ENHANCING WASTE DISPOSAL IN ONDO TOWN THROUGH PUBLIC ENLIGHTENMENT

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Abstract

The disposal of waste is a major environmental problem affecting the quality of the environment. Waste disposal is an organized effort carried out by communities and governments to maintain sanity and a conducive environment. At the core of the problems of waste disposal is the absence of adequate policies, enabling legislation and enlightened public. Public enlightenment programs lack the needed coverage, intensity and continuity to correct the apathetic attitude towards the environment. On the basis of this, the study discussed the various methods of waste generation and means of disposal in Ondo town like open dumping, use of incinerators etc. It also examines public enlightenment as a major way of enhancing waste disposal in our environment.

Awake (1990) defined waste as any material that is not valued or productive like metal scraps, plastics, broken bottles, paper, garden waste, wood, oil lead, acid, batteries, gasses etc.

It has also been defined as something that is not or no longer useful and is to be thrown away or disposed of. Also, it is any material lacking direct value to the producer and so, must be disposed (Ita, 2000). It is any substance or article which requires to be disposed of as being broken, worn out, contaminated or otherwise spoiled (Environmental Protection Agency, 1990).

The percentage of Nigeria's population living in cities and urban areas is more than doubled in the last 15 years. The cities and urban areas experience continuous growth which contributes to enormous generation of solid and liquid wastes. Also, the generation and disposal of waste is an intrinsic part of any developing or industrial society and waste both from domestic and commercial sources have grown significantly in Nigeria over the past decade.

The management of waste is a matter of national and international concern in the sense that the volume of wastes does not actually constitute the problem but the ability or inability of governments, individuals and waste disposal firms to keep up with the task of managing them and the environment. There is no doubt that a dirty

environment affects the standard of living, aesthetic sensibilities, health of the people and thus, the quality of lives (Mowoe, 1990). The corollary is that improper disposal or storage of this waste can constitute hazards to the society through the pollution of air, land and water.

There are different kinds of wastes according to (Federal Ministry of Environment, 2006). There are Solid wastes, Liquid waste and Gaseous waste.
Solid waste can be practically divided into three main categories. These are:
(i) Municipal solid waste which comprises domestic waste, commercial refuse, institutional refuse (from schools, hospitals clinic etc) and street cleaning wastes.
(ii) Industrial waste consisting of refuse generated from industrial operations and by solidification of liquid and gaseous effluents.
(iii) Building construction wastes which mainly arise from demolition, excavation and construction activities.

Wastes disposal is the management of wastes to prevent harm to the environment, injury or long term progressive damage to health. Disposal of waste is where the intention is to permanently store the waste for the duration of its biological and chemical activity, such that it is rendered harmless. It is also an organized effort carried out by individuals, communities and governments to maintain sanity and conducive environment. The process therefore involves the proper storage, collection and disposal of refuse in a way that will not constitute any health hazards to man's life, animals and the environment.

Waste disposal is a growing problem worldwide and is directly connected to industrial development and population growth. Since early modern times, disposing of wastes has been an important concern for individuals and community officials. Although, there have been recent advancements in waste disposal, it remains an overall public safety and environmental health issue that countries around the world continue to address.

Waste disposal has been a serious challenge in Nigerian cities especially as rural-urban migration intensifies. All types of wastes are usually disposed of without any serious consideration for the environment. Wastes are disposed indiscriminately and in an uncoordinated manner thereby, resulting in unhealthy environment.

Waste management is a multidimensional problem that has been aggravated in Nigeria by rapid urbanization and population growth rate in the recent times, as well as change in the consumption patterns of urban dwellers. The expansions are in most cases not corroborated by adequate planning strategies therefore, the state environmental agencies are continuously faced with an increasing amount of solid waste to handle (Agunwamba 1998; Ikelegbe, 2007).

As regards the solid waste sector, the specific actions desired include collection and disposal of solid waste in an environmentally safe manner, setting up and

enforcement of laws, regulations and standards; encouragement of public participation, environmental monitoring and imposition of penalties on defaulters to encourage compliance (Federal Environmental Protection Agency 1989 in Agunwamba 1998).

