EVALUATION OF THE STATUS OF WASTE MANAGEMENT POLICY IMPLEMENTATION IN BAUCHI STATE, NIGERIA

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Abstract

*T*his study evaluated the status of waste management policy implementation in Bauchi state, Nigeria. The data type for this research includes both quantitative and qualitative, derived from the primary and secondary sources. The primary data was generated using questionnaire instrument which provided information on the status of Solid Waste Management (SWM) policy implementation by governments in the State. Simple random sampling technique was used to select 30% of the LGAs as well as 10% of the staff of Bauchi State Environmental Protection Agency (BASEPA) and Local Governments' Health Departments (LGHD) in the sampled LGAs. Descriptive statistics and ANOVA were used in analyzing the data. Results indicated significant variation between and within Local Government Areas (LGAs) in the status of waste management policy implementation in Bauchi State. It was further revealed that about 73% and 67% of SWM vehicles in the State and LGAs were broken down and off the road, which indicate in effective waste management. It was recommended among others that, LGAs without BASEPA should be provided with such agency which if actualized, will enhance balancing the unequal achievements in governments' implementation status and successful SWM policy implementation.*

Key words: Environmental, Protection, Agency, Generation, Effective

Introduction

The growth of human population coupled with increased economic activities and increased consumption of goods and services in towns and cities can result in high rate of solid waste generation. It might be viewed inevitable that almost every human activity involves solid waste generation, hence the need for the provision of effective framework and institutional mechanisms to properly manage these wastes. Waste generation and its management in a society can become a challenge, as long as people have gathered together in sufficient numbers. Improper management of Municipal Solid Waste [MSW] can create unsanitary conditions, that in turn can lead to outbreak of vector-borne diseases such as cholera, typhoid, yaws, rat-bite fever, relapsing fever among others (Ossai, 2006; Kennedy, 2009 and USEPA, 2014).

Today the disposal of wastes by land filling or land spreading, is the ultimate fate of all solid wastes, whether they are residential wastes collected and transported directly to a landfill site, residual materials from material recovery facilities, residue from the combustion of solid waste, compost or other substances from various solid waste processing facilities (Singh *et al.*, 2011). In most Developing Countries, open dumping with open burning is the norm (Schubeler, 1996; Singh *et al.*, 2011 and World Bank, 2009).

There are equally rapid rates of waste generation in the main cities of Nigeria; for example, Lagos, Kaduna and Onitsha. The main drivers of the waste problem in Nigeria are poverty, high population and urbanization growth rates, compounded by a weak and underfunded infrastructure (Ezeah and Roberts, 2012). These examples go to show that the waste management problem in Africa is ubiquitous, manifestly so in North, East, West, Central and Southern Africa. Bauchi State (the study area) in Nigeria is not an exception as it may be faced with similar problems cited in the Nigerian States and other parts of Africa.

Along this line and in realization of the importance of Solid Waste Management [SWM] as an environmental issue that encompasses every human community, the Federal Ministry of Environment [FME] in the year 2005 enacted a policy that provides and assigns institutional roles for the three tiers of government, private sector and the civil society organizations, in tackling SWM problems in Nigeria (FME, 2005).

Policy entails a statement of intent, and is implemented as a procedure or protocol. It may be referred to as a principle of behavior or conduct thought to be desirable or necessary as formally expressed by government or other authoritative body. Policy making process is an extremely complex, analytical and political process to which there is no clear cut beginning or end and the boundaries of which are most uncertain (Egonmwan, 2000). The complex and uncertain nature of public policy-making is in many ways, a reflection of the complexity of modern society and the difficulty of governance. Owing to the complex and uncertain nature of policy making process, it becomes logical for policy making to be studied, researched, analysed and improved.

For effective SWM in Bauchi State, evaluation of the status of implementation of the policy guidelines on waste management in respect of State and Local Governments involvement towards improving

and safeguarding environmental quality, public health and welfare becomes necessary. For the purpose of this study therefore, the roles of governments (State and Local Governments) were considered, based on the ground that the task of waste management policy implementation greatly lays upon them.

