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EFFECTS OF SOLID WASTE MANAGEMENT ON THE QUALITY OF LIFE OF PEOPLE IN BIRNIN KEBBI METROPOLIS

[1]Nura Mainasara, [2]Felix Emmanuel Dodo

[1]Department of Accounting and Finance, Federal University Gusau, Zamfara State.
[2]Department of Economics, Federal University Birni Kebbi, Kebbi State.

Corresponding Author's Email. nura.mainasara@fugusau.edu.ng, Phone No: 08069669277

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ABSTRACT

The study examines the effects of solid waste management on the quality of life of people in Birnin Kebbi Metropolises. The study administered 100 structured questionnaires to collect information from different communities. Additionally, an interview was carried out with officials of the state environmental agencies involved in solid waste management to confirm some of the respondents' information. The study used both chi-square and descriptive statistics for data analysis. The results showed that domestic sources of waste account for roughly 45% of all solid waste in Birnin-Kebbi Metropolises, followed by business sources at 25% and agricultural sources at 19%, with the remaining 11% coming from other sources. The chi-square results state a significant correlation between solid waste management and the quality of life of the people in the Birnin-Kebbi metropolitan areas. This implies that poor solid waste management significantly lowers the quality of life of people in Birnin-Kebbi. Based on the results, the government should establish a well-equipped task force to oversee the careless disposal of waste to preserve environmental cleanliness and prevent the spread of diseases throughout the city.

Keywords: Solid waste management, Standard of Living and Spread of diseases.

INTRODUCTION

In the global context, solid waste is interchangeable with terms like garbage, refuse, and rubbish. Additionally, it encompasses all of the solid and semi-solid materials a community discards due to various human activities (Yosola, 2019). The world's cities produce 2.01 billion tons of solid trash daily, or 0.740 kg per person. Therefore, people in poorer countries are more impacted by inadequate waste management than people in developed countries. This is because 90% of garbage is improperly disposed of in low-income nations, which causes significant problems for the environment, public health and safety of the communities (Odetokun, 2022).

In these regards, waste management entails handling garbage from the point of generation till it is eventually disposed of in an environmentally appropriate manner. Everyone must take responsibility by prioritising garbage minimisation, treatment, and recycling before disposing of it to protect human life and the ecosystem (Bello et al., 2020). Subsequently, the effects of solid waste on people's material well-being are rapidly increasing due to insufficient waste collection systems, open-space waste dumping and burning, uncontrolled or controlled dumpsite operations, and little to no waste recycling or recovery (Linda, 2021). Therefore, waste management is a significant concern for public health authorities because it causes environmental pollution, which affects people (Jallo, Kodiya, & Modu, 2021).

In this sense, solid waste can be seen as materials that come from both human and animal activity, and when it is thrown away because it is no longer needed or sought, it attracts diseases. Inadequate knowledge of the advantages of waste management and inactive governmental environmental regulations are the leading causes of the inefficient solid waste management practices of households, businesses, and individuals. Waste management is a persistent problem in developing nations because of a lack of effective institutions and policies, such as environmental legislation, persistent underfunding, and the fast pace of urbanisation and industrialisation. Waste handling may be impacted by these difficulties and a lack of comprehension of many elements that make up the waste management hierarchy (Odiana & Olorunfemi, 2021).

At the same time, many cities worldwide are still having trouble getting rid of the growing amounts of municipal solid garbage brought on by industrialisation, accelerated economic development, and population growth. Furthermore, the environment and public health are at risk due to the careless disposal of solid waste and the lack of landfilling facilities. One of the leading causes of the deteriorating environmental health conditions in emerging nations is improper solid waste management techniques; poor waste management was linked to unhealthy lifestyle choices, insufficient facilities, and inadequate funding and policy implementation (Adamu et al., 2023).
Numerous studies on solid waste and its effects on people's quality of life have been conducted in Nigeria and worldwide. Nonetheless, there is scanty research on the relationship between these variables in the Birnin Kebbi local government area, where the government has undertaken some initiatives to address the issue of solid waste management in the metropolises. Food, vegetables, paper, leaves, newspapers, bottles, cans, polythene and cellophane bags, metals, scraps, wrapping materials, construction materials, and factory chemicals are among the solid wastes generated in Birnin Kebbi city. In light of this, this study aims to investigate how solid waste management affects the quality of life of people in Birnin Kebbi to pinpoint the obstacles to effective management and give the necessary solutions to address the issue.

