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# Environmental Health and Waste Management Practices in Anambra State: A Study of Anaocha Local Government Area

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**ABSTRACT**

*Environmental health and effective waste management are critical to sustainable urban development and public health, particularly in rapidly urbanizing regions of Nigeria. This study examines waste management practices and their environmental health implications in Anaocha Local Government Area (LGA) of Anambra State. Anchored on Systems Theory, the study adopts a scoping review methodology to synthesize evidence from peer-reviewed literature, government policies, statutory documents, and technical reports from national and international organizations. The findings reveal a pronounced knowledge–practice gap among households: while awareness of sanitation and environmental health is relatively high, practices such as waste segregation and recycling remain limited. Indiscriminate dumping and open burning of waste persist due to inadequate collection services, infrastructural deficits, and affordability constraints. Institutional analysis shows that although the Anambra State Waste Management Authority (ASWAMA) possesses a clear legal mandate, its effectiveness is undermined by chronic underfunding, insufficient equipment, weak enforcement, and uneven service coverage, particularly in semi-urban and rural communities. These systemic failures contribute to serious public health risks, including air pollution, water contamination, and a high prevalence of soil-transmitted helminthiasis (35.2%) linked to poor sanitation. The study also identifies underutilized opportunities in circular economy approaches such as composting and plastic recycling, which could reduce waste volumes, improve environmental quality, and generate local employment. The paper concludes that sustainable waste management in Anaocha requires integrated interventions combining improved infrastructure, stronger institutional capacity, consistent enforcement, and active community participation. Strengthening these interdependent components can enhance environmental health outcomes and support sustainable development in Anambra State.*

**Keywords:** Environmental health; waste management; Anaocha LGA; ASWAMA; public health; sustainability; Anambra State

## INTRODUCTION

Environmental health involves the aspects of human health influenced by physical, chemical, biological, and social factors present in the environment. It focuses on preventing disease and creating health-supportive conditions through safe living, clean air and water, and proper waste handling. Waste management, on the other hand, refers to the systematic control of the generation, storage, collection, transportation, processing, and disposal of waste materials to reduce their harmful effects on people and the environment (Gupta, Sharma & Bhardwaj, 2024). In Nigeria, rapid urbanization, industrial growth, and population increase have worsened challenges in both environmental health and waste management. Southeastern states such as Anambra are particularly affected. Anambra State, with a population exceeding five million, faces mounting environmental pressures due to industrial activities, urban expansion, improper waste disposal, and inadequate infrastructure for effective waste control. These challenges threaten public health, pollute land and waterways, and degrade living standards. Addressing them requires comprehensive waste management strategies, community participation, and government commitment to sustainable environmental health practices.

The Anambra State Waste Management Authority (ASWAMA) is the statutory body established under the 2015 ASWAMA Law and vested with the responsibility of keeping cities, towns, and local

government areas clean across the state (Ezeanokwasa, 2019). The agency was created to provide a structured, sustainable, and centralized framework for tackling the ever-growing challenges of waste generation and disposal, particularly in the face of rapid urbanization and population growth. Its mandate extends beyond refuse collection to include waste segregation, recycling, public awareness campaigns, and the promotion of environmentally sound disposal practices that safeguard human health and the ecosystem. Despite this legal and institutional foundation, significant gaps remain in practice. Waste segregation at source is largely absent, while collection services do not comprehensively cover all urban and rural communities. This has resulted in many households and businesses resorting to indiscriminate dumping in open spaces, roadsides, and water channels. The lack of proper disposal infrastructure has further compounded the problem, with overflowing dumpsites and open burning of refuse releasing harmful pollutants into the air. These shortcomings not only diminish the aesthetic appeal of towns and cities but also create serious public health risks, including the spread of vector-borne diseases and contamination of water sources. Additionally, clogged drainage systems caused by improper waste disposal have contributed to seasonal flooding, disrupting livelihoods and damaging infrastructure.

