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Solid Waste Generation and Management in Yobe State, Problems and Mitigations

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ABSTRACT

Waste management has been a serious topic of discussion among many countries (developed and developing) over the last few decades. People's attitude towards uncontrollable waste generation and indiscriminate disposal of waste has increased recently, with these, some countries especially in Sub-Saharan-Africa have non-existent waste management policy and institution framework. In Nigeria local governments have the responsibility to manage waste at local level. During the study quantitative method was deployed, where questionnaire was administered to the respondents. 220 questionnaires were distributed across the state, 100 questionnaires were filled with (45%) return rate. About 93% of the respondents are male and 95% of the respondents have tertiary education. The results showed that most respondents are aware of waste management. 49% of the respondents dump their waste on roadsides and 63% believed that people's attitudes towards waste disposal should change as it is unethical. The study advocates for a holistic strategy to mitigate indiscriminate generation and disposal of waste in the state. Governments and communities should work together in devising a means to improve waste management.

Keywords: Waste, generation, disposal, problem, mitigation and management

INTRODUCTION

Solid Waste Management in many developing countries is a major environmental problem. In Nigeria, population growth, economic growth over the years and rapid urbanization has made Solid Waste Management difficult. In the past few decades this has been a problem in the major cities of Nigeria for example, Abuja, Kano and Lagos, but other places are now faced with similar environmental threat (Ezeah, 2010). Considering waste challenges and growing economies around the world, countries are facing serious problems in their effort to curtail waste generation (Ezeah, 2010). Many people do not have proper understanding of their attitude towards waste management in their communities. It is difficult to define waste according to many scientists, meanings were derived from sources, ingredients and nature (potential to cause harm) of wastes in most cases (Read, 2001). However, according to the Department of the Environment (DEFRA, 2007; DEFRA, 2008) "*waste is any substance which constitute scrap material or an effluent or other unwanted surplus substance arising from the application of a process, or any substance or article which requires to be disposed of as being broken, worn out, contaminated or otherwise spoiled*". On the other hand, Igoni *et al*., (2007) defined waste as, "*any material which has no value to the producer and must therefore be disposed of*".

Management of Solid waste

Globally, Solid Waste (SW) generation is rising due to growth in socio-economic parameters such as population, personal income and materialistic acquisition (Sakurai, 1990; IPCC, 2006). Few decades ago, waste generation in developed countries have more than doubled (AfDB, 2002). Subsequently, developing countries are also experiencing

increase in Solid Waste generation, it is expected that in the next few decades the annual volume will increase by more than threefold. This is due to the changes in economic status of individuals and countries (AfDB, 2002). According to Ezeah (2010), it is challenging to project and estimate the Solid Waste generated in developing countries especially in Sub-Saharan Africa.

Management of Solid Waste in Africa

During the 1970s solid waste have not been properly managed in most countries of Africa, where there is non-existent policy and institutional framework. In some cases, local governments have the main responsibility to manage waste generated within their jurisdictions (AfDB, 2002). Mostly waste management is not considered as a priority in these local governments. They are mostly inadequately funded by higher authorities in places that depend on the state or federal government for funds. Thus, makes waste management in these local government authorities difficult, where people dispose their waste at any convenient location (Agunwamba, 1998). These practices if not curtailed will lead to serious environmental nuisance and hazard in most of these communities. It is important for government to propose a policy and strategic framework to address problems of waste generation and disposal in African countries. Nigeria is among the African countries that struggles to deal with waste generation due to rapid economic and population growth and inadequate institutional and policy framework (Ezeah, 2010). Thus, the need for research to assess communities' attitudes toward waste generation and disposal. Considering that in Nigeria most waste management are expected to be handled by Local Government Authorities justifies the importance of assessment on waste generation, disposal and management.

METHODOLOGY

A questionnaire survey was used to obtain field information on waste from residents in Yobe State. The results provided insights on how waste is generated and disposed in Yobe. In this study, quantitative methods were employed, which was considered the most suitable method for the empirical study.

Quantitative methods

Quantitative research is an investigation used for testing hypothesis based on variables. It is measured numerically and analysed statistically to determine whether to reject or accept a hypothesis (Amaratunga *et al*., 2002) and can be used to explain social phenomena (Bryman, 2008). Researchers choose, based on how accurate the method addresses their problems (Huberman and Miles, 1994). In social science research, survey is the most used technique and was thus used in this research. It is also used to collect opinions from the sample population (Creswell, 2014). Questionnaire survey is highly suitable technique to collect large data-sets, thus this research employed the sampling technique. Quantitative methods ideally involve probability sampling to enable statistical inferences (Creswell and Clark, 2007).