EMPIRICAL LITERATURE AND THEORETICAL FRAMEWORK

In this section, the empirical literature review and theoretical framework are presented as follows:

2.1. Empirical literature reviews

Amasuomo and Baird (2017) investigated Nigeria's solid waste management trends. The study used the descriptive technique, and the study compiled pertinent data from earlier publications, journal articles, books, reports from environmental organisations, documents, and webpages from waste management agencies are some of the sources used. The study concluded that the lack of an appropriate waste management policy is mostly blamed for Nigeria's waste management issues.

Shamaki and Shehu (2017) evaluated the solid waste management practices in Sokoto State, North-Western Nigeria, and Sokoto. Data for the study came from two primary and secondary sources. One hundred twenty families were given a standardised questionnaire to gather primary data, and ministerial documents were the secondary data source. The data was analysed using descriptive statistics and the chi-square test of association. The results showed that 55.8% of the trash produced in the city comes from home sources, 32.5% from commercial sources, and 11.7% from agricultural sources in the study area. Most respondents (81.7%) stated they gather rubbish in waste bins, often disposed of at nearby drainage or disposal sites.

Lekan (2018) examined the information on the challenges of waste management systems in Nigeria's urban housing system. Seventy sets of questionnaires were distributed to families. The data was analysed using descriptive statistics and basic percentages. The findings indicate that individuals are aware of the consequences of improper garbage disposal and general inadequate sanitation; nevertheless, the locations of refuse dumping stations are occasionally too far away for people to quickly dispose of their waste.

Suleiman (2019) evaluated the effects of solid waste management in northern Nigeria's Katsina State's Daura Township. During two field visits to the town, a direct observational technique was used to accomplish the goal. In addition, a questionnaire was given to respondents specifically chosen for the study, and the Zonal Officer of the waste management organisation responsible for Daura town was interviewed. Significant findings include the following: some residents do not cooperate with the Agency to ensure proper waste management; waste materials are allowed to accumulate before vehicles and equipment are sent to collect the wastes for disposal; and 22.82% of the respondents disposed of their wastes in authorised sites.

David et al. (2020) examined the consequences of inadequate solid waste management techniques in numerous developing nations. This study aimed to comprehend how the general public views and feels about regional waste management methods. Ogun State has five local government areas. The findings demonstrated that essential variables, including age, income, and educational attainment, impacted people's attitudes, behaviours, and perceptions of solid waste management. Most inhabitants (54.4%) believe that sanitation services are too expensive and should be the responsibility of the local and state governments, with an average of 36.6% of the population in the chosen local governments disposing of their solid waste at open dumps.

Chukwueloka, Uzor, and Chukwurah (2021) evaluated the impact of solid waste management policies on community health in Nigeria. The study's specific goals were to determine how solid waste management policies affected the spread of epidemics. Secondary data sources, which used an ex-post facto design, were used in this study. The researcher concluded that SWMP impacts the spread of outbreaks and that its adoption has lessened the issue of drainage blockages.

Chukwuebuka et al. (2022) estimated the material and economic potential of the generated municipal solid waste and the daily and annual generation rates in well-known Nigerian cities. Paper (13%), glass and metal (3% each), textiles (2%) and other materials (14%), plastics (9%), organics (56%), and other materials made up the average MSW composition for 22 cities. Nigerian MSW valorisation has several obstacles, such as inadequate waste management, a lack of awareness of the informal waste sector, a lack of funding, etc. Therefore, having appropriate and efficient policies and decision-making processes is crucial.

Jazat, Akande, and Ogunbode (2023) identified the related difficulties in solid waste management by administering 1,400 structured questionnaires to secure data from respondents in Nigeria. Descriptive and inferential statistics were used to analyse the collected data. Based on household size and stakeholder income, the results indicated an upward trend in solid waste disposal in the two areas. Foods, leaves, papers, clothes, leather, hair attachments, nylons, plastics, metals, and cans are among the solid wastes typically found in the study locations. These items frequently end up littering the dump environment.

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The review of several empirical kinds of literature across Nigeria and its region indicates that solid waste affects the quality of life of the people and the environment. The highlighted gap in the literature is that no study examined how solid waste affected people's quality of life in Birnin Kebbi town, particularly since the amount of solid trash has increased due to urbanisation. By conducting survey research and distributing a questionnaire to approximately 100 households throughout Birnin Kebbi town, this study will address this gap in the literature by determining the impact of improper solid waste disposal on their quality of life and offering suggestions for mitigating the effects. This will add to the body of empirical literature already in existence.

