ASSESSMENT OF THE STATE OF SOLID WASTE MANAGEMENT IN LAFIA TOWN, NASARAWA STATE, NIGERIA

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Abstract

The improper management of solid waste is one of the challenging environmental problems facing urban centres worldwide, particularly in developing countries. Little attention is given to waste management practices. This is why it is common to see heaps of waste in littering the streets, dumped indiscriminately in drainages, vacant plots and open spaces especially in the urban areas of the developing world. Despite the establishment of Nasarawa Urban Development Board as a waste management agency, the problem of solid waste management in Lafia town remains intractable. The study examined the current state of waste management being employed by Nasarawa Urban Development Board in Lafia town, Nasarawa state. The study population was contacted through stratified systematic sampling technique. Data for this 'study were generated through questionnaires, in depth interviews, direct and personal observation. The data generated from the questionnaires were subjected to descriptive analysis using frequencies and percentages. The study revealed that majority (58.5%) of the respondents were not provided with waste collection facilities by Nasarawa Urban Development Board and so disposed their wastes indiscriminately. Majority (65.5%) of the respondents knew nothing about procurement of dustbins, dumpsites and the agency of government that is responsible for refuse/ waste management in, the study area. The agency responsible for waste management in the study area (NUDB) were faced with numerous challenges militating against effective and efficient performance. These challenges were lack of political will, paucity of fund or poor funding, shortage of man power, shortage of functional vehicles (trucks) etc. The study recommended that public awareness or education should be

carried out by Nasarawa Urban Development Board in collaboration with the National Orientation Agency and the mass media on waste management issues. It also recommended that Nasarawa state government should support the Board financially among other needs to enable the Board perform her functions effectively and efficiently.

***Keywords**: State, Solid, Waste, Management, Pollution*

Introduction

In most developing countries, the problems associated with solid waste management are more acute than in the developed countries (Zerbock, 2003). Lack of financial resources and infrastructure to deal with solid waste creates a vicious cycle; lack of resources leads to low quality of service provision which leads to fewer people willing to pay for services, which in turn further erodes the resource base and so on (Kuniyal *et al.*, 1998; Zerbock, 2003). The problem is further complicated by the rapid growth in population and urbanization, which has influenced an increase in the volume of waste being generated and also on waste retrieval/disposal services in municipal areas. However, more often than not, an increase in population is not matched with an equal increase in service and revenue for the local municipalities for waste management (Zerbock, 2003).

Municipal solid waste management (MSWM) continues to be a major challenge for local authorities in both urban and rural areas throughout the world. This challenge is particularly important for the developing countries. The available statistics shows that, although the municipal solid waste generation in the developing countries is still low per-capita compared to that in the developed countries, the developing countries account for more disproportionately high share of the world's solid waste generation relative to their share of world's income (Afroz *et al.*, 2009). Moreover, from a dynamic point of view, the municipal solid waste management in developing countries is predicted to face a great challenge in the future owing to their rapid urbanization and economic growth. Empirical analyses using macroeconomic data indicates that the per capita generation of solid waste is at least 0.3-0.4 kilograms per day even for the poorest people. In general, a one percent increase in population is associated with a 1.04 percent increase in solid waste generation, and a one percent

increase in per capita income is associated with a 0.34 percent increase in total solid waste generation (Afroz *et al.,* 2009).Irrespective of the fact that most of the developing countries are still in the early stage of their urbanization and economic development, it is generally expected that the challenges of solid waste generation and management could be avoidable in such countries considering that most cities in developing countries spends significant portions of their municipal revenue on waste management (Osumanu, 2007; Thomas-Hope, 1998; Schubeler, 1996 and Bartone,
2000; Zhuang *et al.,* 2008), but they are often unable to keep pace with the scope of the problem. Senkoro (2003) indicated that for many African countries, only less than 30% of the urban population has access to proper and regular garbage removal (Altaf and Deshazo, 1996). The current practice of collecting, processing and disposing municipal solid wastes is also considered to be least efficient in the developing countries. The typical problems are —low collection coverage and irregular collection services, crude open dumping and burning without air and inefficient water pollution control, the breading of flies and vermin, and the mishandling and uncontrolled informal waste picking or scavenging activities (Bartone, 1995). Poor solid waste management in the developing countries is a major threat to public health and environmental quality, and reduces the quality of life, particularly for the poorer residents in both urban and rural areas. One of the principal reasons for the inefficient SWM systems in the developing countries is said to be based on their financial misappropriation, mismanagement and constraint, as SWM is given low priority in the developing countries budget, except in few large cities like Johannesburg, Abuja, Soweto, Pretoria, Tunis, Cairo and Accra.

Most Nigerian cities are faced with the environmental problems of coping with solid waste collection and disposal. This is with particular reference to those cities that have now become state capitals as well as the recently emerging urban centres and local government headquarters throughout the country. The cities have continued to expand in population and size since the 1970's, with the attendant need for similar expansion in infrastructural facilities that are required to sustain the growing economy and for social services.

