MAAUN INTERNATIONAL MULTIDISCIPLINARY JOURNAL OF RESEARCH AND INNOVATIONS (MIMJRI)
A Publication of the Institute of Africa Higher Education Research and Innovations (IAHERI)
in Collaboration with
Maryam Abacha American University of Niger (MAAUN) Maradi, Niger Republic
Volume 2 Number 1, June, 2024
ISSN: 3027 – 0294 DOI: https://doi.org/10.59479/jiaheri.v2i1.165

Household Solid Waste Management Practices and Environmental Health Risks in Kano State, Nigeria

Idris, D. M.[1]
Email: daudamuhd6@gmail.com

[1]Departmenrt of Environmental Health, Maryam Abacha American University of Niger, Maradi, Niger Republic

Abstract
Improper household solid waste management remains an important environmental health concern in many rapidly growing urban communities in Nigeria. Inadequate waste storage, irregular collection, open dumping, indiscriminate disposal and open burning can contribute to environmental pollution and create conditions that encourage the presence of disease vectors. This study examines household solid waste management practices and associated environmental health concerns in selected communities of Nasarawa Local Government Area, Kano State, Nigeria. A descriptive cross-sectional research design was adopted for the proposed study. A sample of 384 household respondents was used to demonstrate the presentation and analysis of the study variables. Data were organized around respondents' socio-demographic characteristics, knowledge and attitudes towards solid waste management, household waste-handling practices, environmental sanitation conditions and self-reported environmental health concerns. Descriptive statistics, including frequencies, percentages, means and standard deviations, were used to present the results, while Pearson correlation was used to demonstrate relationships among knowledge, attitude and practice scores. The simulated results suggest that although many respondents possess a reasonable understanding of the environmental implications of poor waste disposal, this knowledge does not consistently translate into appropriate household practices. Open dumping, irregular waste collection, limited waste separation and inadequate recycling were prominent features of the findings. The results also demonstrate how the presence of exposed refuse, flies, rodents and blocked drainage channels may be examined alongside residents reported environmental health concerns. The study highlights the importance of strengthening household environmental health education, improving waste collection services, supporting waste recovery initiatives and enforcing appropriate environmental sanitation measures.
Keywords: Solid waste management, household practices, environmental health, waste disposal, sanitation, Nasarawa LGA, Kano State.

Introduction
The management of solid waste has become an increasingly important environmental health issue, particularly in urban and semi-urban communities experiencing rapid population growth, expanding commercial activities and changes in household consumption patterns. As populations increase, the quantity and variety of waste generated by households also tend to rise. Food remnants, plastics, paper, metal containers, glass, textiles, packaging materials and other

MAAUN INTERNATIONAL MULTIDISCIPLINARY JOURNAL OF RESEARCH AND INNOVATIONS (MIMJRI)
A Publication of the Institute of Africa Higher Education Research and Innovations (IAHERI)
in Collaboration with
Maryam Abacha American University of Niger (MAAUN) Maradi, Niger Republic
Volume 2 Number 1, June, 2024
ISSN: 3027 – 0294 DOI: https://doi.org/10.59479/jiaheri.v2i1.165

domestic refuse are produced daily. When these materials are not properly stored, collected, transported and disposed of, they can accumulate in residential surroundings, drainage channels, open spaces and roadsides. The consequences extend beyond an unpleasant physical environment because poorly managed waste can create conditions that expose residents to environmental hazards.

The World Bank's "What a Waste 2.0" report identified population growth, urbanisation and economic development as important factors influencing global waste generation (Kaza et al., 2018). More recent global evidence presented in "What a Waste 3.0" estimates that approximately 2.56 billion tonnes of municipal solid waste were generated worldwide in 2022, with the quantity projected to increase considerably by 2050 if current practices continue (World Bank, 2026). These figures demonstrate that waste management is not a minor municipal responsibility. It is an essential component of sustainable urban development and environmental protection.

The nature of household waste differs across locations because of variations in income, household size, consumption patterns, food habits and access to goods and services. In many low- and middle-income settings, organic materials such as food remains and other biodegradable waste constitute a substantial part of the waste stream. Plastics, paper, metals, glass and textiles also contribute to the total quantity generated. The relative proportions of these materials influence the most appropriate storage, collection, recycling and treatment arrangements. The World Bank (2026) notes that food and garden waste account for a particularly large share of municipal solid waste in low-income countries. This makes the management of biodegradable household waste especially relevant to communities where formal waste recovery and treatment facilities may be limited.

Household waste management begins at the point where waste is generated. The practices adopted by household members determine whether waste is separated, safely stored, reused or mixed before collection. Proper storage in covered containers can reduce direct exposure to refuse and limit the scattering of waste by wind and animals. However, the use of uncovered containers, plastic bags placed in open spaces and informal storage locations may increase the likelihood of environmental contamination. Storage practices are therefore important because they influence the condition of waste before it is collected or disposed of. Waste collection is another central component of the management process. A household may understand the importance of proper disposal but still experience difficulties when collection services are unavailable, irregular or unaffordable. Where waste remains for extended periods, residents may resort to open dumping, burning or disposal into drainage channels. These practices can create environmental problems and make community sanitation more difficult to maintain. Research on municipal waste collection in sub-Saharan Africa has identified significant differences in service coverage and collection arrangements across countries and urban settings (Adedara et al., 2023). This indicates that waste management should not be examined only as a matter of household responsibility; the performance of collection systems also deserves attention.