Anaocha Local Government Area (LGA) offers a useful microcosm for examining these challenges. Located in the central part of Anambra State, Anaocha is a semi-urban region with an estimated population of about 405,000 people. The LGA comprises towns such as Neni, which serves as the administrative headquarters, along with Agulu, Adazi-Nnukwu, Aguluzigbo, Nri, and Akwaeze. Its unique mix of semi-urban and peri-urban settlements provides a representative context for assessing how waste management practices and policies are translated into everyday realities at the community level. More importantly, Anaocha reflects the broader tensions between rapid population growth, limited infrastructure, and inadequate policy enforcement. As such, it serves as an important case for analyzing the link between waste management systems, environmental health outcomes, and sustainable development within Anambra State (Anaocha.com, 2024).The importance of effective waste management in Anaocha LGA cannot be overstated, as poor practices contribute to soil and water contamination, vector-borne diseases, and overall degradation of environmental health (Azuike, Nwabueze, Onyemachi, Egenti, Okafor, Aniemena, Udedibia & Nwodo, 2015).

This study therefore seeks to examine waste management practices in Anaocha Local Government Area, with particular emphasis on their effects on environmental health and sustainable urban development. It explored how waste is generated, collected, and disposed of, while identifying the key challenges communities face, such as indiscriminate dumping, lack of segregation, and poor disposal infrastructure.

**Statement of Problem**

Anaocha LGA, like much of Anambra State, grapples with inefficient waste management systems that pose severe threats to public health and the environment. Common issues include indiscriminate dumping, open burning of waste, and inadequate collection services, leading to environmental pollution and health hazards such as soil-transmitted helminthiasis (STH) and waterborne diseases. For instance, the prevalence of STH among adolescents in Anaocha stands at 35.2%, classified as a moderate-risk area by WHO standards, largely due to poor sanitation and open defecation practices exacerbated by flooding and lack of functional toilets. Financial constraints, insufficient equipment, and non-compliance with sanitation regulations further compound the problem. In rural parts of Anaocha, waste is often burned or dumped in bushes and gullies, contributing to air pollution, soil degradation, and groundwater contamination. These practices not only affect biodiversity but also increase morbidity rates from diseases like cholera and dysentery, particularly during rainy seasons when waste spreads through floodwaters. The absence of modern recycling facilities and public awareness programs perpetuates a cycle of environmental degradation, underscoring the need for targeted interventions in Anaocha LGA.

## RESEARCH METHOD

This study adopted a scoping review method to examine the environmental and health implications of open waste burning in Anaocha Local Government Area, Anambra State. The scoping method is particularly suited for mapping the breadth of available evidence, identifying thematic patterns, and highlighting research gaps within a broad and complex topic. Unlike systematic reviews, which emphasize narrow

questions and quality appraisal, scoping reviews provide a comprehensive overview of existing knowledge and practice, making them useful for informing policy, community interventions, and future research directions. Following this approach, the study drew upon diverse sources, including: Peer-reviewed literature on waste management, environmental health, and sanitation practices in Anambra and Nigeria more broadly. Statutory and policy documents, such as the National Environmental Standards and Regulations Enforcement Agency (NESREA) Act, 2009 *and the* Anambra State Waste Management Authority (ASWAMA) Law, 2015. Global and regional technical reports from international organizations such as the World Health Organization (WHO) and the National Institutes of Health (NIH). A structured screening process was employed to ensure rigor and credibility. Sources were evaluated for relevance (directly addressing waste management and health outcomes).

## LITERATURE REVIEW

### Conceptual Review

### Environmental Health

Ezirim and Agbo (2018) defined environmental health as the field of public health that focuses on how the surrounding environment, both natural and built, impacts human health. This includes crucial elements like the quality of air, water, and soil, as well as the practices for managing waste. This definition highlights the vital link between a healthy environment and the well-being of the population, underscoring that effective environmental management is a fundamental component of public health. Waste management involves the processes and actions required to manage waste from its inception to final disposal, encompassing collection, transport, treatment, and disposal, alongside monitoring and regulation.

### Waste Management Practices

Mubaslat (2021) defines waste management as the various approaches and procedures designed and implemented to identify, control, and handle different types of waste. This definition emphasizes that waste management is not a single activity but a systematic process involving several interconnected stages. These include waste identification, segregation at source, collection, transportation, treatment, recycling, and final disposal. Effective waste management therefore requires both technical and institutional frameworks that ensure wastes are handled in ways that minimize risks to public health and the environment. In many developing contexts, including Nigeria, waste management practices are often fragmented, with gaps in infrastructure, policy enforcement, and public participation. As a result, improperly managed waste contributes to environmental hazards such as water and air pollution, soil degradation, and climate change through greenhouse gas emissions. Poor handling of solid and liquid wastes also fosters the spread of communicable diseases, thereby placing additional strain on public health systems.