1.2. The Environmental Kuznets Curve (EKC)

This study adopted the Environmental Kuznets curve, developed in response to growing environmental concerns in the 1990s and the need to identify the main factors contributing to ecological degradation. According to the hypothesis, a country's environment suffers during the early stages of economic development, but environmental quality improves as its economy expands. In the early stages of a country's growth, environmental pollution rises higher than income, impacting people's living standards. However, pollution will decrease after a certain per capita income is reached. The pollution reduction was considered to have occurred at the level of per capita income. Higher levels of development will see structural changes in information-intensive industries and services, increased environmental awareness, enforcement of environmental laws, high environmental expenditures, and improved technology, all of which will contribute to a reduction in environmental pollution and degradation and, to a large extent, raise people's standard of living (Franklin & Ruth, 2012).

3. MATERIAL AND METHODS

This study section comprises techniques used in collecting and analysing the data.

3.1. Description of Study Area

The study was conducted in Birnin Kebbi Local Government Area of Kebbi State. The local government area is between Latitude 11.0^0C and 12.50^0C north and Longitude 4.0^0C and 5.50^0C west. The local government is bounded by the Arewa, Argungu, Bunza, Jega, and Kalgo Local Governments. The landscape of Kebbi states is dominated by extensive flood plains (Fadama) of the inland river valley systems.

3.2. Sources and Instruments of Data Collection

In this study, 100 structured questionnaires were administered to collect information, primarily from different areas of Birnin Kebbi Local Governments and officials of State environmental agencies involved in solid waste management. Additionally, an interview confirmed some of the respondents' information. There are two portions to the instrument: A and B. Each respondent's biographical information is included in Section A, and the variables being studied are included in Section B. Strongly Agree, Agree, Disagree, Strongly Disagree, and Undecided are the five (5) response levels on the instrument. Their relative weights are five, four, three, two, and one points.

4. RESULTS AND DISCUSSION

This section comprises the demographic characteristics of respondents and an analysis of results obtained by administering questionnaires in Birnin-Kebbi town.

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4.1. Demographic Characteristics of Respondents

The demographic characteristics of respondents show that roughly 75% of people are men and 25% are women. The findings show that over 95% of respondents are employed, while only 5% are unemployed. This suggests that people who dispose of waste and sewage at dumping areas in Birnin-Kebbi Metropolis are essentially used. Similarly, the findings show that over 55% of the respondents have an HND or B.Sc., 10% have an ND or NCE, 30% have an SSCE, and 5% have just completed primary school. Many residents of Birnin-Kebbi are presumably literate. The respondents' religious affiliations are disclosed; at least 70% identify as Muslims, and roughly 30% identify as Christians. This indicates that Muslims make up the majority of Birnin-Kebbi's population. Lastly, the survey equally records the respondents' marital status. The findings show that over 70% of respondents are married, 15% are widowed, 5% are divorced, and just 10% are not yet married (single).

Table 1 Results of Personal Characteristics of the Respondents

Variables	Frequency	Percentage
Gender		
Male	75	75
Female	25	25
Total (n)	100	100
Employability		
Yes	95	95
No	5	5
Total (n)	100	100
Educational Qualification		
Primary school	5	5
SSCE	30	30
ND/NCE	10	10
HND/B.Sc.	55	55
Total (n)	100	100
Religious Beliefs		
Islam	70	70
Christianity	30	30
Others		
Total (n)	100	100
Marital Status		
Married	70	70
Widow	15	15
Divorced	5	5
Single	10	10
Total (n)	100	100

Source: Field Survey, 2024, SPSS.

4.2. Solid Waste Management in Birnin-Kebbi Metropolis

This section presents solid waste types, sources, and disposal in the Birnin Kebbi metropolis.

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Table 1: Types of Solid Waste Generated in Birnin Kebbi Metropolis

Types of solid waste	Frequency	Percentage
Food waste	20	20
Vegetable waste	10	10
Plastic waste	60	60
Metallic waste	5	5
Others	5	5
Total	100	100

Source: Field Survey, 2024, SPSS.

Table 1 lists the many kinds of solid waste produced in the Birnin-Kebbi metropolis. According to the table, the most prevalent garbage in Birnin-Kebbi is plastic, followed by food waste. Metallic and other waste not included in the study are the least common. The most significant percentage of plastic garbage (60%) comprises plastic plates, nylons, broken rubbers and soft drink bottles. With a second-large percentage (20%), leftover food is the second most prevalent waste in Birnin-Kebbi Metropolis. In Birnin-Kebbi, vegetable waste is not very common. They will keep the vegetable waste specifically to feed their domestic animals.

