

ANALYSIS OF SOLID WASTE MANAGEMENT IN NIGERIAN CITIES: LAGOS AND ADO-EKITI AS CASE STUDY

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ABSTRACT

The paper focuses on solid waste management in Nigerian cities with particular attention to Lagos and Ado-Ekiti cities. It has critically examined the waste storage methods, frequency of wastes collection and waste disposal methods in both cities. Research findings show that solid waste collection and disposal should be on daily basis in the highly commercialized cities, while in the less commercialized cities, solid waste collection and disposal can be carried out on weekly basis. The waste disposal methods such as open dumps, emptying waste into water bodies which pose great hazard to human, animal and plant lives are commonly practiced in Nigeria, while less hazardous methods such as disposal through incineration and sanitary landfill are less employed.

Keywords: Solid Waste, Waste Management, Waste Disposal and Environmental Pollution.

1.0 INTRODUCTION

Solid waste or refuse is one of many types of wastes that must of necessity be generated as a result of daily activities in any inhabited area. The continued generation of these wastes calls for constant removal and effective management. These will prevent the environmental pollution and its accompanied health hazard usually caused by these wastes in dumping site and its neighbouring environments.

Waste management is a serious environmental problem that has been the subject of several studies, conferences, strategic meeting and debates. Its importance lies in its visibility and clear intrusion into the daily lives of people, as well as the numerous secondary effect of its neglect. This accounts for the global and national attempts to improve the management of waste.

The issue of solid waste management, especially in the residential areas could not be handled with levity for some important reasons. In the first place, the volume of waste generation from the residential area constitutes the highest in comparison with others (Afon, 2003). Secondly, it is also the most troublesome to manage since it consists of diverse range of materials (glass, metal, paper, food, nylon etc.) totally mixed together with relatively small amounts of each (Matther and Charman, 1995). Thirdly, it is the most obnoxious because it accumulates easily near communities where it may pose grave health hazards as well as becoming insulting or offensive to sight and smell (Adedibu, 1993). Fourth, the urban residential environment is not only the home of man, but also the engines of economic growth and centre for employment and opportunities. They are also areas of enormous political, social, economic and cultural importance to

the countries where they are found. Therefore, any problem that threatens the well being of man in the urban areas threatens all other spheres of life. Hence, managing effectively waste generated in the residential districts of cities should be considered as very imperative. In essence the means of evolving a sustainable urban solid waste management should be developed at all cost.

The issue of waste generation and disposal has been a matter of great concern in Nigeria of recent. As stated by Afon (2003), one of the major problems confronting medium to large urban centres in Nigeria is that of effectively managing solid waste generated by residents. Evidence of this is reflected in the presence of heaps of waste expecting evacuation in the different residential densities. Efforts have been directed at this at various levels of governance, especially at state and national levels. This situation has made it possible for governments to design programmes targeted toward effective waste disposal and management.

Various means of solving the problem were employed by various arms of government. The current effort of the waste management authorities in both Lagos and Ekiti States, Nigeria shows the importance of this subject on the agenda of the government in both states. The basic problem has been that, in spite of the efforts put in waste management; the gains appear to be incongruous with expectation forecasts. Most policies on waste management in Nigeria have in most cases been frustrated by human and material factors (Filani and Abumere, 1986).

Refuse is littered indiscriminately in the major cities in Nigeria. Refuse dumps are created at mere points that appointed, wherever the individual finds convenient. Indiscriminate dumping of refuse by people is majorly due to their low literacy level and lack of awareness concerning the importance of the effective of waste management and the quality of the environment to human health (Collins and Downes, 1977).

Egunjobi (1986), discovered in his study that 70 % of residents in Benin City, Ibadan, Lagos did not utilize officially provided and prescribed places as refuse dumping ground. Similarly, those in other cities in Nigeria choose places that they thought were convenient to dispose their waste; undeveloped and underdeveloped plots, market places, road sides, water bodies etc.

The national Environmental Sanitation Programme (ESP) introduced in Nigeria in 1985 was

not sustainable; the mode of implementation of the programme stripped it of the ingredients for sustainability. This observation was proved right when ESP was discontinued in 1999 and there was no evidence of any lost value. Even some states that tried to enforced ESP's on separate days after it has been cancelled by Federal Government later discovered the futility of their policies and method (Afon, 2003).