### Theoretical Framework

This study is anchored on Systems Theory, originally developed by Ludwig von Bertalanffy in 1968. The theory views organizations, societies, and environments as complex, interdependent systems in which the effectiveness or failure of one component has a direct impact on the entire whole (Newman & Newman, 2020). Within the context of environmental health and waste management in Anaocha Local Government Area, Systems Theory helps to explain how different actors, processes, and outcomes are interconnected and why a breakdown in any one element results in negative consequences for both the environment and public health.

Households in Anaocha function as the primary generators of waste, while local authorities such as ASWAMA are responsible for organizing collection, transportation, and disposal. Private sector contractors and informal recyclers also form a significant part of the waste management system, and the environment itself, air, water, and soil, acts as both a receptor and a feedback mechanism. Community health outcomes, such as the prevalence of respiratory illness, diarrheal infections, and other sanitation-related diseases, provide a measure of how effectively or poorly the system is functioning. Systems Theory further emphasized the continuous flow of inputs, processes, and outputs. In this context, the waste produced by households and institutions enters the system as input, the collection and disposal activities represent the processing stage, and the ultimate outcome is reflected in the state of the environment and health of the population. Where these processes are managed effectively, the output is a clean

environment and improved well-being; where they are mismanaged, the result is pollution, vector proliferation, and widespread disease.

Equally important is the notion of feedback within systems. Regular and reliable waste collection strengthens community compliance and discourages open dumping or burning, thereby reinforcing a positive cycle of healthy practices. Conversely, irregular services or lack of enforcement generate frustration and lead households to adopt unsafe methods, creating a negative cycle that amplifies environmental degradation. In Anaocha, therefore, the quality of waste management services directly influences the behavioral responses of residents, and these responses, in turn, feed back into the overall effectiveness of the system. The Systems Theory perspective also draws attention to interdependence. If ASWAMA fails to provide sufficient collection trucks or enforcement, even well-intentioned households may be forced into poor practices. Similarly, if households do not participate actively in waste segregation or disposal, institutional efforts will remain ineffective. The system's stability depends on achieving equilibrium, in which households adopt healthy practices, government agencies deliver reliable services, and private actors support recycling initiatives, all while the environment retains its capacity for regeneration.

**Waste practices and household behaviours in Anaocha, Anambra State**

A cross-sectional study of 270 households in Anaocha revealed that while there was generally high awareness of the importance of sanitation and positive attitudes toward cleanliness, gaps persisted in translating this knowledge into actual practices, particularly in recycling and proper sorting of waste (Azuike et al., 2015). This disconnect highlights the well-documented "knowledge–practice" gap in environmental health studies, where individuals understand the benefits of hygienic waste management but fail to adopt the required behavioral practices consistently. The study further showed that residents relied heavily on non-formal and often unsustainable methods of waste disposal, such as open dumping, burning, or reliance on informal collectors, with only limited participation in structured collection systems. Service access was often constrained by inadequate coverage from waste management authorities, thereby compelling households to adopt less hygienic alternatives. The findings also emphasized that convenience is a major driver of waste behavior, with many residents opting for disposal methods that minimize personal effort or cost, even if these methods harm the environment. Moreover, socioeconomic and demographic variables such as educational status, age, gender, and the cost of collection services were found to significantly shape individuals' disposal choices. For example, households with higher educational attainment tended to exhibit more environmentally conscious practices, while lower-income households prioritized affordability over sustainability. Collectively, these insights demonstrate that waste management behavior in Anaocha is shaped not only by awareness levels but also by practical, economic, and social constraints.