Questionnaire survey

Questionnaire surveys are widely used to gather information on peoples' opinions and views. Questionnaires usually contain close-ended questions, (e.g. 'Yes'/'No,' 'Agree'/'Disagree,' and a ranking scale for participants to choose from. There are questionnaires that contain few open questions, which give respondents free options to choose or write their opinion (Denscombe, 2007; Abubakar, 2013). Some studies use standardised questionnaires; thus, adopting a standardised format of questions (Denscombe, 2007). Other studies used customised questionnaires that are adapted to the purpose of their research. There are no strict rules on how to design a questionnaire, but it is important that the questionnaire addresses the research objective(s) (Smith, 2010). In this study questionnaire was designed and

administered to respondents in the three major LGAs of the state including Bade, Damaturu, Potiskum. Where 220 questionnaires were distributed across the state, 100 questionnaires were filled with (45%) return rate. SPSS statistical software was used to analysis the data where frequency distribution was used to understand people attitudes towards waste generation, disposal and management in some parts of Yobe State.

Study area

Yobe State is among the 36 States of Nigeria, which was created on 27 August 1991 and has a land area of 47,153 km^2 with a population of over 2.4 million people (YBS Report, 2010). It shares boundaries from the west with Jigawa and Bauchi States, Gombe and Borno States to the south-east and an international boundary of 323 km with the Niger Republic to the north (Abdullahi *et al.*, 2006). Yobe State has 17 Local Government Areas (LGA) (Bade, Bursari, Damaturu, Fika, Fune, Geidam, Gulani, Jakusko, Karasuwa, Nangere, Nguru, Potiskum, Tarmuwa, Yunusari, Gujba, Machina and Yusufari) (YBS Report, 2010). Figures 1 and 2 show the maps of Nigeria and Yobe State, respectively.

Figure 1: Map of Nigeria and its 36 states, including Yobe State (source: Google, 2018).

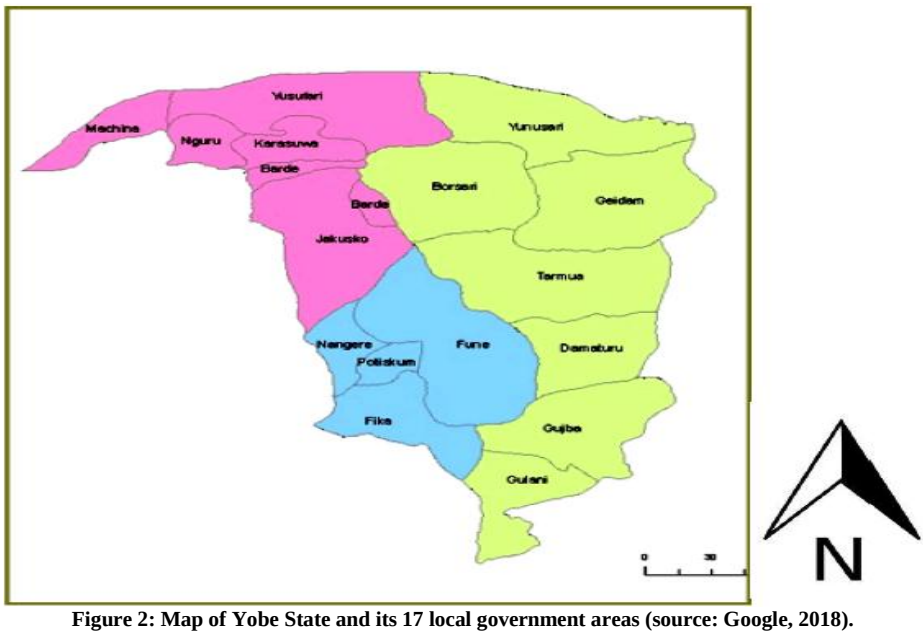

Figure 2: Map of Yobe State and its 17 local government areas (source: Google, 2018).

RESULTS

Table 1 below is the distribution of gender, education status of respondents. However, most respondents are male and have tertiary qualification.

