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Analysis of Challenges Affecting Agencies and Other Stakeholder on Solid Waste Management Practices in Jalingo, Taraba State, Nigeria

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Abstract
There are several factors affecting solid waste management in Nigeria, ranging waste generation, waste reduction, storage, transportation and disposals. This study examines the challenges affecting agencies and other stakeholders on solid waste management in Jalingo Local Government Area. Data for this study were obtained by structured questionnaire and interviewing of 400 respondents in the study area. Structured interview questions is relating to stakeholders on solid waste management, challenges on solid waste management practices and major causes of the challenges were asked. The study revealed that private sectors are the major key players on solid waste management, and the challenges faced were poor funding. It was recommended that Taraba state government should fund the waste management agencies, create a waste agency backed by law and well-funded to tackle menace of solid waste in the study area and also create awareness on waste handling.

Keywords: Challenges, Affecting, Agencies, Stakeholders, Solid Waste, Management and Practices

Introduction

Globally, the production of solid waste has risen in step with other socio-economic indicators like population, per capita income, and consumption trends (Achankeng, 2003). The amount of garbage produced per person in industrialized nations has roughly tripled over the past 20 years (AfDB, 2002). The same study claims that solid waste creation in developing countries is increasing quickly and may double in amount overall within this decade, mostly due to population expansion and rises in living standards. By 2025, the amount of solid waste generated worldwide is likely to have increased fivefold if current trends continue (AfDB, 2002).

Given that waste management in developing nations continues to be a challenge as a result of weak institutions and policies, including environmental laws, persistent underfunding, and rapid urbanization and industrialization, the situation in Nigeria's urban areas may not differ from that of other cities in developing countries (Amasuomo and Baird, 2016). The treatment of garbage may be impacted by these difficulties and a lack of knowledge about the various elements that go into the hierarchy of waste management (Attah, 2013).

According to Douglas (2004), waste is any unwanted or wasted material that results from human or animal activity on the planet. According to Onwughara, Nnorom, and Kanno (2010), urban solid waste encompasses a wide range of substances, including trash, commercial and industrial wastes, construction and demolition wastes, animal carcasses, abandoned vehicles, food scraps, plastics, bottles, polythene materials (nylon bags), metallic objects, furniture and wood materials, papers, and some other unclassified wastes.

Waste management, according to Rodgers (2011), is the systematic management of waste generation, storage, collection, transportation, separation, processing, recovery, and disposal. Taiwo (2011), also states that solid waste management is the systematic management of waste generation, storage, collection, transportation, separation, processing, recovery, and disposal. Solid waste is produced in Nigeria in a variety of settings, including houses, businesses, markets, schools, and the hospitality sector. Therefore, a wide range of

distinct solid wastes originating from various sources might be produced as a result of all of our daily activities. The pace at which these solid wastes are correctly disposed of is known as solid waste management.

Most Nigerian towns do not appropriately handle their waste. The majority of metropolitan areas lack public garbage disposal facilities, which forces inhabitants to choose other disposal methods like burying or burning their waste, which results in careless disposal. It was also discovered that many Nigerian urban areas lack residents who adopt effective solid waste management techniques; they dump their feces in drainages, road sides, and burrow pits. Individual burn trash in their backyards or dumps it at any vacant plot, public area, or river (Ogwueleka, 2003).

According to Dauda and Osita (2003), a location's population, industrialization degree, socioeconomic position, and types of commercial activity all have a significant impact on the quantity and rate of solid waste generated there. The leachate from solid wastes that is heavily contaminated with toxic chemicals and pathogenic organisms renders the water unfit for human consumption, causing diseases linked to solid wastes and subsurface water contamination to cause significant suffering in humans (Adedibu, 2008).