In response to the growing challenges of waste management in Anaocha Local Government Area, the LGA Chairman, Comrade Rome Ibekwe, has initiated community-based cleanup campaigns aimed at restoring environmental sanitation and discouraging indiscriminate dumping. One notable example was the removal of a long-standing refuse dump at St. Andrew's Catholic Church, Neni, where the Chairman personally supervised the exercise while calling on residents to take ownership of their environment (Anambra State Government, 2024). These cleanup efforts have been complemented by awareness drives encouraging households to adopt responsible disposal habits, reflecting a broader attempt to bridge the gap between policy and community action. As part of these initiatives, local leaders have also designated official dumping zones across the LGA to provide structured alternatives for residents who previously relied on informal or illegal disposal methods. In addition, plans are underway to barricade former illegal dump sites to prevent further indiscriminate use, thereby reinforcing compliance with sanitation directives. These measures demonstrate a shift toward community-driven governance in waste management, where local authorities not only enforce rules but also engage directly with citizens to ensure sustainability. However, the long-term success of these interventions will depend on consistent enforcement, regular waste collection, and active community participation, without which old habits may resurface and undermine progress.

**Institutional arrangements in Anambra**

The ASWAMA Law (2015 No. 9) provides the statutory foundation for waste management in Anambra State, establishing the mandate of the Anambra State Waste Management Authority (ASWAMA) across the key functions of collection, transportation, treatment, and disposal of waste (Ezeanokwasa, 2019). The law also empowers the agency to impose fees and levies for sanitation services, as well as to apply sanctions for non-compliance, thereby creating a legal and institutional framework for systematic waste governance. In principle, these provisions were intended to address the long-standing challenges of indiscriminate dumping, inadequate coverage of collection services, and the absence of an integrated disposal system.

Recent assessments of ASWAMA's performance, however, have revealed mixed outcomes. On the one hand, the agency has recorded notable positive initiatives, such as the institutionalization of monthly sanitation exercises, the engagement of community-based organizations and private contractors in waste collection, and collaborations with the Operation Clean and Healthy Anambra (OCHA) Brigade for enforcement of sanitation laws (Obiorah, Alumona, & Okelue, 2025). These efforts have contributed to improved cleanliness in certain urban centers and heightened public awareness of environmental health issues.

On the other hand, chronic institutional and operational constraints continue to undermine ASWAMA's effectiveness. Limited funding allocations, inadequate waste collection equipment, irregular servicing of disposal trucks, and insufficient personnel have hampered comprehensive coverage, particularly in semi-urban and rural communities. Enforcement capacity remains weak, with many households and businesses either evading sanitation levies or failing to comply with waste disposal regulations. Although there have been attempts at targeted revenue enforcement to improve compliance with sanitation levies, challenges relating to sustained compliance, community trust, and transparent reinvestment of collected revenues into improved services persist. These limitations indicate that without stronger institutional capacity, accountability mechanisms, and broader community engagement, ASWAMA's mandate will remain only partially realized.

**Health impacts of poor waste management**

Poor waste management, which includes inadequate collection, improper disposal, and unsafe treatment of solid, liquid, and hazardous wastes, significantly threatens public health globally. It contaminates air, water, and soil, creating pathways for disease transmission, toxic exposures, and long-term health deterioration. According to the World Health Organization (2024), over 2 billion tons of municipal solid waste are generated annually, with mismanagement leading to environmental pollution and health risks like cholera and vector-borne diseases. This issue is exacerbated in developing countries, where low collection rates and open dumping prevail, but it affects all regions, contributing to both acute infections and chronic conditions. This overview synthesizes key impacts, drawing on recent studies to highlight mechanisms, diseases, and vulnerabilities.

Solid waste refers to any type of garbage, trash, refuse, or discarded material that arises from human, commercial, or industrial activities. It is generally classified according to its source of generation. The most common type is municipal solid waste, which originates from households, institutions, and commercial establishments. Other important categories include healthcare waste, which may contain infectious or hazardous materials, and electronic waste (e-waste), which results from discarded electrical and electronic devices such as computers, televisions, and mobile phones. Globally, it is estimated that more than 2 billion tons of municipal solid waste are produced every year, with projections indicating a steady increase due to rapid urbanization, population growth, and changing consumption patterns (World Bank, 2018).

The improper disposal of solid waste has far-reaching environmental and health consequences. When waste is not properly collected, segregated, or treated, it often ends up in open dumps, drainage systems, rivers, or oceans. Such practices lead to water, soil, and air contamination, which can directly or indirectly affect human health. For instance, the open burning of waste releases toxic chemicals and particulate matter that may cause respiratory illnesses, cardiovascular diseases, and even cancer in exposed populations. Waste workers, scavengers, and individuals living near dumpsites are particularly vulnerable to these adverse outcomes. Children and other vulnerable groups face disproportionate risks, as their developing organs and immune systems are more sensitive to toxic exposures.