The Study Area

Bauchi State is located between latitudes $9^{o} 30'$ N to $12^{o}30'$ N and $8^{o}45'$ E to $11^{o} 03'$E (Ajaegbu, 2000 and Logbaby, 2014). With 20 local Government Areas.
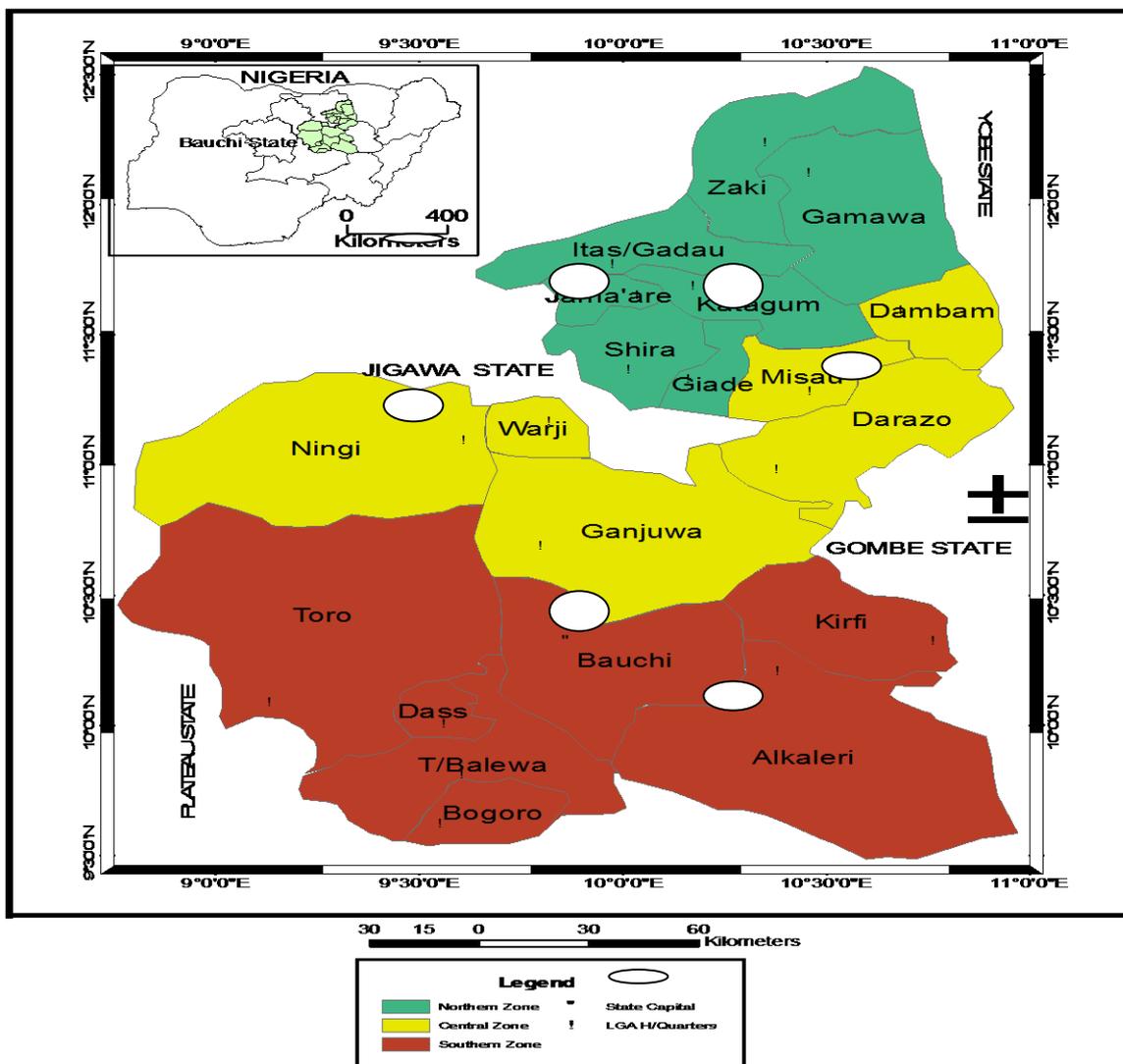
The states that shared common boundary by location, clockwise, are the seven states including Kano and Jigawa from the north, Yobe and Gombe to the east, Taraba and Plateau to the south, and Kaduna to the west (Fig. 1).

Methodology

The data types for this research include both quantitative and qualitative, derived from primary and secondary sources. The primary data was generated using two sets of questionnaires which provided information on the status of government's SWM policy implementation in the State. One questionnaire was used in generating information from Bauchi State Environmental Protection Agency (BASEPA), and the second questionnaire generated information from staff of the Local Governments' Health Departments (LGHD). The secondary data were generated from several sources including maps of the State and the selected Local Government Areas (LGAs), from Urban Development Board Bauchi, population figures from records of the National Population Commission Office Bauchi and from internet and library sources.

