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Household Waste Management and Practice among the Residents of Makama Jahun Ward Bauchi Metropolis, Bauchi State, Nigeria

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Abstract: The study focused on household waste management practices among residents of Makama Jahun, Bauchi Metropolis. Three objectives with three corresponding research questions were formulated. The primary aim of the study is to assess the factors influencing household waste management and practices in Makama Jahun, Bauchi. The specific objectives are: To examine various method of waste disposal among the residents of Makama Jahun, to identify the environmental factors that contribute to indiscriminate waste disposal and to find out the effects of indiscriminate waste disposal in Makama Jahun, Bauchi Metropolis This study aims to improve waste management practices to mitigate negative implications and create a cleaner and healthier environment in Makama Jahun, Bauchi. A test-retest method was employed, and the data were administered with the help of an assistant. The collected data were presented in frequency distribution tables and analyzed using simple percentages. Key findings revealed that 75% of respondents believed that seasonal variations contribute to indiscriminate waste disposal, while 55% did not consider the lack of infrastructure as a contributing factor. The study concludes that indiscriminate waste disposal in Makama Jahun leads to unsanitary conditions and environmental pollution, exacerbated by irregular municipal waste services and various environmental factors. Recommendations include educating the community on the dangers of improper waste disposal, supporting markets for recycled materials, and implementing government policies to prevent waste generation. Further research is suggested to replicate this study in other wards to provide broader insights.

Keywords: Household; Management; Practice; Waste

Introduction

Waste is a useless and unwanted products of human domestic and industrial activities released into the environment (Pilapitiya & Ratnayake, 2024). It can be a solid material, liquid, semi-solid or container of gaseous material. Therefore, the unlawful manner of dumping these refuse such as garbage, sludge from water supply or manufacturing waste, air pollution control facilities and other unusable materials without considering the adverse effect on human health is called indiscriminate Solid waste disposal. Most solid wastes are also gotten from industrial chemicals, radioactive substances and many household make use of open areas, highways, uncompleted buildings and bushes as their dumping sites. Waste management is in crisis in many cites globally because of population growth and increase practices differ between developed and developing nations, between urban and rural areas, and between residential and industrial practices (Agamuthu & Babel,

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2023; Mihai et al., 2021). Management of non-hazardous waste, such as residential and institutional waste in metropolitan areas, is usually the responsibility of local government authorities, while management of non-hazardous commercial and industrial waste usually falls under the responsibility of the generator.

Most cities collect only 50-80% of the generated waste, while spending 20-50% of their municipal budgets on solid waste management. The rate of health retrogression that are waste disposal-related is so alarming that it can lead to health hazards, environmental hazards, accidents in our environment, social and economic effects. In Nigeria today, illegal dumping of refuse mostly in industrial and municipal areas has become a major issue of concern to human and its environment. The present environmental pollution derived from solid waste littering has create a lot of health challenge to household residents around the dumping sites. It is evident that most of the people living around the dumping location are not aware of the harmful effects of refuse dumping other than the offensive odors spreading around the untidy environment and also when the wastes becomes wet and start to decay. Urbanization, overpopulation, industrial revolution has become major cause of waste generation and inappropriate disposal method especially in urban areas of Nigeria. Human exposure to this unlawful act has triggered more health risks to the populace which advertently affects the entire livelihood and their major landscape.

Lack of appropriate storage facilities, inadequate waste management and planning, wrong perceptions by residents and non-challant attitudes towards environmental cleaning and sanitation might be a cause of this problem. When an environment is not hygienic and clean it poses a lot of harms and negative impacts on human especially outdoor workers, workers producing infectious materials while young children get easily contacted and are most vulnerable to this act of ignorance and dirtiness (Mavrouli et al., 2023). The outcome of indiscriminate disposal of solid wastes expose human to environmental degradation such as in flooding, drainage obstruction, widespread of infectious diseases, cholera, diarrhea (Jung et al., 2023). Typhoid fever, waterway blockage which leads to infestation of flies, ticks and breeding of mosquitoes that cause malaria and other plagues. In most remote parts of Nigeria like Bauchi, it has been noticed that heaps of littering wastes dumps are in virtually all market areas, outskirts of the cities and even on roadsides for weeks without devising any adequate means of wastes collection either by private sector or government. Policy makers in the country have neglected some areas and fail to carry out a thorough inspection during environmental sanitation (Kedia, 2022; Mtika & Tilley, 2020). I think such attitude an act of indulgence and negligence on the part of waste workers. It would be of great benefit if solid waste can be organised, collected and channeled through modern landfill for recycling while such areas must be far from human residents to avoid environmental disorder, all kinds of pollution and health hazards (Siddiqua et al., 2022; Liu et al., 2023).