The relationship between household behaviour and waste management services is particularly important when considering waste separation and recycling. Separation at source

MAAUN INTERNATIONAL MULTIDISCIPLINARY JOURNAL OF RESEARCH AND INNOVATIONS (MIMJRI)
A Publication of the Institute of Africa Higher Education Research and Innovations (IAHERI)
in Collaboration with
Maryam Abacha American University of Niger (MAAUN) Maradi, Niger Republic
Volume 2 Number 1, June, 2024
ISSN: 3027 – 0294 DOI: https://doi.org/10.59479/jiaheri.v2i1.165

allows materials with different properties to be handled separately. Organic waste may be suitable for composting under appropriate conditions, while selected plastics, metals, glass and paper may be recovered for reuse or recycling. When these materials are mixed with general refuse, their recovery becomes more difficult and may require additional sorting, labour and financial resources. Trushna et al. (2024), in a systematic review of household waste segregation interventions, found that information provision was a commonly used approach, but also highlighted the need to examine the role of incentives and infrastructure in encouraging sustained participation. Their review further identified a shortage of intervention research in low- and middle-income countries. This is relevant to Nigerian communities where awareness alone may not be sufficient to produce consistent changes in household practices.

In Nigeria, solid waste management remains a major responsibility shared among government institutions, private operators, households and informal waste recovery actors. The effectiveness of this arrangement varies between states and local government areas. Inadequate collection infrastructure, irregular service delivery, limited public participation and the continued use of informal disposal methods have been identified as recurring concerns in the country's waste management environment. Fakunle (2024) observed that the Nigerian waste management situation is influenced by institutional, financial, infrastructural and behavioural factors. This suggests that interventions focusing exclusively on household attitudes may fail to address the practical circumstances that shape disposal decisions.

Evidence from Nigerian cities also demonstrates the importance of examining waste management at the household and community levels. Studies have documented differences in waste generation, collection arrangements and disposal practices across urban settlements. In Kano, Musa (2023) reported that waste collection and disposal were not sufficiently regular in the study area and identified the role of privately owned operators in the collection process. Balogun et al. (2020), in a study conducted in Nasarawa Local Government Area of Kano State, identified organic waste, nylons and plastics among the prominent waste materials and reported open dumping as a commonly practised disposal method. These findings provide a local basis for examining how households manage the waste they generate and the conditions under which different practices occur. The environmental consequences of poor waste management are not limited to unpleasant surroundings. Accumulated waste may obstruct drainage channels, create conditions that attract flies and rodents, and expose residents and waste handlers to potentially harmful materials. Open burning may also generate smoke and other pollutants. However, the presence of refuse or disease vectors in a community does not by itself establish that a particular disease has occurred because of the waste. Public health risks depend on the nature of the waste, exposure pathways, environmental conditions and the vulnerability of exposed populations. The World Health Organization (2025) emphasises the need to understand these exposure pathways and strengthen integrated waste management as part of public health protection.

Nasarawa Local Government Area provides a relevant setting for examining household waste management because of the environmental and service delivery challenges associated with growing urban communities. Household practices may differ according to the availability of

MAAUN INTERNATIONAL MULTIDISCIPLINARY JOURNAL OF RESEARCH AND INNOVATIONS (MIMJRI)
A Publication of the Institute of Africa Higher Education Research and Innovations (IAHERI)
in Collaboration with
Maryam Abacha American University of Niger (MAAUN) Maradi, Niger Republic
Volume 2 Number 1, June, 2024
ISSN: 3027 – 0294 DOI: https://doi.org/10.59479/jiaheri.v2i1.165

storage containers, the frequency of collection, access to communal disposal points and awareness of waste recovery options. Understanding these practices is important for identifying areas where household participation and public waste services may require improvement. Although studies have examined municipal solid waste management in Kano and other Nigerian cities, there remains a need for location-specific assessments that bring together household storage, collection, disposal, separation and recovery practices. Such assessments can provide useful information for environmental health planning and community-level interventions. This study therefore assesses household solid waste management practices in selected communities of Nasarawa Local Government Area, Kano State, Nigeria. The study concentrates on household practices as its main variable, examining the different activities through which household waste is generated, stored, collected, disposed of and potentially recovered.

Method

The study adopted a descriptive cross-sectional research design to examine household solid waste management practices and environmental health conditions in selected communities of Nasarawa Local Government Area, Kano State, Nigeria. The design is appropriate for assessing the knowledge, attitudes and practices of residents at a particular period and for describing environmental conditions associated with household waste handling. It also provides an opportunity to examine relationships among selected variables without manipulating the living conditions or waste management behaviour of respondents.

