



**AN ASSESSMENT OF HOUSEHOLD SOLID WASTE MANAGEMENT PRACTICES IN KONTAGORA, NIGER STATE**

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**Abstract**

*This paper examined household solid waste management practices in Kontagora. The paper focused on the types of solid waste generated, their composition and quantity, the methods of solid waste storage and disposal practices, including the capacity of solid waste management agency in Kontagora. Data for the study were obtained from primary and secondary sources. The primary data were collected from a cross-sectional survey of 130 households using well-structured questionnaires. Secondary data were obtained from different published sources. The data obtained were analysed using descriptive statistics. The study found out that the composition and quantity of solid waste generated differ from one household to another according to their socioeconomic characteristics. The solid waste stream comprises biodegradable and non-biodegradable waste. The study also revealed that almost all the household temporarily store their waste before final disposal in open spaces, dump sites, roadsides, and drainages among others. The rate of generation of these waste have now defied all efforts of the waste management agency in Kontagora, due to inadequate equipment, funding, trained personnel, etc. The study recommends the promotion of integrated sustainable solid waste management (ISWM) procedures and community participation.*

**Keywords:** Household, Solid waste, Management, Community

**1. Introduction**

Human activities naturally result in the generation of waste in solid, liquid or gaseous forms. This is an unavoidable event in the household day-to-day living. The wastes



generated must be disposed of properly to preserve environmental quality, human health and natural resources. However the inability of most households and communities to effectively manage waste generated has played a significant role in the increasing extant environmental and health problems facing most societies today (Ike, Ezeibe, Anijiofor & Daud, 2018).

Solid waste management in Nigeria is characterised by inefficient collection methods, insufficient coverage of the collection system and improper disposal. The waste generation has consistently expanded both in volume and complexity. This is due to the rapid increase in population over the years, urbanisation, economic activities, industrialisation, technology advancements, changing lifestyles and consumption patterns, among others. Sadly, these developments have not been matched by adequate provisions of infrastructural facilities and equipment, including funding and personnel to sustainably manage the ever growing quantum of waste (Agbesola, 2013).

Household Solid Waste (HSW), also known as domestic or residential waste refers to garbage and rubbish created or caused to be created in the day-to-day living of a residential dwelling unit. Household solid waste can be classified into different groups such as hazardous and non-hazardous waste; biodegradable and non-biodegradable waste (Karim & Nawshin, 2012).

According to Babalola, Ishaku, Busu & Majid (2010), household solid waste (HSW) has both direct and indirect effects on environment and human welfare. Direct effects range from the damage of materials and loss of aesthetic importance to the impairment of human health, thus creating significant socioeconomic impacts. Indirect effects are mainly long-term effects which range from change in ecosystem structure and environmental degradation which in turn will affect socio-economy and the sustainability of the region. This has brought a new challenge to the local government authorities especially in dealing with the issue of municipal solid waste (MSW) disposal, particularly domestic household wastes. Thus, it is a common feature to see all manners of wastes clog drainages, roadside, market places, vacant plots, water bodies and uncompleted building among others. This has in many cases resulted environmental hazards which facilitate the spread of communicable diseases (Benedine, Robert & Abbas, 2011). This paper therefore, takes a critical look into household solid waste management practices with a view to analyse some of the strengths and deficiencies in the current solid waste management practices. The objectives of this study is to identify the types of household solid waste composition and quantity generated; examine the household methods of solid waste storage and disposal practices; and to investigate the capacity of solid waste management agency.