Lagos State Waste Disposal was established in 1978 and Board was charged with the responsibility of managing solid waste in the state. The impact of the Board was not felt much, even as the name continues to change over time. The Guardian Newspaper of Monday, October 4, 1999 reported that Lagos State Waste Management Authority (LAWMA) could not effectively cope with the disposal of solid waste generation in Lagos State. In June 2003, Lagos was described as a city of "flood and filth" (Tell, June 23, 2003).

Various studies reviewed above show that the success rate of waste management nationally and locally has been low. Secondly, the programmes for the implementation of policies has either not been well designed or have been poorly implemented. Thirdly, programme executors (government and their designated agents) have not been fully committed to the assignment adequately. And fourthly, there has been very low awareness of waste management behaviour both among the citizens and those in government. The handicap of such authorized government officials has made them unable to effect much change in behaviour.

This paper analyses solid waste management in Nigerian cities with particular attention to Lagos and Ado-Ekiti States. Solid waste storage methods, frequency of waste disposal and waste disposal methods are also critically examined.

2.0 METHODOLOGY

In making research into solid wastes management in Nigerian cities, relevant information were gathered both in Lagos and Ado-Ekiti States about waste storage methods, frequency of waste disposal and waste disposal methods. The information gathered forms the research data. The data were gathered through administration of questionnaires to the residence of those cities. In Lagos, out of 316 questionnaires that were administered, 142 were returned and the rest could not be retrieved due to misplacements. Also, in Ado-Ekiti, out of 182 questionnaires that were administered, 75 were returned and the rest could not be retrieved.

2.1 Classification of Solid Wastes:

Solid wastes can be classified into municipal wastes, industrial wastes and hazardous wastes. Municipal wastes are wastes generated from residences or activities from commercial and institution settings which include food wastes, rubbish etc. Those wastes arising from industrial activities which include rubbish, ashes, demolition and construction wastes are referred to as industrial wastes. Hazardous wastes are those wastes that posed substantial danger immediately or over a period of time to human, animal or plant live. This type of wastes is flammable, corrosive, reactive or toxic. They include radioactive substances, chemical, biological wastes, flammable and explosive wastes. The Incineration Institute of America classified solid wastes into six groups. Table 1 shows these classifications with their moisture contents and heat values.

3.0 RESULTS AND DISCUSSION

3.1 Waste Storage Methods:

The analysis is based on the four methods or types of container employed in waste storage which are common in most residential areas of Nigerian cities (Table 2). Fig. 1 shows that in Lagos, 33.8 % of respondents used carton container and 30.3 % use disposable bags as the means of storing wastes. These containers are both and cannot store much refuse. Therefore, they will demand frequent collection. While in Ado-Ekiti, as shown in Fig. 1, 46.67 % of respondents uses plastic or metal container as the most means of storing wastes. These containers can store refuse more than both cartons and disposable bags; therefore, the collection will not be as frequent as that of Lagos.

Table 1: Classification of Solid Wastes

| TYPE | GROUP | CONTENT | MOISTURE CONTENT (%) | HEAT VALUE (kJ/kg) |
|------|---------------------|---|----------------------|--------------------|
| 0 | Trash | Waste paper, cardboard and wood | 10 | 8500 |
| 1 | Rubbish | Paper, wood scraps, floor-sorcepts and foliages | 25 | 6500 |
| 2 | Refuse | An even mixture of rubbish and garbage | 50 | 4300 |
| 3 | Garbage | Animal and vegetables | 70 | 2500 |
| 4 | Pathological wastes | Animal and human remains | 85 | 1000 |
| 5 | Special wastes | Industrial gaseous and semi-liquid | 90 | 9500 |

Sources: Ashworth, 1991

Table 2: Waste Storage Methods

| Types of Container Employed in Storing Waste | No of Respondents | | Percentage of Respondents (%) | |
|--|-------------------|-----------|-------------------------------|-----------|
| | Lagos | Ado-Ekiti | Lagos | Ado-Ekiti |
| Plastic or Metal Container | 39 | 35 | 27.47 | 46.67 |
| Carton Container | 48 | 14 | 33.80 | 18.67 |
| Disposable Bags | 43 | 22 | 30.38 | 29.33 |
| Barrel | 12 | 4 | 8.45 | 5.33 |
| Total | 142 | 75 | 100.00 | 100.00 |