The study area was Nasarawa Local Government Area in Kano State, north-western Nigeria. The local government area contains residential and commercial settlements where household and business activities generate different categories of solid waste. The selection of Nasarawa LGA was based on its urban characteristics and the relevance of household waste management to environmental sanitation. The proposed study focused on selected communities within the local government area rather than assuming that all communities have identical waste management conditions.

The target population comprised adult residents aged 18 years and above who lived in the selected communities and were familiar with the household's waste storage and disposal arrangements. One respondent was selected from each participating household to avoid unnecessary duplication of household-level information. A sample size of 384 respondents was adopted for the analysis. This sample size was based on Cochran's formula for estimating a proportion in a large population, using a 95% confidence level, an assumed population proportion of 0.5 and a 5% margin of error. The calculation provides a conventional planning estimate; the final sample size and allocation should be confirmed using the population information and sampling frame available for the actual field study.

A multistage sampling approach was proposed. In the first stage, selected communities or wards were identified within Nasarawa LGA. In the second stage, streets or residential clusters were identified within the selected communities. In the final stage, households were selected systematically or through an appropriate random procedure, depending on the availability of

MAAUN INTERNATIONAL MULTIDISCIPLINARY JOURNAL OF RESEARCH AND INNOVATIONS (MIMJRI)
A Publication of the Institute of Africa Higher Education Research and Innovations (IAHERI)
in Collaboration with
Maryam Abacha American University of Niger (MAAUN) Maradi, Niger Republic
Volume 2 Number 1, June, 2024
ISSN: 3027 – 0294 DOI: https://doi.org/10.59479/jiaheri.v2i1.165

household listings and access to the residential areas. One eligible adult respondent was interviewed in each selected household. Where more than one eligible adult was available, the respondent was selected using a consistent procedure to reduce interviewer preference.

Data collection was designed around a structured questionnaire and an environmental observation checklist. The questionnaire covered respondents' socio-demographic characteristics, knowledge of solid waste management, attitudes towards environmental sanitation, household waste generation and storage, waste separation, recycling, collection arrangements and disposal methods. It also included questions on environmental conditions and health concerns experienced by residents. The observation checklist was designed to record visible conditions around sampled households, including exposed refuse, overflowing waste containers, waste deposited in drainage channels, evidence of open burning, flies, rodents and other observable sanitation concerns. These observations were intended to complement, rather than replace, the information provided by respondents.

Knowledge was assessed through questions concerning appropriate waste storage, waste separation, recycling, open dumping, open burning and the environmental health implications of improper disposal. Attitude was assessed through statements relating to residents' willingness to use designated collection points, participate in community sanitation, separate recyclable materials and support responsible waste management. Practice was assessed through reported household behaviour, including storage arrangements, disposal methods, waste separation, reuse, recycling and composting. Responses to attitude and knowledge items were organised using an appropriate scoring procedure, while household practices were described using frequencies and percentages.

The data analysis plan involved descriptive and inferential statistical methods. Frequencies and percentages were used to summarise categorical variables, while means and standard deviations were used for suitable composite scores. Pearson's correlation coefficient was proposed to examine relationships among knowledge, attitude and practice scores where the assumptions for its use were reasonably satisfied. Chi-square tests were proposed for examining associations between selected categorical variables, such as household waste disposal practices and observed environmental conditions. Statistical significance was set at 5% (p

Below are the Results and Discussion tables (Tables 1–10), presented in tab-separated format (TSV) for easy copying into Microsoft Word or Excel. Each column is separated by a tab, not spaces. The figures remain and simulated for a sample of 384 respondents; they are not actual field data from Nasarawa LGA.

Results

Socio-demographic characteristics of respondent

The results in Table 1 show that females constituted 59.9% of respondents, while males accounted for 40.1%. Respondents aged 26–35 years formed the largest age category (29.2%). Married respondents represented 68.5% of the sample, while those with secondary education accounted for 37.2%. Trading and business activities were the most frequently reported occupations (30.2%). The predominance of households with four to six members (47.1%) is

MAAUN INTERNATIONAL MULTIDISCIPLINARY JOURNAL OF RESEARCH AND INNOVATIONS (MIMJRI)
A Publication of the Institute of Africa Higher Education Research and Innovations (IAHERI)
in Collaboration with
Maryam Abacha American University of Niger (MAAUN) Maradi, Niger Republic
Volume 2 Number 1, June, 2024
ISSN: 3027 – 0294 DOI: https://doi.org/10.59479/jiaheri.v2i1.165

relevant because household size may influence the quantity of waste generated. These characteristics provide a background for examining differences in household waste management behaviour.

