Waste Management Practices and Their Public Health Implications in Some Selected Markets in Federal Capital Territory, Abuja

[*1]Tarkumbul, E. S., [2]Gimba, U. N., [3]Ushie, G. A., [4]Akaazua, T., [5]Igbokwe, C. O. and [6]Omoarebu, I. J.

[1]Department of Public Health, National Open University of Nigeria, Abuja.
[2]Department of Biology, Ibrahim Badamasi Babangida University Lapai Niger state Nigeria.
[3]Department of Public Health, Ahmadu Bello University, Zaria. Kaduna State, Nigeria.
[4]Department of Microbiology, Benue State University Teaching Hospital, Makurdi, Benue State, Nigeria.
[5]Molecular Virology Laboratory, Medical Microbiology Division, Medical Laboratory Services, University of Benin Teaching Hospital, Edo State, Nigeria.
[6]Department of Medical Microbiology University of Benin teaching Hospital, Benin, Edo state, Nigeria.
Correspondence Author Email address: etarkumbul@gmail.com

Direct Research Journal of Public Health and Environmental Technology

Direct RESEARCH JOURNALS

Vol. 11(1), Pp. 12-18, January 2026

Research Article
ISSN: 2734-2182
https://journals.directresearchpublisher.org/index.php/drjphet; https://www.ajol.info/index.php/drjphet

Received 10 November 2025, Accepted 20 December 2025, Published 14 January 2026

ABSTRACT

This study assessed waste management practices and their public health implications in selected markets within the Federal Capital Territory (FCT), Abuja. Rapid urbanization and commercial activities in major markets such as Wuse, Garki, Gwagwalada, and Kuje have resulted in increased waste generation, yet management practices remain inadequate. A descriptive cross-sectional survey design was adopted, and data were collected from 382 respondents using structured questionnaires, interviews with market officials and environmental personnel, and direct field observations. Findings revealed that organic waste constituted the highest proportion of market waste (46.3%), followed by plastics (28.0%) and paper waste (12.0%), reflecting the predominance of food-related trading activities. Waste management practices were largely substandard, with 52.0% of traders engaging in open dumping, while only 30.0% used waste bins. Recycling was minimally practiced across all stakeholder groups. Awareness of the health risks of improper waste disposal was moderately high (61.0%); however, this did not translate into appropriate waste handling behaviors. Public health implications were evident as 47.5% of respondents reported vector-borne diseases such as malaria, typhoid, and cholera linked to poor market sanitation, while respiratory infections (18.8%) and gastrointestinal illnesses (12.5%) were also reported. The study concludes that poor waste management practices in FCT markets significantly compromise environmental hygiene and increase disease risks among traders and consumers. Strengthening institutional capacity, improving waste infrastructure, enforcing environmental regulations, and promoting public awareness and behavioral change are essential for achieving sustainable market sanitation and safeguarding public health in Abuja.

Keywords: *Waste management, public health, Abuja, environmental health, waste disposal*

Citation: Tarkumbul, E. S., Gimba, U. N., Ushie, G. A., Akaazua, T., Igbokwe, C. O. & Omoarebu, I. J. (2026). Waste Management Practices and Their Public Health Implications in Some Selected Markets in Federal Capital Territory, Abuja. *Direct Research Journal of Public Health and Environmental.* Vol. 11(1), Pp. 12-18
https://doi.org/10.26765/DRJPHET5583125

INTRODUCTION

Waste management has emerged as one of the most urgent issues of the environment and public health of the fast urbanizing cities and in particular in the developing countries like Nigeria. Abuja the administrative and political centre of the country has a high human and commercial activity that produce high amounts of waste every day and the major markets in the city like Garki, Wuse, Utako, and Nyanya are the major producers of the waste. Solid waste management in these locations is a big challenge since waste segregation is of poor quality, waste collection systems are limited, and waste is improperly disposed of (Aatamila et al., 2010). Markets are key economic points of trading foodstuffs, perishable goods, plastic and other commercial materials thus resulting in the buildup of both biodegradable and non-biodegradable wastes. Poor management of these wastes leads to breeding areas of disease vectors, drainage systems and sources of surface and ground waters, which pose serious threats to the health of the people (Adeyeba, & Akinbo, 2002).