In Bauchi, effective waste management and disposal must begin at the household level, as improper practices lead to numerous health and environmental hazards (Fadhullah et al., 2022; Abdel-Shafy & Mansour, 2018). Residents commonly discard waste such as water sachets, biscuit wrappers, bottles, cans, and candy packs on roadsides, in vehicles, or on highways, contributing to environmental degradation. This longstanding habit must change, and residents need to transition from indiscriminate dumping to responsible waste bagging. Despite government efforts to address indiscriminate waste disposal through laws and initiatives, Jahun Ward in Bauchi metropolis still faces significant waste management challenges. Improper waste disposal leads to serious issues such as disease outbreaks (e.g., cholera and malaria), and flooding caused by compacted waste blocking drainage systems. This not only contaminates water bodies but also poses severe health risks to the community. Containers for storing solid waste, often lacking proper lids, result in spillage and further environmental contamination.

The government should prioritize household waste collection and provide financial support to state and local governments for effective waste disposal. Strategically placing waste bins, ensuring daily waste collections, and conducting comprehensive public advocacy are essential steps. Additionally, educating households about the importance of paying for waste management services will help sustain these practices. Given the severe implications of improper waste management, this research aims to identify and assess the factors influencing household waste practices in Bauchi and their impacts on the community. The goal is to develop strategies to improve waste management, protect public health, and create a cleaner and healthier environment in Bauchi.

The main objectives of the study are to assess the factors influencing household waste management and in Makama Jahun Ward, Bauchi metropolis. The specific objectives are:; To examine various methods of waste disposal among residents of Makama Jahun ward, Bauchi Metropolis; To identify the environmental factors that contribute to indiscriminate waste disposal among the residents of Makama Jahun ward, Bauchi Metropolis; To find out the effects of indiscriminate waste disposal in Makama Jahun ward, Bauchi Metropolis. Understanding and adherence to proper waste disposal and household waste management

practices among the residents of Makama Jahun Ward in Bauchi Metropolis are crucial for mitigating the associated negative implications. Prevention, as the adage goes, is better than cure. This study aims to provide a comprehensive assessment of the methods of household waste disposal in Makama Jahun Ward. Based on the findings, appropriate recommendations for improving household waste management practices in the metropolis will be made. The study's relevance lies in its ability to provide evidence-based recommendations and suggestions to health officers and stakeholders.

These insights will stimulate and encourage policymakers at the metropolitan and regional levels to formulate comprehensive strategies for improving current waste disposal and management practices. By addressing the root causes and proposing effective solutions, this research will contribute to creating a cleaner, healthier environment in Makama Jahun Ward, Bauchi Metropolis, and potentially beyond. Household waste: Any solid waste generated from households, including kitchen waste, paper products, plastics, textiles, etc. Solid waste: Wastes from residential, commercial, governments, and institutional sources, such as durable and non-durable goods, containers and packaging, food scraps, yard trimmings, inorganic wastes, and construction and demolition debris; Special waste: A non-regulatory term used by tribes to describe problem wastes typically generated by households that are not disposed in household garbage containers primarily due to their size or because of disposal restrictions e.g. tires, furniture, bicycles, appliances; Indiscriminate: refers to the improper and careless disposal of waste by residents, such as dumping waste on roadsides, open fields, and water bodies without following proper waste management protocols; Environmental degradation: pertains to the negative impacts caused by improper waste disposal, such as pollution, soil contamination, water contamination, and the disruption of local ecosystems (Gebrekidan et al., 2024; Raphela et al., 2024).

Waste management: the strategies and practices employed by households and local authorities to handle solid waste effectively, including the use of waste bins, regular collection services, recycling programs, and public education campaigns on proper waste disposal methods. Recycling: A series of activities that include collecting recyclable materials that would otherwise be considered waste, sorting and processing these recyclables into raw materials such as fibers or manufacturing raw materials into new products; Reuse: A process whereby a product is used more than once, either for the same purpose or for a different purpose. The reused products could be repaired, donated to charity and community groups, and sold. This process would reduce waste.