Table 1: Distribution of the respondents according to their socio-demographic characteristics

Gender	Frequency (%)
Male	93 (93%)
Female	7 (7%)
Education level	
Primary	2 (2%)
Tertiary	95 (95%)
Occupation	
Student	13 (13%)
Civil servant	80 (80%)
Business	6 (6%)
Unemployed	1 (%)

The table below shows the level of waste management in the state. The results showed that most respondents generate and dispose waste indiscriminately. Most respondents also agreed that wastes indiscriminately disposed are unpleasant visually and can cause health hazard. People's attitude toward waste generation and disposal needs to change based on the responses. However, according to some respondents they have thought of taking action on waste management in their various communities. There is also no effort made by either government or NGOs to create awareness on waste disposal and management to people. According to the respondents they dispose their waste by the road side.

Table 2: Level of waste management among the respondents in Yobe State

What do you think about how people generate and dispose waste?	Indiscriminately	39(39%)
	Reasonably normal	14 (14%)
	Not good at all	35 (35%)
	Worse than expected	12 (12%)
How do you understand waste?	Nuisance	13 (13%)
	Unpleasant to see	41 (41%)
	People attitude should change	39 (39%)
	People attitude towards waste generation and disposal is commendable	7 (7%)
What do you think of people's behaviours /attitude toward waste generation and disposal	It normal	5 (5.1%)
	Not normal	28 (28.3%)
	People attitude should change	63 (63.6%)
	People attitude towards waste generation and disposal is commendable	3 (33%)
Have you thought about doing something about waste generation and disposal in the area?	Yes	77 (78.6%)
	No	21 (21.4%)
Has government/NGO made any effort to create awareness towards reducing waste generation and disposal?	Yes	44 (44%)
	No	56 (56%)
Are you aware of solid waste management?	Yes	68 (68%)
	No	32 (32%)
Where do you dump the solid waste generated from your home	Road side	49 (49%)
	Taken to the incineration	1 (1%)
	Disposed on the site provided	1 (1%)
	Open dump sites	12 (12%)
Where do residents of your community dump their waste?	Refuse bin provided	17 (17.3%)
	Incinerator	13 (13.3%)
	On roadside	57 (58.2%)
	Not sure	11 (11.2%)

Table 3: Method/measures of Managing the Problem with Solid Waste Generation and disposal

How do you think people will behave towards solid waste?	Unethically	
What techniques or options do you think will improve the solid waste management?	Public enlightenment on solid waste disposal	39 (39%)
	An effective integration of public and private sector participation in solid waste disposal and management	43 (43%)
	Authorities should penalize individuals or groups that dispose waste wrongly	18 (18%)
Has government/NGO provided any means of waste disposal in your area e.g. bins, landfill, or incinerator for disposing	If yes, state what	38 (38.4%)
	No	61 (61.6%)

In table 3, many respondents believed that people's waste management attitude is unethical and that there is a need for public enlightenment on waste disposal in most of their communities in order to improve waste management. Government has not provided infrastructure for proper waste disposal in most communities.

DISCUSSION OF RESULTS

Waste generation and management has been a serious problem to many developed and developing countries. This is mainly due to changes in people's and countries attitudes toward consumption, economic and population growths. However, some countries have these problems due to inadequate waste management infrastructure and lack of institutional framework that guides waste disposal and management. Eneji *et al* (2017) in their study reported that, lack of waste collection and disposal points in some cities of Nigeria have caused serious health problems as a result of indiscriminate waste disposal. This has also increased government spending on health care as a result of diseases caused by health hazard due to waste disposal. In India, people resort to open dumping, open burning and road side disposal which has caused serious health issues in these places (Prabu, 2009). Similarly, respondents in the study area practice uncontrol waste disposal, which if not handled can cause disease outbreak in these communities. Solid Waste Management has been identified as the major challenges of the 21st Century, where many countries and organisations have non-existent waste management framework. There is need for proper and regulated waste management policies and laws that would improve solid management especially in developing countries. Currently, Yobe State has no proper waste management framework and guided policy that will assist in mitigating indiscriminate waste disposal and management.

CONCLUSIONS

Generally, waste management (generation, disposal and handling) is a serious problem that has not received the needed attention in many parts of the world especially, Sub-Saharan Africa (SSA). Lack of government policy and institution framework and inadequate infrastructure to guide and management waste is considered the major issues in Nigeria and particularly Yobe State. Results from the survey showed that people's attitude on waste management needs to change as many observed that awareness is lacking. A holistic approach can be adopted by government at all levels in the State and communities to improve waste management in order to reduce serious health hazard and uncontrollable waste generation and disposal in the State.

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