Justification of the Study

The disposal of waste in Ondo town is a problem that continues to grow with the advent of small-scale industries and population growth. Human being generate wastes and it has become imperative that disposal of waste must take place within the environment. It is a common sight to see heaps / accumulation of festering waste dumps in the town, on some sides of residential apartments, the drains, the highways, corners of major and minor streets. Also, undeveloped plots of land have all become waste dumps for many households. The challenge today is how to strike a balance between development and sustainability of the environment for future generations.

Aim and Objectives of the Study

The aim of the paper was to discuss public enlightenment as a method of waste disposal system in the study area so as to strike a balance between development and sustainability in the environment. To achieve this aim, the following objectives were considered;

1. To identify various sources of waste in the selected area.
2. To examine various methods of waste disposal.
3. To identify methods of waste disposal in the town.
4. To discuss public enlightenment as a major means of mitigating the problems of waste disposal

Research Questions

The following research questions were considered

1. What are the various sources of waste generated in the study area?
2. What are the identified methods of wastes disposal in the area?
3. How can public enlightenment help in solving the problems of waste disposal?

Study Area

The study area is Ondo town which is one of the major towns in Ondo state. It lies between latitude $7^0$6'N and longitude 4^o 51'E. The area is characterized by heavy rainfall, high temperature and humidity, which are the features of tropical climate. It experiences two seasons; wet and dry seasons. The wet season ranges from March-November while the dry season is between December and February with mean annual temperature of 26^0C.

Research Method

The study was carried out in Ondo town and the data for the study was collected in 2010. The town was randomly grouped into six (6) zones based on the intensity of waste disposed. The areas are: Yaba area, Oka axis, Arigbabola /Ife Road, Sabo, Market and Ayeyemi/ Okeodunwo. The data used for study was obtained from respondents with

the use of structured questionnaire designed for the purpose. The information collected was analyzed with the use of simple percentage and graphical representation.

Results and Discussions

Table 1: Sources of Waste Disposal

Sources of wastes	Respondents	Frequency in percentage (%)
Home/domestic wastes	120	40
Industrial wastes	65	22
Agricultural wastes	40	13
Automobile	20	07
Market	55	18
Total	**300**	**100**