Household waste is commonly referred to as garbage or trash, Household waste management practice is considered as the methods and strategies used by individuals and families to handle, collect, dispose of, and reduce waste generated at home. This includes various types of waste such as organic, recyclable, hazardous, and non-recyclable materials. As the population of the world expands, so does the amount of waste produced. Generally, the more automated and industrialized human societies become, the more waste they produce. In most African countries today there are generally little control over the disposal of waste from individual dwellings in villages, factories and cities. Every house generates waste materials such as exceta, maize husk, sugarcane shaft to mention but a few. For example, the industrial revolution introduced new manufactured products and new manufacturing processes that added to household solid waste and industrial waste. Modern consumerism and the excess packaging of many products also contribute significantly to the increasing amount of solid waste.

The government's new waste management approach sees waste as a valuable resource and emphasises strategies, such as reducing, re-using, and recycling waste (Awasthi et al., 2021; Zhang et al., 2024; Laureti et al., 2024). The types of solid waste generated by households vary according to economic circumstances, seasons, as well as the demographic landscape and location of the areas, in higher-income areas, for example, more inorganic waste is generated whereas in low-income areas more organic waste is produced. The population density and socio-cultural, as well as seasonal, factors (e.g., fluctuations in garden waste) affect waste volumes (Laureti et al., 2024; Liu et al., 2023). Firstly, studies indicate that there is often a lack of awareness about the environmental impact of improper refuse disposal. Many individuals may not fully comprehend the extent of pollution and harm caused by indiscriminate refuse disposal, leading to a more casual attitude towards the issue. Additionally, cultural and social norms may play a role, as certain communities may have a higher tolerance for littering and improper waste management (Y. Zhang et al., 2023; Rahman et al., 2025; Kibria et al., 2023).

Moreover, research suggests that access to proper waste disposal infrastructure, such as recycling facilities and waste collection services, significantly influences people's attitudes towards refuse disposal. In areas where such infrastructure is lacking, the populace may be more inclined to engage in indiscriminate refuse disposal due to the absence of viable alternatives. Furthermore, psychological factors are also at play. Studies have shown that individuals who do not

perceive a direct personal impact of their actions on the environment may be less motivated to properly dispose of their refuse.

Method

Research Design

The researcher employed a descriptive survey research design which was used to assess the factors influencing household waste management practices and its health impact among residents of Makama Jahun ward, Bauchi Metropolis. Descriptive research design is a sort of research design that systematically gathers data to characterize a phenomenon, circumstance, or population that is being examined, according to Alade et al. (2023).

Settings

Makama Jahun Ward is a southeastern neighborhood in Bauchi metropolis, Bauchi State, situated in a lowland area. Predominant ethnic groups include Fulani, Hausa, Gerawa and Jarawa, with major occupations in business, civil service, and farming. The area has several schools such as Kobi Primary School, Mu'azu Junior Secondary School, and Yalwa Secondary School. It is bounded by Dutsen Tanshi and Federal Low-Cost Housing Estate to the north, and by Gwallaga Street, Nassarawa, Wunti, and Kobi to the northwest. To the southwest, it is bordered by bank roads, Sky Bank, Eco Bank, and State Low-Cost Housing Estate, among others. Jahun has uneven housing, inadequate drainage and waste disposal, and is overcrowded. Residents practice polygamous marriages, and the area hosts many extended families. Dominant religions are Islam and Christianity, and it experiences a tropical climate with distinct dry and rainy seasons.

Target Population

The target population for this studies comprise all residents of Jahun ward, Bauchi metropolis, Bauchi LGA of Bauchi state, estimated to be 680 in number (NPC, 2015). Orodho (2006) defined population as all items or people under consideration.

Sample Size

A total of 136 residents of Makama Jahun were used as the sample size, representing 20% of the target population. This is in accordance to Nwana's rule of thumb (1981), which suggest that for a population of few hundreds, a sample size of 40% or more is sufficient; for many hundreds, a 20% sample is adequate; for a few thousands, a 10% sample is appropriate; and for several thousands, a 5% or less sample is representative of the population.

Sampling Technique

The researcher used simple random sampling technique, Simple random sampling technique is a type of probability sampling technique in which each member of the subset has an equal probability of being chosen. It is meant to be an unbiased representation of a group. It is considered a fair way to select a sample from a larger population since every member of the population has an equal chance of getting selected.