In Nigeria, urbanization and population increase have been very fast compared to the development of proper waste management facilities. The National Environmental Standards and Regulations Enforcement Agency (NESREA, 2023) notes that poor solid waste management is one of the causes of environmental degradation, air pollution, and the transmission of the infectious diseases (cholera, typhoid, malaria, dysentery) through improper waste handling. The markets in the FCT are more susceptible due to the high number of traders and consumers that generate various types of solid waste materials that were randomly discarded along the open areas or close to the waterways. This is compounded by poor funding, non-observation of environmental laws, and little knowledge among the population on the best practices that can be employed in the management of the waste (Aina, 2006).

There are many implications of poor waste management in terms of public health. Research has revealed that random dumping of market wastes leads to air pollution due to emission of harmful gases caused by the decomposition of organic substances, and plastic waste obstructs drainage systems leading to floods and transmission of the diseases transmitted by vectors (Uche & Eze, 2022). The markets are usually those close to the residential places and therefore poor sanitation and uncontrolled wastes may directly affect the immediate communities. In its report, the World Health Organization (WHO, 2021) highlighted that 22 percent of deaths are connected to environmental factors, and one of them is poor waste management. It has been observed that the proper management and disposal of waste in the Nigerian context still fail to support the objective of sustainable urban development, and pose a risk to the lives of people, especially market women, traders and consumers since they are directly exposed to unhealthy environments. Waste management needs to be holistic approach that entails waste segregation at the source, collection and transportation, recycling and disposal of the waste at the sanitary landfills. Nevertheless, waste collection in the majority of FCT markets is not systematic and a market authority has no technical ability and power to establish appropriate waste treatment systems (Al-Delaimy et al., 2014). Moreover, waste disposal attitudes and practices are also important factors in the development of existing practices. Open dumping or burning remains a favorite waste disposal method among many traders because they have little information on the environmental and health impact (Al-Delaimy et al., 2014). Poor cooperation between local government, private waste contractors and the market associations also contribute to the inefficiency of the municipal waste management systems in Abuja.

In the public health terms improperly controlled waste may result in outbreaks of communicable diseases, exposures to dangerous substances and contamination of food sold in the markets. Rat and flies, and other vectors of diseases in the marketplace are usually a direct result of piled up garbage.

Okonkwo et al. (2023) note that the piles of waste in the urban markets act as breeding grounds of houseflies and rats, which spread the pathogens that cause foodborne and waterborne diseases. Moreover, the waste decomposition leachates can find their way into aquatic systems in the neighborhood wells and streams or wetlands and contaminate drinking or food washing water.

Therefore, the need to learn about waste management activities, as well as their effects on the health of the population in their markets, is relevant to the Federal Capital Territory in designing sustainable approaches to ensure environmental hygiene and protecting the health of the people. These risks can be greatly reduced by intervention policies that are market-based, i.e. better waste infrastructure, environmental education, and the enforcement of sanitation regulations. The evaluation of the current waste management will offer a superior level of understanding of the loopholes that should be filled by policy makers and environmental health agencies (Ezeh and Nwosu, 2023).

Effective waste management in markets does not just represent a mere environmental issue but is a core concern in the public health. As a symbol of national development, the Federal Capital Territory must set a example of sustainable practices of waste management which guarantee clean markets, healthy environment and a decreased disease burden.

To deal with this challenge, it will be necessary to engage in a collective effort that will incorporate market authorities, governmental agencies, traders, and even the general population in order to guarantee the safety of human health and environment.

