

SOLID WASTE MANAGEMENT IN SOUTH WESTERN NIGERIA

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ABSTRACT: This study researches into solid waste management in South-West Nigeria in relation to pollution control using Ibadan North as a case study. The generation pattern, storage, collection and transportation, and the final disposal of solid waste in the local government are all discussed. Data used for this study were collected by the use of structured questionnaires and oral interviews. Analysis of the data revealed that all the functional elements of solid waste management system in the local government and the city of Ibadan in general as practised by existing institution – Ibadan Solid Waste Management Authority, are engulfed with fundamental problems which apparently have been the reason why institutions are unsuccessful in the efficient management of solid waste and control of environmental pollution. The various problems are identified, analyzed and discussed, pragmatic means of solving the problems, such as the encouragement of waste recycling; the active provision of adequate fund; increasing the active part of the private sector in solid waste management etc. are recommended.

INTRODUCTION

Changes throughout the urban centers in the country over the years, particularly in demographic expansion have brought about phenomenal increase in the volume and diversity of solid waste generated daily in the country. Heaps of refuse and garbage are common sight in the state capitals and urban areas of the federation. The solid wastes problem has, today, become number one serious environmental problem facing the country with its consequent effects on the pollution of water, air and land, not to mention its hazards to health and other natural resources of social and economic importance. Waste is any unavoidable material resulting from domestic activities or industrial operations for which there is no economic demand and which must be disposed of, while solid wastes are all the wastes arising from human and animal activities, that are normally solid and are discarded as useless or unwanted (Sridhar, 1999).

There are three categories of solid waste: municipal, industrial, and hazardous solid wastes. Whatever the category, it is no longer of use to the population and it has

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*International Journal of Environmental Issues Vol. 2 No.1 & 2
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no intrinsic value to the society. It is therefore discarded, and if not disposed of properly, will be a source of potential problems to the population that discarded it. However, the satisfactory disposal of solid waste requires a highly integrated and professionally operated system. Such a system will include three processes: storage, collection and disposal. The two alternatives available for final disposal of solid waste are disposal on or in the earth's mantle and disposal at the bottom of the ocean. The common methods of disposal include sanitary landfill, incineration and composting. (Beyene, 1999)

Recently, it has been observed that the efficiency of this disposal techniques soon becomes lowered because of their negative impact on the environment. Air, water and land resources are being polluted. Consequently, environmental damages in the form of ecological disturbances ultimately result in biodiversity and morbidity of population. There is the need therefore to evolve an efficient solid waste management base on the skill of engineering management taking into consideration, more importantly, environmental pollution. Ibadan north Local Government, the most populous of Local Government Areas in the city of Ibadan, the capital of Oyo State, Nigeria (fig. 1) provides a good example of a region where all the categories of solid waste are adequately represented and thus the study of its management system.

As part of the solid waste and channelization components of Oyo State Urban Development project a detailed environmental impact assessment of the projects was carried out in order to forestall any negative environmental effects and satisfy community and environmental interest (Agbede, 1996). The results showed that the soils at the dump and landfill sites are suitable for the propose solid waste management project. The limiting factors however are the shallow depth to the bed rock and to the water table (Agbede, 1996). This study presents solid wastes management as practised in Ibadan North Nigeria. The generation/storage, collection and transportation, and the disposal of solid wastes are fully examined and the various problems militating against a successful management by the Ibadan solid waste management are observed. Inferences and appropriate recommendations were made towards an effective solid waste management in the local government in particular in the city of Ibadan in general.

RESEARCH METHODOLOGY

The principal methods employed in this study are critical observation, questionnaires, and literature review. In addition, based on personal life experiences, purposely-organized field tour to major areas of focus in the city-a number of final disposal sites at the outskirts and the inner core areas of the city, including the roadsides and central depots.

For the collection of data, firstly, the entire study area was sectioned into residential, market, industries, and institutions. Secondly, the residential sample was obtained by grouping the areas into five (5) zones based on the criteria of proximity

and accessibility. The zones are Agbowo, Agodi, Bodija, Oke Itunu and Sango. Moreso, an average of twenty houses were randomly selected from each zone. Thirdly, thirty (30) traders were randomly selected, mostly, from the two major markets within the area Bodija and Sango markets. Lastly, ten (10) industries were selected at random within the area for the purpose of study.

