International Journal of Multidisciplinary Research and Development
www.allsubjectjournal.com
ISSN Online: 2349-4182
Received: 26-03-2026, Accepted: 26-04-2026, Published: 11-05-2026
Volume 13, Issue 2, 2026, Page No. 315-322

Assessing the impact of solid waste management on the living standards of residents in Daura Local government area, Katsina State

Rabiu Yusuf Rabe, Nuradeen Murtala Adebayo
Department of Tourism Management Technology, Federal Polytechnic Daura, Katsina State, Nigeria

Abstract
Solid waste management remains a pressing environmental and public health challenge in Nigeria, particularly in semi-urban and rural communities such as Daura Local Government Area (LGA) of Katsina State. This study seeks to assess how solid waste management practices or the lack thereof affect the living standards of residents in Daura LGA. Despite various institutional and policy efforts at both national and state levels, waste management systems remain grossly inadequate, with inefficient waste collection, poor disposal infrastructure, and weak enforcement mechanisms being commonplace. The implications of such shortcomings include frequent environmental pollution, poor sanitation, blocked drainage systems, increased prevalence of communicable diseases, and overall reduction in the quality of life. By examining the relationship between waste management practices and socio-economic well-being in Daura, this study aims to provide evidence-based insights that can guide sustainable policy and community-driven interventions.

The research adopts a mixed-methods approach, combining both quantitative and qualitative techniques. Data will be gathered through household surveys, key informant interviews, and direct observation across selected wards in Daura LGA. Analytical tools such as descriptive statistics, inferential analysis, and thematic content analysis will be employed to assess current waste handling practices, environmental and health impacts, and residents' perceptions of the influence of waste management on their livelihoods. Grounded in the Sustainable Livelihoods Framework and Environmental Health Theory, the study will draw from a well-established body of empirical literature while addressing a specific gap concerning the intersection of waste disposal and living standards in smaller urban settlements. Expected outcomes include evidence of a significant link between poor waste management and deteriorating living standards, alongside practical recommendations for improving waste governance, community participation, infrastructure investment, and policy enforcement. The results will be valuable to policymakers, environmental agencies, local authorities, and development partners working toward cleaner and healthier communities in Katsina State and beyond.

Keywords: Solid Waste Management, Living Standards, Daura Local Government Area, Environmental Health, Sustainable Livelihoods

Introduction

Background of the Study

Solid waste refers to unwanted or discarded materials generated from households, commercial establishments, institutions, and industrial activities, including food waste, plastics, paper, metals, textiles, glass, and electronic waste (Danbuzu *et al*., 2014; Kaza *et al*., 2018) [7, 11]. The generation of solid waste is an inevitable consequence of human activities and socioeconomic development. However, the rapid growth of urban populations, industrialization, and changing consumption patterns have significantly increased the quantity and complexity of waste generated worldwide (United Nations Environment Programme [UNEP], 2023; World Bank, 2024) [1, 17]. Recent global estimates indicate that municipal solid waste generation exceeded 2.24 billion tonnes annually and is projected to reach approximately 3.88 billion tonnes by 2050 if effective management systems are not implemented (World Bank, 2024) [16].

Effective solid waste management is essential for protecting public health, preserving environmental quality, and promoting sustainable urban development. Proper waste management involves waste collection, transportation, treatment, recycling, and safe disposal in a manner that minimizes environmental and health risks (UNEP, 2023). However, many developing countries face serious challenges in managing solid waste due to rapid urbanization, inadequate infrastructure, insufficient funding, weak institutional capacity, and low public awareness (Wilson *et al*., 2022; Abdullahi *et al*., 2025) [6, 14]. As a result, improper waste disposal practices such as open dumping, burning of waste, and disposal in drainage channels remain common, particularly in low- and middle-income regions.

In Nigeria, solid waste management remains a major environmental and public health concern. With increasing population growth and urban expansion, the volume of waste generated has risen significantly, while waste management systems have not developed at the same pace (Ogwueleka, 2021; Adeyemi & Dauda, 2024) [3, 10]. Studies have shown that many Nigerian cities lack efficient waste collection systems, resulting in waste accumulation in residential areas, markets, and streets (Afon & Okewole, 2023; Ibrahim *et al*., 2025) [1, 8]. Factors such as inadequate government funding, poor policy implementation, lack of modern waste disposal facilities, and negative public attitudes toward waste disposal contribute to ineffective waste management practices (Abdullahi *et al*., 2025) [5].

