



# International Journal of World Policy and Development Studies

ISSN(e): 2415-2331, ISSN(p): 2415-5241

Vol. 3, No. 2, pp: 10-15, 2017

URL: <http://arpgweb.com/?ic=journal&journal=11&info=aims>

## Challenges of Solid Waste Management in Rural Area

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**Abstract:** A good environment they say predetermines good health. If good health is to be measured at all the people and the environment will play a significant role. Illness and disease however, do not exist in isolation of the environment in particular. Waste is an object for which we have no further use and which has to be disposed off because of the danger it poses to the environment. Solid waste refers to garbage, refuse, rubbish, trash or litter generated through the domestic, commercial and industrial activities of man. As the population increased efforts were made to transport waste out of the cities. This study therefore examined the problems of solid waste disposal in Ibarapa East Local Government Area of Oyo state. Two hundred respondents were sampled from the study area. The major instruments of data collection were questionnaire administration, personal observation and oral interview Data were analyzed using cross tabulation and simple percentage The findings shows that the respondents were aware of effects that improper solid waste to have in their environment and health but still indulge in insanitary wasted disposal. Also the role of Government in waste disposal was below normal standard. It was recommended that the people should change their unsanitary system of waste disposal and government should improve on waste disposal policy.

**Keywords:** Waste; Solid; Challenge; Rural area.

### 1. Introduction

Towards the latter part of the 19<sup>th</sup> century, the first refuse incinerate was invented in England. Technological advancement continued during the first half of the 20<sup>th</sup> century; including the development of sanitary land fills to replace the practice of open dumping and to reduce the reliance on waste incinerator. Modern solid waste management practice emphasizes the practice of re-cycling and reduction at the source rather than incineration and land disposal

In Nigeria today, solid wastes are particularly of great concern because of the increase in their generation due to population explosion of the crude methods of disposal as well as inadequate management

The word "WASTE" has been used in different circumstances to mean different things. It has sometimes been used interchangeably with other words like refuse, excreta or sewage. It is generally accepted that "WASTE" can be considered as any valueless matter which is discarded as it is no longer being useful in the economy. Sridhar (2000) shared view that a waste is only unavoidable material generated from domestic or industrial operations for which there is no economic demand and which must be disposed. From the above definition, waste is any rejected matter which must be removed from material flow pattern and disposed off

The meaning of environment is premised on the physical economic social and geographical features. The denotative meaning of environment is given as all the surrounding condition which influences growth and development. In other words, the environment simply means the surrounding of a living organization. This one can rightly submit that physical environment is that which is concerned.

The major role of man as a component of the environment is the maintenance of the environment so as to promote good health and prevent diseases. However, humans over the years have neglected this undisputed role. One of the social waste managements, in a country where the economy is in a depressed state a huge investment in this sector would improve the health status of the populace. There is no doubt that adequate waste management strategy is the bed rock of a healthy nation, physically, mentally and socially. In order to maintain this healthy status effort should be geared towards introducing less cumbersome, less expensive and very efficient methods of collection and disposal of social waste.

Solid waste has been given various definitions by authors, institutions and agencies. Fatola (1997) differentiates solid waste from liquid waste by angle of repose a characteristic of the piles, substance fluidity. He describes solid waste as waste materials that possesses significant angle of repose forms, sufficient enough to permit its handling by solid handling equipment such as conveyors, franted loaders and shovels.

Solid wastes have been classified in different ways. One classification quoted by Gyuse (1985) grouped all solid waste into seven waste categories namely garbage, rubbish, ashes, street, release dead animals, abandoned automobile, demolition waste and construction wastes (see table 1). This classification pays particular attention to the way the wastes are produced.

**Table-1.** Types, composition and sources of solid waste

No	Kind	Composition	Sources
1.	Garbage	Waste from food preparation market waste, wastes from handling storage and distribution	Household market and institution
2.	Rubbish	Type 1: combustible carbon paper, wood tree branches type:2 Non combustible class elastic metal dirt	Household market and institutions
3.	Ashes	Residue from cooking fires and incinerators	Street/side works street/ side walks
4.	Trash from street	Sweeping, leaves, litres, receptacles	Street/side walk
5.	Abandoned vehicles	Unwanted cars, trucks, lefts properly	Highway mechanics
6.	Demotion waste	Limber, bricks, and other construction materials from	Demlition sites
7.	Construction waste	Demolished building scrap lumber and other construction scrap	Construction

Sources: Gyuse (1985)

## 2. Waste Management

Waste management is the systematic administration of activities which provide for the collection, transportation and processing of waste therefore, environmental sanitation is detained as the central of factors in a person's physical environment which exercise, or may, exercise, a disastrous effect on his/her physical, mental social well being (World Health Organization (W.H.O) Expert Committee, 1971) as the organization and systematic changing of waste through practically, economically and technical appropriate recovery or disposal, routes, consistent with acceptable public health environmental safeguards.