## **2. Literature Review**

Solid wastes constitute a growing problem and have gained increased political awareness over recent years. The amount of solid waste generated in the world is steadily increasing and every government in the world is currently focusing on methods to approach the



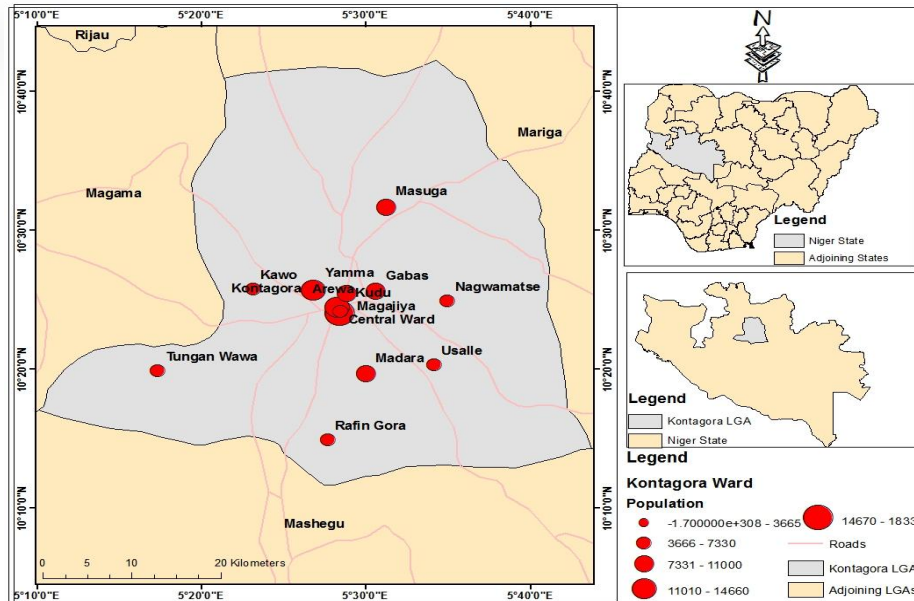
challenges posed by solid waste management (Amuda, Adebisi, Jimoda & Alade, 2014). It is estimated that more than 3.5 billion or more than 52% of the world population does not have access to the most elementary waste management services like sound solid waste collection and removal out of the residential areas and at least a controlled disposal. In Nigeria waste generation rate is estimated at 0.65-0.95 kg/capita/day which gives an average of 42 million tonnes of wastes generated annually (Babalola et'al, 2010). This is more than half of 62 million tonnes of waste generated in sub-Sahara Africa annually and where and how to channel these wastes becomes a huge problem for the nation (Ike et 'al, 2018).

The reasons behind inefficient waste management practice in Nigeria have been well researched. For example, Adeyemi, Olorunfemi & Adewoye (2001) observed that in Nigeria the management of municipal solid waste revolves mainly around open burning, open dumps, land filling, reuse/recycling and waste conversion. Arukwe (2012) added that the only management practice adopted widely throughout Nigeria involves disposal of waste on open dumps. Imam et al. (2009) reported that piles of wastes are dumped by the road side and other open spaces thereby posing environmental risk, with severe health, social and economic implications. These require urgent intervention by concerned Government agencies and related bodies on environmental management to control the increased rate of environmental deterioration as a result of indiscriminate dumping of solid waste.

### **3. Methodology**

#### *Study area*

Kontagora is a major town on the south bank of Kontagora River in north-west Niger State, Nigeria. It is the capital city of the Kontagora Emirate (Figure 1).Its Geographical coordinates are latitude 10°24'1" N and longitude 5°28'11" E in DMS (Degrees Minutes Seconds) and it is situated at an elevation 339 meters above sea level. Its covers an area of 13,219 square miles (34,237 square km) in Niger state. Kontagora has a population of 98,754 according to 2006 census making it the 4th biggest city in Niger State. Kontagora is a nodal point for local roads and a collecting point for several agricultural produce such as cotton, groundnuts millet, cowpeas, beans, gum arabic, kola nuts, cattle, goats, chickens and guinea fowl among others. This makes it an epicenter for economic activities. Essentially, all these economic and consumption activities that the people are engaged in create byproducts or waste materials that are socially costly to handle.



Source: Department of Geography F.C.E  
Figure 1: Map of Kontagora LGA

#### Data collection

The data for the study were obtained from primary source. The primary data were collected from cross-sectional survey of 130 households using well-structured questionnaires in combination with some selected Participatory Rural Appraisal Tools (PRA).