In addition, poor waste collection and disposal systems have significant implications for urban planning and environmental health. Uncollected waste clogs drainage channels and waterways, creating stagnant pools of water that serve as breeding grounds for disease vectors. This often leads to flooding during rainy seasons, which damages infrastructure, displaces populations, and increases the spread of waterborne diseases such as cholera, typhoid, and dysentery. Similarly, vector-borne diseases such as malaria and dengue fever thrive in environments where stagnant water accumulates in discarded waste items such as plastic containers, tires, and cans. These outcomes demonstrate the close interconnection between waste management practices, environmental quality, and public health.

Another growing dimension of the waste challenge is the rapid increase in electronic waste (e-waste). According to the Global E-Waste Monitor (2020), approximately 54 million tons of e-waste were generated globally in 2019, and this figure is expected to rise to 75 million tons by 2030. E-waste is particularly problematic because it often contains hazardous substances such as lead, mercury, cadmium, and brominated flame retardants. When improperly handled or disposed of, these materials can leach into soil and groundwater, contaminating drinking water supplies and agricultural lands. In many low- and middle-income countries, including Nigeria, informal recycling practices such as manual dismantling or open burning of e-waste are widespread. These activities expose workers, often without protective equipment, to toxic fumes and hazardous dust. The health consequences can include respiratory problems, neurological damage, impaired immune function, and developmental disorders in children.

## FINDINGS AND DISCUSSION

### 1. Household Behaviours: Awareness versus Practice

Studies of household waste practices in Anaocha Local Government Area reveal a paradox between knowledge and behavior. Azuike et al. (2015) observed that while residents exhibit high levels of awareness about the importance of environmental sanitation and often express positive attitudes toward cleanliness, this awareness does not consistently translate into sustainable waste management practices. For instance, households generally acknowledge the dangers of indiscriminate dumping and burning of refuse, yet these practices remain widespread due to the absence of convenient alternatives. This reflects what is often termed the “knowledge–practice gap,” where individuals understand the right course of action but are constrained by social, infrastructural, or economic realities. One of the major limitations lies in the area of waste segregation and recycling. Despite global and national campaigns encouraging households to separate biodegradable from non-biodegradable waste, most residents in Anaocha do not practice systematic sorting. Recycling activities are minimal, largely confined to informal scavengers who retrieve plastics, cans, and metals from communal dumps. The responsibility for proper segregation is seldom assumed by households, partly because of inadequate sensitization and partly due to a lack of structured systems to support such efforts. Service delivery gaps exacerbate these behaviours. Irregular or insufficient waste collection services force many residents to resort to self-help methods, which frequently involve open dumping in nearby vacant plots or water channels. Cost also plays a role: for lower-income households, paying sanitation levies or private collectors is often viewed as burdensome, making open dumping or burning the more “convenient” option. Consequently, household behavior in Anaocha reflects a tension between positive sanitation attitudes and the everyday pressures of affordability, accessibility, and convenience. Addressing these behavioral dynamics requires not only awareness campaigns but also reliable infrastructure, affordable services, and sustained community engagement.

### 2. Open burning is prevalent and hazardous.

Open burning of solid waste remains one of the most widespread yet hazardous waste disposal methods in many parts of Nigeria, including Anaocha Local Government Area. Households and small businesses frequently resort to this practice as a quick and low-cost way to manage refuse, particularly when formal waste collection systems are irregular or inaccessible. However, the environmental and health consequences are severe. Evidence shows that open trash burning is a significant source of fine particulate matter (PM2.5) and other toxic emissions, including carbon monoxide, volatile organic compounds, polycyclic aromatic hydrocarbons, and heavy metals (World Health Organization, 2025). These pollutants contribute directly to air quality degradation and are linked with a wide range of acute and chronic health conditions. Short-term exposure to emissions from open burning can cause acute irritant effects, including eye irritation, coughing, throat discomfort, and respiratory distress. More concerning are the long-term impacts, with studies linking chronic exposure to elevated risks of cardiopulmonary diseases, asthma, reduced lung function, and premature mortality (Gordon et al., 2023). Children, the elderly, and individuals

