



# ASSESSMENT OF SOLID WASTE COLLECTION AND DISPOSAL SYSTEM IN JIMETA, ADAMAWA STATE, NIGERIA



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**Abstract:** Human activities, such as agriculture, industry and domestic activities generate wastes that need to be carefully collected and disposed for safer environment. The paper examined solid waste collection system with a view to examining its adequacy or otherwise. Data for the paper was derived from both the primary and secondary sources. A sample size of 250 households, representing 0.4 percent of the total population was isolated for detailed investigation. The methods of data analysis were based on the frequency tables and figures using simple descriptive statistics of percentages. The results of the study show that polythene bags constitute dominant type of solid waste generated. This may be explained by the fact households normally use polythene bags in covering goods purchased either in the markets or along their ways home. The observed collection methods of solid wastes is unsatisfactory; for example, the four waste collection vehicles appear to be far below the volumes of solid wastes generated in a big city like Jimeta. It is concluded that for proper solid wastes collection, such as the number of vehicles should be increased and the frequency of collection should also be increased. This will go a long way to improving the sanitary conditions of the environment.

**Keywords:** Collection facility, sanitary, solid waste

## Introduction

Human activities for satisfying needs such as food, shelter, clothing, mobility as well as aesthetic quality of life invariably lead to waste generation. These wastes generated, need to be disposed off ultimately in such a way that it would not cause nuisance or any environmental pollution. As cities are growing in size, coupled with a rise in population, the quantity of wastes generated is increasingly becomes unmanageable.

Wastes which can be solid and liquid are any discarded materials, with no consumer value at the particular time (Achi, 2000). This can be generated by either domestic commercial, industrial healthcare agricultural mineral places, etc. The words "garbage" "trash", "refuse" and "rubbish" is used to refer to some forms of solid waste. The solid waste often generated in Jimeta, from each household is approximately 1 ton of domestic waste per year. The incidence of much garbage lying uncollected in the streets, dustbins, causing inconvenience environmental pollution, and constitute a risk for public health in the area. Although, government authorities are trying to control this, hence the piles of wastes only seem to grow from day to day, as a result of non collection and disposal. The average per capital waste generation is 0.8 kg per person per day (ASME, 2011). The problem is likely to intensify unless alternate approaches are developed.

The private sector is seen as a key participant in full range of waste management activities, including collection, transportation, treatment, processing, separation, recycling, composting and disposal of waste. In some countries, like Cameroon and Zimbabwe, for example, community neighborhood association, small and informal enterprises are increasingly involving themselves in the collection of wastes (Achi, 2000).

## Materials and Methods

### The study area

Jimeta is located at the central middle of Adamawa State with Yola being the State Capital. The town is surrounded by Geirei and Fufore Local Governments. Jimeta is basically administrative, and social centre noted for their commercial activities. Furthermore, Jimeta is geographically on Latitude 11055'N and longitude 11011'.

### Collection of data

The sources used for gathering data for the paper involved two sources of data, primary and secondary. The primary data were collected using a well structured questionnaire that contain variables such as types of solid wastes, frequency of collection, distance of households to evaluation points, among others. Secondary data include information generated and obtained from published materials such as text books published academic journals, and records among others

The population of the study area was randomly selected and sampled based on wards as shown in the table below and out of which 250 respondents were interviewed. The study area consists of 7 wards and the total population is 62,396 according to INEC 2016 records (Table 1). The entire 7 wards were all considered for the study where 0.4% of the total of each ward was randomly selected for detailed field data collection. Thus, the size of the samples is adequate in each of the 7 wards and the reason being that the area is homogenous.

**Table 1: Population of the study area**

S/N	Name of ward	Population	% of population
1	Jambutu	8,368	34
2	Doubali	14,464	58
3	Nasarawo	7,396	30
4	Alkalawa	10,725	42
5	Bako	5015	20
6	Yolde pate	8320	33
7	Makama A	8108	33
	<b>Total</b>	<b>62,396</b>	<b>250</b>

Source: INEC, 2016

The data for this paper was generated using the instrument of the questionnaire administration. The questionnaire was design to content information of sources of wastes, type of wastes etc a uniform questionnaire is use for all people selected for the study.