A multi stage sampling procedure was employed in selecting the representative households. The first stage involved division of the Local Government Area into the thirteen (13) existing wards. At the second stage, 13 households were randomly selected from each of these wards, making a total of 130 respondents. The third stage was the selection and identification of the household heads interviewed. The result obtained was analysed using descriptive statistics.

#### 4. Results

##### *Socio-economic characteristics of the respondents:*

Table 1 presents the distribution of the respondents' socio-economic characteristics. It reveals that 60.8% of the household heads were males, while the rest females. Majority (72.3%) of them were married, 18.0% divorced, and 7.7% were widowed. 68.5%) were older than 45 years, while only about 5.5% were younger than 35 years. Most of the respondents (74.5%) have larger household sizes in their households with only 3.2% with



less than 5 persons in their household and majority belonging to #10,100 <20,100 and #20,100 <30,100 monthly income groups. Nearly half of the household head (48.5%) had no formal education which implies that they had qur'anic education, a slightly higher number than one quarter 27.7% had only primary education, while only less than one quarter of the respondents had tertiary education. The result indicates variation in respondents' socioeconomic characteristics; this implies that household waste generation differs from one household to another. The finding agrees with the studies of Nwabinye et' al. (2017) and Limbu (2013). They both established that household solid waste generation are closely linked to socio-economic parameters of the households.

Table 1: Distribution of respondents' socioeconomic characteristics

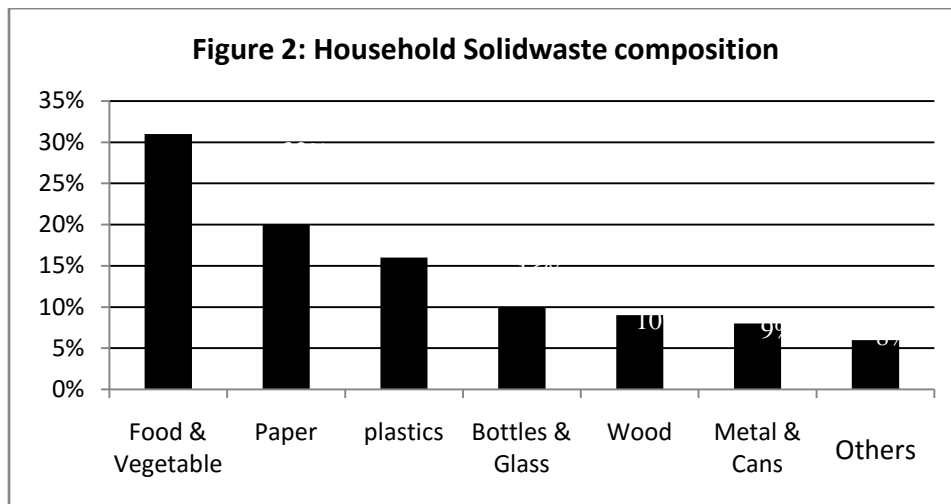
Socio-economic characteristics	Frequency	Percentage
<i>Sex</i>		
Male	79	60.8
Female	51	39.2
<i>Age</i>		
Below 35	5	5.5
35-45	39	30
Above 45	86	64.5
<i>Household Size</i>		
1 – 5	32	24.5
6 -10	88	67.7
Above 10	10	7.7
<i>Education</i>		
No formal education	63	48.5
Primary education	36	27.7
Secondary education	24	18.5
Tertiary education	9	6.9
<i>Marital Status</i>		
Married	94	72.3
Divorced	17	13.0
Widowed	10	7.7
Separated	9	7.0
<i>Occupation</i>		
Farming	60	46.1
Artisan	25	19.2
Trading	30	23.1
Salary earners	15	11.6
<i>Monthly Income (N)</i>		
Below 10,100	8	6.1
#10,100 <20,100	58	44.6
#20,100 <30,100	29	22.4
#30,100 –<40,100	18	13.8
Above 40,100	17	13.1

Sources: Field survey, 2019.

