

Solid Waste Management in Obantoko Area of Abeokuta, Nigeria

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Abstract

The problems associated with Municipal Solid Waste Management in developing countries, like Nigeria, have become pronounced in recent years as a result of urbanization and inadequate disposal of waste. This paper examines the current method of waste disposal in Obantoko area of Abeokuta, Ogun State, attempts to discover the most viable option of solid waste disposal in the study area and recommend ways of improving its operation. Data for this study were collected by questionnaire administration, personal observations, field trips and interviews. 57.9% of the respondents in this practice open dumping, 32.9% burn their wastes while 9.2% dump their wastes in drainages and water bodies. The study reveals that the use of open dumps is the most feasible option of solid waste disposal in the study area. However, the open dumps studied are poorly managed and there is a need to upgrade them to semi controlled landfills in order to prevent road accidents and reduce infiltration of leachate and eventual contamination of ground water. Open dumping will continue to be the most widely adopted method of disposing waste by most towns in Nigeria due to their inability to construct engineered landfills. It is therefore important to ensure that the open dumps are improved upon; they should be properly monitored so that they do not become environmental hazards.

Keywords: solid waste, disposal, open dumps, semi controlled landfill, Nigeria

INTRODUCTION

Waste is indissoluble from man, for as long as man lives, he will generate waste. Solid waste is any material, which is not in liquid form, and has no value to the person who is responsible for it (Zurbrugg, 2003). In other words, Babatola (2008) described waste as any material lacking direct value to the user and so must be disposed of. According to Allende (2009), waste was an early problem of mankind, and a growing one that is of major concern to every nation of the world. Municipal Solid Waste (MSW) management is one of the major problems facing city planners all over the world. The problem is especially severe in most developing-country cities where increased urbanization, poor planning, and lack of adequate resources contribute to the poor state of municipal solid waste management (Obirih-Opareh and Post, 2002). The four most common methods of MSW management are landfilling, incineration, composting and anaerobic digestion. Incineration, composting and anaerobic digestion are volume reducing technologies; ultimately, residues from these methods must be landfilled (Seo *et al.*, 2004). MSW management constitutes one of the most crucial health and environmental problems facing governments of African cities. MSW disposal is a huge task in most developing countries across the globe, as poverty, rapid population growth and high urbanization rates combined with an under-funded government prevents efficient management of wastes. According to Abdulahi (2009), the rate of generation of solid waste in our society is increasing with increase in population, technological development

and change in our lifestyle. Although cities in Africa use 20-50 percent of their budget in solid waste management, only 20-80 percent of the waste is collected.

Solid waste collection and disposal are among the most serious threats to waste management in most cities (Donevska *et al.*, 2006). The uncollected or illegally dumped wastes constitute a disaster for human health and lead to environmental degradation (Achankeng, 2003). Uncollected waste is illegally dumped in open spaces, water bodies, storm-drainage channels, buried, burnt or deposited along the streets or roadsides. The prevalence of tetanus, malaria, cholera, and diarrhea so common in many African can be linked to unsanitary conditions caused by waste being simply scattered around (McMichael, 2000). Cases of several diseases have been recorded as a result of contact with smokes from burning of solid wastes and gaseous emission from dumpsites (Oyelola *et al.*, 2009). Blocked drainage channels as a result of improper dumping of refuse can cause flooding. Folorunso and Awosika (2001) linked flooding in Lagos State, Nigeria to clogging of drainage channels by dumped solid wastes. Solid waste management has become a serious problem in Nigerian cities (Akinola and Salami, 2001). 87% of Nigerians use unsanitary methods of solid waste disposal which constitute nuisance, ugly sight, produce unpleasant odour, and create a breeding ground for pests and diseases. In Nigeria, the common method of disposal is open dump (Onwughara *et al.*, 2010).

Indiscriminate solid waste disposal is actually a menace and embarrassment to the nation where heaps of refuse litter most parts of the city (Isu, 2005). Considerable percentage of urban waste in developing countries is deposited either on the roads, or road sides, unapproved dump sites, in water ways drainage system, or in open sites which adversely affect environmental friendliness (Kalu *et al.*, 2009). Open dumps are the preferred method of disposing of solid waste as an alternative of landfills in most African countries (Remigios, 2010). In Nigeria most landfills are open dumps. They are usually not provided with liners, fences, compactors or soil cover. In open dumps refuse is simply dumped in low lying areas on open land. Open dumps are characterized by an absence of engineered measures, no leachate management or consideration of landfill gas management, and few if any operational measures, such as registration of users, control of the number of tipping fronts, or compaction of waste (Zerbock, 2003). Vulnerability of pollution of surface and groundwater is high because local authorities rarely consider environmental impact in siting solid waste disposal sites. Indiscriminate dumping of household solid wastes on our streets, rivers and drainages has contributed in no small measure to drainage blockage, flooded road and the spread of offensive odours and diseases (Momoh and Oladebeye, 2010) and also poses environmental threats on nearby properties.