In Nigeria, solid waste problem started with the rapid increase in urban growth resulting partly from the increase in population and more importantly with the increase in its immigration status (Egunjobi, 1996), no town in Nigeria can

boast of haven found a lasting solution to the problem of filthy and huge piles of solid waste, rather the problem continues to assume monstrous dimensions (Okpala, 2002). To urban dwellers, public hygiene starts and ends in their immediate surrounding and indeed the city would take care of itself. The situation has so deteriorated that today the problem of solid waste has become one of the nation's most serious environmental problems.

The accelerated rate of urbanization, now a common feature in most Nigeria cities, have created serious environmental problems, notable among which is the disposal of solid waste (Akinola, 1978). According to Mabogunje (1974), the rate at which our environment is being polluted by solid waste is alarming. As observed by Audu (1994), the greater problem however, has been the increasing gap between the waste generated and the rate at which it is evacuated and managed.

A conspicuous result of this negative gap is the heaps of refuse and garbage commonly found in our state capitals and other urban areas. These form part of the urbanization process that has gone wrong. Thus, solid waste problem has today become about the most serious environmental problem facing the country with its consequent effects on the quality of the environment (Babalola *et al.*, 2010; Wilson *et al.,* 2009). Therefore, the primary objective of solid waste management is to dispose off refuse in a hygienic and sustainable manner, at the barest practicable cost. A visit to any Nigerian city will show a prevalence of uncontrolled heaps of refuse in open spaces, streams channels, drainages, roadsides and market places (Onibokun *et al.,* 1986).

Waste management in Lafia city is becoming an increasing problem daily and a complex task. The Nasarawa State Urban Development Borad was established to develop and implement policies on the management of solid and liquid wastes that would promote the health and well-being of the people. To this end, NUDB has the responsibility to ensure effective and efficient collection, removal, treatment and disposal of all kinds of wastes. It also has a mandate to check the illegal dumping of refuse at roadsides, enclosures, streams in neighbourhoods and in drains. The agency is further empowered to prosecute defaulters of sanitation laws, while providing waste management facilities. The state's sanitation laws compel residents to cooperate with NUDB in efforts to keep the environment clean. This they are required to do by cleaning up their

environment, bagging wastes and disposing them at nearby designated dump-sites.

In Lafia, human activities have generated waste in various forms in gaseous (abattoirs), liquid and solid. These wastes have often been discarded because they were all considered as negative value goods. The more prevalent method of disposal of these wastes have been to first collect them from their source and then burn them in a landfill site or throw them in the surrounding deep erosion gullies and drainages in the state capital. Steady increase of landfill site, deposition in the gullies, and waste generally has caused a lot of havoc to the potable water being extracted from downstream and ground water. In most parts of Lafia urban areas, there are no public facilities for disposing refuse within reasonable distance, dump sites or waste bins are non-existent and in locations where dumpsites are made available, they are observed to overflow with refuse within few hours of disposal due to the rate of waste generated by populace within the area constituting health hazards. However, recently solid waste vehicles are used and yet solid waste still constitute a major health hazard in Lafia Urban area. It is believed that the refuse disposal vehicles are insufficient to cover their designated areas. The areas that are more susceptible to the endemic problem are areas within the Lafia metropolis of Shabu, Tudun Gwandara, Alhamis and new market, owing to the highly populated nature of the areas.

Materials and Methods

Data Analysis

Cooper and Schindler (2014), defined data preparation or analysis as the processes that ensure the accuracy of data and their conversion from raw form into classified forms appropriate for analysis. The analysis and interpretation of data used in this study was based on the research questions and objectives of the study. As earlier pointed out, the study elicits both quantitative and qualitative data. Hence, these data were processed and analysed both quantitatively and qualitatively. In analysing the quantitative data used in the study, the researcher employed the use of Microsoft Excel, and IBM SPSS Statistical package version 26, to organize the data collected from the participants of the study via the survey questionnaires into manageable information that was understood. These data were edited by inspecting the data

pieces before coding them. The process helped in identifying those items on the survey questionnaires that were wrongly responded to, spelling mistakes, and blank spaces left by the respondents. The data was then coded to facilitate data entry into the computer to allow for statistical analysis.

The analytical method used in analysing the data was the univariate. The univariate method of analysis used was the descriptive statistics such as; frequency distribution, mean, standard deviation, coefficient of variation, and simple percentage. Qualitative data used in the study were transcribed verbatim into English, together with observational notes. Furthermore, the data were shifted and sorted. The qualitative data were analysed using content analysis

Results and Discussions

Sources of solid waste in the study area

Table 1. Sources of solid waste in the study area

Land Use	Frequency	Percentage
Residential	107	**53.5**
Commercial t	31	**15.5**
Industrial	25	**12.5**
Educational	37	**18.5**
Types of Waste	**Frequency**	Percentage
Ashes	4	**2.0**
Garbage	12	**6**
Rubbish	134	**67**
Others	50	**25**
Sources of Waste Generated	**Frequency**	Percentage
Domestic activities	71	**35.5**
Industrial activities	63	**31.5**
Commercial activities	29	**14.5**
Educational activities	37	**18.5**
Kind of Waste Storage Containers	**Frequency**	Percentage
Plastic waste bins	50	**25**
Sack/polythene	82	**41**
Drum/bucket,	29	**14.5**
Others	39	**19.5**
Refuse Disposal Methods	**Frequency**	Percentage