Consequently, a structured questionnaire comprising open and close-ended questions was prepared for each section-residents, markets, and industries. In addition a questionnaire was prepared for the Ibadan solid waste management and the local government officials. The questionnaires, were prepared to obtain information about solid waste management – storage, collection, and disposal, as practised by individual household and market traders. They were also prepared to obtain information about the problems of manpower, professional competence and adequate supervisory management in ensuring prompt and efficient collection and disposal of solid waste.

RESULTS AND DISCUSSION

From the questionnaires returned it was gathered that all the elements of solid waste management are associated with one problem or another. Household refuse has food remnants as the most common waste generated (fig. 2). This is an indication that waste is notably biodegradable and would therefore pose minimal disposal problems where the consumers are adequately informed on issues relating to waste management. The non- biodegradable wastes commonly generated in the local government households are various forms of plastic wares, bags, rappers, containers etc. Most of these materials are non durable and are soon discarded and become wastes, which pose disposal challenges to households.

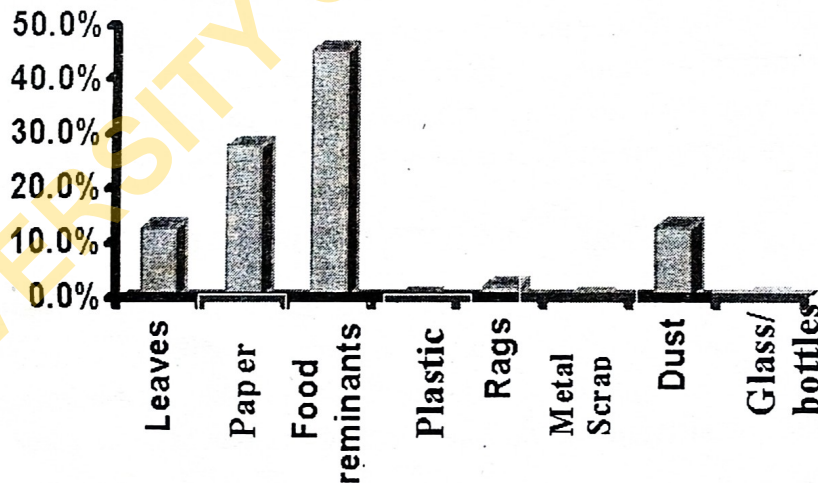


Fig. 2: Household refuse composition

Most often solid waste management fails at the proper collection system. The respondents use various non-durable containers (Plate 1). This is an indication of the absence of byelaws or regulations on the type of containers to be used for waste disposal, a situation that calls for attention. The few households that have dustbins and are serviced by refuse contractors use metal drums located by the kerbsides or within their premises as storage container.

Collection and Transportation of Solid Waste: House to house collection of refuse in Ibadan is being hampered by the low standard of urban planning. Consequently, the waste collected by this method is believed to represent about three percent (3%) of the total waste and this is mainly in well-planned area like Old Bodija by the private waste contractor. The majority of the refuse, however, was collected by the depot method. The depot is either a skip container (Plate 2) or unapproved open dump (Plate 3). According to the Ibadan Solid Waste Management Authority (IWMA) only ten approved depots are available within Ibadan North Local Government while the people, the rate of which is quite high, illegally create others.

In markets, refuse are collected at different stalls and carried to the collection depot by traders themselves. These depots are inadequately located at different positions in the markets and of inadequate size that can contain waste generated for two days at least before collection. In addition to this method of depot in the market is the collection by refuse vehicle of the IWMA that stops on the main road for traders to empty their refuse in the trunk in exchange for an amount of money relative to the size of refuse container. The transportation of refuse from premises to the depot is non-mechanical and is done mostly by children. Where private waste contractors are responsible for collection of refuse, tippers and skip-eaters hired from the IWMA are adopted for conveying refuse from the generation point to the point of disposal.

Treatment Given to Waste Prior to Disposal: Both in household and markets even including industries no effort is made at treating different types of waste differently for disposal purposes. Thus the biodegradable are left to mix up with the non-biogradable as can easily be seen on the dumpsites that the waste be sorted out and disposed according to type.