Multistage sampling technique was employed to select representative samples of LGAs for the study. At the first instance, all the senatorial zones in Bauchi State were selected as they cover the entire study area from which samples were drawn. Considering the assertion of Adegboye *et al.*, (2015), simple random sampling technique was used to select 30% of the LGAs. In this vein, two LGAs from each senatorial zone emerged as samples for this study. Furthermore, Yount's (2006) rule for setting sample size was considered in the selection of respondents from BASEPA and LGHDs of the sampled LGAs. By this, a random sample of 10% of the staff of BASEPA as well as that of LGHD in LGAs yielded the sample sizes indicated in Table 1.

Using Statistical Package for Social Sciences (SPSS – version 20), frequency and percentage (Descriptive Statistics) of the responses as well as Analysis of Variance (ANOVA) were used in order to test whether there is variation between and within LGAs on one hand, as well as between and within agencies on the other hand, in the status of waste management policy implementation by governments in Bauchi State.

Results and Discussion

Status of waste management policy implementation

The data generated from responses of BASEPA and LGHD officials in respect of waste management policy implementation were presented in Table 2. Based on their perceptions, about 57% and 43% of the participants from the State and LGAs respectively agreed that, waste management policy implementation was earning support and participation of government in implementing the policy provisions.

Conversely, about 43% and 57% of the respondents held a contrary opinion respectively. The perception of LG official about success in the implementation of the policy showed a tendency towards general rejection or dissatisfaction. Only about 43% think that the implementation was successful. To clarify this finding, the Likert scale questions responses in Table 2 were further subjected to Analysis of Variance (ANOVA), to test for variations between and within LGAs in the status of policy implementation and the results were presented in Table 3. From Table 3, the calculated F-value of 2.74 is greater than the critical F-value of 2.37 at 0.05% level of significance. Hence the null hypothesis that "there is no variation between LGAs in the status at which waste

management policy implementation is operated by BASEPA in Bauchi State" was rejected. As such we can conclude that there is significant variation in the status of waste management policy implementation by BASEPA in LGAs of Bauchi State.

On the other hand, results of the ANOVA on variations of sampled Local Government officials on waste management policy implementation yielded an F-value of 26.81 which is
 greater than the critical F-value of 2.37 at 0.05% level of significance. Hence, the null hypothesis that "there is no variation between LGAs in the status at which waste management policy implementation is operated by LGHD in Bauchi State" was rejected in favour of the alternative hypothesis. This showed that there is a significant variation in the status of waste management policy implementation by LGHD in LGAs of Bauchi State.

Table 1: Sample Size Distribution by LGA

LGA	Number of employees from BASEPA		Number of employees from LGHD		Total
	Actual	Sampled (10%)	Actual	Sampled (10%)	
Alkaleri	102	10	428	43	53
Bauchi	354	35	1180	118	153
Darazo	111	11	292	29	40
Jama'are	109	11	348	35	46
Katagum	137	14	468	47	61
Ningi	135	14	520	52	66
Total	948	95	3236	324	419

Source: Field work 2015

Table 2: Perception about Success of Solid Waste Management Policy Implementation by Staff of BASEPA and LGHD by LGA

Agency	LGA	Number of responses				
		SA	A	U	D	SD
BASEPA	Alkaleri	7	47	6	8	2
	Bauchi	43	75	62	44	21
	Darazo	11	16	12	16	22
	Ningi	19	44	35	0	0
	Jama'are	21	35	13	6	2
	Katagum	6	54	14	24	0
	Total	107	271	142	98	47
	Percentage (%)	16	41	21	15	7
LGHD	Alkaleri	139	85	18	3	0

Bauchi	125	95	101	192	124
Darazo	31	51	20	80	21
Ningi	39	41	82	151	37
Jama'are	21	62	55	52	34
Katagum	60	109	39	107	14
Total	415	443	315	585	230
Percentage (%)	21	22	16	29	12

Table 3: Variation in Waste Management Policy Implementation by BASEPA and LGHD in Bauchi State

Agency	Source of variation	Sum of Squares	DF	Mean Square	F Ratio	Critical F
BASEPA	SSA	28.975	4	7.244	2.74	2.37
	SSE	1745.046	660	2.644		
	SST	1774.021	664			
LGHD	SSA	287.581	4	71.895	26.81	2.73
	SSE	5318.630	1983	2.682		
	SST	5606.211	1987			

With these findings, we can deduce with 95% confidence level that the status at which waste management policy implementation is operated by government agencies was not the same in the sampled LGAs. The nature of the inequality in Table 2 portray that the relatively more developed/urbanized LGAs which include Bauchi, Ningi and Katagum were positive about effective waste management policy implementation. This advantage partially explains why these LGAs appeared better in terms of aesthetic and environmental cleanliness. This inequality trend was supported by the fact that only Bauchi, Katagum and Ningi LGAs among the sampled LGAs were having BASEPA office (the establishment responsible for implementing the SWM policy). What obtained in the other LGAs instead, was Water and Sanitation Board that functions as proxy for BASEPA.