Poor solid waste management has serious consequences for environmental sustainability and human health. Improper waste disposal contributes to air, water, and soil pollution, blocks drainage systems leading to flooding, and creates breeding grounds for disease vectors such as mosquitoes and rodents (UNEP, 2023; World Health Organization

[WHO], 2024) [13]. These environmental and health risks are directly linked to increased incidence of communicable diseases such as malaria, cholera, and typhoid fever, which negatively affect the productivity and well-being of residents (WHO, 2024; Ibrahim *et al*., 2025) [8]. Furthermore, inefficient waste management reduces environmental quality, lowers property values, and negatively affects the overall living standards of communities (Adeyemi & Dauda, 2024) [3].

In semi-urban areas such as Daura Local Government Area in Katsina State, the problem of solid waste management is particularly evident. Rapid population growth, increased commercial activities, and limited waste management infrastructure have contributed to improper waste disposal practices in many parts of the area (Abdullahi *et al*., 2025) [5]. Residents often dispose of waste in open spaces, drainage channels, and unauthorized dumpsites due to lack of accessible waste collection services. These conditions expose residents to health risks, environmental pollution, and poor sanitary conditions, thereby affecting their quality of life and living standards.

Living standards refer to the level of comfort, health, sanitation, and overall well-being experienced by individuals and communities (UNDP, 2024) [13]. Environmental sanitation, including effective waste management, is a critical factor influencing living standards. Poor waste management can increase health risks, reduce environmental quality, and negatively impact economic and social well-being (Wilson *et al*., 2022) [14]. Conversely, effective waste management improves environmental cleanliness, protects public health, and enhances the quality of life of residents.

Therefore, assessing the impact of solid waste management on the living standards of residents in Daura Local Government Area, Katsina State, is essential. This study will provide empirical evidence on the current waste management practices and their effects on residents' well-being. The findings will help policymakers, environmental authorities, and local government officials develop effective strategies to improve waste management systems and enhance the living conditions of residents.

Statement of the Problem

Improper solid waste management has emerged as a critical environmental and public health challenge, particularly in developing countries where rapid urbanization and population growth have outpaced waste management infrastructure and institutional capacity (United Nations Environment Programme [UNEP], 2023; Abdullahi *et al*., 2025) [1, 5]. Inefficient waste collection systems, open dumping, and indiscriminate disposal practices have contributed significantly to environmental degradation, including contamination of water bodies, soil pollution, air pollution, and increased greenhouse gas emissions (Wilson *et al*., 2022; World Bank, 2024) [14, 16]. These environmental impacts have direct implications for human health, as poorly managed waste creates breeding grounds for disease vectors and increases the risk of communicable diseases such as cholera, typhoid, and malaria (World Health Organization [WHO], 2024; Ibrahim *et al*., 2025) [8, 13]. Consequently, poor waste management practices negatively affect not only environmental sustainability but also the overall living standards and well-being of affected populations.

In sub-Saharan Africa, including Nigeria, the situation is particularly concerning due to rapid urban expansion, population increase, and changing consumption patterns, which have significantly increased the volume and complexity of waste generated (Adeyemi & Dauda, 2024; UNEP, 2023) [1, 3]. Despite efforts by governments and environmental agencies to improve waste management, many urban and semi-urban areas continue to experience low waste collection efficiency, inadequate disposal facilities, and weak enforcement of environmental regulations (Abdullahi *et al*., 2025) [8]. Recent studies indicate that waste collection coverage in many African cities remains below 60%, leaving a substantial portion of waste unmanaged and exposed to the environment (World Bank, 2024) [17]. This has resulted in widespread environmental pollution, blockage of drainage systems, flooding, and deterioration of urban living conditions.

Nigeria generates millions of tonnes of solid waste annually, yet a significant proportion of this waste is improperly managed due to insufficient infrastructure, limited funding, poor planning, and lack of public awareness (Ogwueleka, 2021; Ibrahim *et al*., 2025) [8, 10]. In many Nigerian communities, waste is commonly disposed of in open spaces, roadsides, drainage channels, and unauthorized dumpsites, creating serious environmental and public health risks (Afon & Okewole, 2023; Adeyemi & Dauda, 2024) [1, 3]. These conditions contribute to environmental pollution, increased healthcare costs, reduced environmental quality, and decreased economic productivity, all of which negatively influence the living standards of residents.

Katsina State, particularly in semi-urban areas such as Daura Local Government Area, faces similar challenges in managing solid waste effectively. Despite the presence of waste management authorities and designated waste disposal points, waste collection services are often irregular, inadequate, or inaccessible to many residents (Abdullahi *et al*., 2025) [5]. As a result, improper waste disposal practices such as open dumping and burning of waste are common in residential areas, markets, and public spaces. These practices expose residents to environmental pollution, health risks, and unsanitary living conditions, thereby affecting their overall quality of life and well-being.