Instruments for Data Collection

The researcher employed interview and self-administered questionnaires for data collection. Structured questionnaires with close-ended questionnaire which consist of two sections: Section A consist of personal data and Section B contain questions related to waste management practices.

Reliability of the Instrument

In this study reliability was established using test-retest method, the instrument was reliable after repeated administration to the sample.

Method of Data Collection

136 questionnaire was printed, and distributed to the respondents, whose consent was obtained with the help of an assistant in the community. The questionnaire was randomly distributed with explanation to the respondents. The respondents was given time to provide the required information, the questionnaire was collected back through the same means.

Method of Data Analysis

The statistical tool that was used in this study is frequency distribution tables, percentage, and mean for data presentation and analysis the three research questions.

Ethical Considerations

All information that was obtained from the respondents was dealt with absolute confidentiality and the researcher was assured of their confidentiality. The respondents' cultural beliefs was judiciously taken into consideration while obtaining the information.

Result and Discussion

Table 1 shows 30% of the respondents are between 15-25 years, 40% are between 26-35 years, 21% are between 36-45 years, and 9% are between 46 years and above. Majority of the respondents are 55% male and 45% female. However, the educational statuses of the respondents were 42% tertiary, 36% secondary, and 22% primary level.

Table 1. Demographic Data

Data	Frequency	Percentage (%)
Age distribution of the respondents		
15-25	41	30
26-35	55	40
36-45	28	21
46 & above	12	9
Total	136	100
Sex distribution of the respondents		
Males	75	55
Females	61	45
Total	136	100
Educational status of the respondents		
Primary	57	42
Secondary	49	36
Tertiary	30	22
None	0	0
Total	136	100

Table 2. Checklist Responses

Variables	Responses	Frequency	Percentage
Do you have waste bin at your home	Yes	92	68%
	No	44	32%
	Total	136	100%
Do you use plastic bags for your waste disposal	Yes	82	60%
	No	54	40%
	Total	136	100%
Is your waste collected by municipal services	Yes	69	51%
	No	67	49%
	Total	136	100
Do you dispose your wastes by your self	Yes	74	54
	No	62	46
	Total	136	100
Are your waste disposal sites easily accessible	Yes	94	69
	No	42	31
	Total	136	100
Is your waste collected daily	Yes	59	42
	No	79	58
	Total	136	100
Twice a week	Yes	100	74
	No	36	26
	Total	136	100
Weekly	Yes	58	43
	No	78	57
	Total	136	100

Table 2 indicate that 68% of the respondents have dustbin in their home, while 60% use plastic bags for their waste disposal, 51% of the respondents waste is being collected by municipal waste, were 54% of the respondents dispose their waste by themselves.

However, 69% have easy access to waste disposal sites, 58% do not dispose their waste daily, 74% dispose their waste twice a week, and 57% do not dispose their waste weekly.

Table 3. Various Methods of Waste Disposal

Method	Responses	Frequency	Percentage (%)
Open dumping	Yes	88	65
	No	48	35
	Total	136	100
Composting	Yes	98	72
	No	38	28
	Total	136	100
Burning	Yes	79	55
	No	57	42
	Total	136	100
Incineration	Yes	77	57
	No	59	43
	Total	136	100
Land filling	Yes	53	39
	No	83	61
	Total	136	100

Table 3, shows that 65% of the respondents agreed to open dumping as a method of their waste disposal, where 72% agreed to composting as a method of their waste disposal, 58% agreed to burning as a method of their waste disposal, in which 57% agreed to incineration as a method of waste disposal, and 61% agreed that land filling is not a method of their waste disposal.

Table 4. Environmental Factors that Contribute to Indiscriminate Waste Disposal

Method	Responses	Frequency	Percentage (%)
Yearly Season	Yes	102	75
	No	34	25
	Total	136	100
Geographical Location	Yes	95	70
	No	41	30
	Total	136	100
Lack of Infrastructure	Yes	61	45
	No	75	55
	Total	136	100
Population Density	Yes	89	65
	No	47	35
	Total	136	100

Table 4 above shows that 75% majority of the respondents believe that season is a contributing factor to indiscriminate waste disposal, 70% believe that geographical location is a factor, where 55% believe that lack of infrastructure is not a contributing factor, and 65% of the respondents believe that population density is a contributing factor to indiscriminate waste disposal.

Table 5 shows that 85% of the respondents believe that spread of disease like cholera are effects of indiscriminate waste disposal, in which 72% believe that decreased income is also an effect, where 51% believe that closure of institutions is not an effect of indiscriminate waste disposal and 53% believe that

retard development is also an effect of indiscriminate waste disposal.