Table 2: Sources of Solid Waste Generation in Birnin Kebbi Metropolis

Sources of Solid Waste	Frequency	Percentage
Domestic sources	45	45
Commercial sources	25	25
Agricultural sources	19	11
Other sources	11	11
Total	100	100

Source: Field Survey, 2024, SPSS.

Table 2 presents an analysis of the sources of solid waste generation in the Birnin Kebbi Metropolis. Most unfinished structures in the study region are converted to dumping areas where households have formed the practice of disposing of waste and sewage, making homes the primary source of solid waste generation in the area. According to the findings, domestic sources account for roughly 45% of all solid waste in Birnin-Kebbi Metropolises, followed by business sources at 25% and agricultural sources at 19%, with the remaining 11% coming from sources not included in the study.

Table 3: Disposal of Solid Waste in Birnin Kebbi Metropolis

Disposal of Solid Waste	Frequency	Percentage
Authorised waste disposal	41	41
Unauthorised waste disposal	59	59
Total	100	100

Source: Field Survey, 2024, SPSS.

Table 4 presents the results of solid waste disposal in the study area. According to the findings, 41% of all solid trash is disposed of in an authorised dumping site, while unapproved ways

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account for roughly 59%. This suggests that most residents dump their solid waste in unauthorised sites.

The study uses chi-square to investigate how solid waste management affects the quality of life of people in Birnin-Kebbi metropolitan areas. The following tables present the test's findings: The null hypothesis states a significant correlation between solid waste management and the quality of life of the people in the Birnin-Kebbi metropolitan areas. In contrast, the alternative hypothesis asserts no considerable association at all.

Table 4: Relationship between Solid Waste Management and Quality of Life

Responses	Observed Values	Expected values	X^2-Calculated	Df	X^2-Critical Value
SA	7	20	8.45	4	9.488
A	80	20	180		
UD	0	20	20		
D	10	20	5		
SD	3	20	14.45		
TOTAL	100	100	227.9		

Source: Field Survey, 2024, SPSS.

X^2 calculated value= 227.9
X^2 critical value= 9.488

Decision rule: If the X2 calculated value (227.9) is greater than the X2 critical value (9.488), the null hypothesis is accepted, and the alternative hypothesis is rejected. From the Chi-square result in Table 5, the calculated X2 is 227.9, while the critical value X2 is 9.488 at a 5% significance level with 4 degrees of freedom. Therefore, the analysis concludes that solid waste management and quality of life in Birnin-Kebi Metropolis are significantly correlated.

The null hypothesis reveals that solid waste management significantly lowers the quality of life of people in Birnin-Kebbi. In contrast, the alternative hypothesis that solid waste management has no detrimental effect on the standard of quality of life of people in the Birnin-Kebbi metropolitan areas is presented as follows.

Table 5. Testing for the Negative Impact of Solid Waste Management on Quality of Life

Responses	Observed Values	Expected values	X^2-Calculated	Df	X^2-Critical value
SA	16	20	0.8	4	9.488
A	76	20	156.8		
UD	0	20	20		
D	5	20	11.25		
SD	3	20	14.45		
Total	100	100	203.3		

Source: Field Survey, 2024, SPSS.

X^2 calculated value= 227.9
X^2 critical value= 9.488

Decision rule: If the X2 calculated value (203.3) is greater than the X2 critical value (9.488), the null hypothesis is accepted, and the alternative hypothesis is rejected. From the Chi-square result in Table 6, the calculated X2 is 203.3, while the critical value X2 is 9.488 at a 5% significance level with four as the degree of freedom. Consequently, the study concludes that solid waste management significantly lowers the quality of life of people in Birnin-Kebi Metropolis.

5. CONCLUSION AND RECOMMENDATIONS

The study examined the effects of solid waste on the quality of life of the people in the Birnin Kebbi metropolis. This study administered 100 structural questionnaires to households to gather primary data, while other documents were sourced from secondary data. The data was analysed using the chi-square test and descriptive statistics. The results showed that most of the garbage produced in the metropolis comes from home sources, followed by other sources of solid waste in the study area. According to the findings, domestic sources account for roughly 45% of all solid waste in Birnin-Kebbi Metropolises, followed by business sources at 25% and agricultural sources at 19%, with the remaining 11% coming from other sources. The chi-square results show a significant correlation between solid waste management and the quality of life of the people in the Birnin-Kebbi metropolitan areas. The results reveal that poor solid waste management significantly lowers the quality of life of people in Birnin-Kebbi. Based on the results, the government should establish a well-equipped task force to oversee the careless disposal of waste to preserve environmental cleanliness and prevent the spread of diseases throughout the city.

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