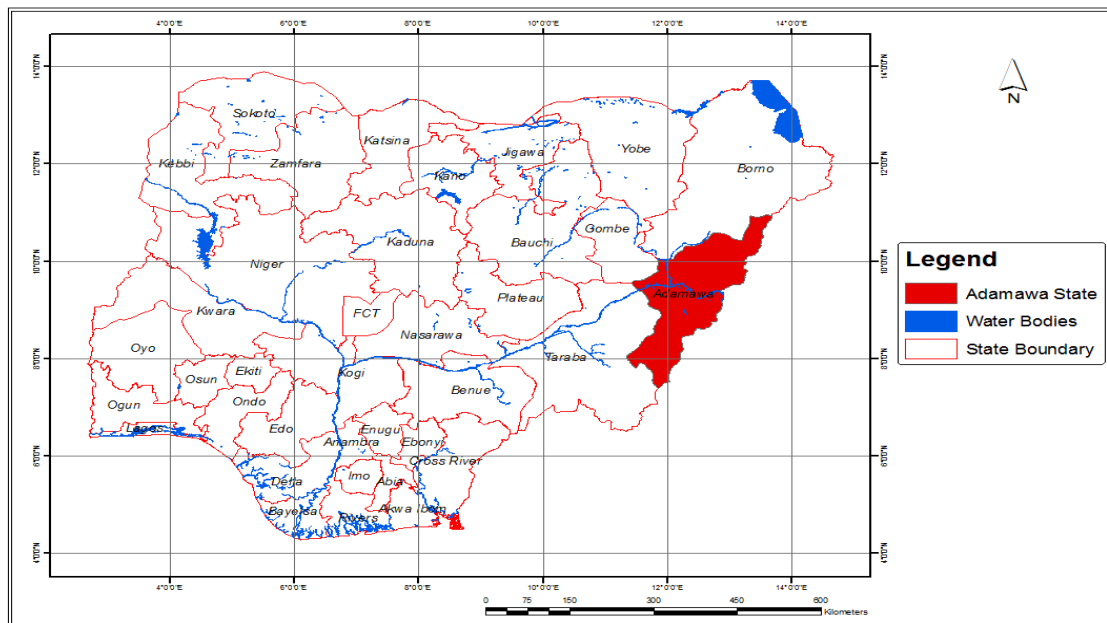
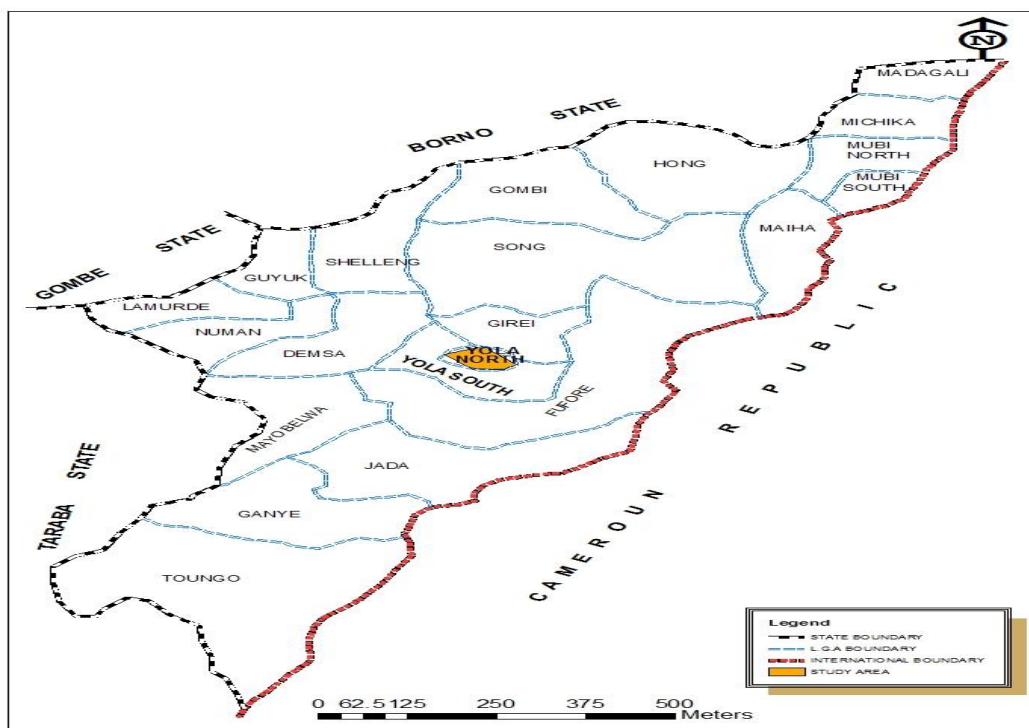