*Household Solid waste composition*



The solid waste composition generated by the respondents in the study area was determined and the finding reveals that household solid waste stream comprises rich organic and easily biodegradable food scraps, vegetables, fruits, leaves and paper as well as inorganic and non biodegradable materials such as plastic, glass, cans including hazardous wastes like pesticides, batteries, ash and discarded medicines. Figure 1 shows that food scraps, and vegetable wastes, plastics and paper constituted the largest components of solid waste generated in the area; amounting to some (31.0%), (20.0%) and (16.0%) of the wastes respectively. Bottles and glasses (10.0%), wood (9.0%), metals and cans constitute about (8.0%), respectively, while other wastes amounted to (6.0%) of the total waste generated. This indicates that household waste composition differs from and household to another and is influenced by several factors such as socio-demographic variables, cultural norms and energy sources among others.



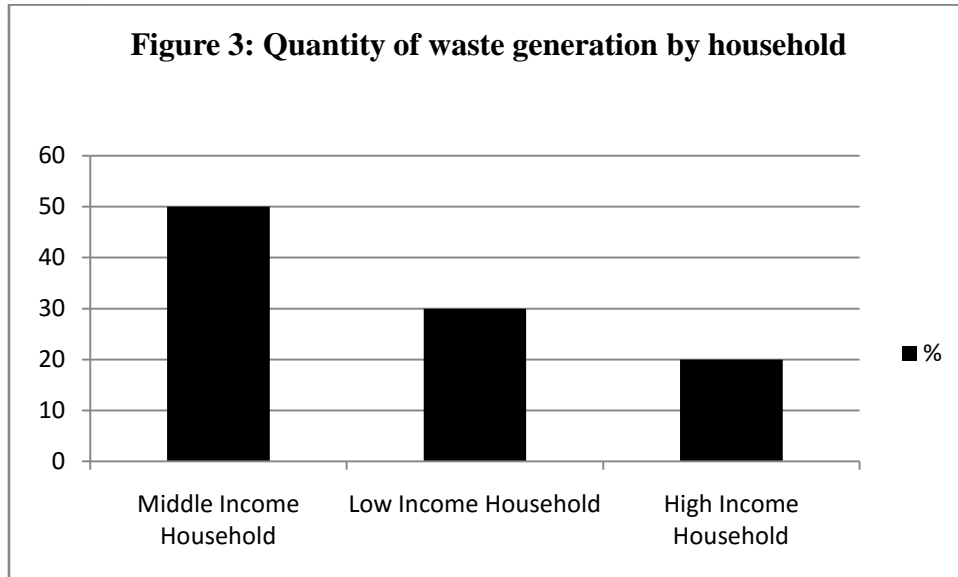
Sources: Field survey, 2019.

#### *Quantities and generation of Household Waste*

Fig. 3 revealed that the quantity of household solid waste generated. A total of approximately 15.0 tons of solid waste was generated over the three weeks period used for the assessment. Half of this total quantity of solid waste emanated from households in the middle income family whilst low- and high-income households contributed 30% and 20% respectively. The greater proportion of waste emanating from middle income households is due to relatively larger household size as compared to low and high income households. The average per capita waste generation rate in the entire area was (0.75kg/capita/day). The finding vindicates the study of Sanko et'al (2012). The correlation coefficient analysis on the various socioeconomic factors of their study indicates that monthly income, average



family size and employment status were the main influential factors in the quantity and composition of solid wastes generated