Table 1: Socio-demographic characteristics of respondent

Variable	Category	Frequency	Percentage (%)
Sex	Male	154	40.1
	Female	230	59.9
	Total	384	100.0
Age group (years)	18–25	54	14.1
	26–35	112	29.2
	36–45	91	23.7
	46–55	73	19.0
	56 and above	54	14.1
	Total	384	100.0
Marital status	Single	79	20.6
	Married	263	68.5
	Separated/divorced	17	4.4
	Widowed	25	6.5
	Total	384	100.0
Educational level	No formal education	62	16.1
	Primary education	74	19.3
	Secondary education	143	37.2
	Tertiary education	105	27.3
	Total	384	100.0
Occupation	Trading/business	116	30.2
	Civil/public service	52	13.5
	Artisan	61	15.9
	Private employment	48	12.5
	Student	34	8.9
	Unemployed	40	10.4
	Other	33	8.6
	Total	384	100.0
Household size	1–3 persons	75	19.5
	4–6 persons	181	47.1
	7–9 persons	97	25.3
	10 persons and above	31	8.1
	Total	384	100.0
Length of residence	Less than 1 year	21	5.5
	1–5 years	87	22.7
	6–10 years	102	26.6

MAAUN INTERNATIONAL MULTIDISCIPLINARY JOURNAL OF RESEARCH AND INNOVATIONS (MIMJRI)
A Publication of the Institute of Africa Higher Education Research and Innovations (IAHERI)
in Collaboration with
Maryam Abacha American University of Niger (MAAUN) Maradi, Niger Republic
Volume 2 Number 1, June, 2024
ISSN: 3027 – 0294 DOI: https://doi.org/10.59479/jiaheri.v2i1.165

More than 10 years	174	45.3
Total	384	100.0

Source: author's dataset, 2026.

Respondents' knowledge of household solid waste management

The results indicated that 79.7% of respondents correctly recognised that waste deposited in drainage channels could obstruct water flow. Similarly, 78.1% understood the importance of storing household waste in suitable containers. However, knowledge of composting was comparatively lower, with 56.3% providing the correct response. This suggests that knowledge of the environmental consequences of improper disposal may be stronger than knowledge of practical waste recovery methods. Environmental health education should therefore cover waste reduction, separation, reuse, recycling and composting in addition to the dangers of indiscriminate disposal.

Attitudes towards household solid waste management

The results revealed that generally favourable attitudes towards proper waste management. A combined 82.5% strongly agreed or agreed that proper waste management was the responsibility of every household. Likewise, 85.1% supported discouraging the disposal of refuse in drainage channels. However, willingness to pay reasonable charges for reliable collection was less pronounced, with 55.0% agreeing or strongly agreeing. This difference suggests that positive attitudes towards environmental cleanliness may not automatically translate into financial commitment or practical action. The affordability and reliability of waste collection services should therefore be considered when designing interventions.

Household waste generation, storage and collection

Food remnants and organic waste were the most frequently reported waste types in the results (75.8%), followed by plastics (72.4%). Only 37.0% of households were represented as using covered containers for waste storage. Irregular collection was reported by 32.8%, while 13.0% had no organised collection. These results illustrate how inadequate storage and unreliable collection may encourage the accumulation of refuse around residential areas. Improving collection schedules and providing suitable storage facilities are therefore important components of household environmental sanitation.

MAAUN INTERNATIONAL MULTIDISCIPLINARY JOURNAL OF RESEARCH AND INNOVATIONS (MIMJRI)
A Publication of the Institute of Africa Higher Education Research and Innovations (IAHERI)
in Collaboration with
Maryam Abacha American University of Niger (MAAUN) Maradi, Niger Republic
Volume 2 Number 1, June, 2024
ISSN: 3027 – 0294 DOI: https://doi.org/10.59479/jiaheri.v2i1.165

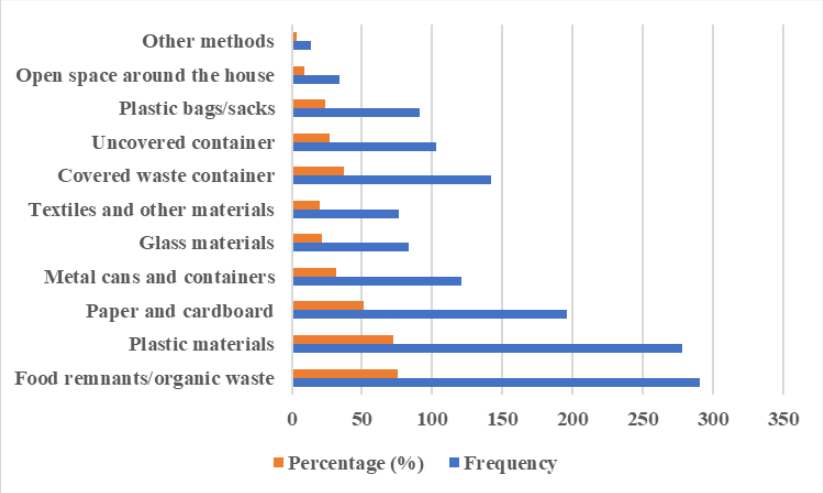


Figure 1. Household waste types, storage methods and collection frequency
Source: author's dataset, 2026.

