

# Harmful Effects and Management of Indiscriminate Solid Waste Disposal on Human and its Environment in Nigeria: A Review

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## Abstract

The rate of solid waste generation has increased to a devastating and uncontrollable rate in Nigeria as a result of human daily and economic activities. Although, the issue of indiscriminate solid waste disposal is a global one. Modernization, high standard of living, increase in population, technological innovation and excessive urbanization over the years has drastically contributed to the generation of municipal waste, through industrial and domestic activities. Due to inadequate waste disposal method, dumping of refuse in an unauthorized places is now the order of the day in the country, both in local and national level and penalties that are placed on defaulters are not been effectively carried out. Environment close to dump sites are exposed to significant and rapid environmental degradation mostly in municipal areas in Nigeria which brings about adverse effect on the general sustainability of urban life, poor agricultural yield, widespread of germs and diseases, extinction of aquatic bodies due to water toxicity and acidification.

Apart from the fact that human health is at great risk, life becomes unbearable to dwellers in such environments. The rate of human vulnerability depends on how close the household settlements are to the open areas unlawfully made as dumping sites. When solid wastes are indiscriminately disposed it results to climate change, photochemical reactions, abiotic depletion and extreme weather events like global warming produced by the breakdown of greenhouse gases generated from chemical and radioactive wastes. There are water contamination and water bodies' blockage, soil and air pollution, communicable and non-communicable diseases in most areas of the country.

This paper discusses on the harmful effects of indiscriminate disposal of solid waste on human and its environment in Nigeria and also reviews the possible waste management method and regulations that must guide against this act.

**Keywords:** Solid waste; Indiscriminate; Environmental degradation; Human health; Disposal; Environment; Waste management

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## Introduction

Waste is a useless and unwanted products of human domestic and industrial activities released into the environment [1]. It can be a solid material, liquid, semi-solid or container of gaseous material. Therefore, the unlawful manner of dumping these refuse such as garbage, sludge from water supply or manufacturing waste,

air pollution control facilities and other unuseable materials without considering the adverse effect on human health is called indiscriminate Solid waste disposal. Most solid wastes are also gotten from industrial chemicals, radioactive substances and many household make use of open areas, highways, uncompleted buildings and bushes as their dumping sites.

In Nigeria today, illegal dumping of refuse mostly in industrial and

municipal areas has become a major issue of concern to human and its environment. The present environmental pollution derived from solid waste littering has create a lot of health challenge to household residents around the dumping sites. It is evident that most of the people living around the dumping location are not aware of the harmful effects of refuse dumping other than the offensive odors spreading around the untidy environment and also when the wastes becomes wet and start to decay.

Urbanization, overpopulation, industrial revolution has become major cause of waste generation and inappropriate disposal method especially in urban areas of Nigeria. Human exposure to this unlawful act has triggered more health risks to the populace which advertently affects the entire livelihood and their major landscape.

Lack of appropriate storage facilities, inadequate waste management and planning, wrong perceptions by residents and non-challant attitudes towards environmental cleaning and sanitation might be a cause of this problem.

When an environment is not hygienic and clean it poses a lot of harms and negative impacts on human especially outdoor workers, workers producing infectious materials while young children get easily contacted and are most vulnerable to this act of ignorance and dirtiness [2].

The outcome of indiscriminate disposal of solid wastes expose human to environmental degradation such as in flooding, drainage obstruction, widespread of infectious diseases, cholera, diarrhea [3], typhoid fever, waterway blockage which leads to infestation of flies, ticks and breeding of mosquitoes that cause malaria and other plagues.

In most remote parts of Nigeria like Lagos, Delta State, Oyo State and Abuja, it has been noticed that heaps of littering wastes dumps are in virtually all market areas, outskirts of the cities and even on roadsides for weeks without devising any adequate means of wastes collection either by private sector or government. Policy makers in the country have neglected some areas and fail to carry out a thorough inspection during environmental sanitation. I think such attitude an act of indulgence and negligence on the part of waste workers. It would be of great benefit if solid waste can be organised, collected and channeled through modern landfill for recycling while such areas must be far from human residents to avoid environmental disorder, all kinds of pollution and health hazards [4].

## Nigeria (Lagos State) as a Case Study

Nigeria with the population of 197,848,805 million people (population equivalent to 2.57% of the total world population) [www.worldometers.info//] is one of the largest producers of solid waste in Africa. The country is one of the largest waste producers in Africa and it generates more than 32 million tons of waste annually while only 20-30% is collected and 70% are dumped in unsafe places [5]. 10,000 tons of municipal wastes are generated in Lagos which makes an average of 3.65million tons per year. In Nigeria, municipal waste can also be classified as solid wastes generated from

- Domestic waste: (Those gotten from households, food centres, markets and commercial centres)
- Industrial waste: (Toxic or radioactive wastes that requires separate handling and disposal)
- Institutional wastes: wastes produced from schools, hospitals, government establishments, recreational centres) [1].

Lagos is a highly industrialized and one of the fastest growing cities in Nigeria and Africa. The population of the state is estimated at around 22millions this year and still experiencing a high level of migration from all over the country and the West Africa suburbs [6]. Waste generated in Lagos alone within six months is up to 80,000 tons from 100 illegal dumping sites. It is a collective responsibility that should include individual citizens, government and private stakeholders in order to achieve effective and productive means of waste disposal in the country. There must be realistic framework policies for managing, collection, processing and disposal of waste [6].