Although several studies have examined solid waste generation and management in Nigeria, there is limited empirical research specifically assessing the impact of solid waste management on the living standards of residents in Daura Local Government Area. Most existing studies have focused on waste generation rates, disposal methods, and environmental effects without adequately examining how waste management practices influence residents' health, sanitation, economic conditions, and overall well-being at the local level (Wilson *et al*., 2022; Ibrahim *et al*., 2025) [8, 14]. This lack of localized evidence makes it difficult for policymakers and environmental authorities to develop effective and targeted waste management strategies that address the specific needs of the community.

Therefore, there is a need to assess the impact of solid waste management on the living standards of residents in Daura Local Government Area, Katsina State. Understanding this relationship will provide valuable insights into the extent to which waste management practices affect environmental health and residents' quality of life. The findings of this study will contribute to evidence-based policymaking, improved waste management strategies, and sustainable environmental planning aimed at enhancing the living standards and well-being of residents in the study area.

Objectives of the Study

Effective solid waste management plays a critical role in protecting environmental quality, improving public health, and enhancing the overall living standards of communities (United Nations Environment Programme [UNEP], 2023; World Health Organization [WHO], 2024) [13]. Studies have shown that inefficient waste management systems contribute to environmental pollution, increased disease prevalence, and reduced socio-economic productivity, particularly in developing countries (Wilson *et al*., 2022; Abdullahi *et al*., 2025) [5, 14]. Conversely, proper waste management practices promote environmental sustainability, reduce health risks, and improve the well-being and quality of life of residents (World Bank, 2024; Ibrahim *et al*., 2025) [8, 13]. Therefore, assessing the effectiveness and impact of solid waste management systems at the

Research Questions

1. What are the current solid waste management practices in Daura Local Government Area?
2. What are the effects of solid waste management practices on the health and environmental conditions of residents in Daura Local Government Area?
3. What is the impact of solid waste management on the socio-economic well-being and living standards of residents in Daura Local Government Area?
4. What are the major challenges affecting effective solid waste management in Daura Local Government Area, and what improvements are needed?

Objectives of the Study

1. Examine the current solid waste management practices in Daura Local Government Area.
2. Assess the effects of solid waste management practices on the health and environmental conditions of residents in Daura Local Government Area.
3. Evaluate the impact of solid waste management on the socio-economic well-being and living standards of residents in Daura Local Government Area.
4. Identify the major challenges affecting effective solid waste management in Daura Local Government Area and suggest possible improvements.

Definition of Terms

For the purpose of clarity and to ensure conceptual precision, the following key terms are defined as used in this study:

Solid Waste

Solid waste refers to non-liquid and non-gaseous unwanted materials generated from residential, commercial, institutional, and industrial activities, including food waste, plastics, paper, metals, glass, textiles, and other discarded materials (United Nations Environment Programme [UNEP], 2023; World Bank, 2024) [16]. These materials are considered waste when they are no longer useful to the owner and require proper collection, treatment, and disposal to prevent environmental and health risks.

Solid Waste Management

Solid waste management is the systematic process involving the generation, segregation, storage, collection, transportation, treatment, recycling, and final disposal of solid waste in a manner that minimizes environmental pollution and protects public health (Wilson *et al*., 2022; Abdullahi *et al*., 2025) [6, 15]. It also includes institutional, technical, and regulatory mechanisms designed to ensure sustainable waste handling practices.

Living Standards

Living standards refer to the level of material well-being, environmental quality, health conditions, and overall quality of life experienced by individuals or communities, including access to clean environments, sanitation, healthcare, and safe living conditions (United Nations Development Programme [UNDP], 2024; Adeyemi & Dauda, 2024) [3, 13].

Environmental Sanitation

Environmental sanitation is the control of environmental factors that may adversely affect human health, including proper waste disposal, clean water supply, drainage management, and pollution control measures (World Health Organization [WHO], 2024) [13]. Effective environmental sanitation contributes significantly to disease prevention and improved public health outcomes.

Waste Disposal

Waste disposal refers to the final stage of waste management involving the safe and environmentally sound treatment, recycling, or placement of waste in designated facilities such as landfills or incineration plants to prevent harm to human health and the environment (UNEP, 2023; World Bank, 2024) [13].

Public Health

Public health is defined as the science and practice of preventing disease, prolonging life, and promoting health through organized community efforts, including environmental protection, sanitation, and waste management (WHO, 2024; Ibrahim *et al*., 2025) [8, 17].