Household solid waste disposal methods

As shown in Figure 2 below, municipal collection accounted for 24.5% of the primary disposal methods in the dataset, while open dumping in vacant spaces accounted for 22.9%. Disposal into drainage channels and open burning represented 8.1% and 10.2%, respectively. Together, these three unsafe disposal methods accounted for 41.2% of respondents, not 40.9%. This shows the potential importance of improving access to organised collection and discouraging disposal methods that expose waste to the surrounding environment.

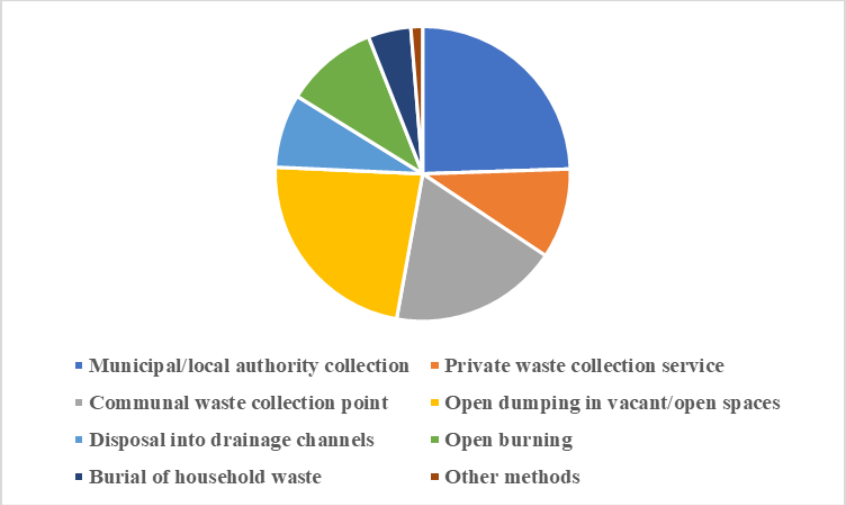


Figure 2. Primary household solid waste disposal methods
Source: author's dataset, 2026.

MAAUN INTERNATIONAL MULTIDISCIPLINARY JOURNAL OF RESEARCH AND INNOVATIONS (MIMJRI)
A Publication of the Institute of Africa Higher Education Research and Innovations (IAHERI)
in Collaboration with
Maryam Abacha American University of Niger (MAAUN) Maradi, Niger Republic
Volume 2 Number 1, June, 2024
ISSN: 3027 – 0294 DOI: https://doi.org/10.59479/jiaheri.v2i1.165

Waste separation, reuse, recycling and composting

The results show that only 21.6% of respondents always separated household waste, while 41.7% never separated it. Regular recycling was reported by 15.4%, and only 12.5% practised composting. These figures illustrate possible limitations in household waste recovery. The low level of awareness of recycling collection points (31.8%) also suggests that access to information and facilities may influence household participation. Recycling and composting programmes should therefore be supported by practical collection arrangements, community education and accessible recovery facilities.

Environmental sanitation conditions around households

Table 2: Environmental sanitation observations around sampled households (n = 384)

Environmental condition	Observed: Yes (n)	Observed: Yes (%)	Observed: No (n)	Observed: No (%)
Exposed household refuse	161	41.9	223	58.1
Waste accumulation in nearby open spaces	139	36.2	245	63.8
Waste deposited in drainage channels	77	20.1	307	79.9
Blocked or obstructed drainage channels	96	25.0	288	75.0
Evidence of open waste burning	63	16.4	321	83.6
Exposed food or biodegradable waste	148	38.5	236	61.5
Visible presence of flies	172	44.8	212	55.2
Visible evidence of rodents	89	23.2	295	76.8
Overflowing waste containers	114	29.7	270	70.3
Evidence of organised waste collection	139	36.2	245	63.8

Source: author's dataset, 2026.

The environmental observations in Table 2 indicate that exposed refuse was present around 41.9% of sampled households, while visible flies were recorded around 44.8%. Waste accumulation in nearby open spaces was represented in 36.2% of observations. These conditions may contribute to poor environmental sanitation and create opportunities for pests to access household waste. The presence of waste in drainage channels and blocked drains also deserves

MAAUN INTERNATIONAL MULTIDISCIPLINARY JOURNAL OF RESEARCH AND INNOVATIONS (MIMJRI)
A Publication of the Institute of Africa Higher Education Research and Innovations (IAHERI)
in Collaboration with
Maryam Abacha American University of Niger (MAAUN) Maradi, Niger Republic
Volume 2 Number 1, June, 2024
ISSN: 3027 – 0294 DOI: https://doi.org/10.59479/jiaheri.v2i1.165

attention because it may obstruct water flow. Regular environmental monitoring and improved waste collection are necessary to address these conditions.