Jalingo Local Government Area like most Nigerian urban centers is today facing serious challenges affecting stakeholders on waste management. It was discovered that rapid urbanization has outpaced the financial resources for the provision and management of basic infrastructure in Jalingo city due to population pressure. Increased solid waste generation is also affecting the environmental quality of the residents in the city because of inadequate logistics for solid waste management and poor attitudes of the people towards the stakeholders on solid waste management. This war can only be worn if the residents, industry, traders, institutions and community would change their misconception that waste management is the sole responsibility of the government alone but see themselves as a stakeholder in solid waste management in Jalingo Local Government Area. Because one of the major factors that have contributed to the challenges affecting the stakeholders on waste management in Jalingo is lack of funding and people's perception on who to handle solid waste management.

This study seeks to analyze challenges affecting stakeholders on solid waste management in Jalingo local Government, Taraba State, Nigeria, the current level of the challenges affecting agencies and other stakeholders on solid waste management in Jalingo as well as what need to be done to improve solid waste management in the study area.

Materials and Methods

Study area

The Jalingo Local Government Area, with a land area of roughly 195km^2 and an elevation of 351 meters above sea level, is located between latitudes 08° 43'N and 09° 07'N of the equator and longitudes 10° 50'E and 11° 25'E of the Greenwich meridian. According to Oruonye (2016), Jalingo is bordered to the north by the Ardo-Kola Local Government Area, to the east by the Yorro Local Government Area, and to the south and west by the Lau Local Government Area. Ten administrative wards (Turaki A, Turaki B, Sintali A, Sintali B, Majidadi, Sarkin Dawaki, Kachalla Sembe, Barade, Kona, and Yelwa) make up the city's political and administrative structure.

The majority of solid trash in the form of packaging materials, including polythene, cans, bottles, and cardboard boxes, is produced by cross-border activity. Banking, retail, and the freight industry make up the majority of the town's formal commerce, while auto mechanics, food vendors selling things like cell phone accessories, and apparel flea markets dominate the informal sector (Chanza et al., 2017).