METHODOLOGY

Study Area

The research was carried out in the Federal Capital Territory (FCT) which is the administrative and political capital of Nigeria and lies in the central part of the country. There are six Abuja Municipal Area Council (AMAC) in FCT, which consists of Bwari, Gwagwalada, Kuje, Kwali, and Abaji with a unique demographic and economic background each. Major markets like Wuse Market, Garki Market, Gwagwalada Market and Kuje Market are important economic centers in the country where thousands of traders and buyers attend their markets every day, causing great amounts of solid waste to be produced.

Research Design

In this study, the descriptive cross sectional survey design was utilized to assess the waste management practices and the health implication to the population in the sampled markets in Abuja. Creswell (2018) states that the descriptive survey design presents a systematic way of describing the nature of the population as it is. It was also especially appropriate in this study as the study aimed to get knowledge on current waste management practices and not to control variables. Data triangulation and maximization of the validity of results were achieved by the use of questionnaires, interviews, and observation checklists.

Population of the Study

The sampling method employed was the multi-stage sampling. Four area councils (AMAC, Gwagwalada, Kuje, and Bwari) were purposely chosen in the first stage in terms of the population density and commercial activity. Each council was randomly chosen to select one large market in the second stage. Last, the respondents were selected methodically in each market according to the type of traders (foodstuff sellers, meat vendors, textile traders, etc.) to cover the waste-generating activities.

$$n = \frac{N}{1 + N(e)^2}$$

Where:

i. nnn = sample size
ii. NNN = population size (10,000)
iii. eee = level of precision (0.05)

$$n = \frac{10,000}{1 + 10,000(0.05)^2} = 400$$

Sources of Data

Primary data were gathered directly through the respondents by use of structured questionnaires, interviews, and field observations. These have been used to give direct data on waste production patterns, management and health results of traders and market consumers. Institutional reports, scholarly literature, governmental documents, and past research works were used to gather secondary data as far as waste management and public health are concerned (Adewumi and Oloyede, 2022; World Bank, 2022). The secondary data was able to give a contextual base to the interpretation of the primary data gathered.

Questionnaire, Interview Guide (Research Instruments)

The questionnaire was designed in a structured format to gather quantitative information of the traders and waste handlers. The questionnaire had closed and open-ended questions grouped into under seven sections involving demographic information, waste generation habits, management practices, and perceived health impacts. The semi-structured interviews were undertaken with the officials of the markets and the AEPB staff to acquire a qualitative understanding of institutional dilemmas, policy implementation, and management policies.

Validity Research Instruments/ Reliability Research Instruments

The instruments were checked against content and construct validity. The method used to guarantee content validity was the expert review involving two environmental health specialists and one expert in research methods of the University of Abuja, who verified the relevance and clarity of every item. Construct validity was determined by a pilot study was done in Nyanya Market which was not a part of the main study area. The Cronbach Alpha coefficient was used to measure reliability and the result was 0.82, which showed high level of internal consistency. Kothari (2014) says that an instrument has a high degree of reliability when its alpha coefficient is more than 0.70. It was changed in response to pilot feedback in order to increase clarity and minimize ambiguity.

Method of Data Collection

The data collection was done in four weeks; both through self-administered and interviewer administered questionnaire. The administration of the instruments was assisted by research assistants who had been trained on the ethics and procedures of data collection. Each of the markets was observed to document the physical waste situations and to check the respondent claims. The interviews were held with environmental health officers

and market administrators in order to complement quantitative data by the qualitative information.

Method of Data Analysis

The Statistical Package of the Social Sciences (SPSS) version 26.0 was used in the analysis of data. This was summarized using descriptive statistics including frequencies, percentages and mean scores and inferential statistics including Chi-square test were used to test hypotheses of the research at 0.05 significance level.

Ethical Considerations

All the participants gave informed consent before taking part in the questionnaires and interviews. Information confidentiality had been observed through anonymity of response and safe storage of information. The research also followed the principles of non-maleficence where none of the participants were subjected to any harm or coercion throughout the study.