Self-reported environmental health concerns

Mosquito nuisance was the most frequently reported concern in the findings (52.3%), followed by the presence of flies (48.4%) and unpleasant odour (43.5%). Smoke exposure was reported by 21.1% of respondents. These findings illustrate the environmental discomforts that may accompany poor sanitation conditions. However, the reported symptoms cannot establish that household waste caused a particular illness. Other environmental and personal factors may contribute to these experiences, and further investigation would be required to establish specific health relationships.

Mean scores for knowledge, attitude and practice

Table 3: Mean scores for knowledge, attitude and practice

Variable	Mean	Standard deviation	Interpretation
Knowledge	3.42	0.68	Relatively higher score
Attitude	3.31	0.61	Relatively higher score
Practice	2.84	0.72	Lower score than knowledge and attitude

Source: author's dataset, 2026.

As shown in Table 3 above, Knowledge recorded the highest mean score (3.42), followed by attitude (3.31), while practice had the lowest mean score (2.84). This pattern demonstrates a possible gap between environmental health awareness and household behaviour. Residents may understand the importance of proper waste management but remain constrained by inadequate collection services, limited facilities or financial considerations. The findings illustrate why interventions should combine education with improvements in waste management infrastructure.

Relationship among knowledge, attitude and practice

The pearson correlation results show positive relationships among knowledge, attitude and practice. Knowledge and attitude recorded a correlation coefficient of 0.48, while knowledge and practice recorded 0.32. Attitude and practice recorded a coefficient of 0.41. These relationships suggest that higher knowledge and more favourable attitudes may be associated with better household waste management practices. However, correlation does not establish causation, and other factors such as income, access to collection services and availability of disposal facilities may also influence household behaviour.

Conclusion

Solid waste management remains an important environmental health concern because improper handling and disposal of household refuse can contribute to environmental pollution,

MAAUN INTERNATIONAL MULTIDISCIPLINARY JOURNAL OF RESEARCH AND INNOVATIONS (MIMJRI)
A Publication of the Institute of Africa Higher Education Research and Innovations (IAHERI)
in Collaboration with
Maryam Abacha American University of Niger (MAAUN) Maradi, Niger Republic
Volume 2 Number 1, June, 2024
ISSN: 3027 – 0294 DOI: https://doi.org/10.59479/jiaheri.v2i1.165

poor sanitation and conditions that increase human exposure to environmental hazards. This study examined household solid waste management practices and environmental health concerns in selected communities of Nasarawa Local Government Area, Kano State, with particular attention to residents' knowledge, attitudes, waste disposal behaviour and surrounding environmental conditions. The results indicate that respondents may possess reasonable knowledge of the importance of proper household waste management. However, this awareness does not consistently translate into appropriate waste-handling practices. The lower practice score compared with the knowledge and attitude scores demonstrates a possible gap between environmental health awareness and actual household behaviour. This suggests that inadequate waste management should not be attributed solely to a lack of public knowledge. The availability, affordability and reliability of waste collection services, together with access to suitable storage and disposal facilities, are important considerations. The findings further show the challenges associated with open dumping, irregular waste collection, inadequate waste separation, limited recycling and low participation in composting. These practices can contribute to the accumulation of refuse in residential surroundings and increase the difficulty of maintaining a clean environment. The environmental observations also identify exposed waste, blocked drainage channels, overflowing containers, flies and rodents as conditions requiring attention from households and environmental health authorities.

The positive relationships demonstrated among knowledge, attitude and practice suggest that environmental health awareness and favourable attitudes may support better waste management behaviour. Nevertheless, improved knowledge alone may not produce the desired changes where households lack practical alternatives for disposing of their refuse. Effective solid waste management therefore requires a coordinated approach involving residents, local government authorities, environmental health personnel, private waste operators and community organisations.

The study concludes that improving household solid waste management in Nasarawa LGA requires more than occasional sanitation campaigns. It requires dependable waste collection, accessible disposal facilities, household participation, effective environmental monitoring and practical waste recovery initiatives. Combining these measures can support cleaner residential surroundings and reduce environmental conditions associated with potential health hazards.

Based on the issues examined and the findings, the following specific recommendations are proposed:

1. The Nasarawa Local Government environmental health authority, in collaboration with relevant waste management operators, should establish clearly defined waste collection schedules for residential communities. Collection should take place at least once weekly, with more frequent collection in densely populated areas and locations generating large quantities of refuse. Collection schedules should be communicated through community leaders, public announcements and other accessible channels.
2. Designated collection points should be provided at suitable locations within residential communities. These facilities should be positioned to allow reasonable access without

MAAUN INTERNATIONAL MULTIDISCIPLINARY JOURNAL OF RESEARCH AND INNOVATIONS (MIMJRI)
A Publication of the Institute of Africa Higher Education Research and Innovations (IAHERI)
in Collaboration with
Maryam Abacha American University of Niger (MAAUN) Maradi, Niger Republic
Volume 2 Number 1, June, 2024
ISSN: 3027 – 0294 DOI: https://doi.org/10.59479/jiaheri.v2i1.165

obstructing roads, pedestrian routes or drainage channels. Each collection point should have suitable containers, a clearly identified responsible operator and a regular emptying arrangement.