with pre-existing respiratory conditions are particularly vulnerable. In Anaocha, the risks are further amplified during the dry season when air dispersion is poor, allowing smoke and pollutants to linger in residential areas. Open burning also poses spatial risks depending on where it occurs. In many communities, waste is burned close to schools, markets, and residential compounds, thereby exposing large populations to hazardous emissions on a daily basis. Beyond health, the practice contributes to climate change by releasing black carbon and other greenhouse gases into the atmosphere. Despite these dangers, open burning persists largely because of gaps in formal collection services, limited awareness of its risks, and the absence of affordable, practical alternatives.

3. **Institutional mandate exists but is under-resourced.**

The Anambra State Waste Management Authority (ASWAMA) operates under a clear legal mandate established by the 2015 ASWAMA Law, which provides the agency with authority over waste collection, transportation, treatment, and disposal across the state. This strong institutional foundation theoretically places ASWAMA in a strategic position to ensure effective waste governance. However, in practice, significant resource and operational constraints undermine its capacity to deliver reliable services. According to Obiorah, Alumona, and Okelue (2025), chronic underfunding remains one of the most persistent challenges, limiting the agency's ability to maintain infrastructure, recruit and train staff, and expand coverage beyond urban centers. Operational inefficiencies are also widespread. A considerable proportion of ASWAMA's collection trucks and equipment frequently experience downtime due to poor maintenance or lack of spare parts, resulting in irregular collection schedules and unattended waste in many communities. The limited number of transfer stations and material recovery facilities (MRFs) across the state constrains opportunities for waste segregation, recycling, and resource recovery. This infrastructural gap means that most waste is still transported directly to dumpsites, perpetuating a reliance on unsustainable disposal practices. Although private-sector contractors have been engaged to complement ASWAMA's services, their performance has been inconsistent, often hampered by inadequate oversight, weak contractual enforcement, and poor logistical coordination. Periodic enforcement of sanitation levies has also been attempted to generate revenue for operations. However, residents often perceive such enforcement as punitive, particularly when the levies do not correspond with visible improvements in service delivery. This has weakened compliance and eroded public trust in ASWAMA's capacity to deliver value for collected revenues.

4. **Regulatory tools are available but unevenly enforced.**

Nigeria has developed a comprehensive regulatory framework for environmental protection and waste management at both the federal and state levels. At the national level, the National Environmental Standards and Regulations Enforcement Agency (NESREA) issued regulations in 2009 that provide detailed standards for waste control, penalties for violations, and specific provisions for hazardous and healthcare waste management (Federal Republic of Nigeria, 2009; NESREA, 2009). At the state level, the ASWAMA Law (2015) similarly establishes enforcement powers, revenue collection mechanisms, and sanctions to ensure compliance. Collectively, these instruments create a robust legal foundation intended to align household, institutional, and commercial actors with sustainable waste management practices. In practice, however, enforcement has been uneven and inconsistent. While the legal framework is clear, local monitoring capacity is often weak due to underfunding, shortage of skilled personnel, and poor inter-agency coordination. As a result, violations such as open dumping, illegal burning, and non-compliance with sanitation levies frequently go unpunished. Data systems for waste routing, tonnages, and compliance monitoring are also poorly developed, limiting the ability of regulatory agencies to track performance or evaluate policy effectiveness. This lack of reliable data impedes evidence-based planning and makes it difficult to assess whether existing policies are reducing environmental and health risks. Healthcare waste represents a particularly critical gap. Despite NESREA's provisions, many health facilities in Anambra and other states lack structured systems for segregating infectious from general waste, often resorting to indiscriminate disposal. Weak monitoring of such practices increases risks of cross-contamination and disease transmission.