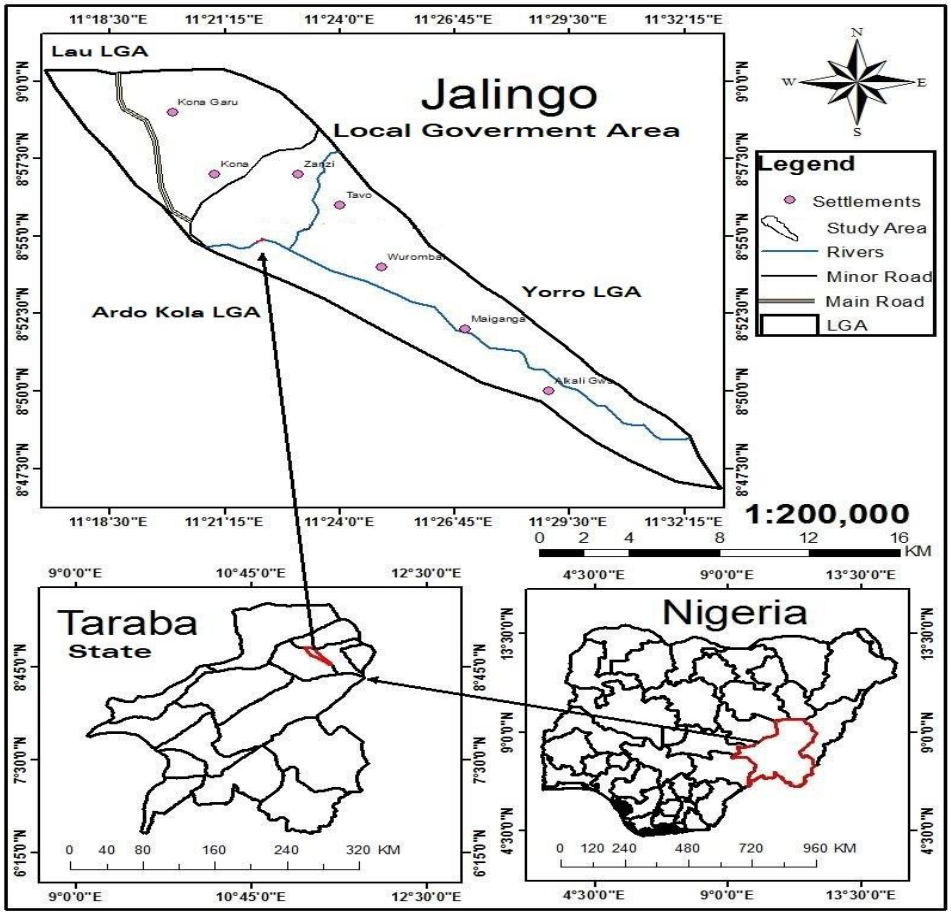

Figure 1: The Study Area
Source: Geography Department Taraba State University Jalingo, (2022).

Study design

To analyze the challenges affecting agencies and other stakeholders on solid waste management practices in the study area, a cross-sectional survey was conducted. The study's design was appropriate since it made it possible to ascertain the challenges that waste managers faced in the study area. This kind of study provided an overall picture of the traits and regularity of trash creation, waste collection, and storage facilities related to challenges solid waste managers faced in the study area.

Study population and sampling

The estimated population of the ten administrative wards that make up the Jalingo Local Government Area is 266,841 (Oruonye and Bange, 2016). These wards are Barade, Kona, Majidadi, Sarkin-Dawaki, Mayo-Goi, Turaki A, Turaki B, Kachalla-Sembe, Abbare-Yelwa, and Sintali. However, this study only examines five of the 10 wards in the Jalingo Local Government Area, namely Barade, Kona, Majidadi, Sarkin-Dawaki, and Mayo-Goi, which have a combined estimated population of 88,014 people.

To determine the sample size for the study, the Taro Yamane (1967), formula for sample size determination was applied and the sample size of 400 was chosen for the study.

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

Where n = sample size
N = Total Population
$(e)^2$ = the level of precision
(e) = 5% (0.05)

$$n = \frac{88104}{1+88104 \text{ X } 0.0025} \quad n = \frac{88104}{220.3} = 400$$

Using the formula above, 400 respondents were randomly selected from the 88,014 total population of the study region (Table 2.1). The technique of purposive random sampling was later adopted

because it was seen to be more suitable for locating cases for in-depth research. The respondents in the study area were given copies of the questionnaire at random.

Questionnaire return rates from the respondents

This shows the actual number of questionnaires that were completed, properly filled out by the respondents, and collated for the study. Table 1 shows that out of the 400 copies of questionnaire that were administered, 11 were not returned, 389 were recovered, 10 were not properly filled and were later discarded due to errors, that is to say 21 questionnaires were not used, leaving a total of 379 questionnaires on which analysis was based. This represents about 94.6% of the questionnaires distributed.

Table 1: Questionnaire Return Rates from the Respondents

Sampled Wards	NO of Q Issued	NO of Q Not Returned	NO of Q Returned	NO of Q Not Properly Filled	NO of Q Properly Filled	% of Properly Filled
Barade	90	3	87	2	85	22.4
Kona	102	3	99	2	97	25.6
Majidadi	61	2	59	2	57	15.0
Sarkin Dawaki	65	1	64	2	62	16.4
Mayo Goi	82	2	80	2	78	20.6
Total	**400**	**11**	**389**	**10**	**379**	**100**

Source: Author's Fieldwork (2021).

Data Collection and Tools

Data were primarily sourced using a questionnaire administered to waste generators, preliminary field investigations, and face-to-face interviews with TASEPA staff. 400 copies of the structured questionnaire were distributed randomly in households and shops in Jalingo. Data collected through a questionnaire survey were on the following variables: demographic and socioeconomic characteristics of the respondents, challenges associated with solid waste management and agencies responsible for solid waste management in the study area.

The questionnaire was piloted on the households in Jalingo Local Government Area and no adjustments were made. Heads of the households or adult members who were 18 years and above who gave their written consent to participate in the study were surveyed. The questionnaire had pre-determined responses from which the respondents would then choose Yes or No options on whether they had challenges on waste management and the agencies responsible for waste collection in the study area. There were also multiple choices for the different age groups, household waste management practices which may or may not predispose the respondents to the health hazards.