Sources: Fields survey, 2019

#### *Household Waste Storage and Disposal*

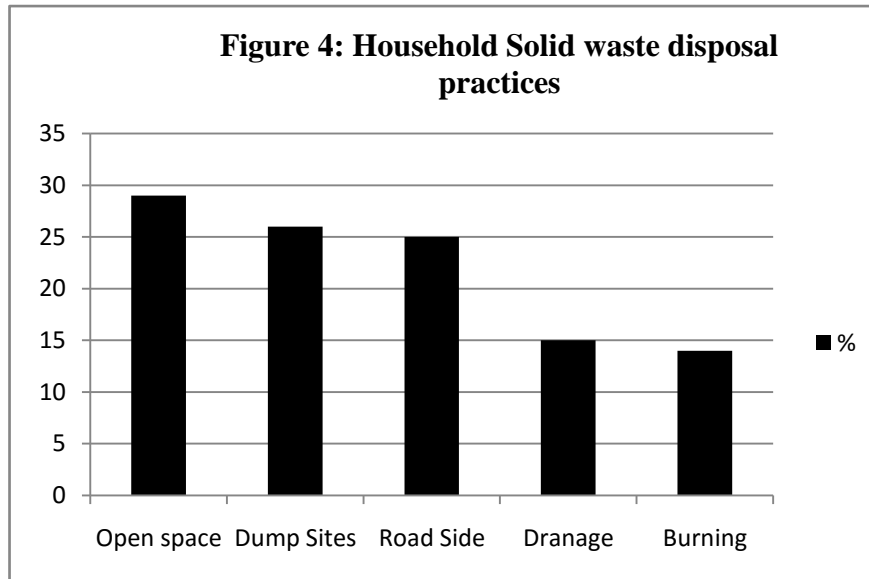
The method adopted by the households for storage and disposal of solid waste are presented in Table 2. The findings revealed that all the waste streams were stored together in either sack; open bucket or containers and plastics bags before final. It also revealed that household solid waste final disposal practice in the area includes a direct dumping in open space, designated dumps sites, roadsides, drainage and burning. It is apparent that majority of the respondents dispose their waste illegally. It is therefore a common feature to see heaps of refuse on our streets, roadside, market places, and vacant plots among others. This could have adverse effects on health, the environment and aesthetics. The finding indicates that the existing waste management practices in the study area are inefficient due to improper management by different households and waste management agency concerned.



Table 2: Waste storage and disposal practices

Variable		Frequency (No)	Percentage (%)
Method of Storage	Open container	42	32
	Sack	57	44
	Plastic bag	31	24
Method of Disposal	Burning	20	15
	Open space	38	29
	Dump sites	32	25
	Drainage	15	12
	Road side	25	19
	<b>Total</b>		<b>130</b>

Sources: Field survey, 2019.



Sources: Fields survey, 2019

*Household distance to the dump sites*

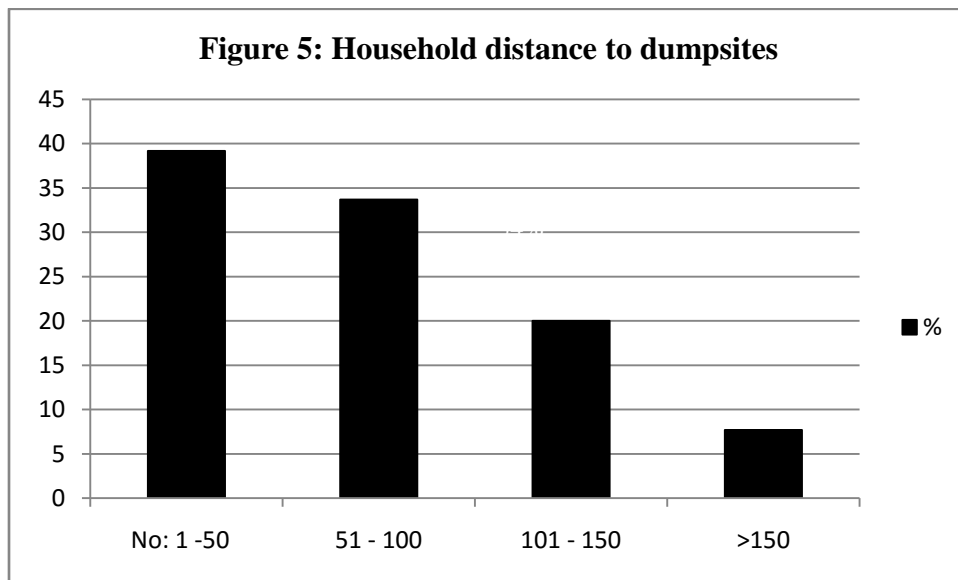
The study found that there is only one legally designated dump site in Kontagora. However there are several illegal dumpsites and heaps of waste spread indiscriminately which poses serious environmental and health challenges. The result presented in Figure 5. Shows that





distance of households to various disposal points in the study area in meters play significant role in the final disposal of waste.