RESULTS AND DISCUSSION

Among 400 questionnaires mailed to traders, market officials and waste handlers, 382 were returned and confirmed as valid to analyze them, which is 95.5 percent response rate. The research employed descriptive statistics as the frequency counts, percentages, and means summarized the results, whereas qualitative responses in terms of the interview and observation were used to give additional background to the results. The results of Table 1 reveal that organic waste is the most prevalent source of waste produced in the markets with the highest number of 185 instances (46.3%), which was produced by traders of perishable commodities including food, vegetables, and fruits. Plastic waste is the second with 112 instances (28.0%), which is mostly produced by the traders and consumers using the nylon bags, bottles, and packaging materials. Paper and carton waste comprise 48 entries (12.0%), which is commonly related to the process of packaging and bookkeeping. Waste made of metals and glass consists of 28 cases (7.0%), most of them as a result of canned products and broken bottles. Others (27 cases, 6.7 percent) category includes e-waste, textiles, and mixed rubbish. In total, the number of waste amounts to 400 (100%), which implies that there are different waste streams resulting in various market activities.

Open dumping is mostly practiced by traders as showed in (Table 2) with a prevalence of 52.0 and a minor prevalence of 10% and 5%, respectively; therefore, traders depend on improper disposal. Waste agencies (60.0%) and market authorities (45.0) use waste bins and collection bags more frequently than traders (30.0%), indicating more organized behaviour in the formal agencies. One-fifth of traders and one-tenth of market authorities report burning of waste, whereas none of the waste agencies do, which suggests a higher tendency to use environmentally friendly approaches by agencies. Recycling or sorting is least exercised among all groups with 3.0, 5.0, and 10.0 percent respectively among traders, authorities, and agencies respectively. Using waste evacuation which is done by 30.0% market authorities and 75.0% waste agencies, it is evident that agencies play a greater role in ensuring market cleanliness.

Table 3 shows different awareness and attitudes of market users. The level of knowledge on the right waste segregation is fairly balanced with 42.0 percent having high knowledge, 30.0 percent moderate and 28.0 percent low in their knowledge. The highest level of awareness on the danger of poor waste handling has been recorded with 61.0% being highly aware, and 23.0% and 16.0% having moderate and low level of awareness respectively. The involvement in activities related to market clean-up is moderate with 48.0% highly involved, 22.0% moderately involved and 30.0% having low involvement. The willingness in the place of better sanitation is quite high as 53.0% expressed strong willingness, 20.0% moderately, and 27.0% low. In the meantime, there is a balanced distribution of environmental regulations adherence, 36.0% are high, 32.0% moderate, and 32.0% low, indicating that there is uneven adherence to environmental regulations across the users.

Table 4 shows that the most common challenge is inadequate waste bins and collection systems, recorded 135 times (33.8%), with the suggested solution being the provision of standardized bins and frequent evacuation. Poor enforcement of sanitation laws is the second major challenge with 90 cases (22.5%), suggesting the need for stronger monitoring and penalties. Low funding and logistical constraints account for 65 responses (16.3%), indicating the need for increased budgetary support and private-sector partnerships. Poor public attitude and cooperation appear in 70 cases (17.5%), with continuous awareness and behavior-change campaigns recommended. The least-reported challenge is lack of recycling infrastructure, recorded 40 times (10.0%), for which establishing local recycling hubs and incentives is suggested.

DISCUSSION

The results showed that the nature and origin of waste produced in the chosen markets were majorly organic (food leftovers, fruits, and vegetables), then came the plastics, paper, metals, and other miscellaneous waste. The findings are in line with those obtained by Olanrewaju and Ilemobade (2022), who established that the market waste in urban centers in Nigeria comprises more than 60 percent of biodegradable materials. Organic wastes are also a lot in large quantities because of the type of market

Table 1: Types and Sources of Waste Generated in Selected Markets within the FCT, Abuja.