5. **Co-benefits from circular solutions are under-tapped.**

Circular economy approaches present significant opportunities to improve environmental health outcomes while stimulating local economic development in Anaocha Local Government Area. Municipal

solid waste (MSW) in Nigeria is typically dominated by organic materials, with studies estimating that more than 50–60% of household waste is biodegradable (organic kitchen and agricultural residues). Harnessing this fraction through composting initiatives could substantially reduce the volume of waste requiring collection and disposal, lower methane emissions from open dumping, and produce low-cost organic fertilizer to support local agriculture. Despite these benefits, composting practices remain largely informal and underdeveloped in Anaocha, with no coordinated municipal or private sector investment in large-scale systems. Similarly, plastic recovery and recycling, particularly of polyethylene terephthalate (PET) bottles and high-density polyethylene (HDPE) containers, offers dual advantages of reducing environmental pollution and providing raw materials for Nigeria's growing recycling industries. Pilot efforts in extended producer responsibility (EPR) and recycling schemes have demonstrated that plastic collection and buy-back centers can create steady streams of local employment, particularly for youths and women engaged in informal waste picking. However, in Anaocha, such efforts remain fragmented, poorly incentivized, and not yet institutionalized within formal waste management plans. Small-scale EPR pilots run in parts of Nigeria illustrate how producers and distributors can take responsibility for post-consumer packaging, easing the financial burden on local waste authorities while fostering accountability across value chains. Expanding such models in Anaocha could significantly reduce open burning and indiscriminate dumping—both of which are major sources of air pollution and blocked drainage in the area

**6. Soil-Transmitted Helminthiasis and Sanitation Challenges**

Public health consequences of poor waste management in Anaocha are significant, particularly through pathways of parasitic and infectious disease transmission. Recent epidemiological findings show that soil-transmitted helminth (STH) infections remain a pressing concern, with an overall prevalence of 35.2% among surveyed populations. Within this burden, Ascaris lumbricoides alone accounts for 16.9%, underscoring the extent of intestinal parasitism linked to environmental sanitation gaps. Importantly, pit latrine usage was found to elevate infection risks significantly (Odds Ratio = 3.750), highlighting the synergistic hazards of unimproved sanitation and inadequate waste disposal (Aribodor et al., 2025). The health risks are compounded by open dumping and burning practices, which not only facilitate vector breeding but also contribute to air and soil contamination. Open waste sites become reservoirs for flies, rodents, and other disease vectors, increasing community exposure to diarrheal pathogens, helminths, and food-borne illnesses. Meanwhile, inhalation of smoke from burning plastics and mixed refuse contributes to chronic respiratory conditions, eye irritation, and cardiovascular risks, as supported by global evidence linking uncontrolled burning to elevated PM2.5 and toxic chemical exposure. Children are disproportionately affected due to their frequent contact with contaminated soil and immature immune systems, which makes helminth infections more persistent and debilitating. The resulting morbidity manifests in malnutrition, stunted growth, cognitive impairment, and reduced school attendance—outcomes that perpetuate cycles of poverty and hinder human capital development in the LGA.

**7. Structural and Community-Level Barriers to Effective Waste Management in Anaocha**

Waste management in Anaocha Local Government Area (LGA) is constrained by infrastructural deficiencies and governance gaps that mirror wider state-level challenges in Anambra. A chronic shortage of waste bins and designated collection points across communities reduces the efficiency of waste segregation and encourages indiscriminate dumping in open spaces, drainage channels, and water bodies. Furthermore, the inadequacy of collection vehicles, compounded by frequent mechanical breakdowns and fuel constraints, disrupts routine collection schedules. This inconsistency fosters waste accumulation along major roads and markets, with offensive odors and leachates contributing to environmental pollution and health hazards. In rural parts of Anaocha, the problem is more severe due to the absence of formal dumpsites or engineered landfills. Residents resort to disposing waste in bushes, shallow pits, or erosion sites, practices that aggravate the gully erosion menace already endemic in Anambra State. Such indiscriminate dumping accelerates soil degradation, contaminates surface and groundwater sources, and increases the vulnerability of farming households whose livelihoods depend on fertile land. Additionally, non-compliance with established disposal regulations is widespread, reflecting weak enforcement capacity and limited public awareness. This results in minimal adherence to sanitation laws despite the existence of regulatory provisions at state and federal levels. The cumulative impact of these impediments extends beyond environmental degradation to public health. Uncollected waste attracts disease vectors such as

flies, rodents, and mosquitoes, heightening risks of waterborne diseases and parasitic infections. Moreover, open burning of waste—common in areas where collection fails—releases toxic emissions that impair air quality and contribute to respiratory illnesses. These challenges highlight the urgent need for strengthened waste management infrastructure, consistent policy enforcement, and community engagement. Without coordinated interventions, Anaocha's waste management system will remain overwhelmed, exacerbating ecological and health vulnerabilities (Ononuju et al., 2021).