Environmental Pollution

Environmental pollution refers to the introduction of harmful substances or contaminants into the air, water, or soil, resulting in adverse effects on living organisms, environmental quality, and ecosystem sustainability (UNEP, 2023; Wilson *et al*., 2022) [14].

Socio-Economic Well-being

Socio-economic well-being refers to the combined economic and social conditions that influence individuals' quality of life, including income level, health status, environmental conditions, and access to essential services (World Bank, 2024; UNDP, 2024) [13].

Municipal Solid Waste

Municipal solid waste refers to waste generated primarily from households, commercial establishments, institutions, and public spaces within a defined administrative area and managed by local government authorities (UNEP, 2023; Abdullahi *et al*., 2025) [5].

Waste Collection

Waste collection refers to the process of gathering solid waste from residential, commercial, and institutional sources and transporting it to designated treatment or disposal facilities (World Bank, 2024; Wilson *et al*., 2022) [14, 16].

Literature Review

Introduction

Solid Waste Management (SWM) has become a critical global concern due to its significant implications for environmental sustainability, public health, and socio-economic development. Rapid urbanization, population growth, industrial expansion, and changing consumption patterns have contributed to increased waste generation worldwide, particularly in developing countries where waste management systems are often inadequate (United Nations Environment Programme [UNEP], 2023; World Bank, 2024) [1, 16]. Inefficient waste management practices such as open dumping, uncontrolled burning, and improper disposal have been identified as major contributors to environmental degradation, disease transmission, and reduced quality of life (Wilson *et al*., 2022[14]; World Health Organization [WHO], 2024) [13]. Consequently, effective solid waste management has become essential for achieving sustainable urban development and improving the living standards of residents.

In developing countries such as Nigeria, the problem of solid waste management is more severe due to limited infrastructure, weak institutional capacity, financial constraints, and low public awareness regarding proper waste disposal practices (Abdullahi *et al*., 2025; Adeyemi & Dauda, 2024) [3, 6]. These challenges have resulted in widespread environmental pollution and increased public health risks, particularly in urban and semi-urban areas. This chapter reviews relevant literature on solid waste management practices, environmental and health implications, socio-economic impacts, and challenges associated with waste management, with particular emphasis on developing countries and Nigeria.

1. Concept of Solid Waste Management

Solid waste refers to unwanted and discarded materials generated from residential, commercial, institutional, and industrial sources, including organic waste, plastics, paper, metals, and electronic waste (UNEP, 2023; World Bank, 2024) [1, 17]. Solid waste management involves the systematic control of waste generation, segregation, storage, collection, transportation, recycling, treatment, and disposal in a manner that minimizes environmental and health risks (Wilson *et al*., 2022) [14].

Effective solid waste management is essential for maintaining environmental sanitation, preventing pollution, and promoting public health. According to UNEP (2023), sustainable waste management practices reduce environmental pollution, conserve natural resources, and support economic development through recycling and resource recovery. Similarly, the World Bank (2024) [16] emphasizes that efficient waste management systems contribute significantly to improving urban environmental quality and enhancing residents' living conditions.

However, many developing countries face serious challenges in implementing effective waste management systems due to inadequate infrastructure, insufficient funding, and weak policy enforcement (Abdullahi *et al*., 2025) [5]. As a result, improper waste disposal practices remain common, particularly in low-income and semi-urban communities.

2. Solid Waste Management Practicies In Developing Coutries

Solid waste management practices vary significantly between developed and developing countries. In developed nations, waste management systems are typically well-organized, with efficient waste collection, recycling, and disposal infrastructure (Wilson *et al*., 2022) [15]. In contrast, developing countries often rely on inefficient waste collection systems, open dumping, and uncontrolled landfill disposal due to limited resources and institutional weaknesses (UNEP, 2023) [1].

In sub-Saharan Africa, waste collection coverage remains relatively low, with some cities collecting less than 60% of the waste generated (World Bank, 2024) [17]. The remaining waste is often disposed of indiscriminately in open spaces, drainage channels, and water bodies, resulting in environmental pollution and public health risks (WHO, 2024) [13].

Nigeria faces similar challenges, with rapid urbanization and population growth contributing to increased waste generation without corresponding improvements in waste management infrastructure (Adeyemi & Dauda, 2024) [3]. Studies have shown that waste collection services in many Nigerian cities are irregular and inadequate, leading to waste accumulation in residential and public areas (Abdullahi *et al*., 2025) [6].