3. The local government authority and relevant environmental health officers should strengthen monitoring of drainage channels and enforce existing environmental sanitation regulations against indiscriminate waste disposal. Enforcement should be accompanied by public education and the provision of alternative collection arrangements so that households are not left without practical disposal options.
4. Households should be encouraged to store refuse in durable, covered and easily washable containers. Community environmental health officers should demonstrate appropriate waste storage methods during household visits and sanitation campaigns. Particular attention should be given to preventing the exposure of food remnants and other biodegradable materials.
5. Community-based waste separation should begin with practical categories that residents can easily understand, such as biodegradable waste, recyclable materials and residual waste. The programme should be introduced alongside separate collection or recovery arrangements. Households should not be expected to maintain separation where collected materials are subsequently mixed without explanation.
6. The local government authority should collaborate with registered recycling businesses, private operators and community-based organisations to establish collection and recovery arrangements for plastics, metals, paper and other recyclable materials. Collection points and information on participating operators should be made accessible to residents. Such partnerships could also provide opportunities for small-scale employment and income generation.
7. Environmental health and agricultural extension personnel should provide practical guidance on converting suitable biodegradable household waste into compost. Demonstration activities should be organised in interested communities, particularly where there is sufficient space and demand for organic soil amendments. Composting should be promoted with appropriate guidance on separating unsuitable materials and maintaining hygienic conditions.
8. Environmental health officers should carry out routine inspections of residential surroundings, communal collection points, markets and drainage channels. Inspection records should identify locations with exposed refuse, overflowing containers, accumulated waste and evidence of open burning. Repeatedly affected locations should receive priority attention, and corrective actions should be documented.
9. Community education and environmental sanitation enforcement should address the uncontrolled burning of mixed household waste. Residents should be informed about the potential risks of smoke exposure and directed towards appropriate collection and disposal alternatives. Waste collection services should be strengthened in areas where open burning is used because formal collection is unavailable or irregular.

Contribution to Environmental Health Practice

MAAUN INTERNATIONAL MULTIDISCIPLINARY JOURNAL OF RESEARCH AND INNOVATIONS (MIMJRI)
A Publication of the Institute of Africa Higher Education Research and Innovations (IAHERI)
in Collaboration with
Maryam Abacha American University of Niger (MAAUN) Maradi, Niger Republic
Volume 2 Number 1, June, 2024
ISSN: 3027 – 0294 DOI: https://doi.org/10.59479/jiaheri.v2i1.165

The study provides a framework for examining household solid waste management as both an environmental sanitation issue and a public health concern. It highlights the importance of considering household knowledge, attitudes, disposal practices and the availability of waste management services together. It also provides a basis for developing community-level interventions that combine environmental health education with improved collection infrastructure, waste recovery and environmental monitoring.

References

Abila, B., & Kantola, J. (2013). Municipal solid waste management problems in Nigeria: Evolving knowledge management solution. "International Journal of Environmental, Ecological, Geological and Geophysical Engineering, 7"(6), 303–308.

Adedara, O. A., Taiwo, R., & Bork, H.-R. (2023). Municipal solid waste collection and coverage rates in sub-Saharan African countries: A comprehensive systematic review and meta-analysis. "Waste, 1"(2), 389–413. https://doi.org/10.3390/waste1020024

Alhassan, H., Kwakwa, P. A., & Owusu-Sekyere, E. (2020). Households' source separation behaviour and solid waste disposal options in Ghana's Millennium City. "Journal of Environmental Management, 259", 110055. https://doi.org/10.1016/j.jenvman.2019.110055

Aluko, O. O., et al. (2022). Solid waste management and health hazards associated with residence around open dumpsites in heterogeneous urban settlements in Southwest Nigeria. "International Journal of Environmental Health Research, 32"(6), 1313–1328. https://doi.org/10.1080/09603123.2021.1879738

Babayemi, J. O., & Dauda, K. T. (2009). Evaluation of solid waste generation, categories and disposal options in developing countries: A case study of Nigeria. "Journal of Applied Sciences and Environmental Management, 13"(3), 83–88.

Balogun, D. O., Ibrahim, A., Mshelia, A. N., Okewu, A. A., Adgidzi, J. A., & Boyi, S. (2020). Municipal solid waste management practices and impact on the environment in Nasarawa Local Government Area, Kano State. "World Wide Journal of Multidisciplinary Research and Development, 6"(9).

Boadi, K. O., & Kuitunen, M. (2003). Municipal solid waste management in the Accra metropolitan area, Ghana. "The Environmentalist, 23", 211–218.