Residents need be encouraged to sort out their solid waste prior to disposal. This practice not only facilitates waste disposal but it also enhances the use of waste for various desirable purposes. Municipal solid waste, crop residues, and livestock dung are rich in organic matter and other essential nutrients such as nitrogen, phosphorus and potassium and micronutrients. Most often these wastes are normally associated with other wastes from human activities such as metals, glass, plastics and a host of human utilities. However, some of them have great recyclable values if properly collected and utilized. Once the recyclable waste are removed and made use of, the leftovers are

mostly organic in nature. They can then be converted to organic fertilizers or compost as being practised at Bodija market in Ibadan North Local Government, to process part of their waste. The project was conceived by the Sustainable Ibadan Project and funded by the Oyo State Government (Sridhar, 1999)

Disposal of Solid Wastes: Effective refuse disposal in private premises requires the committed involvement of every family member. The result of analysis revealed that over 70% of parents and adults devolve disposal of refuse to their children or young ones. The consequence of this is that the kids dispose their receptacles on the surrounding of the high depot container. For final disposal sanitary landfill, compost, and incineration are the most variable methods. In some significant parts of the study area, open burning of refuse occurs at every depot even at times inside the skip container. The environmentally acceptable and scientifically approved method of solid waste disposal in Oyo State and Nigeria is sanitary landfill. However, the method of ultimate waste disposal observed all over Nigeria is open dumping of refuse instead of sanitary landfill method. An open dumpsite is a place where solid wastes are disposed of or dumped on land with little regard for public health and landscape aesthetics. Ibadan Solid Waste Management Authority is managing three of such sites. The disposal sites are located at Aba Eku along Akanran road, Lapite along Oyo road, Awotan along Akufo road and Ajakanga along Odo-Ona Elewe road all in the city of Ibadan. Also the University of Ibadan disposes on a dumpsite situated at Ajibode.

Refuse vehicles of the IWMA (Plate 5) and that of private waste contractors dump the refuse on these sites with essentially no earth cover but sporadic burning being the normal occurrence. Ibadan Solid Waste Management Authority, the only institution responsible for the management of solid waste in the entire city of Ibadan, has so far not been successful in getting the city of Ibadan rid of solid waste consequence of a number of problems militating against the smooth operations of the institution. Among the numerous problems are political interference, technical and labour limitations and inadequate finance. Only 12.5% of the annual financial requirement is made available to the waste organization (Agbola, 1996). Lastly, a major operational problem in the management of waste in Ibadan is the issue of vehicle and road networks. Obviously, the narrow and winding nature of roads in the core areas of the town is a major problem. Consequently, the frequency of refuse collection by private waste contractors reduces from fortnightly to monthly. This is not desirable as frequency of refuse collection ensures a sanitary environment.

CONCLUSION

An environment with a high standard of sanitation, that is both clean and beautiful, has a great influence on our psychological, emotional and social well being. It enhances public health and our quality of living. Therefore, to ensure a healthy environment, solid wastes need to be properly managed to control or limit pollution. A major step towards controlling pollution and effective solid waste management is to raise public awareness not only on the importance of creating healthy environment but also on the mechanisms of controlling generation of waste at the source, alternative disposal and share of responsibilities between the non-governmental and governmental institutions.

In addition, there is the need to minimize the production of solid waste by encouraging manufacturers to make use of reusable containers for packaging of consumable goods. Also promoting of waste sorting at individual level and reduce generation rate by providing separate containers for sorting recyclable and non-recyclable wastes, are parts of solution to the persistent solid waste and pollution problems.

Finally, by increasing the active participation of the private sector in solid waste management and by providing legal procedures which impose user-charges on sources and restrictions on disposing waste in an unauthorized spaces, the acute problem of solid waste management in the city of Ibadan, the capital of Oyo State, will become a thing of the past