Data Analysis

Data were analyzed using descriptive statistical techniques, table and the simple percentage was used to test for statistically significant differences on the challenges affecting agencies and other stakeholders on solid waste management practices in the study area. The majority of the data were presented using tables, percentages, and charts.

Results and Discussion

Respondents' profile

The overall response rate was 97% as 389 of the 400 study participants successfully responded to the questionnaire. Females constitute 55% of the respondents and this trend was similar across all five sampling sites. The majority of the respondents were in the age group of 31–40 years which constitutes 40%. 65% of the respondents were married couples, while family size one to three has the highest respondent of 36%. And 37% of the respondents were civil servants who earned 22,000 to 37,000 naira monthly. These findings are presented in Table 3.1.

Table 2: Respondents' Profile

Sex of the Respondents	**Frequency**	**Percentage %**
Female	209	55.1
Male	170	44.9
Total	**379**	**100**
Age Distribution	**Frequency**	**Percentage %**
Below 20	38	10
20 – 30	93	24.5
31 – 40	152	40.2
41 – 50	87	22.9
Above 50	9	2.4
Total	**379**	**100**
Marital Status	**Frequency**	**Percentage %**
Single	86	22.7
Married	246	64.9
Divorced	17	4.5
Widowed	30	7.9
Total	**379**	**100**
Occupation	**Frequency**	**Percentage %**
Farmers	81	21.4
Businessmen	75	19.8
Civil Servant	139	36.7
House Wife	38	10
Others	46	12.1
Total	**379**	**100**

Source: Author's Fieldwork (2021).

Stakeholders on the Solid Waste Management

The results on the stakeholders involved in solid waste management practices in the study area are shown in Figure 2.

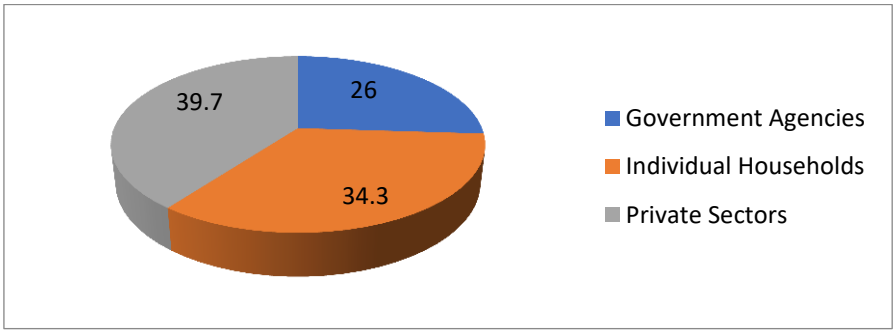

Figure 2: Stakeholders on the Solid Waste Management
Source: Author's Fieldwork (2021).

From the chart above, the study showed that 26% of the respondents reported that the government plays the key role in managing solid waste in the study area through the Taraba State Environmental Protection Agency (TASEPA), 39.7% of the respondents reported that the private sector plays a key role in waste management in the study area through pay as you throw, and 34.3% of the respondents reported that individual households play the key role in managing solid waste in the study area through different avenues like the use of trucks and wheel barrows. Scavengers also operate

in the study area, picking up recyclable materials as they are thrown away.

Challenges of Solid Waste Management Practices

In order to achieve the fifth objective of the study, the results on the challenges of solid waste management practices in the study area are presented in Figure 3 below. The figure shows that 23% of the respondents report that poor funding is the challenge of solid waste management practices in the study area; 21% of the respondents report that poor legislation and policy implementation is the challenge of solid waste management practices in the study area; 20% of the respondents report that an increase in population is the challenge of solid waste management practices in the study area; 19% of the respondents report that uncontrolled urbanization growth is the challenge of solid waste management practices in the study area; and 17% of the respondents report that poor management strategies are the challenge of solid waste management in the study area.