Fakunle, F. F. (2024). Peculiarities in household solid waste management in Nigeria: A quick review. "Frontiers in Sustainability, 5", 1440758. https://doi.org/10.3389/frsus.2024.1440758

Ferronato, N., & Torretta, V. (2019). Waste mismanagement in developing countries: A review of global issues. "International Journal of Environmental Research and Public Health, 16"(6), 1060. https://doi.org/10.3390/ijerph16061060

Guerrero, L. A., Maas, G., & Hogland, W. (2013). Solid waste management challenges for cities in developing countries. "Waste Management, 33"(1), 220–232. https://doi.org/10.1016/j.wasman.2012.09.008

MAAUN INTERNATIONAL MULTIDISCIPLINARY JOURNAL OF RESEARCH AND INNOVATIONS (MIMJRI)
A Publication of the Institute of Africa Higher Education Research and Innovations (IAHERI)
in Collaboration with
Maryam Abacha American University of Niger (MAAUN) Maradi, Niger Republic
Volume 2 Number 1, June, 2024
ISSN: 3027 – 0294 DOI: https://doi.org/10.59479/jiaheri.v2i1.165

Hoornweg, D., & Bhada-Tata, P. (2012). "What a waste: A global review of solid waste management". World Bank.

Imam, A., Mohammed, B., Wilson, D. C., & Cheeseman, C. R. (2008). Solid waste management in Abuja, Nigeria. "Waste Management, 28"(2), 468–472. https://doi.org/10.1016/j.wasman.2007.01.006

Kang, A. (2025). The administrative mechanism behind sustainable waste disposal practices: Evidence from state-level specific authorities in Nigeria. "Growth and Change, 56"(2), e70029. https://doi.org/10.1111/grow.70029

Kaza, S., Yao, L. C., Bhada-Tata, P., & Van Woerden, F. (2018). "What a waste 2.0: A global snapshot of solid waste management to 2050". World Bank. https://doi.org/10.1596/978-1-4648-1329-0

Musa, R. M. (2023). An assessment of environmental solid waste management in Kano Metropolis. "Jalingo Journal of Social and Management Sciences, 4"(4).

Nabegu, A. B. (2010). An analysis of municipal solid waste in Kano metropolis, Nigeria. "Journal of Human Ecology, 31"(2), 111–119.

Nnaji, C. C. (2015). Status of municipal solid waste generation and disposal in Nigeria. "Management of Environmental Quality: An International Journal, 26"(1), 53–71.

Ogwueleka, T. C. (2009). Municipal solid waste characteristics and management in Nigeria. "Iranian Journal of Environmental Health Science & Engineering, 6"(3), 173–180.

Osotuyi, B. O., et al. (2025). Assessing waste separation behaviour in Nigeria: Implications for post-COVID-19 pandemic waste management strategies. "Environmental Research Communications, 7", 015020. https://doi.org/10.1088/2515-7620/ada41f

Trushna, T., Krishnan, K., Soni, R., Singh, S., Kalyanasundaram, M., Annerstedt, K. S., Pathak, A., Purohit, M., Stålsby Lundborg, C., Sabde, Y., Atkins, S., Sahoo, K. C., Rousta, K., & Diwan, V. (2024). Interventions to promote household waste segregation: A systematic review. "Heliyon, 10"(2), e24332. https://doi.org/10.1016/j.heliyon.2024.e24332

United Nations Environment Programme. (2015). "Global waste management outlook". UNEP.

United Nations Environment Programme. (2024). "Global waste management outlook 2024: Beyond an age of waste—Turning rubbish into a resource". UNEP. https://doi.org/10.59117/20.500.11822/44939

United Nations Human Settlements Programme. (2010). "Solid waste management in the world's cities: Water and sanitation in the world's cities 2010". Earthscan.

Wilson, D. C., Rodic, L., Modak, P., Soos, R., Carpintero, A., Velis, C., Iyer, M., & Simonett, O. (2015). "Global waste management outlook". United Nations Environment Programme and International Solid Waste Association.

World Bank. (2026). "What a waste 3.0". https://www.worldbank.org/en/publication/what-a-waste

World Health Organization. (2025). "Throwing away our health: The impact of solid waste on human health—Evidence, knowledge gaps, and health sector responses". WHO. https://www.who.int/publications/i/item/9789240118287

MAAUN INTERNATIONAL MULTIDISCIPLINARY JOURNAL OF RESEARCH AND INNOVATIONS (MIMJRI)
A Publication of the Institute of Africa Higher Education Research and Innovations (IAHERI)
in Collaboration with
Maryam Abacha American University of Niger (MAAUN) Maradi, Niger Republic
Volume 2 Number 1, June, 2024
ISSN: 3027 – 0294 DOI: https://doi.org/10.59479/jiaheri.v2i1.165

Yakubu, A., Woodard, R., & Aboagye-Nimo, E. (2023). Generation and composition of solid waste in low-income areas of Jos, Plateau State, Nigeria. "World Journal of Advanced Research and Reviews, 18"(2), 906–918. https://doi.org/10.30574/wjarr.2023.18.2.0886

Zurbrügg, C. (2003). "Urban solid waste management in low-income countries of Asia: How to cope with the garbage crisis". Scientific Committee on Problems of the Environment (SCOPE).