Almost half of the household have their disposal point located at a distance of 1- 50 meters, 33.7% at a distance of 51 -100meters , 20%at a distance of 101 -150 meters. While only 7.7% at a distance of < 150.It is evident from the result that the farther the designated dump-sites, the lesser the use by the respondents. This further confirmed that majority of the people dispose their waste illegally, they are of the habit of dumping their refuse within a close range to their residence or where they carry out their daily activities. Relating their views on waste disposal, Anyanwu & Adefila (2014) confirmed that the farther the designated dump-sites, the lesser the use by the respondents. This further explains why people tend to disregard the use of designated official dump-sites and create alternative points.



Sources: Fields survey, 2019

#### *The Capacity of Solid Waste Management Agency*

Niger State Environmental protection Agency (NISEPA) is the agency responsible for household solid waste management in Kontagora. The study revealed that the waste management agency was not able to cope with the volume of waste generated in the area since the amount of solid wastes produced often exceeds the rate of disposal. This is largely due to inadequate equipment; funding, trained personnel coupled with the attitude and perception of the public on environmental issues and complete lack of community participation as a whole in household solid waste management. It was observed that the



waste management agency in Kontagora zone has only five functional refuse trucks for the collection and transportation of solid wastes from the town to the designated dumpsite, there is no pay-loader used to compact the waste before burning. In general most of the available facilities are either inadequate or not functional to cover the entire study area. This explains in part why the frequency of refuse collection takes rather too long to be evacuated.

Table 3: Equipment and Personnel of waste management Agency in Kontagora

Types of Equipment	Number Required	Number available
Refuse Truck	8	5
Pay loader	1	-
Bulldozer	1	-
Receptacles (Refuse containers)	5	-
Shovel	30	30
Brooms	30	30
TYPES OF PERSONNEL		
Administrative	5	1
Technical	4	-
Causal workers	100	65

Sources: Fields survey, 2019

### 5. Conclusion and Recommendations

Kontagora, like any other city, has been struggling with the problem of household solid wastes management in recent times; this is further worsed by the growing population and economic activities. This has consequently led to a substantial increase in the quantity and diversity of the solid waste being churned out on daily basis. The household solid waste generated comprises biodegradable and non- biogradable wastes. In addition majority of the household temporarily store the waste generated within the household before final disposal through direct dumping in open space, burning and dumps sites. The rate of generation of these waste have now defied all efforts of the waste management agency in Kontagora largely due to inadequate equipment, funding, trained personnel etc, The study recommends the promotion of ISWM strategy, provision of adequate personnel, funding and equipment among others.

Based on the finding of the study the following recommendations are proffered to facilitate efficient household solid waste management: The promotion of the concept of integrated sustainable solid waste management (ISWM) strategy for the managing of household solid waste. This practice will minimize waste generation, maximize waste management and ensure safe waste disposal. Other recommendations include delineation of the city into manageable zones for the introduction of door-to-door collection and provision of standard receptacles within the reach of households on a street or wards to ensure effective coverage and easy waste management; enforcement of environmental laws (rules and regulations) that deter indiscriminate waste disposal; embarking on an aggressive campaign using handbills, posters, seminars, radio, television and any other available



medium to educate the public on environmentally friendly ways of disposing domestic solid waste; community participation in management of household solid waste. This will make residents to organise themselves and become involved at the level of their living area or neighborhoods, to improve the conditions of their immediate surroundings; and governments should ensure the provision of efficient funding, personnel and equipment required for efficient waste management.

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