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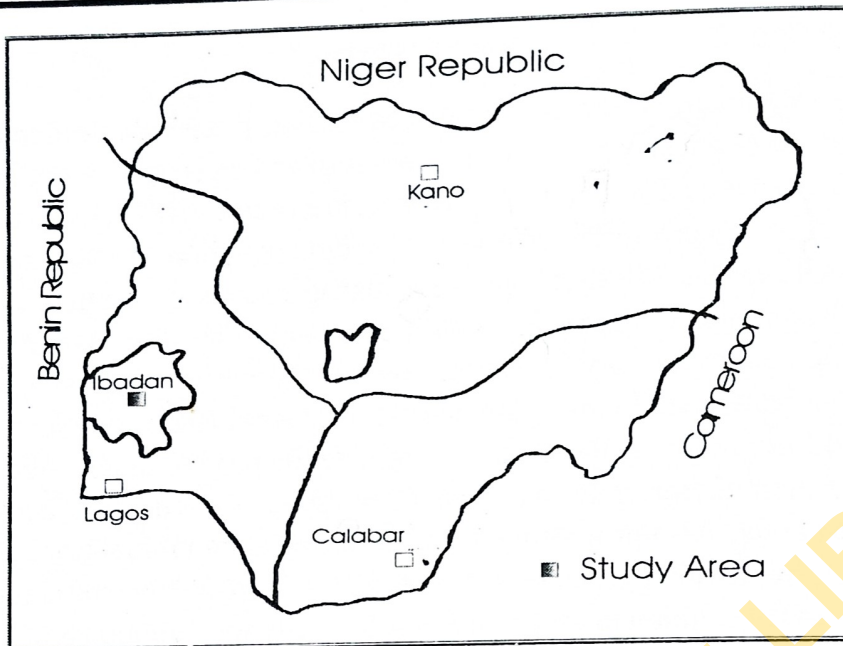