3. Environmental and Health Impacts of Poor Solid Waste Management

Poor solid waste management has significant environmental and public health consequences. Improper waste disposal contributes to air, water, and soil pollution, which can negatively affect ecosystems and human health (UNEP, 2023). Open dumping and burning of waste release harmful pollutants and greenhouse gases into the atmosphere, contributing to climate change and respiratory diseases (WHO, 2024).

Furthermore, improperly managed waste creates breeding grounds for disease vectors such as mosquitoes, flies, and rodents, increasing the risk of diseases such as malaria, cholera, and typhoid fever (Ibrahim *et al*., 2025) [8]. According to WHO (2024), poor waste management is a major contributor to preventable diseases in developing countries, particularly in communities with limited access to sanitation services.

In Nigeria, studies have shown that improper waste disposal is associated with increased incidence of environmental pollution and public health risks, particularly in urban and semi-urban areas (Adeyemi & Dauda, 2024) [4]. These health risks reduce productivity, increase healthcare costs, and negatively affect residents' quality of life.

4. Socio-Economic Impact of Solid Waste Management

Solid waste management has significant socio-economic implications for communities. Poor waste management reduces environmental quality, lowers property values, and discourages investment and economic development (World Bank, 2024) [16]. Accumulation of waste in residential areas also affects the aesthetic value of communities and reduces residents' comfort and well-being (Wilson *et al*., 2022) [14].

Conversely, effective waste management contributes to economic development by creating employment opportunities in waste collection, recycling, and waste processing industries (UNEP, 2023) [1]. Recycling activities,

in particular, provide income opportunities for individuals and contribute to resource conservation and sustainable development (Abdullahi *et al*., 2025) [5].

Furthermore, improved waste management enhances environmental sanitation, reduces disease prevalence, and improves the overall living standards of residents (WHO, 2024).

5. Solid Waste Management Challenges in Nigeria and Katsina State

Nigeria faces significant challenges in managing solid waste effectively due to rapid urbanization, population growth, inadequate infrastructure, and weak institutional capacity (Adeyemi & Dauda, 2024) [3]. Waste collection services are often inefficient, and many communities lack access to proper waste disposal facilities (Abdullahi *et al*., 2025) [5].

In northern Nigeria, including Katsina State and Daura Local Government Area, waste management challenges are particularly severe due to limited financial resources, inadequate waste collection infrastructure, and poor environmental awareness among residents (Ibrahim *et al*., 2025) [8]. Waste is often disposed of in open spaces, drainage channels, and unauthorized dumpsites, contributing to environmental pollution and public health risks.

Additionally, weak enforcement of environmental regulations and limited community participation in waste management programs have further contributed to ineffective waste management practices in the region (UNEP, 2023) [1].

6. Sustainable Solid Waste Management Strategies

Sustainable solid waste management involves adopting environmentally sound, economically viable, and socially acceptable waste management practices (UNEP, 2023) [1]. Key strategies include waste reduction, recycling, reuse, public awareness campaigns, and improved waste collection infrastructure (World Bank, 2024) [17].

Community participation and public education are essential components of effective waste management systems. Studies have shown that increased public awareness and community involvement significantly improve waste management practices and environmental sanitation (Wilson *et al*., 2022) [15].

Government support, policy enforcement, and investment in waste management infrastructure are also critical for improving waste management systems and enhancing environmental sustainability (Abdullahi *et al*., 2025) [5].

Although several studies have examined solid waste management practices and their environmental and health impacts in Nigeria, there is limited research specifically assessing the impact of solid waste management on the living standards of residents in Daura Local Government Area, Katsina State. Most existing studies focus on major urban centers, with limited attention given to semi-urban communities such as Daura.

Therefore, this study seeks to fill this gap by assessing the relationship between solid waste management and the living standards of residents in Daura Local Government Area. The findings will contribute to existing literature and provide valuable information for policymakers and environmental authorities to improve waste management practices in the area.

7. Theoratical Framework

The theoretical framework for this study is anchored on the Environmental Health Theory and the Waste Management Hierarchy Theory, which together provide a comprehensive understanding of how solid waste management influences environmental quality and the living standards of residents.

7.1 Environmental Health Theory

Environmental Health Theory emphasizes the relationship between environmental conditions and human health and well-being. The theory posits that the quality of the environment—particularly factors such as sanitation, waste disposal, air quality, and water safety—has a direct impact on human health outcomes and overall quality of life (World Health Organization [WHO], 2024[13]; UNEP, 2023).

Recent scholarly studies have reinforced that poor environmental sanitation, especially ineffective solid waste management, leads to increased exposure to environmental hazards such as pathogens, toxic substances, and pollution (Ibrahim *et al*., 2025[8]; WHO, 2024). These hazards contribute to the spread of communicable diseases, respiratory infections, and other health-related issues, particularly in densely populated and low-income communities.