This new concept aims at achieving the goal of solid waste management which is public health through sustainable waste management system in order to safeguard environment quality (Centre for Africa Settle Studies AKP Development (CASSAD), 2000).

Solid waste is one of the fundamental environmental health problems in our urban and pre-urban cities of the world Nigeria inclusive. Although the general public is now becoming increasingly aware of the danger inherent in inadequate solid waste disposal, the state of affairs is that solid waste management problem is related to concentrated nature of the population and the consequent concentration of solid wastes as well as the greater livelihood of pathogenic contact with humans.

Oganga and Obijoroh (1985) advanced that problems of waste management in developing countries include: Inadequate coverage of population (i.e. total population) limited utilization of source separation and recycling, specific problems in final disposal and difficulties encountered in hazardous waste management.

However, Nigeria Environmental Study Action Team (NESTI) (1991) believed the problem of solid waste management in Nigeria is not due to lack of studies or researchers but owing to inability to distillate and synthesis what has been observed, therefore, efforts should be made to check to menace of solid waste management in the country in other to improve the health status of all Nigeria

As a consequence of the enormous problems associated with waste management, World Health Organization (WHO) worked with National Government Agencies, local organizations and industries to provide guideline (listed below) aimed at ensuring preventive waste management world wide (Peally *et al.*, 1985). These principles include.

- Segregating non-hazardous wastes from hazardous waste producing processes to avoid innocuous hazardous components
- Avoiding existing operations and production methods to reduce the volume of waste produced
- Routine maintenance and process control to prevent occurrence of waste in various processes
- Storing hazardous materials from working and nearly residential areas
- Storing waste in covered containers to avoid leakage of liquid components into the environment
- Ensuring that individual operators and municipal work together to develop sanitary land fill
- Pretreat hazardous waste (wherever possible to reduce the volume requiring disposal and its toxicity to disposal)

## 3. Treatment and Disposal of Solid Waste

There are some treatments and disposal of solid waste in Nigeria and other parts of the world. Prominent among these are composting land filling controlled tipping etc.

### **3.1. Composition**

Composition is essentially the controlled aerobic decomposition of putrescible materials. The process of composting is the attempt to control the natural decomposition of organic matters in a warm, moist environment through the action of bacterial, fungi, moulds and other organisms present in the refuse. This may be achieved either through aerobic or anaerobic process. However in order to speed up the rate of decomposition, eliminate odour and excessive fly breeding, fresh air is introduced periodically

Although, this method has been recognized for long practice is still very low in Nigeria. Sridhar (1999) remarked that only 21 local government Areas (LGA'S) in the whole federation use some kind of composition for recovery. The two organic fertilizer plants in Ibadan are presently not operating due to some financial and bureaucratic constraints.

### **3.2. Incineration**

Incineration has been practice since 1980 and its is an extremely effective bulk waste reduction technology, typically reducing waste volume by 90% and mass by around 70% (Ogundele, 2005). Incineration (this is otherwise known as destruction by fire) is an excellent method of refuse disposal from the sanitary. Stand point rubbish and garbage are burnt together. Refuse is reduced to ash by burning at high temperature usually between 45<sup>0</sup>c to 1100<sup>0</sup>c American Public Work Association (APWA) Institute for Solid Waste (1970), the high temperature is needed to kill the odour and solids remaining after incineration are used to fill land.

There are two categories of incineration, central and on-site incineration. Central incineration serve municipality while on-site incineration are used in hospitals, stores, houses, etc. This is the most acceptable method of disposal that Nigerians can least afford.

### **3.3. Pulverization**

This is a treatment process meant to reduce waste volume. It is a method by which heterogeneous waste can be made homogenous through shredding is a quick and relatively simple treatment that a dense homogenous and less offensive waste.

There are two broad types of pulverization the hammer mill and Rotary. The hammer mill is found that power consumption increases sharply with the decrease in the particle size of the product while rotary pulverization is done inside the rotary drum by attrition and abrasion.