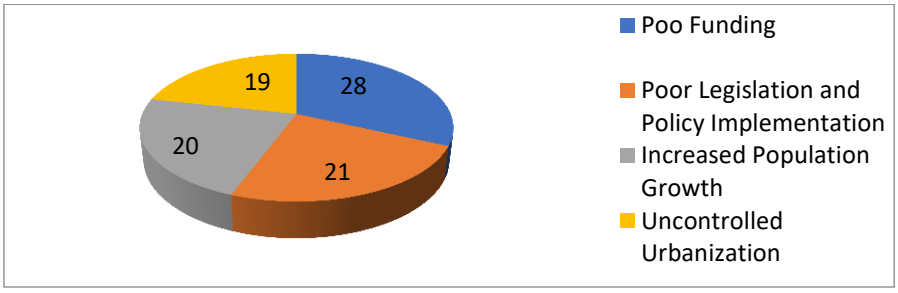

Figure 3: Challenges of Solid Waste Management Practices
Source: Author's Fieldwork (2021).

According to Attah (2013), the problems with waste management in Nigeria and many part of it are not due to only insufficient funding but rather to population growth, a lack of trained professional waste managers, ineffective monitoring and control, a peculiar attitude among Nigerians, a lack of modern technology, and a lack of enthusiasm for putting effective waste management practices into practice.

Major Causes of Poor Solid Waste Management Practice

The results on the major causes of poor solid waste management practices in the study area are shown in Table 3.2. The table shows that 52% of the respondents report that improper disposal of solid waste is the major cause of poor solid waste management practices in the study area; 5% of the respondents report an increase in population; 3% of the respondents report laziness; 6% of the respondents report a lack of education and public awareness; and 34% of the respondents report insufficient coverage of the collection system.

Table 3: Major Causes of Poor Solid Waste Management Practices

Cause	Frequency	Percentage %
Improper Dump of Solid Waste	197	52
Increased in Population	17	4.5
Laziness	12	3.2
Lack of Education and Public Awareness	24	6.3
Insufficient Coverage of Collection System	129	34
Total	**379**	**100**

Source: Author's Fieldwork (2021).

Municipal solid waste generation is influenced by economic conditions, living standards, urbanization (Liu and Wu, 2010; Saeed, Hassan, and Mujeebu, 2009), and population (Chiemchaisri, Juanga, and Visvanathan, 2007).

Conclusions

The careless dumping of solid waste has degraded a healthy environment in the majority of Nigerian locations. As a result, it needs effective management because human activities lead to the development of solid waste. It is impossible to overstate the importance of having a sound waste management plan in every community since poor waste management has a detrimental effect on both the environment and public health.

Public education, composting, management enhancement, and bolstering and supporting waste management agencies are all ways to handle solid waste in Nigeria. However, insufficient financing, ineffective management techniques, population expansion, inadequate laws, and ineffective policy execution may have an impact on effective solid waste management. As a result, keeping a healthy environment necessitates paying close attention to it, which calls for the effective management of solid waste.

In view of the challenges affecting agencies and other stakeholders on solid waste management practices in Jalingo; the following recommendations are made: Public awareness campaigns via electronic and print media, by the chiefs and community leaders, should be launched so as to enlighten the general public regarding the effects of poor waste disposal and the need for effective waste management; The public and private partnership should be highly encouraged to participate in effective solid-waste management for the sustenance of a healthy environment; The government should encourage more research projects in the area of waste management; There should be comprehensive environmental legislation that relates to environmental sanitation offences; There should be adequate and proper town planning for effective solid-waste management for example, there is a big need to provide a good access to roads to ease the evacuation of solid waste from all the nooks and crannies of the town; Solid Waste Management in Nigeria should be the concern of everybody not one agency by itself; There should be provision for sanitary landfill facilities for a proper deposition of solid waste. This will help minimize pests, disease, air pollution, ground and surface water pollution and also improve aesthetic values.

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