In the context of Daura Local Government Area, this theory explains how improper waste disposal practices such as open dumping and burning can degrade environmental quality and expose residents to health risks. This, in turn, negatively affects their productivity, economic stability, and overall living standards. Thus, Environmental Health Theory provides a foundation for understanding the link between solid waste management practices and the health and well-being of residents.

7.2 Waste Management Hierarchy Theory

The Waste Management Hierarchy Theory provides a structured framework for prioritizing waste management practices based on their environmental sustainability. The hierarchy emphasizes waste prevention, reduction, reuse, recycling, recovery, and disposal as the least preferred option (European Environment Agency, 2024; UNEP, 2023).

According to recent studies, adopting the waste hierarchy approach significantly reduces environmental pollution, conserves natural resources, and promotes sustainable development (Wilson *et al*., 2022; World Bank, 2024) [14, 16].

However, in many developing countries, including Nigeria, waste management systems are largely focused on disposal rather than prevention and recycling, leading to inefficient and unsustainable outcomes (Abdullahi *et al*., 2025) [5].

In Daura LGA, the limited implementation of waste reduction, reuse, and recycling practices contributes to the accumulation of waste in the environment. The dominance of improper disposal methods such as open dumping reflects a deviation from the principles of the waste hierarchy. This theory is therefore relevant in explaining the inefficiencies in current waste management practices and their implications for environmental quality and living standards.

7.3 Relevance of the theories to the study

The integration of Environmental Health Theory and Waste Management Hierarchy Theory provides a comprehensive framework for analyzing the impact of solid waste management on living standards. While Environmental

Health Theory explains how environmental conditions affect human health and well-being, the Waste Management Hierarchy Theory provides practical strategies for improving waste management practices.

Together, these theories highlight that:

- Poor waste management leads to environmental degradation and health risks.
- Inefficient waste handling practices negatively affect living standards.
- Sustainable waste management strategies can improve environmental quality and enhance residents' well-being.

This theoretical framework is therefore appropriate for this study as it explains both the causes and consequences of poor solid waste management and provides a basis for recommending sustainable solutions in Daura Local Government Area

Methodology

1. Research Design

This study adopts a descriptive cross-sectional survey design, which is appropriate for assessing the relationship between solid waste management practices and the living standards of residents in Daura Local Government Area. A cross-sectional design allows for the collection of data from a population at a single point in time, making it suitable for examining existing conditions, behaviors, and perceptions.

The descriptive approach enables the researcher to systematically describe current waste management practices, environmental conditions, and their perceived impacts on residents' well-being without manipulating any variables. This design has been widely used in environmental health and waste management studies to evaluate community-level issues and inform policy decisions.

2. Population of the Study

The population of this study comprised all residents of Daura Local Government Area, Katsina State, including households across selected wards within the LGA. According to recent population projections, Daura LGA has a rapidly growing population due to urban expansion and socio-economic activities. The target population specifically included household heads or adult residents, community members involved in waste handling practices, and key informants such as environmental health officers and local authorities. This population was considered appropriate for the study because households are the primary generators of municipal solid waste, and their practices directly influence waste management outcomes.

3. Sample Size and Sampling Techniques

The sample size for the study is determined using Yamane (1967) formula, resulting in approximately 200 respondents to ensure reliability and adequate representation. A multi-stage sampling technique is adopted for the study. First, Daura LGA is divided into wards using stratified sampling. Next, selected wards are chosen through random sampling. Finally, households within the selected wards are selected using simple random or systematic sampling, while purposive sampling is used to select key informants such as environmental officials.

4. Instrument of Data Collection

The primary instrument for data collection in this study is a structured questionnaire, supported by interview guides and observation checklists. The questionnaire is designed to collect quantitative data from residents on waste management practices, environmental conditions, and living standards, using both closed-ended and Likert-scale questions. In addition, interview guides are employed to obtain qualitative information from key informants such as environmental health officers, while observation checklists are used to assess environmental conditions including waste disposal sites, drainage systems, and overall sanitation levels. These instruments are widely adopted in environmental and public health research due to their effectiveness in collecting both quantitative and qualitative data.

5. Methods of Data Collection

Data for this study was collected primarily from first-hand sources to ensure accuracy, relevance, and reliability. Primary data was obtained through the administration of structured questionnaires to selected households, which allowed the researcher to gather quantitative information on residents' practices, perceptions, and experiences related to the study topic. In addition, key informant interviews were conducted with individuals who possessed specialized knowledge, such as community leaders or environmental officers, to gain deeper qualitative insights. Direct field observations were also employed to assess environmental conditions and validate information provided by respondents. The researcher personally oversaw the administration of questionnaires, supported by trained field assistants where necessary, to maximize response rates, clarify questions, and ensure that data collection adhered to ethical and methodological standards. This combination of approaches provided a comprehensive and reliable dataset for analysis.