### **3.4. Land Filling**

Land filling is an improvement on open dumping. In Nigeria there are some land filling activities around the major cities such as Ibadan, Ilorin, Enugu, and Lagos etc. land filling involves the use of an existing pit such as quarry or open mining in some cases a pit of about 12metres deep could be used. Refuse are then dumped into it. Spread and compacted layer of up to 12 metres thick. By this fly and other pests are eliminated.

### **3.5. Controlled Tipping**

It is systematic deposition of refuse on to the land which is compacted in shallow layer. Another method of solid waste management in Nigeria is controlled tipping, this is also an effective and proven method for hygienic disposal of refuse and can be used whenever efficient and suitable land is available basically it consists of four steps (Udoh, 1980).

- Deposition refuse in a planned control manner
- Spreading and compacting it into layers to reduce its volume
- Covering the material with a layer of earth
- Compacting the earth cover. The initial investment is low and health hazards fire and nuisance are eliminated

The final choice of method to be used for the sanitary disposal of refuse will depend will naturally vary from rural to city areas it will depend on a population density the availability of land and other facilities at one's disposal.

At household level, very few houses outside the elite GRA'S are refuse receptacles.

Refuse are deposited on the street. In a study at Ibadan by which 1980, it was found that only 18% of plots had any street refuse receptacles. This creates a number of problems the refuse decomposition on the street is a nuisance because of odour, it is also a breeding ground for flies which may carry diseases like dysentery and in some cases the refuse blocks water channels creating stagnant pools favoured as breeding ground for mosquitoes.

## **4. Effectiveness of Solid Waste on the Environment**

As at 1994, Oluwande (1997), reported that 13% of Nigerian disposed their solid wastes through government or personal bins, 50% disposed their refuse within their compound while about 37% dump their refuse elsewhere. Sridhar (1999) summarized the ecological disturbance caused by solid waste as;

- Blockage of drains and stream flows resulting in food disasters
- Fire hazard when the waste are dry
- Obnoxious small gaseous and smoke emissions
- Breeding site for rat flies and other vectors for public health importance
- Harbour and acts as reservoir infections agents

- Offers avenue for stray animal destitute and lunatics
- Morbidity or mortality of population due to injuries and infection

## 5. Materials and Methods

The major instruments of data collection were questionnaire administration, personal observation and oral interview. The study was carried out in Ibarapa East Local Government Area of Oyo State. East Local Government has an area of 838km<sup>2</sup> and a population of one hundred and eighteen thousand, two hundred and twenty six people (National Population Commission, 2006). The major occupation of the people in the area is farming, some people engage in other occupation like trading, teaching and civil service as well as artisan. Ibarapa East Local Government is bounded in the south by Ibarapa Central Local Government, in the west by Ibarapa North Local Government, in the East by Ido Local Government and Odeda Local Government, Ogun State and in the north by Iseyin Local Government. The population of this study is all farmers in Ibarapa East Local Government. The population for the study consist of scavengers picking from local dump sites residents near and around refuse collection points, residents near legal and illegal dump sites as well as waste collections. The waste collectors include those that work for the waste management authorities within Ibarapa East Local Government. The two major towns in the local Government area where selected. In each town 5 streets each are sampled. In Eruwa streets sampled are Sango, Isaba, Okeola, New Eruwa and Aborerin. In lanlate streets sample are Isale-bale, Olorunsogo, Surulere, Agasa and Oke-otun. Data analysis were mainly descriptive in nature, these are cross tabulation and simple percentages.

## 6. Results

**Table-2.** Demographic Characteristic of the respondents and methods of waste disposal

	Frequency	Percentage (%)
<b>Sex</b>		
Male	135	67.50
Female	65	32.50
<b>Age Group</b>		
Below 20 years	15	7.50
21 – 30 years	30	15
31 – 40 years	70	35
41 – 50 years	60	30
Above 50 years	25	12.50
<b>Primary Occupation</b>		
Civil servant	30	15
Trading	44	22
Students	40	20
Farming	86	43
<b>Education</b>		
No Education	30	15
Primary level	35	17.50
Secondary level	55	27.50
Post Secondary	80	40
<b>Methods of waste disposal</b>		
Dumping in open space	20	10
Burning	60	30
Dump sites	50	25
Waste disposal company	45	22.5
Incinerator	25	12.5