Fig. 1: Map of Nigeria showing the Study Area

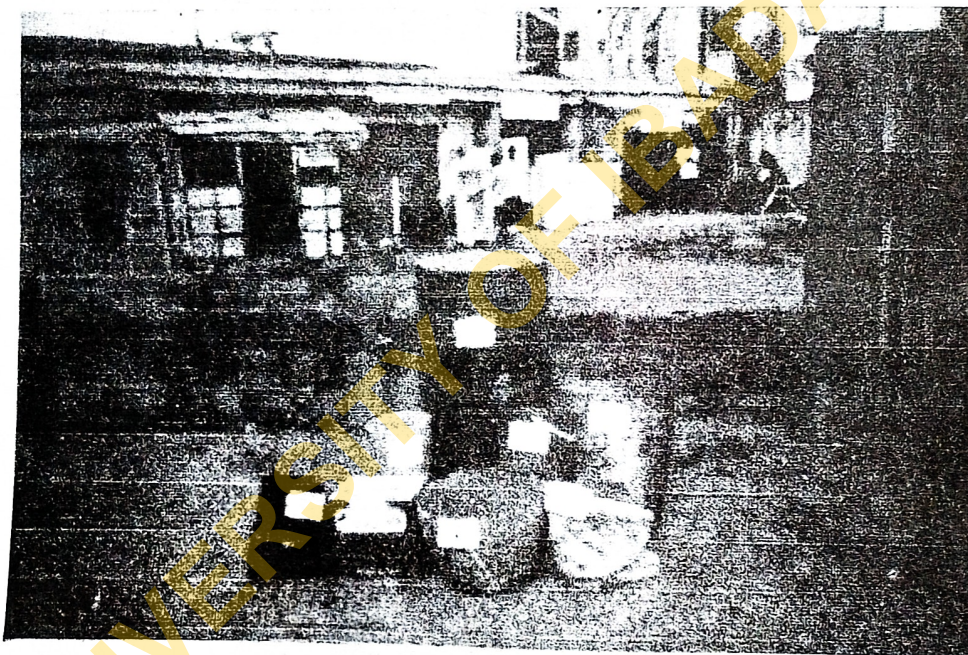


Plate 1: Types of Storage Container

1. Drum
2. Metal bin
3. Carton
4. Plastic
5. Basket
6. Sack
7. Polythene bag
8. Plastic bucket

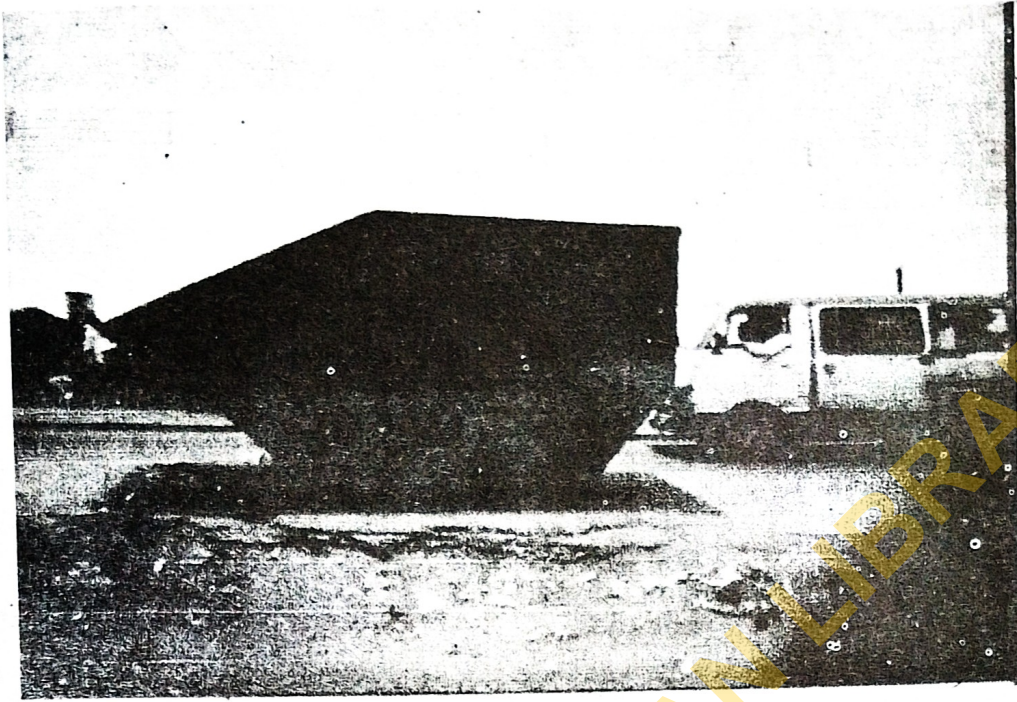


Plate 2: Skip Containers



Plate 3: Unapproved Open Dump Site at Sanngo

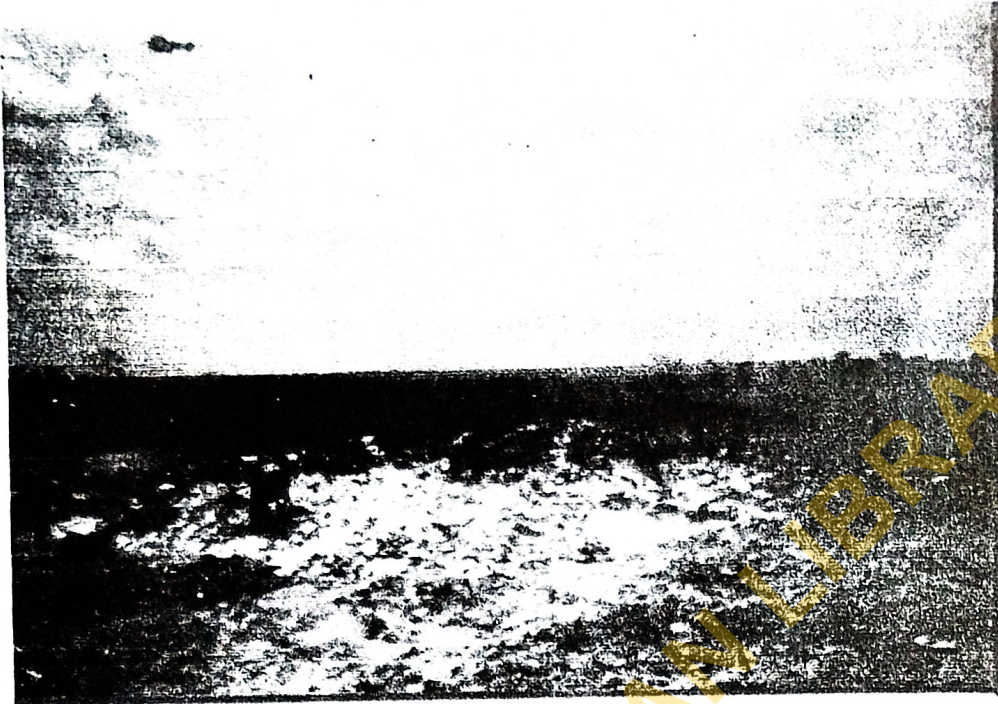


Plate 4: Unsorted Waste at Aba-Eku Site



Plate 5: IWMA Skip-eater

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