Fig: 1 Nigeria showing Adamawa State



Map of Adamawa State Showing Yola North  
Source: Adamawa Geographic Information System (ADGIS)

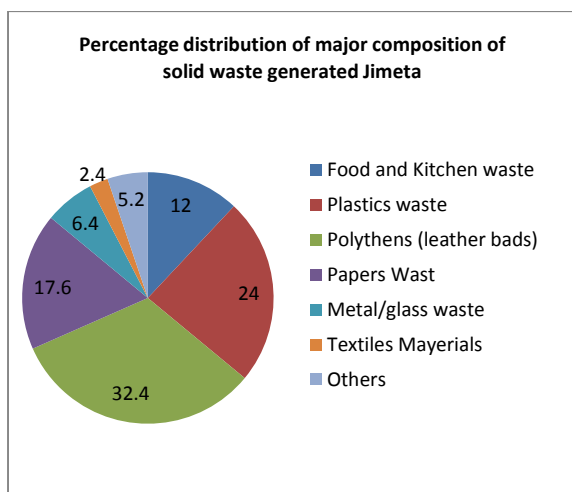
Fig. 2: Adamawa State showing the study area

**Results and Discussion**

**Composition of solid waste generated**

The predominant type of solid wastes generated in Jimeta is polythene bags, commonly called leather bags. This waste category constitutes 32.4% of the total identified waste generation in the study area. This may not be far from the fact that traders are more than any other occupation in the area and these traders sell their goods using polythene bags to wrap

them. These predominant solid waste materials can be recycled if proper, public enlightenment is done on reuse and recycling of waste materials. Other waste type identified include, food/kitchen waste 12.0%, plastic waste 24.0%, paper waste 17.6% metals/glass waste 6.4% textile waste 2.4% and miscellaneous waste 5.2%. These waste types when put together and dumped on the street present very unaesthetic picture of the town.



Source: Zarma, 2014

Fig. 1: Major composition of solid waste generated in Jimeta

**Solid waste collection in the study area**

On solid wastes collection, the people were asked whether there was wastes collection in their area and their responses showed that current efforts put into waste management in Jimeta is far from reaching its intended potential. However, about 39.2% of the people responded that there was waste collection point in their area while 6% responded that there was no waste collection. 40.8% affirms that wastes are being collected sometimes in a non frequent manner. This is mainly responsible for heaps of solid wastes within streets and roads in Jimeta. Another 18% of the people are however not aware of any waste collection as they usually dispose their solid wastes themselves using various means (Table 2).

Table 2: Solid waste collection

Opinion	Number of respondents	Percentage (%)
There is waste collection	98	39.2
There is no waste collection	15	6
Sometimes	102	40.8
No knowledge	45	18
Total	250	100

Source: Zarma, 2014

Table 3: Existence of communal or collective waste containers or collective pints

Response	Number of respondents	Percentage (%)
Yes	80	32
No	170	68
Total	250	100

Source: Zarma, 2014

**Communal/collective waste points**

The paper show that the higher number of the people (68%) do not have communal collective wastes containers in the area. With 32% of them claiming that collective wastes containers never existed in their neighbourhoods (Table 2).

**Waste management as a means of business opportunity**

A higher number of household agreed that waste management is a business opportunity in their community. This may be attributed mainly to the work of waste scavengers that are so common, especially in the area, and only a few number of respondents (36%), did not agree that waste management is a business opportunity (Table 4).