Sources: Author's survey 2016

In the above table, it was indicated that 67.50% of the respondents were male and 32.50% were females. Also that 7.5% of the respondents were below the age 20years 15% were between the ages of 20-30yrs 35% were between 31-40yrs 60% were between the 45-50 and 12.5% are 50yrs. The implication of this is that majority of the respondents were mature adults who understand the basic text of what the research was all about. In the stage of education, 40% of the respondents had post secondary qualification 27.5% were secondary school leaves 17.5% were primary school certificate holders and 15% had no education. There is no doubt therefore that the above analysis shows that majority of the respondents were equipped with adequate knowledge of the problems of waste disposal. The table shows that sanitary waste disposal in the area was not effective since only 22.50% disposed their waste through registered waste disposal companies that charged certain fee for picking wastes from homes and disposing the waste of designated points also 12.50% disposal their waste using incinerator

The above two methods to a greater extent represent efficient methods of waste disposal. 10% of the respondents disposal their waste into open spaces 30% burned their waste and 25% dumped their waste on dumpsites.

## 7. Discussion

The perception of respondents on what unsanitary waste disposal constitute to the environment was high 95% of the respondents agreed that solid waste unsanitary disposal can result to environmental degradation and abuse, for instance in most of the areas sampled waste and dumped in open spaces nearly bushes, drainage channels and unkept dumpsites. A part from the waste areas is obnoxious.

Furthermore, 98% of the fact that they serve as eye sores odour emanating from the respondents agreed that such improper waste disposal can lead to pollution of the environment especially water, among the reasons postulated was that waste dumped in open filed and drainage channels are carried by run off into rivers and even shallow well through sewage this thus pollute the water and make it useless for use. In area like Isale-Bale and Sango, most dumpsites illegally set up by the people were over bloated. These dumpsites not only mar the beauty of the city, but also serve as eye sore as well as breeding places for disease vectors.

90% of the respondents established relationship between unsanitary waste disposal and health hazard for instance they agreed that environmental pollution induced by improper waste disposal resulted into health problems such as outbreak of intestinal diseases like typhoid fever, dysentery and cholera.

On the group of people that can be infected 60% of the respondents agreed that scavengers were at most risk 50% agreed that people who patronized road side eateries are liable to infection. While 45% agreed that everybody irrespective of age, educational qualification and occupation could be infected because even if they observed constant environmental sanitation, their wells or boreholes can be contaminated by waste dumped several away from their abode.

The problems associated with waste disposal in the study area have been attributed to certain factors, for instance 75% of the respondents agreed that the roles of government in waste management was not sufficient, for example the said that the number of health personals that suppose to oversee sanitary waste management were few a part from this waste disposal vehicles available on the city was for below the required number, hence waste dumped in government approved sites were left for many days unclear.

Furthermore, 80% of the respondents agreed that most residents attitude towards waste disposal in the area was poor, most people dumped their wastes indiscriminately into open gutters, rivers causes, surrounding bushes among others places this habits according to them constitute environmental degradation.

The role of companies in insanitary waste disposal in the area was also condemned by the respondents they accused most eaferos, workshop etc. contributing to waste disposal problems, for instance most workshops such as electronic, dumped cases of television, sets, radio, fans, among others on the dumpsites where those waste take years before they get decomposed instead of transporting such to legal dumpsites. Apart from this most resident and workshops result to burning of these wastes which result to pollution of the environment for examples burning of types by mechanical workshops.

The problems of waste disposal management in Ibarapa East Local Government Area have been critically analyzed, it concluded then that waste disposal management in Ibarapa East Local Government Area was unsanitary, due to attitude of the people towards waste disposal.

Government roles disposal was not sufficient to ensure proper waste management, for instance inadequate waste disposal vehicle, detect waste disposal policy among others constitute causes of improper waste disposal management.

These problems thus lead to environmental degradation as well as health risks inform of outbreak of intestinal diseases and pollution of sources of water.

## Recommendations

- (1) Government should make provision for adequate fund for her agencies involve in environmental management so as to meet the financial aspect of tackling environmental, problems
- (2) There is need for the public to change their environment and participate actively in environmental exercise
- (3) Government should provide more health inspectors who will move to the interiors of this area to enforce environmental health laws
- (4) Environmental health education campaign shall mounted in all the major streets in Ibarapa East Local Government Area about the need to ensure sanitary solid waste disposal

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