Source: fieldwork 2010

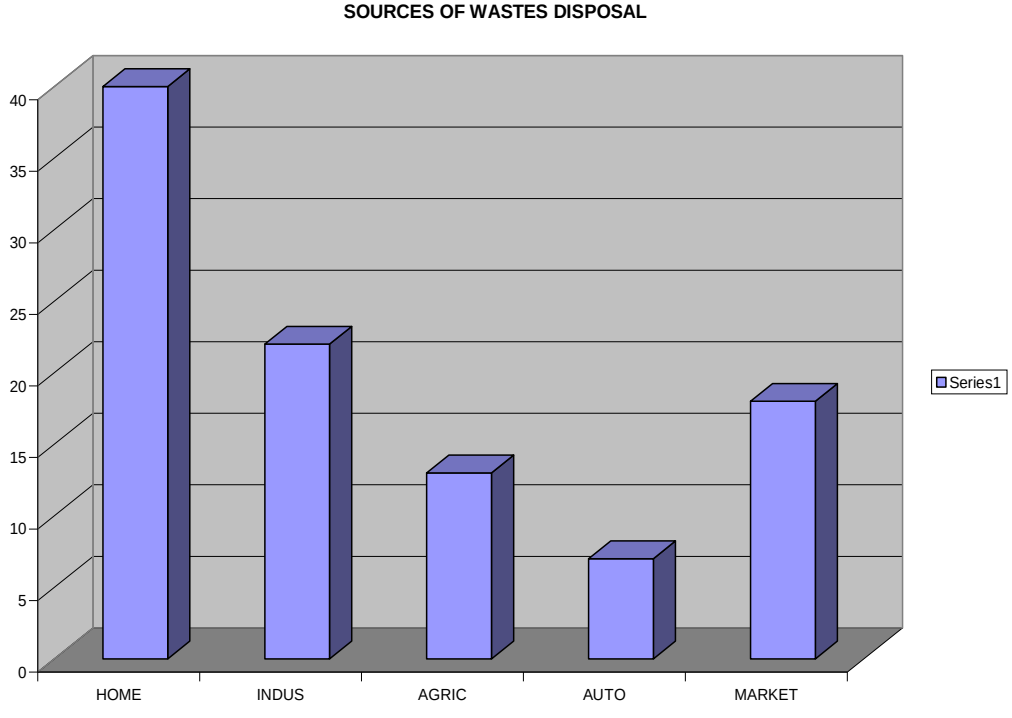

Fig.1: Sources of wastes disposal

From **figure 1** above, findings revealed that greater percentage of the respondents 120 (40%) agreed that Home/domestic waste is the major source of waste generated within the town followed by wastes from industries. It can be concluded that the major source of wastes in the town are through domestic and industrial wastes.

The implication of this is that apart from population growth or size of the family, that has a significant role to play in the generation of wastes, increase in commercial and industrial activities equally brings about a dramatic increase in the volume and density of wastes generated.

Methods of Waste Disposal

1. **Landfill**

Disposing of waste in a landfill involves burying waste and this remains a common practice in most countries. Landfills are often established in abandoned or unused quarries, mining voids or borrow pits. A properly-designed and well-managed landfill can be a hygienic and relatively inexpensive method of disposing of waste materials. Older, poorly-designed or poorly-managed landfills can create a number of adverse environmental impacts such as wind-blown litter, attraction of vermin, and generation of liquid leachate. Another common byproduct of landfills is gas (mostly composed of methane and carbon dioxide), which is produced as organic waste breaks down anaerobically. This gas can create odor problems, kill surface vegetation, and is a greenhouse gas.

Sanitary landfill is the cheapest satisfactory means of disposal, but only if suitable land is within economic range of the source of the wastes. In a modern landfill, refuse is spread in thin layers, each of which is compacted by a bulldozer before the next is spread. When about 3m (about 10 ft) of refuse has been laid down, it is covered by a thin layer of clean earth, which also is compacted. Pollution of surface and groundwater is minimized by lining and contouring the fill, compacting and planting the cover, selecting proper soil, diverting upland drainage, and placing wastes in sites not subject to flooding or high groundwater levels. A landfill must have a lining to shield it from water seeping into the landfill thereby making water poisonous and unfit for consumption.

2. **Incineration**

Incineration is a disposal method that involves combustion of waste material. Incineration and other high temperature waste treatment systems are sometimes described as "thermal treatment". Incinerators convert waste materials into heat, gas, steam, and ash.

Incineration is carried out both on a small scale by individuals and on a large scale by industry. It is used to dispose of solid, liquid and gaseous waste. It is recognized as a practical method of disposing of certain hazardous waste materials (such as biological medical waste). Incineration is a controversial method of waste disposal, due to issues such as emission of gaseous pollutants. Incineration is common in countries such as Japan where land is scarcer, as these facilities generally do not require as much area as landfills. Waste-to-energy (WtE) or energy-from-waste (EfW) is broad terms for facilities that burn waste in a furnace or boiler to generate heat, steam and/or electricity. Combustion in an incinerator is not always perfect and there have been concerns about

micro- pollutants in gaseous emissions from incinerator stacks. Particular concern has focused on some very persistent organics such as dioxins which may be created within the incinerator and which may have serious environmental consequences in the area immediately around the incinerator. On the other hand, this method produces heat that can be used as energy.

3. **Recycling Methods**

The process of extracting resources or values from wastes is generally referred to as recycling, meaning to recover or reuse the material. There are a number of different methods by which waste materials are recycled: The raw materials for instance may be extracted and reprocessed, or the calorific content of the waste may be converted to electricity. New methods of recycling are being developed continuously; an example is physical reprocessing whereby there is collection and reuse of everyday waste materials such as empty beverage containers. These are collected and sorted into common types so that the raw materials from which the items are made can be reprocessed into new products. Material for recycling may be collected separately from general waste, using dedicated bins and collection vehicles, or sorted directly from mixed waste streams.