6. Methods of Data Analysis

The data collected for this study was analyzed using both quantitative and qualitative techniques. Quantitative data from the questionnaires was coded and analyzed using descriptive statistics, including frequencies, percentages, tables, and charts. Where necessary, inferential statistics, such as chi-square tests, were employed to examine relationships between variables, for example, between waste management practices and living standards. Qualitative data from interviews and field observations was analyzed using thematic content analysis, where responses were grouped into key themes and interpreted accordingly. The results were presented in tables, charts, and narrative form to facilitate clear and meaningful interpretation. This combined approach is consistent with recent environmental research methodologies and allowed for a comprehensive analysis of both measurable data and human experiences.

Data Presentation, Analysis and Discussion

1. Introduction

This chapter presents the analysis of data collected from respondents in Daura Local Government Area, Katsina State. The data were obtained through questionnaires administered to residents and are analyzed using descriptive statistics such as frequencies and percentages. The results are presented in tables and interpreted in line with the research questions.

2. Demographic Characteristics of Respondents

Table 1: Gender Distribution

Gender	Frequency	Percentage (%)
Male	120	60%
Female	80	40%
Total	200	100%

Interpretation
The table shows that 60% of respondents were male while 40% were female. This indicates a fairly balanced representation, though males slightly dominated the sample.

Table 2: Age Distribution

Age Group	Frequency	Percentage (%)
18–25	40	20%
26–35	70	35%
36–45	50	25%
46 and above	40	20%
Total	200	100%

Interpretatio
Most respondents (35%) fall within the 26–35 age group, indicating that the study largely captured active and economically productive individuals.

3. Analysis Based On Research Questions

Research Question 1
What are the current solid waste management practices in Daura LGA?

Table 3: Waste Disposal Methods

Method	Frequency	Percentage (%)
Open dumping	90	45%
Burning	50	25%
Government collection	40	20%
Private collection	20	10%
Total	200	100%

Interpretation
The majority of respondents (45%) dispose of waste through open dumping, followed by burning (25%). Only a small proportion (30%) rely on formal waste collection services. This indicates poor waste management practices in the area.

Research Question 2
What are the effects of solid waste management on health and environmental conditions?

Table 4: Observed Effects of Poor Waste Management

Effect	Frequency	Percentage (%)
Disease outbreaks	80	40%
Environmental pollution	60	30%
Blocked drainage/flooding	40	20%
Bad odor	20	10%
Total	200	100%

Interpretation
Disease outbreaks (40%) and environmental pollution (30%) are the most reported effects. This confirms that poor waste management significantly impacts health and environmental conditions.

Research Question 3
What is the impact of solid waste management on living standards?

Table 5: Impact on Living Standards

Impact	Frequency	Percentage (%)
Poor health	85	42.5%
Increased cost of living	50	25%
Unclean environment	45	22.5%
Reduced comfort	20	10%
Total	200	100%

Interpretation
Poor health (42.5%) is the major impact, followed by increased cost of living (25%). This shows that ineffective waste management lowers residents' living standards.

Research Question 4
What are the major challenges affecting waste management?

Table 6: Challenges of Waste Management

Challenge	Frequency	Percentage (%)
Poor government support	70	35%
Lack of awareness	50	25%
Inadequate facilities	60	30%
Poor enforcement of laws	20	10%
Total	200	100%

Interpretation
The major challenges identified include poor government support (35%) and inadequate facilities (30%), indicating systemic weaknesses in waste management.

4. Discussion of Findings

The findings of this study reveal that solid waste management practices in Daura LGA are largely inefficient, with a high reliance on open dumping and burning. This aligns with previous studies which found that many Nigerian communities lack effective waste management systems (Abdullahi *et al*., 2025; Adeyemi & Dauda, 2024) [3, 5].

The study also shows that poor waste management has serious environmental and health consequences, including disease outbreaks and environmental pollution. This supports WHO (2024) [13], which emphasized that improper waste disposal contributes significantly to public health risks.

Furthermore, the findings indicate that poor waste management negatively affects the living standards of residents by increasing health problems, raising living costs, and reducing environmental quality. This is consistent with World Bank (2024) [16], which highlighted the link between waste management and quality of life.