Table 5. Effects of Indiscriminate Waste Disposal

Effects	Responses	Frequency	Percentage
Spread of disease like cholera	Yes	116	85%
	No	20	15%
	Total	136	100%
Decreased income	Yes	98	72%
	No	38	28%
	Total	136	100%
Closure of institutions	Yes	67	49%
	No	69	51%
	Total	136	100%
Retardation of development	Yes	72	53%
	No	64	47%
	Total	136	100%

Discussion of Key Findings

The discussion of major findings was based on the research objectives and questions. Research Question 1: What are the various method of waste disposal among the residents of Makama Jahun Ward? The research findings of the study discovered that open dumping, composting, burning, and incineration as the method of waste disposal adopted by the population. This is in line with Adedara et al. (2023), who in his study discovered that due to irregular municipal services rendered to the public compel them to find ways of disposing their waste, in which they adopted burning, composting, or indiscriminate open dumping (Meena et al., 2023; Ogunmakinde et al., 2019), it is estimated that 83% of the population dumped their waste in either authorized or unauthorized sites in their neighborhood, and due to waste capacity to handle waste, unsanitary conditions are created (Darmey et al., 2023).

Research Question 2: How can environmental factors contribute to indiscriminate waste disposal among the residents of Makama Jahun Ward? The study identifies several environmental factors contributing to the menace of indiscriminate waste disposal among the residents of Makama Jahun wards, including seasons, geographical location, and population density. These findings are consistent with Lohani et al. (2025) and Hidalgo-Crespo et al. (2024), who stated that the types of solid waste generated by households vary according to economic circumstances, seasons, and the demographic landscape and location of the areas. For example, higher-income areas tend to generate more inorganic waste, whereas lower-income areas produce more organic waste. Additionally, population density, socio-cultural factors, and seasonal changes (e.g., fluctuations in garden waste) significantly affect waste volumes (Cao et al., 2023; Kamran et al., 2015; Schuyler et al., 2021).

Research Question 3; What are the effects of indiscriminate waste disposal in Makama Jahun ward? From the findings in the previous chapter, it was discovered that indiscriminate waste disposal poses significant dangers to the residents of Makama Jahun. These effects include an increased spread of diseases such as cholera, decreased income, and retardation of development. These findings align with Moghimi Dehkordi et al. (2024) and Ferronato et al. (2019), who discovered that improper waste management can lead to substantial negative environmental impacts such as air pollution and soil contamination (Jakhar et al., 2023; Manisalidis et al., 2020). Additionally, it can result in health and safety problems, with diseases spread by insects and rodents via garbage heaps and unsanitary disposal sites (De & Debnath, 2016), if these conditions are not properly addressed, environmental health issues, particularly diseases such as malaria, dysentery, and cholera, will increase (Kitole et al., 2024; Pinto et al., 2025; Pascual et al., 2002). Such diseases may lead to the closure of institutions like schools and businesses, resulting in a decline in productivity (Deen et al., 2020; Onwunta et al., 2025).

Conclusion

The results of this study indicate that indiscriminate disposal of waste in Makama Jahun Ward, Bauchi Metropolis, is associated with numerous challenges that must be addressed holistically to achieve the core objectives of waste management: the protection of public health and the quality of the environment. The key findings regarding these challenges are as follows: The study revealed that the primary methods of waste disposal among residents include open dumping, composting, burning, and incineration. This aligns with previous research, which found that irregular municipal waste services compel residents to adopt these disposal methods. Consequently, a significant portion of the population resorts to dumping waste in both authorized and unauthorized sites, creating unsanitary conditions. Indiscriminate waste disposal is a significant problem in Makama Jahun Ward, where a large portion of the population dumps waste in both authorized and unauthorized sites, creating unsanitary conditions. Environmental factors such as seasonal variations, geographical location, and population density contribute to this issue, with household waste varying by economic status, season, and demographics. This poor waste management leads to the spread of diseases, decreased income, and environmental impacts like air pollution and soil contamination. If left unaddressed, these conditions can worsen, leading to increased disease and decreased productivity. However, nurses can play a crucial role in mitigating these factors by

educating the community, organizing cleanup campaigns, and advocating for better waste management policies, ultimately making a significant impact on addressing indiscriminate waste disposal in Makama Jahun Ward.

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