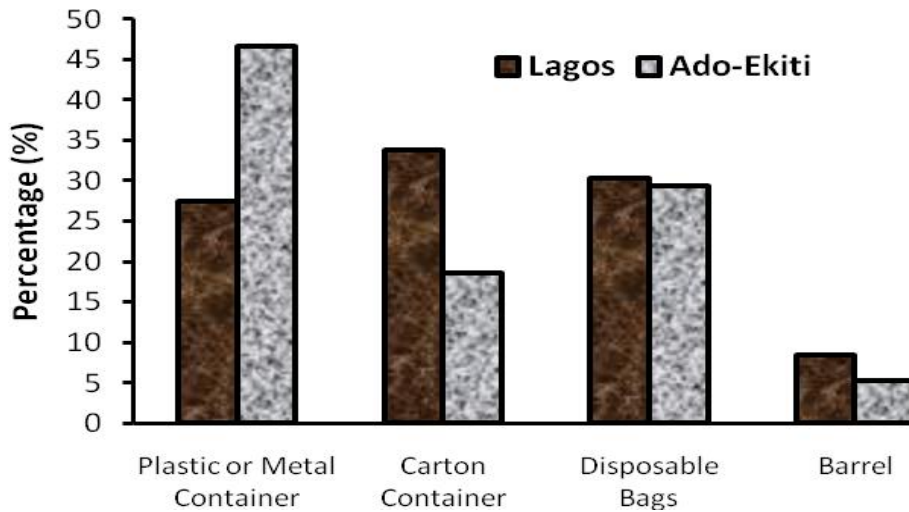


Fig. 1: Percentage Utilization of Various Waste Storage Containers

3.2 Frequency of Waste Disposal

The data collected (Table 3) shows that most stored wastes are being disposed off daily in Lagos. Percentage of respondents that disposed their wastes daily is 42.96 % while weekly and monthly are 20.42 and 7.75 %, respectively (Fig. 2). Therefore, the collection of refuse at Lagos should be on daily basis to forestall environmental pollution. On the other hand the data collected at

Ado-Ekiti shows that 42.67 % respondents disposed their refuse weekly while are 12.00 and 25.33 %, disposed their refuse daily and monthly, respectively (Fig. 2). This reveals that the rate of waste generation in Lagos is much more than that of Ado-Ekiti. Nevertheless, refuse collection should be carried out weekly or earlier at Ado-Ekiti, any delay in collection time more higher than this will result to serious environmental pollution.

Table 3: Frequency of Waste Disposal

| Frequency of Waste Disposal | No of Respondents | | Percentage of Respondents (%) | |
|-----------------------------|-------------------|-----------|-------------------------------|-----------|
| | Lagos | Ado-Ekiti | Lagos | Ado-Ekiti |
| Daily | 61 | 19 | 42.96 | 25.33 |
| Weekly | 29 | 32 | 20.42 | 42.67 |
| Monthly | 11 | 9 | 7.75 | 12.00 |
| Others | 41 | 15 | 28.87 | 20.00 |
| Total | 142 | 75 | 100.00 | 100.00 |

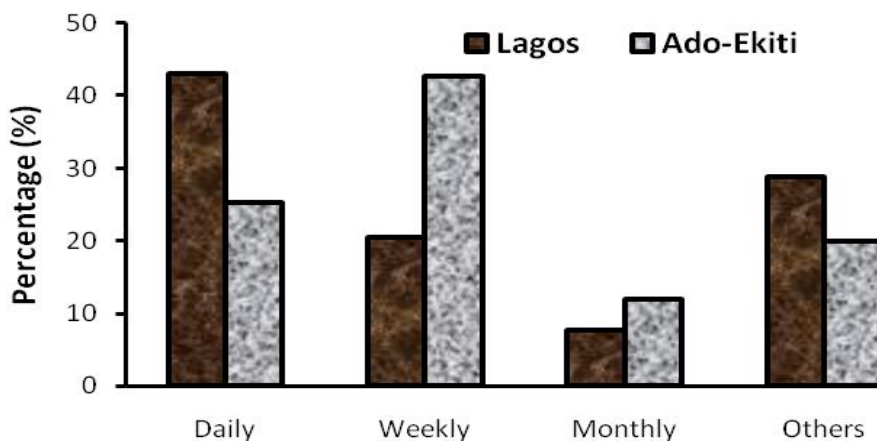


Fig. 2: Frequency of Waste Disposal

3.3 Waste Disposal Methods:

The waste disposal methods employed in most Nigerian cities are use of waste vehicle/truck, landfill, open dump, emptying into the water bodies and incineration. The questionnaire is drawn based on these methods. The data collected (Table 4) shows that both cities; Lagos and Ado-Ekiti, emptied their refuse into the water bodies and refuse dumping sites (open dump method) while disposal through incineration, which has some basic advantages, is less used. From Fig. 3, at Lagos, the percentage of people disposing their wastes through open dump method was 33.10 %, those who emptied their wastes into water bodies (streams, lakes, oceans) was 22.54 % while those who disposed their wastes through landfill and incineration were 16.20 and 7.74 %, respectively.