Table 4 Waste management as a means of business opportunity

Means of business opportunity	Number of respondents	Percentage (%)
Yes	160	64
No	90	36
Total	250	100

Source: Zarma, 2014

Table 5: Distance between households and collection points

Distance (M)	Frequency	Percentage (%)
1-100	42	16.8
101-200	34	13.6
201-300	37	14.8
301-400	39	15.6
401 – 500	44	17.6
501 +	54	21.6
Total	250	100

Source: Zarma, 2014

**Location/distance of households to collection depots**

The distance of households to waste collection points also plays a significant role in the disposal of wastes. The households that are far from collection point were the ones fond to practice indiscriminate wastes disposal. Table 4 shows that the 21.6% of the inhabitants interviewed cover over 500 meters distance before disposing their wastes at the appropriate points. This is highly above the maximum distance one should cover to dispose wastes and largely contributes to indiscriminate refuse disposal as under age children who because of distance dispose of the refuse before reaching the point provided.

**Problem of wastes collection**

The paper shows that there are number of problems militating against the smooth collection of solid wastes. The first of such problems is ignorance of appropriate collection points and this is a major problem. As a result of this, wastes are seen in almost all the collection points littering in Jimeta. Some people claimed ignorance of appropriate wastes collection points: This is quite obvious because most of the people cannot easily relate health problems to poor solid waste collection or even see solid waste as a source of wealth.

Furthermore, the mode of transportation poses serious challenges to proper wastes collection. In most areas is common to see uncover vehicles transporting wastes with wind blowing and scattering wastes, particularly the dried solid wastes. Areas like WuroKuturu in Nassarawo ward lack proper accessibility for the movement of vehicles, and this makes refuse bunkers provided to be filled without evacuation. This makes the entire environment un-conducive. Also the people in this area are at risk because of their exposure to pollution.

Similarly, the availability of vehicles used for the evacuation of solid waste are grossly inadequate in the study area. Most of them have broken down. The major, source of solid waste management is the state and local government, allocation to this activity only increased during the environmental sanitation days. Now resources available to the government are only competing among other needs. This implies that other means should be sought and waste to waste will be ideal.

**Conditions of wastes collection, trucks**

The inventory of the following items was taken during the inventory survey as the chief executive of the relevant agency

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was interviewed. The table above shows the available solid wastes management facilities within the study area, as clearly presented most of them have broken down which are represented by 'grounded'. Therefore there is need to see solid

waste as source of wealth to all stakeholders so as to create other, opportunities to the private sectors to invest to ensure other source of fund for the activity.

**Table 5 Conditions of wastes collection trucks**

S/N	Item Description	Reg. No	Purpose	Location	Remarks
1	DAF roll-on-off-trucks	AD04-A31	Waste collection	Yola	On road
2	DAF roH-on-off-trucks	ADOS- A3 1	Waste collection	Yola	On road
3	DAF roll-on-off-trucks	AD06-A31	Waste collection	Jimeta	Grounded
4	DAF roll-on-off-trucks	AD08-A31	Waste collection	Jim eta	On road
5	DAF roll-on-off-trucks	AD05-A09	Waste collection	Jimeta	On road
6	TIPPER DAF	7ADSA1125	Waste collection	Yola	Grounded
7	TIPPER DAF	7ADSA1127	Waste collection	Jimeta	Grounded
8	TIPPER DAF	7DSG1133	Waste collection	Yola	Grounded
9	Front Loader	ADSG1114	Waste collection	Yola	Grounded
10	Front Loader	7ADSG1115	Waste collection	Jimeta	On road
11	Slide Loader	7ADSG1026	Waste collection	J/Yola	Grounded
12	Road Sweeper	7ADSG1148	Waste collection	J/Yola	Grounded
13	A emptier	AD09-A31	Waste collection	J/Yola	On road

Source: Field Survey, 2016

### Poor funding

Poor funding of the various agencies responsible for solid waste collection in the study area is another factor militates against the purchase of new vehicles and the maintenance of existing ones. The poor funding is a function of the very low budgetary allocation to the waste management agencies and this has also affected the recruitment of staff both technical and non-technical.

### Conclusion

It can be deduced from this paper that lack of effective solid waste collection system and lack of technology are the major problems of waste collection and management in Jimeta, Adamawa State. This indicates that the current situation of Jimeta in regards to solid waste management need attention from both government and people of the study area. It is therefore recommended that adequate budgetary allocation be made to the waste management agencies to enable them purchase waste collection vehicles and to recruit more hands as a basis for effective environmental sanitation.

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