There are various problems facing Obantoko area of Abeokuta in South Western Nigeria. Among these numerous problems are inadequate water supply, bad road network and poor waste management. The most prominent among them that needs urgent attention is that of waste management. This paper attempts to discover the most viable option of solid waste disposal in the study area and recommend ways of improving its operation. Findings of this study will also help in suggesting alternative methods of solid waste management in the study area and Nigeria at large.

The objectives of this paper are to:

- (i) identify the methods of solid waste disposal in the study area;
- (ii) identify the environmental problems associated with indiscriminate solid waste disposal in the study area;
- (iii) suggest methods of improving the current method of disposing waste in the study area; and
- (iv) suggest other feasible methods of managing solid waste in the study area.

This study is limited to the evaluation of the methods of waste disposal practiced by residents of the study area; the effect of improper waste disposal on the quality of ground water in the study area is not

studied. Regular examination of the quality of ground water in the study area is recommended in order to ascertain the possibility of groundwater contamination through the infiltration of leachate

METHODOLOGY

Case Study Area

The study was carried out in Obantoko area of Abeokuta in Ogun State, Nigeria. Obantoko falls within two local governments – Odeda and Abeokuta South. It is bordered by Fajol at one end and Odoeran at the other. Other areas in Obantoko include Alogi and Somorin. The population of the study area could not be determined at the time of carrying out this study but Obantoko has a high concentration of people due to rapid urbanization as a result of two Federal institutions of higher learning located close by – The Federal College of Education, Osiele and the University of Agriculture, Abeokuta. Solid waste generation in Abeokuta is put at 0.60Kg/person/day (Adewumi *et al.*, 2005).

Mode of Data Collection

Data for this study were collected by

- i. personal observations, field trip and interviews
- ii. Questionnaire administration.

A total of 7 waste dumpsites were visited in the study area. 2 were located along the Abeokuta- Ibadan express way while the remaining 5 were within streets in Obantoko. A total of 76 questionnaires were distributed and retrieved. The questionnaires contained questions on demographical characteristics of the respondents and also on waste management issues such as types of waste generated, method of waste disposal and public awareness of waste recycling and reuse

RESULTS AND DISCUSSION

Demographic Characteristic of the respondents

A total of 76 questionnaires were administered in May, 2011. Out of the 76 respondents, 46 were females while 30 were males. 8 of the respondents were between 12 and 18 years of age, 55 were between 18 and 50 years while 13 were above 40 years. The results show that majority of the respondents are youths between the ages of 18 and 40. On the occupation of the respondents, 12 were students of secondary and tertiary institutions, 36 had low income jobs such as tailoring, hairdressing and petty trading, 22 had medium to high income jobs. This includes teachers of primary and secondary school, lecturers of tertiary institutions and other civil servants. Only 5 out of the respondents were unemployed. This shows that the study area is rapidly undergoing urbanization as a result of the diversity in the occupation of the respondents.

Waste Disposal Methods and Prospect of Waste Recycling

On issues relating to waste disposal, out of the 76 questionnaire administered, 44 of the respondents claimed that they dispose their waste in open dump sites, 25 of the respondents practice open burning of waste while the remaining 7 dump their waste in drainages and open water bodies especially during the raining season. The results are presented in Table 1 and a graphical illustration of the results is given in Figure 1. The result shows that majority of the respondents dump their refuse in open dumps. On distance to waste disposal sites, 11 of the 44 respondents that dump their refuse in dump sites claim that their dumpsites are within a distance of 200m to their residences, 28 claim that the distance between their dumpsite and their residences are between 200m and 1000m while only 5 have their dumpsites located at distances greater than 1000m to their residences. Further clarification of the results are given in Table 2 and Figure 2. The results show that the dumpsites are accessible.