Open space/backyard	120	**60**
Burning of refuse	40	**20**
Burying of refuse	23	**12.5**
Dumping in drainage	17	**8.5**
Total	**200**	**100**

Source: Field Survey, 2019

Table 1. shows that more than half (53.5%) of the areas where the research was conducted were residential houses for commercial purposes, 31 respondents representing 15.5% of the total sample population, 25 respondents representing 12.5% were for industrial purposes while 37% representing 18.5% were for educational purposes. The types of waste generated in the area, ashes (2%), garbage (6%), rubbish (67%), while other waste *such as agricultural, demolition or construction wastes, hospital wastes, constitute 25% (Table 1.)

Substantial proportion of the wastes generated were from domestic activities (35.5%). This high percentage further agrees with the findings that most areas were for residential purposes as indicted in Table 4.2. About 31.5% of respondents generated wastes from industrial activities, 14.5% generated from commercial activities, while 18.5% of the total sample population reported that it was generated from educational activities. The findings of this study agrees with work of Arzumanyan (2004)

Table 1 also shows that more than fourth to firths (41%) of the respondents used sack/ polythene as their waste storage containers, 25% were using plastic containers, 14.5% used drum/ bucket as their waste storage containers, while 19.5% were using other storage containers such as cartons which they improvised. This could be attributed to the fact that the activities of NUDB is more pronounced at the city centres such as Akwanga, Shendam and Makurdi roads, all in Lafia where some of their metal waste bins are found. Other parts of Lafia such as the interior parts or out skirts of Lafia town were neglected in terms of wastes evacuation by NUDB. These findings of this study agree with the work of Oguntoyinbo, (2012); Oumarou, Dauda, Abdulrahim, and Abubakar (2012); Wilson, Ezeah, Fazakerly, and Roberts (2013); Konya, Zitte and Ugwulor (2013).

Plate 1: Waste bin provided by NUDB sanitation unit overflown with solid wastes along Shendam road, Lafia awaiting evacuation.
Source: Field Survey, 2019.

Three to fifth (60%) of the respondents reported that most wastes were disposed openly (open space/backyards). 20% disposed their wastes by burning, 12.5% disposed their wastes by burying, while 8.5% disposed their wastes through other means that could be described as indiscriminate dumping. This is because they dumped their wastes in drainages, unauthorized locations (sites) such as side and on the roads, and uncompleted buildings within their area. The indiscriminate dumping of refuse to buttress the study position that enough waste bins were not provided at specific points/ locations by the agency. Also, the inability of the Board to involve the public in their activities through

enlightenment campaigns on proper methods of wastes disposal. This is consistent with the work of Ngumah, Ogbulie, Orji, and Amadi, (2013).

Plate 2: The implications of these practices are environmental pollution (air, water and land), which are detrimental to public health, blockage of drainages that can cause erosion and flooding

Reasons of indiscriminate dumping of refuse in the study area

Table 2: Reasons for indiscriminate dumping of refuse:

Variables	Frequency	Percentage
Inadequate waste collection facilities	117	**58.5**
Lack of enforcement of environmental and sanitation laws	18	**9**
Absence of timely information on sustainable disposal options	14	**7**

Distance to dump site	51	**25.5**
Total	**200**	**100**

Source: Field Survey, 2019

Respondents were asked to indicate reasons for the indiscriminate dumping of refuse (Table 2.) slightly more than half (58.5%) of the respondents were of the view that the main reason for indiscriminate dumping of refuse (waste) in their area was the inadequate or lack of waste collection facilities that were not provided by government. Only 9% of the total sample population reported lack of enforcement of environmental and sanitation laws, 7% attributed it to absence of timely information on sustainable disposal options, 25.5% attributed it to distance to dump sites from their houses which was far. The reasons given by the respondents again affirmed that enough waste bins were not provided by the Board at specific locations as well as ineffectiveness and lack of creation of awareness campaign against the indiscriminate dumping of solid wastes in collaboration with other agencies such as the National Orientation Agency (NOA), the mass media (both printed and electronic media). The findings of this study agrees with work of Umaru (2010).

Conclusion

Waste management practiced in Lafia town was unsatisfactory and NUDB has not completely met its stated goal and objectives in providing services to the residents of Lafia town. This was as a result of some challenges militating against their effective and efficient performance in solid waste management. The methods, mode of waste collection and manpower responsible for evacuation of waste in the town have not performed optimally due to some factors militating against their effective and efficient performance. The agency responsible for the management of waste has been deteriorating in the discharge of their duties especially in terms of public awareness and involvement in waste management programs. Therefore, good strategies/measures need to be employed to salvage the situation.

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