4.**Burning**

Even though landfills is a cheap option which may be used if large amounts of waste is collected, burning provides an alternative through which the volume can be quickly reduced. Environmental friendly burning methods do not just burn all waste lying around, but uses filters and scrubbers so that poisonous and acidic gases are not released into the atmosphere. Moreover, this method prevents ash from being released into theatmosphere.

5. **Compost**

Compost is made by harnessing the natural decomposition process carried out by certain species of microorganisms. These microorganisms, primarily bacteria and fungi, live in intimate association with their food supply on the surface of dead plants, in soil, or in animal wastes. By breaking down these materials with their digestive enzymes, the tiny creatures release and absorb the nutrients within. For home gardeners, making compost is simply a matter of collecting food for microorganisms in one place and letting them go to work.

Others Include

Avoidance and Reduction Methods

An important method of waste management is the prevention of waste material being created, also known as waste reduction. Methods of avoidance include reuse of second-hand products, repairing broken items instead of buying new, designing products to be refillable or reusable (such as cotton instead of plastic shopping bags), encouraging consumers to avoid using disposable products (such as disposable *cutlery)* and designing products that use less material to achieve the same purpose.

Waste Handling and Transport

Waste collection methods vary widely among different countries and regions. Domestic waste collection services are often provided by local government authorities, or by private companies in the industry. Waste handling systems include a method of disposal, whereby the city collects waste and/or recyclables on a scheduled basis. In rural areas people often dispose of their wastes by hauling it to a transfer station and thereafter collected and transported to a regional landfill.

Technologies

New technologies such as (Radio Frequency Identification) *RFID* tags, (Global Positioning System) GPS, and integrated software packages, which enable better quality data to be collected without the use of estimation or manual data entry are also very useful as wastes disposal methods.Technologies like RFID tags are being used to collect data on presentation rates for curb-side pick-ups and the benefits of GPS tracking is particularly evident when considering the efficiency of ad hoc pick-ups (like skip bins or dumpsters) where the collection is done on a consumer request basis and integrated software packages are useful in aggregating data for use in optimization of operations for waste collection operations.

Out of all these methods explained above, few are found to be in operation in the study area. The table below shows the various method of waste disposal identified in the study area.

Table 2: Methods of Wastes Disposal

Methods	**Respondents**	**Percentage (%)**
Open Dumping Method	160	53
Incineration Method	102	34
Opening Burning Method	38	13
Total	**300**	**100**