Type of Waste	Frequency	Percentage (%)	Major Source
Organic Waste (food remnants, vegetables, fruits)	185	46.3	Traders in food and perishable goods
Plastic Waste (nylon, bottles, packaging)	112	28.0	Traders and consumers
Paper and Carton Waste	48	12.0	Packaging and record keeping
Metal and Glass Waste	28	7.0	Canned goods and broken bottles
Others (e-waste, textiles, mixed debris)	27	6.7	Miscellaneous
Total	400	100	—

Source: Field Survey, (2025)

Table 2: Existing Waste Management Practices Employed by Traders, Market Authorities, and Waste Agencies

Waste Management Practice	Traders (%)	Market Authorities (%)	Waste Agencies (%)
Open dumping	52.0	10.0	5.0
Use of waste bins and collection bags	30.0	45.0	60.0
Burning of waste	15.0	10.0	0.0
Recycling/Sorting	3.0	5.0	10.0
Regular waste evacuation	—	30.0	75.0

Source: Field Survey, (2025)

Table 3: Awareness and Attitudes of Market Users towards Proper Waste Management.

Awareness Indicator	High (%)	Moderate (%)	Low (%)
Knowledge of proper waste segregation	42.0	30.0	28.0
Understanding of health risks of poor waste handling	61.0	23.0	16.0
Participation in market clean-up activities	48.0	22.0	30.0
Willingness to pay for improved sanitation	53.0	20.0	27.0
Adherence to environmental regulations	36.0	32.0	32.0

Source: Field Survey, (2025)

Table 4: Challenges Hindering Effective Waste Management and Suggested Solutions.

Reported Health Issue	Frequency	Percentage (%)
Vector-borne diseases (malaria, typhoid, cholera)	190	47.5
Respiratory infections due to burning	75	18.8
Skin infections and allergies	60	15.0
Gastrointestinal infections (diarrhea, dysentery)	50	12.5
Psychological stress and odor-related discomfort	25	6.2
Total	400	100

Source: Field Survey, (2025)

activities which are based on food products and perishable products. The sheer volume of organic waste on the other hand is both a challenge and opportunity. It helps in the production of odor, the growth of vectors, and fast decomposition of waste, but on the other hand, potential in the process of composting and biogas generation can convert waste into economic assets in the event that they are adequately utilized. This is similar to the study by Okafor et al. (2023), who pointed out that resource recovery and composting could go a long way in ensuring that the quantity of waste is lowered and agricultural output in Nigeria enhanced.

The paper also discovered that management of the waste in the chosen markets was informal mostly, with the most common being the open dumping and sporadic collection. More than half of traders acknowledged dumping trash (both on the market and outside it) plain into sight, and only a small part of them also claimed to use bins or engage in any recycling measures. This observation supports previous research by Ogbonna and Amadi (2021) and Adeyemi et al. (2022) identifying open dumping as an intractable issue in the markets of Nigeria because of the poor implementations of the institutions and unavailability of the appropriate waste collection systems. In the FCT, the Abuja Environmental Protection Board (AEPB) is the key body in charge of waste disposal, but the agency encounters myriad of problems which include; lack of manpower, vehicles, and poor collaboration with market users. The continuation of the open dumping in the urban markets explains why decentralized waste management systems are required to enable local market authorities and traders to own the sanitation efforts.

The other major conclusion of the research was that there was moderate awareness and understanding of proper waste management among the users of the market. Despite the fact that 61% of the respondents proved the knowledge of the health threat posed by the improper waste disposal, the knowledge was not applied in the real practices. This awareness-behavior gap has been

extensively recorded in the literature of environmental behavior especially in the Theory of Planned Behavior (2022) by Ajzen, which argues that knowledge and attitude alone are not a sufficient factor to trigger behavior change unless the enabling conditions and mechanisms of enforcement are available. On the same note, Odeyemi et al. (2023) expressed that awareness creation is not enough to put environmental indiscipline among urban traders into check unless able to see the presence of sanctions, regular waste collection, and proper infrastructure. The significance of behavioral interventions is also demonstrated in this finding including community-based environmental education, incentive programs, and increased regulatory oversight.

