc.**-Master of Science and **B. Ed**- Bachelor's of Education.

Table 2: Major types and sources of Refuse.

Variable	No. of Response	Percentages
Refuse Types		
Biodegradation	144	68.9%
Non-Biodegradable	56	26.7%
No response	9	4.4%
Refuses Sources		
Residential homes	30	14.3%
Markets	102	48.8%
Academic institutions	7	3.3%
Hospitals	7	3.3%
Business outfits (banks, hotels, etc.)	20	9.5%
Two or more options	40	19.1%
No response	2	0.9%

emissions negatively impact both humans and animals, leading to adverse health complications.

This finding contrasts with the view of Olafusi (2024), a United Nations representative interviewed at the Ministry of Petroleum and Environment, who identified residential dwellings as the primary source of refuse. However, markets undeniably serve as the central hubs of commercial activity in urban areas, often accommodating larger populations than any other sector at any given time. The increasing human population and intensifying market activities likely account for the vast quantities and diversity of refuse observed in the municipality and its surrounding areas.

In terms of refuse management methods (Table 3), open dumping (55.5%) was judged to be the least acceptable approach, whereas sanitary landfill (5.7%) and burning (12.9%) were ranked second and third, respectively. These findings are consistent with those of Olafusi (2024) and Iman et al (2022), who stated that in most cities in Nigeria and other developing nations, the majority of refuse created is dumped on the ground surface along main roads, streets, and open areas. The discovery was further supported by information gleaned from field visits and firsthand observations, which revealed the presence of over 248 dumpsites of all sizes across the municipality and its surrounding areas.

Table 3: Available refuse management methods.

Variables	No. of Respondents	Percentages
Sanitary landfill	12	5.7%
Burning	27	12.9%
Open dumping	116	55.5%
Ocean dumping	4	1.9%
Composting	4	1.9%
Recycling	2	0.9%
Refuse separation	12	5.7%
Two or more options	30	14.3%
No response	2	0.9%

Table 4: Health and environmental impacts of refuse.

Variables	No. of Respondents	Percentages of (n)
Effectiveness of the refuse management system		
Yes	36	17.2
No	173	82.8
Generators' perception of the health impacts of refuse dumpsites		
Yes	95	45.4
No	114	54.6
Observed features of refuse dumpsites		
Burning/smoke	33	15.8
Flies and mosquitoes	20	9.6
Odour emission	70	33.5
Rodents and other animals	2	0.9
Refuse-pickers	14	6.7
Two or more options	65	31.1
No response	5	2.4
Some observed impacts		
Pollution	46	22.0
Flooding	10	4.8
Disease vectors	45	21.5
Fire out-break	4	1.9
Road blockage	10	4.8
Accidents	3	1.4
Land degradation	18	8.6
Two or more options	69	33.0
No response	4	1.9

The details for using open dumping as the primary trash disposal method may include a lack of adequate manpower and equipment, inaccessibility to final dumpsites, people's negative attitudes about environmental sanitation, and the system's low cost but ineffectiveness. It was revealed that the quality of refuse generated regularly had surpassed the available manpower and equipment, resulting in continual breakdowns. This assertion was supported by information obtained from the Bureau of Sanitation and Transport Unit, ENTRACO, which listed the following existing equipment: Ford Tractor 2 (not functional), NDDC Trucks 19 (9 functional, 10 not functional), Axon Mercedes tippers (4 fully operational), 31 recently acquired refuse bins, 122 old bins, and 57 damaged bins.

The lack of suitable equipment and skilled manpower in refuse management can be attributed to several interrelated factors, including inadequate funding, corruption, poor maintenance culture, and a lack of political will. Investment in waste management is often perceived as unproductive or non-

profitable, leading to its low prioritization in public policy and budgeting. Additionally, other identified refuse management strategies were either underutilized or implemented at minimal levels, thereby failing to make any significant contribution to effective waste management in the study area. Individuals directly involved in refuse handling corroborated these findings, noting that there is no structured or comprehensive refuse management system in place. Instead, the current practice amounts to mere refuse displacement—essentially transporting waste from one location to another without proper treatment or final disposal.

Table 4 provides a comprehensive analysis of the effectiveness of the existing refuse management system and the level of awareness of its impacts. The data reveal that several observed consequences are closely associated with environmental pollution (22%), flooding (4.8%), disease vectors (21.5%), fire outbreaks (1.9%), road blockages (4.8%), accidents (1.4%), and land degradation (8.6%). Additionally, a significant proportion of the responses (34.9%) fall under

"other" impacts, indicating the presence of various yet unidentified factors. Overall, the findings suggest that pollution, disease vectors, and land degradation are the most significant contributors to the health and environmental challenges posed by refuse in the selected areas of Owerri, Imo State. The data indicate that although most individuals are aware of the health and environmental implications of improper waste disposal, refuse continues to be indiscriminately dumped across the city. This contradiction suggests that the prevailing unsanitary conditions are not solely due to a lack of equipment, inadequate manpower, or limited awareness. Rather, they are also a consequence of negative public attitudes toward waste disposal and environmental hygiene, as well as the absence or weak enforcement of relevant legislation. Evidence of this includes common practices such as discarding refuse from moving vehicles, littering residential and institutional areas, markets, and commercial premises, as well as the misuse of public toilets and open defecation—even in broad daylight. In some cases, landlords fail to provide toilet facilities, forcing tenants to resort to defecating in nearby bushes or using polythene bags, which are subsequently discarded with other refuse. Additionally, wastewater from refuse is often channeled into street drainage systems, exacerbating environmental pollution.