## CONCLUSION

The study of environmental health and waste management practices in Anaocha Local Government Area (LGA) reveals a complex interplay of systemic, behavioral, and institutional factors that undermine sustainable waste governance and public health outcomes. Despite the presence of a robust legal framework through the Anambra State Waste Management Authority (ASWAMA) and national regulations like NESREA (2009), implementation gaps—marked by underfunding, inadequate infrastructure, and weak enforcement—have perpetuated inefficient waste management systems. Household behaviors reflect a significant knowledge–practice gap, where awareness of sanitation benefits does not translate into consistent actions due to limited access to affordable and reliable waste collection services. Practices such as open dumping and burning, driven by convenience and necessity, exacerbate environmental pollution, contributing to air, soil, and water contamination, as well as public health risks like soil-transmitted helminthiasis (STH) and respiratory illnesses.

The prevalence of STH at 35.2% in Anaocha underscores the urgent need for integrated interventions that address both sanitation infrastructure and community practices. Circular economy solutions, such as composting and plastic recycling, remain underutilized despite their potential to reduce waste volumes, mitigate environmental harm, and stimulate local economic opportunities. Community-driven initiatives, such as cleanup campaigns led by local leaders, demonstrate promising steps toward fostering collective responsibility, but their sustainability hinges on consistent service delivery and public trust. To achieve sustainable environmental health and waste management in Anaocha, a multi-pronged approach is essential. This includes increased investment in waste collection infrastructure, regular maintenance of equipment, and expansion of recycling and composting programs. Strengthening enforcement mechanisms, improving public awareness, and fostering partnerships between ASWAMA, private contractors, and community stakeholders will be critical to closing the gap between policy and practice. By addressing these challenges, Anaocha LGA can serve as a model for scalable, community-centered waste management systems that enhance environmental health, reduce disease burdens, and promote sustainable urban development in Anambra State.

## RECOMMENDATIONS

Based on the findings, the following seven recommendations are proposed to address the identified challenges:

1. ASWAMA and the Anaocha LGA Council should collaborate to design and fund awareness campaigns, leveraging local leaders to disseminate messages through town hall meetings, churches, and schools. NGOs can provide expertise in community engagement and educational materials to highlight the health risks of open dumping and burning, promoting waste segregation and recycling.
2. The Anaocha LGA Council should procure and deploy waste bins and establish collection points, particularly in rural areas, with funding support from the Anambra State Ministry of Environment. ASWAMA should oversee regular maintenance of collection vehicles, ensuring consistent service delivery through allocated budgets and private sector partnerships.
3. ASWAMA and the Anaocha LGA Council should initiate composting programs, providing training and starter kits to households and farmers. Private sector partners should establish and manage plastic recycling buy-back centers, with CBOs mobilizing youth and women for waste collection and job creation, supported by state incentives.
4. The Anambra State Government should increase budgetary allocations to ASWAMA through the Ministry of Finance to fund equipment procurement and staff training. ASWAMA should

implement transparent revenue collection systems, publishing reports on levy utilization to build public trust and encourage compliance.

5. ASWAMA and NESREA should enhance monitoring through joint task forces, imposing penalties for non-compliance with waste disposal regulations. The Anaocha LGA Council and OCHA Brigade should develop and maintain data systems to track waste management metrics, ensuring accountability and evidence-based planning.
6. The Anambra State Ministry of Health, in collaboration with the Anaocha LGA Council, should fund and construct modern pit latrines and public toilets. ASWAMA should support vector control programs by ensuring timely waste collection to eliminate breeding grounds. The Federal Ministry of Health can provide technical support and funding for health impact assessments and disease prevention campaigns.
7. The Anaocha LGA Council, led by the LGA Chairman, should institutionalize monthly cleanup campaigns and establish waste management committees comprising community leaders and residents. ASWAMA and CBOs should support barricading illegal dump sites and promote designated disposal zones, ensuring accessible and affordable collection services.

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