Source: fieldwork 2010

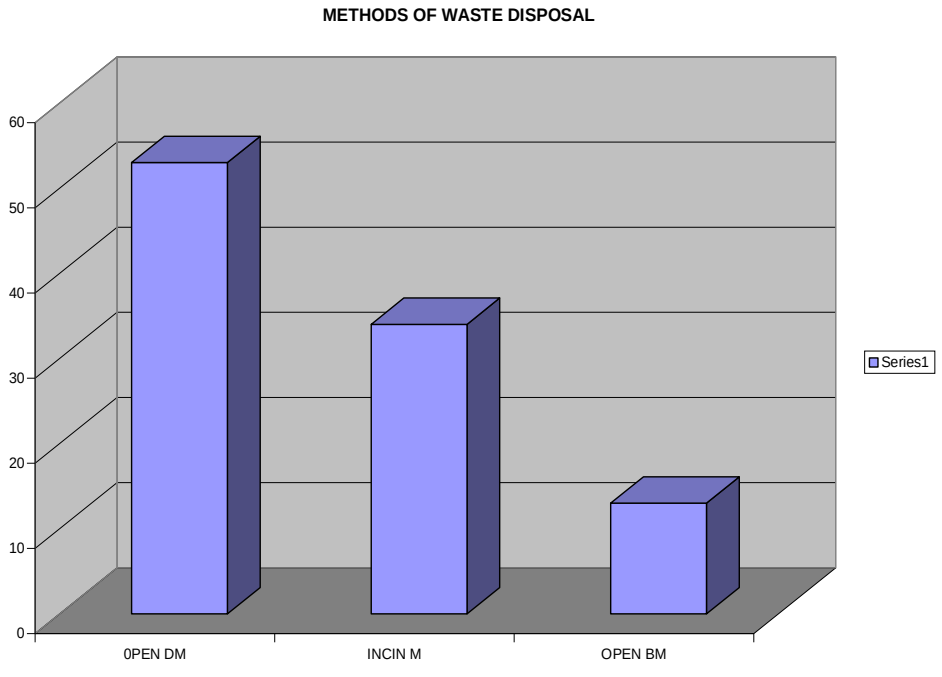

Fig.2: Methods of Waste Disposal

Figure 2 above shows various means of waste disposal identified in the study area. The most common method of disposal is the open dumping method which is accepted by 53% of the respondents. This is clearly notable in some part of the town as wastes are dumped in undeveloped land, culverts and other inappropriate places. The other methods adopted are the incinerator method and open burning method as supported by 34% and 13% of the respondent respectively.

From the above presentation, there is the likeness that the inhabitants are not aware of other waste disposal methods hence the need for enlightenment.

Public Enlightenment on Waste Disposal

Public enlightenment is a method of providing information to people in the community on issues of particular concern. It provides members with simple instructions on how to participate in programs going on in the community.

Public enlightenment can take a variety of forms including written materials (news letter, articles, flyer, inserts in newspaper and newsletter etc), visual materials (signs, posters, charts and pictures) and events (community meetings, workshops, school events, public briefings and presentations, media events etc).

Forms of public enlightenment include the following

Signage – These are signs placed in specific locations which are ways of educating community members about various waste management options or regulations. E.g. No dumping of refuse here.

Newsletter - This provides people with specific information about the development and implementation of waste management programs or other activities going on in a community. They usually provide more specific information than one can put in advertisement in a newspaper.

Inserts, Flyers and Other Written Materials - These are low cost method of enlightening people. By developing a simple message and distributing to households and businesses in the community, information can quickly and easily be passed across to members of the community. It is also useful because people can keep and refer to the information when needed.

Door to Door Campaign – This is beneficial because outreach workers or volunteers can easily interact with people living in the community. Although, it can be more time consuming and labour intensive than others, but it can be valuable in reaching people especially in situations where rules have changed or where resistance is been anticipated towards new program.

Media Coverage - This can take a number of different forms like radio talk shows, public service announcement, news conference etc. It can be achieved by sending a news release or making personal contact with a reporter who covers community news.

Workshops and Training - These are valuable ways to educate people about a new program policy or waste management program. This can provide opportunity to ask questions and try out new techniques.

School Activities And Events - Educating students about solid waste management issues and practices help develop a positive attitude among both students and parents regarding these issues. It encourages community involvement that will contribute to the success of solid waste management programs. These programs are conducted with the hope that children will teach their family what they learn in school and take personal responsibility for whatever they do.

All these methods listed above if properly adopted and used, given the necessary coverage and intensity, will help in reducing the problems posed by waste disposal in the environment.

Importance of Public Enlightenment

Public enlightenment plays an important part in the process of any solid waste management program and. Well-planned education and outreach activities can help waste disposal in several ways as listed below:

*It will generate understanding and support for waste management issues in the community.

*They can also be used to teach community members how to comply with waste and recycling activities to the overall benefit of the community.

*Public enlightenment provides an opportunity for community members to obtain information about their community waste management programs.

*It also makes a way for community members to express opinions and for community decision makers to take opinions into consideration.

*It is a source of information regarding opportunities for participation in the outlined programs for a community.

Conclusion

Since human beings cannot do without generating wastes daily, great attention should be given to a good environmental education on waste disposal systems to reduce the problems that might emanate. The society should also have a good knowledge of disposal of solid waste so as to maintain a balanced environment.

Recommendations

For proper environmental education, it is recommended that:

1. There should be adequate funding of waste management programs by the government.
2. Professional waste managers should be employed to monitor the community and facilities as well as the waste disposal system in the environment.
3. There should be proper and effective monitoring and control of waste disposal methods.
4. Modern Technology / lethargy should be implemented in efficient management methods.

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