The results also showed that ineffective waste management in the markets has a great impact on the public health. Most of the respondents (47.5) indicated that the most prevalent illnesses associated with bad sanitation were the vector-borne diseases which included malaria, cholera, and typhoid. This confirms the claim made by Adamu and Ibrahim (2021) that poorly treated waste offer habitats to flies, mosquitos, and rodents which are vectors of diseases. In the same manner, Chukwuma et al. (2023) reported that the closeness of the food stalls to waste heaps heightens the chances of cross-contamination and foodborne infection. As observed in the chosen FCT markets, food sellers usually set their products close to unrestricted waste heaps, which expose food products to pathogens. The existence of stagnant water, decomposing organic materials and overflowing bins also increases the chances of gastrointestinal diseases and respiratory illnesses because of open burning of trash. Thus, the paper confirms that environmental sanitation is closely connected to the health outcomes of people in highly populated cities.

When addressing the institutional and infrastructural problems of poor waste management, the study cited some of the most significant problems such as lack of waste bins, poor collection, lack of adequate funding, and lack of enforcement of sanitation laws. Poor public attitudes and absence of recycling facilities were also found to be a major barrier by respondents. These results can be compared with the works of Okonjo and Eze (2024) and Adewumi and Oloyede (2022), who also state that ineffective waste management in Nigeria is caused by institutional inefficiency, gaps between policies, and the lack of coordination among agencies. With this example of Abuja, even though there are policies in place like the National Environmental (Sanitation and Waste Control) Regulations, 2009, the implementation is poor given that there are very few resources and there is no political goodwill. Furthermore, the lack of proper co-ordination of the AEPB and local market associations and individual waste contractors continues to restrict the sustainability of sanitation. Partnerships and performance-based contract introduction have the potential to strengthen such partnerships and improve accountability and service delivery.

It is interesting to note that the research has also identified an increase in the willingness of traders (53) to be willing to pay to have better waste collection services on the condition that the services are routine and transparent. This implies that models of user-based financing schemes like sanitation charges or the pay-as-you-throw scheme might be useful in maintaining waste management in market places provided the stakeholders see value in the services offered. This is consistent with the results of Olawale and Danjuma (2023) who indicated that community participation and cost-sharing schemes are fundamental to the success of the long-term implementation of urban waste management initiatives in developing nations. Nonetheless, in order to be effective, there should be high accountability, transparency and frequent service provision of such models. These findings when compared with that of other African urban centers show that there is a common trend of issues. As an example, Mensah and Larbi (2022) also stated that the markets in Accra, Ghana, experience such issues as open dumping, inconsistent waste collection, and low awareness of people, and Njoroge et al. (2021) mentioned that the market waste system of Nairobi has such problems as the inappropriate infrastructure and the lack of coordination between the waste actors.

Conclusion

In the article, Assessment of Waste Management Practices and their Public health implications in selected markets within the Federal Capital territories (FCT), Abuja, has made it possible to fully appreciate the current status of sanitation in the market, waste management practices, and their impact on the population in one of the most economically active cities in Nigeria. The study found out that market activities in the FCT play major roles in economic growth, however, the activities produce huge amounts of unmanaged wastes, especially biodegradable products including food wastes, vegetables, and fruit wastes. When this waste is not managed well, then it presents very severe environmental and health problems such as disease outbreaks, air pollution due to open burning, and also contamination of the surrounding water sources.

Recommendations

According to the findings and conclusions of this research, the following were the recommendations;

i. Institutional capacity of waste management agencies like the Abuja Environmental Protection Board (AEPB), local councils and market management authorities warrants an urgent requirement to improve their capacity.

ii. The market management committees and the government should make sure that in any market, there

are enough waste bins, waste containers, and collection points.

iii. The segregation of waste at the generation point should also be enforced in the large markets in the FCT.

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