Similarly, from Fig. 3, at Ado-Ekiti, the percentage of people disposing their wastes through open dump method was 32.00 %, those who emptied their wastes into water bodies was 40.00 % while those who disposed their wastes through landfill and incineration were 17.33 and 6.67 %, respectively.

The ultimate aim of any solid waste disposal activity is to be sanitarily and aesthetically acceptable and economically convenient (Gilpin, 1996). Therefore, these two methods of waste disposal (open dump and emptying into water bodies) commonly employed in most Nigerian cities are both ignominious and dangerous. This is because the leachate effect (i.e. the chemical and biological contaminants in wastes) will constitute a direct risk to human health.

Table 4: Waste Disposal Methods

| Waste Disposal Methods | No of Respondents | | Percentage of Respondents (%) | |
|----------------------------|-------------------|-----------|-------------------------------|-----------|
| | Lagos | Ado-Ekiti | Lagos | Ado-Ekiti |
| Waste Vehicle/Truck | 29 | 3 | 20.42 | 4.00 |
| Landfill | 23 | 13 | 16.20 | 17.33 |
| Emptying into Water Bodies | 32 | 30 | 22.54 | 40.00 |
| Open Dump | 47 | 24 | 33.10 | 32.00 |
| Incineration | 11 | 5 | 7.74 | 6.67 |
| Total | 142 | 75 | 100.00 | 100.00 |

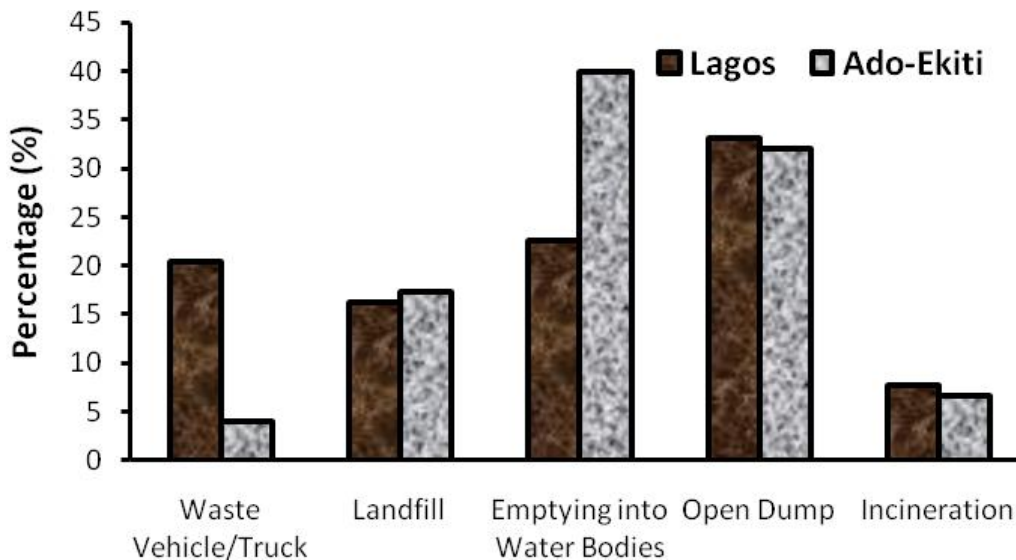


Fig. 3: Percentage Utilization of Waste Disposal Methods

4.0 CONCLUSIONS

This study has revealed the important of managing effectively waste generated in the residential areas of Nigerian cities. It also helps to know the means of evolving sustainable urban solid waste management. The findings on frequency of wastes collection and disposal show that the collection of refuse in the highly commercialized cities such as Lagos should be carried out on daily basis to forestall environmental pollution. While in the less commercialized cities such as Ado-Ekiti, the refuse collection can be on weekly basis or earlier. The waste disposal through incineration, sanitary landfill which has some basic advantages are less used in Nigeria, while open dump and emptying into water bodies (streams, lakes, oceans) are the most common methods employed. These methods and all other forms of indiscriminate dumping of wastes are regarded as environmentally unfriendly and therefore constitute threats to the health of residents either directly or indirectly.

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