Similarly, responses from LGA officials portrayed variation in the effectiveness of waste management policy implementation among the LGAs. For example, between 20 - 26% of the respondents in Alkaleri, Bauchi and Katagum LGAs held positive opinion about effectiveness of waste management policy implementation in their LGAs. On the contrary, only 9.67% in Jama'are, Darazo (9.56%) and (9.32%) in Ningi LGAs believed that the policy implementation was effective.

The apparent ineffectiveness of policy implementation in Bauchi State was further supported by the fact that about 73% and 67% of SWM vehicles in the State and LGAs were broken down and off the road (Table 4). These categories of vehicles, together with the fewer vehicles 'on road', in terms of their number, were considered not adequate to serve the needs of a large population of about

1,875,876 that was distributed across a vast land area of about19,174 Km². In general, the inadequacy of equipment for SWM appeared not suitable and capable for effective waste management policy implementation.

In consideration of the above findings, it may be deduced that the tangible manifestations of waste management policy which may be regarded as policy output of governments at the state and Local Government levels were not the same in all LGAs. This resulted to the prevalence of unequal achievements of waste management goals in Bauchi State. On the ultimate, if all sectors will effectively and efficiently discharge their responsibilities as provided by the policy guidelines, Bauchi State could be considered to have maintained successful SWM methods, thereby safeguarding public health and welfare. However there seem to be unequal status of policy implementation in the State. The nature of this inequality portrayed that relatively urbanized/developed LGAs were receiving higher BASEPA's attention in waste management policy implementation. This advantage makes it possible for these LGAs to be better in terms of aesthetic and environmental cleanliness.

Table 4: Number of Vehicles for SWM by LGA in Bauchi State

LGA	Population	Area (Km²)	BASEPA			LGHD		
			On Road	Off Road	Total	On Road	Off Road	Total
Alkaleri	329,424	5,918	0	0	0	1	1	2
Bauchi	493,810	3,687	4	8	12	0	0	0
Darazo	251,597	3,015	0	0	0	0	1	1
Ningi	387,192	4,625	0	0	0	0	0	0
Jama'are	117,883	493	0	3	3	2	3	5
Katagum	295,970	1,436	0	0	0	0	1	1
Total	1,875,876	19,174	4	11	15	3	6	9
Percentage (%)			26.67	73.33	100	33.33	66.67	100

Source field work 2016

To realized equal achievements of waste management goals, effective SWM required the definition of clear roles and legal responsibilities of institutions and government bodies to avoid controversies, ineffectiveness, inaction, and making SWM systems politically unstable. In consequence, even when regulatory and legislative frameworks exist, governments with weak institutional structures are easily overwhelmed by increasing demands for SWM as urban populations explode (Marshall and Farahbakhsh, 2013).

Conclusion

Policy provisions were uniformly implemented by government agencies in all the LGAs of the State. This resulted to the prevalence of equal achievements of waste management goals in Bauchi State. The nature of this inequality portrayed that relatively developed/urbanized places were the areas receiving higher Government's attention. Such advantages made the developed areas (Bauchi, Ningi and Katagum) to be better in terms of aesthetics and environmental cleanliness (20 - 26% effectiveness) as compared to the developing towns which comprises Jama'are, Alkaleri and Darazo (9.32 - 9.67% effectiveness). Inadequacy/unavailability of equipment/facilities for effective and efficient waste management policy implementation were termed as the major causes of unequal policy implementation by the governments' agencies. The apparent ineffectiveness of policy implementation in Bauchi State was further supported by the fact that about 73% and 67% of SWM vehicles in the State and LGAs were broken down and off the road. These appeared not suitable and capable for effective waste management, hence the prevalence of poor SWM problems in the State.

Recommendations

In consideration of the findings of this work, the following recommendations were hereby offered, with the view of providing a means of achieving successful SWM policy implementation Bauchi State.

1. Success of a policy often depends on the behaviour of the administrative organizations charged with its implementation. Therefore, LGAs without BASEPA should be provided with such agencies. These if actualized, will enhance balancing unequal governments' implementation status and realisation of successful SWM policy implementation across the state.

2. Public health education programs on the effects of poor SWM on the environment should be organized by the State and Local Governments. The public should be encouraged to establish community self - help groups, so as to help in environmental sanitation in their individual neighbourhood. This will essentially reduce public level of ignorance on wastes and its implications, hence the appreciation of environmental quality in terms of cleanliness.

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