This finding aligns with previous research by Yhdego and Majura (2023), Stephen and Harpham (2024), and Songsore and MacGranahan (2021), who identified a strong correlation between poor sanitation practices and increased disease incidence, morbidity, and mortality in African cities. It is also consistent with reports from Environment Canada (2020), Olotuah and Fadaïro (2005), and USAID (2023), which linked environmental degradation, flooding, and climate change in developing countries to ineffective waste management systems.

The primary objective of environmental sanitation is to establish and maintain conditions that promote both human and environmental health while minimizing the risk of disease transmission (Lucas and Gilles, 2020). Poor sanitary conditions have been directly linked to a range of air- and water-borne diseases such as cholera, dysentery, diarrhea, gastroenteritis, malaria, and typhoid fever (USAID, 2023; Refuse Info Sheet, 2025). If left untreated, these illnesses can lead to significant morbidity and, in severe cases, mortality. A deteriorating environment, compounded by a weakened labor force, hinders individuals from fully harnessing the benefits of environmental development and utilizing available resources to satisfy essential human needs. This scenario adversely affects the overall economic development of urban areas and undermines efforts to achieve long-term sustainable development.

CONCLUSION

According to the findings, biodegradable waste predominates in the urban regions studied. Commercial markets and individual homes generate the majority of waste. The refuse administration is not sterilized, resulting in environmental littering and pollution. Contamination, disease outbreaks, and environmental dangers such as flooding, road closures, accidents, and fire outbreaks are among the consequences, in addition to aesthetic devaluation. This demonstrates that there

is a substantial link between proper trash management and the health of the urban population. Consequently, this has an impact on economic growth.

In light of the effects of inapt trash disposal/administration on human and public health, the following recommendations were proposed: (1) A comprehensive refuse administration system that includes refuse separation, recycling, composting, sanitary landfilling, and incineration is required. (2) All levels of government should consider making reasonable provisions for the purchase and repair of current technological equipment, as well as training and hiring of refuse management experts. (3) Users should pass and enforce feasible laws ensuring proper disposal of refuse items and general refuse control systems; (4) Refuse administration and related matters should be separated and handled by technically non-biased personnel to avoid function overlap, which may lead to incompetence and managerial racketeering.

REFERENCES

- Abdulrahman RC (2024). Urban refuse: An unwanted resource in developing nations. *Journal of Waste Technology and Innovation* 12(9): 98-107.
- Asomani-Boateng R and Haight M (2023). Reusing organic Refuse in urban farming in African Cities: a challenge for Urban planners. *Documents II* (15):1-14.
- Buckle FG and Smith SA (2022). *Refuse handling in the Metropolitan*. Washington D.C. United States Public Health Service (USPHS) publication.
- Brathwaite D (2023). Redefining green economy: Global perspective? *Journal of Science and Technology* 9(1): 61-68.
- Environment Canada (2020). *Curbing the Effects of Refuse on Climate*. http://www.ec.gc.ca/science/sandenovoz/article1_e.htm.
- Imam A, Mohammed B, Wilson DC, Cheeseman CR (2022). *Refuse management in Abuja*. Doi:10.1016/j.wasman. 2022.01.006.
- Iwuala MOE (2024). *Green Economy: The Practical Implications*. In the proceedings of the 2024 World Environment Day. Owerri, Imo State, Nigeria.
- Lucas AO and Gilles HM (2020). *A Short Textbook of Preventive Medicine for the Tropics*. Ibadan, Nigeria. Bounty Press Limited.
- Nwankwo BO (2023). *Refuse Generation and Management among Traders in Owerri Municipal Markets, Imo State*. *The Journal of Environmental Health*, 5(2): 56-63.
- Oil Resources and Allied Limited (2023). *The study of Refuse Generation and Management in Owerri Metropolitan City*. A consultancy service agreement report was presented to the Ministry of Petroleum and Environment. Owerri: August 13, 2023.
- Olafusi OR (2024). *Refuse Disposal and Management. A case for a healthy environment*. Unpublished Housing Seminar Report, Department of Architecture, Federal University of Technology, Akure, Nigeria.
- Olotuah AO and Fadaïro G (2005). *Flooding and the Urban Environment*. *Journal of Applied Sciences*. 8(1): 4511-4518.
- Songsore J and Mc Granahan G (2021). *Environment, Wealth and Health: Towards an Analysis of Intra-Urban Differential within the Greater Accra Metropolitan Area, Accra, Ghana*. Sweden.
- Stephen C and Harpham T (2024). *Health and Environment in Urban Areas in Developing Countries*. *Third World Planning Review*. 14 (3): 96-104.
- USAID (2023). *Urban Sanitation and Refuse Water Treatment: Making Cities Work*. http://www.makingcitieswork.org/urban_themes/environment/sanitation (Accessed March 5, 2025).
- Refuse Info sheet (2025). *Urban and rural refuse disposal methods: advantages and disadvantages*. <file:///D:/assign/refusedisposalmethod.htm> (Accessed April 17, 2025)

Yhdego M and Majura P (2025). Malaria control in Tanzania.
Environmental International. 14 (5): 479-483.