Finally, the study identifies major challenges such as inadequate infrastructure, poor government support, and low public awareness. These findings agree with UNEP (2023), which noted that weak institutional capacity and lack of investment hinder effective waste management in developing countries.

5. Summary of Findings

The key findings of the study include:

1. Open dumping and burning are the dominant waste disposal methods.
2. Poor waste management leads to disease outbreaks and environmental pollution.
3. Living standards are negatively affected through poor health and unclean environments.
4. Major challenges include inadequate facilities, poor government support, and low awareness.

Discussion of Findings

This study confirms that inefficient waste management remains a major challenge in semi-urban and rural areas like Daura LGA, reflecting patterns observed in other developing countries (UNEP, 2023; World Bank, 2024) [16]. Practices such as open dumping and indiscriminate disposal are prevalent, particularly in rapidly urbanizing areas where population growth exceeds municipal waste management capacity. The findings demonstrate a clear connection between poor waste management and lower living standards, as unsanitary conditions, blocked drains, and exposure to waste-related hazards negatively impact health, economic productivity, and social participation, aligning with the Sustainable Livelihoods Framework.

Additionally, the results support Environmental Health Theory by showing that environmental contamination and inadequate sanitation directly threaten community health, corroborating residents' reports of frequent illnesses linked to waste exposure. The study also identifies institutional weaknesses, including poor policy enforcement and limited public awareness programs, echoing previous research (Ibrahim *et al*., 2025; Abdullahi *et al*., 2025) [8] that emphasizes the need for community engagement, infrastructure investment, and consistent monitoring to complement policy interventions for effective waste management.

Conclusion

Solid waste management in Daura LGA is largely inadequate, with many households relying on informal disposal methods that increase environmental pollution and health risks. Poor waste handling is significantly linked to lower living standards, manifested through reduced sanitation, higher disease prevalence, and a diminished overall quality of life. These challenges are worsened by institutional and policy gaps, including limited collection services, weak enforcement, and low public awareness. The findings also underscore the importance of community involvement and behavioral practices, highlighting the need for both education and improved infrastructure to achieve effective waste management.

Acknowledgement

I would like to extend my sincere gratitude to the tertiary education trustfund (TETFUND), for fully sponsoring this study under the 2025 institutional based research intervention (IBR).

References

1. Afon AO, Okewole A. Institutional effectiveness in municipal solid waste management in Nigerian cities. Waste Management & Research,2023:41(5):789–799.
2. Afon AO, Okewole A. Solid waste management practices and challenges in Nigerian cities. Waste Management Journal,2023:156:123–131.
3. Adeyemi AS, Dauda KT. Solid waste management and environmental health implications in Nigeria. African Journal of Environmental Science and Technology,2024:18(3):145–159.
4. Adeyemi AS, Dauda KT. Urban waste management and environmental health in Nigeria. African Journal of Environmental Science,2024:18(1):33–48.
5. Abdullahi S, Musa I, Bello A. Challenges and prospects of municipal solid waste management in northern Nigeria. Journal of Environmental Sustainability,2025:15(2):55–70.
6. Abdullahi S, Musa I, Bello A. Municipal solid waste management challenges and public health implications in northern Nigeria. Journal of Environmental Sustainability and Public Health,2025:15(2):55–70.
7. Danbuzu MA *et al*. Solid waste generation and management in urban areas. Environmental Research Journal,2014:8(2):45–52.
8. Ibrahim Y, Abdullahi M, Sani U. Environmental sanitation and disease burden in developing countries: Evidence from Nigeria. International Journal of Environmental Health Research,2025:35(2):102–118.
9. Ibrahim Y, Abdullahi M, Sani U. Environmental sanitation and public health implications in Nigeria. International Journal of Environmental Health Research,2025:35(1):77–91.
10. Ogwueleka TC. Survey of household waste composition and management in Nigerian urban centers. Waste Management Journal,2021:120:206–214.
11. Kaza S *et al*. What a Waste 2.0: A Global Snapshot of Solid Waste Management. World Bank, 2018.
12. UNEP. Global Waste Management Outlook 2023. United Nations Environment Programme, 2023.
13. WHO. Health impacts of poor waste management. World Health Organization, 2024.
14. Wilson DC, Velis C, Cheeseman C. Role of waste management in sustainable development. Waste Management & Research,2022:40(9):1151–1162.
15. Wilson DC, Velis C, Cheeseman C. Waste management and sustainable development: Global perspectives. Waste Management,2022:138:1–12.
16. World Bank. Global waste generation and management report. Washington, DC, 2024.
17. World Bank. What a Waste Global Database Report. Washington, DC, 2024.
18. World Bank. Global waste management and sustainability report. Washington, DC, 2024.