On recycling and reuse of waste, 11 out of the respondents segregate their waste at the source and reuse them. The remaining 65 practice no form of recycling. The waste that are recycled by the respondents are mainly plastics, papers and textiles. The results show that majority of the respondents are oblivious of the fact that recycling of waste is a viable option in solid waste management

Table1: Method of waste disposal practiced

Method of waste disposal	Frequency	%
Open dump site	44	57.9
Open burning of Waste	25	32.9
Dumping in drainages and water bodies	7	9.2
Total	76	100

Table 2: Distance of dumpsites to respondents residences

Distance of dumpsites to respondents residences	Frequency	%
Less than 200m	11	25
200 – 1000m	28	63.6
Greater than 1000m	5	11.4
Total	44	100

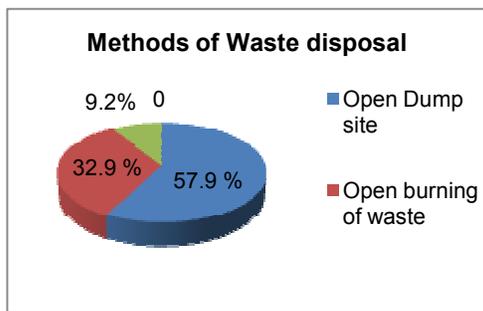


Figure 1: Graphical illustration of methods of waste disposal

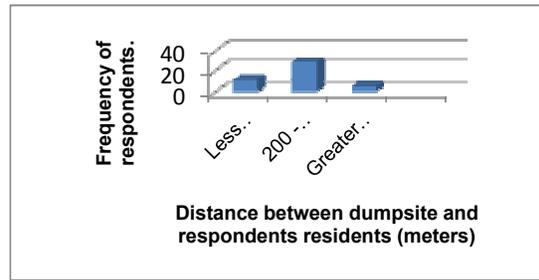


Figure 2: Graphical illustration of methods of waste disposal

Personal Observation of the Disposal Sites

The disposal sites studied were commonly used for the disposal of domestic non hazardous waste mainly kitchen waste from residential locations and wastes arising from market and office activities, including paper, textiles, leaves, food, plastics, rubbers, metals, glass, grits, wood and tyres. Plate 1 shows some of the waste deposited on a dumpsite in the study area. One of the dumpsites visited was located very close to an electric pole (see Plate 2). Indiscriminate burning of waste in such a site, which is a common practice in most of the dumpsites visited, could lead to electric fire explosion. Plate 3 shows one of the dumpsites observed located close to an highway, to achieve proper selection of waste disposal sites road map should be buffered at a distance of 100m to ensure sites are not located close to roads. A risk posed by inappropriate disposal of waste in open dumps, along highways is that of accidents caused by reduced visibility from the smoke of burning refuse; or caused by collisions with birds and other animals commonly found in such places (Jaramillo, 2003). Plate 4 shows a dumpsite in the study area affected by rainfall. This may lead to water pollution as a result of infiltration of the leachate produced by the decomposition of solid wastes in the open dump. This anticipated pollution of groundwater calls for attention since this is the only source of water for majority of the inhabitants in the study area. If not properly addressed, polluted ground water sources may adversely public health and lead to disease outbreak

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Plate 1: A dumpsite showing a variety of solid waste Source: Field trip (2011). Picture taken by the author.



Plate 2: A dumpsite located close to an electric pole.
Source: Field trip (2011). Picture taken by the author



Plate 3: A dumpsite in the study area, located close to the Abeokuta-Ibadan express way
Source: Field trip (2011). Picture taken by the author.



Plate 4: A dumpsite in the study area affected by rainfall.
Source: Field trip (2011). Picture taken by the author

CONCLUSIONS AND RECOMMENDATIONS

The use of open dumps remains the most feasible option of solid waste disposal in the study area due to its ease of operation. It is the simplest, cheapest and most cost-effective method of disposing of waste for inhabitants of the study area. However, there is an urgent need to improve the open dumping system. It may be necessary to upgrade it to semi controlled landfill; the base should be compacted, to reduce infiltration of leachate to ground water. The waste should also be covered with soil on a regular basis to prevent disease vectors, such as flies, from getting to

the waste. This also will reduce the amount of odour that is released from the dumpsites. The dumps should be fenced off in order to prevent animals and scavengers from getting into the site. The study revealed that there is poor awareness on the health risks and environmental effects associated with poor waste management practices such as dumping of refuse on open dump sites, drains and water channels and burning of refuse in open places. The population needs to be reminded time and again of the importance of environmental awareness and the health risks associated with poor waste management practices.

From this study, the following recommendations have been drawn:

- i. the generation of waste should be avoided where practicable and economically feasible;
- ii. waste generation should be reduced to a minimum where it is not possible to completely avoid it;
- iii. where practicable, waste recovery, reprocessing, reuse and recycling should be encouraged. Residents in municipal areas should be educated on the need to segregate waste in order to assist in the recycling process; and
- iv. the open dumps in the study area should be upgraded to semi-landfills in order to prevent infiltration of leachate and contamination of ground water.

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