## Methodology

This paper was extensively reviewed from other write up on waste management and disposal. Solid waste analysis and annual aggregates for Lagos State as one of the largest manufacturing city in Nigeria and Africa were obtained from literature search. Industrial wastes materials, heavy metals and gaseous containers from industrial production sites, household refuse were gotten from dump locations near settlements and bushes. Questions are been asked from dwellers living around dump sites on how they are able to adapt with the untidy environments.

## Best way to start in Nigeria

Waste management and disposal in Nigeria must be a joint effort and this must start from the household and the family level. The government must focus on collection of waste from the household. Packing wastes into plastic, polythene bags, glass and so on is a good method to start keeping our environment clean. An average Nigerian drop their water sachets, biscuits nylon, bottled or can drinks container and candy packs either by the roadsides, in boarded vehicles or on highways, this has always from time immemorial and it's high time for Nigerians to desist from indiscriminate refuse dumping to mobile waste bagging. Government should push aside non-essential things and focus on implementing more initiatives to have a cleaner and healthier environment. There should be full financial support to help each state and local governments in waste disposal all over the households. Waste bins must be bought and placed in strategic areas on streets and communities with effective monitoring and supervision by waste workers. There should be daily waste collections and thorough advocacy to the public for them to be aware of the negative implications of an unkempt, dirty environment. However, household must be sensitized and moderately leveled to pay for services rendered.

There are monetary resources in the country which is more than enough to have well-pay waste workers and also provide the necessary amenities such as vehicles for collections, materials

for storage facilities, modern sanitary landfill areas for recycling transportation of municipal, institutional, and domestic waste. I think the government need to act fast because most of this unlawful wastes dumping contaminate water channels and make human vulnerable to infections.

## Possible Measures of Solid Waste Disposal

### Incineration

Incineration is a less expensive and the most widely used method of waste disposal. This can otherwise be called combustion. Waste are been subjected to heat as to convert them to gaseous products and ash. It is a more practicable and efficient ways of disposing municipal waste as volume of waste are been reduced by 85 - 90%. Burning of waste can cause environmental pollution from gaseous emission derived from combustion which contains micro-pollutants from incineration stack but still can be reduced by filters (Figure 1) [7].

### Reduce

An effort intended to minimize the amount of waste generated. Individual practices should promote measures to support a more sustainable society and this can be done through products redesigning and means to avoid creating waste from manufacturing to society consumption pattern. Waste generation can also be drastically reduced through industrial or manufacturing method and knowledge of production processes [7].

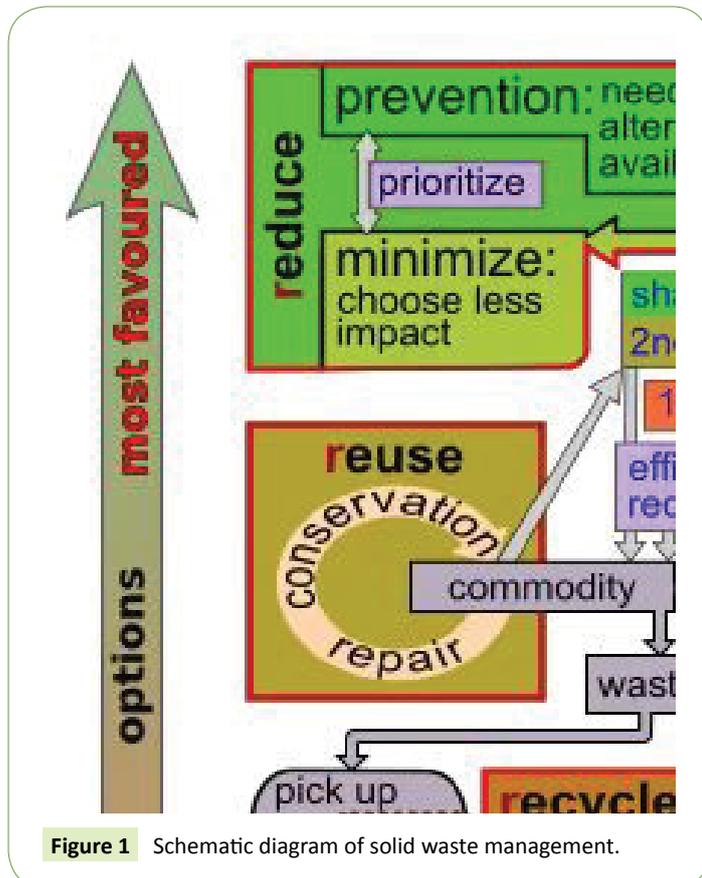


Figure 1 Schematic diagram of solid waste management.

### Recycling

This includes composting and waste-to-energy process. This is a method of recovering which involves the collection and re-use of solid waste generated such as glass bottles, stainless steel, food and drink cans, metals etc. Waste that needs to be recycled should be collected in a separate waste bins and can even be sorted out in a recycling facility area. Citation: this process makes the environment cleaner, minimise air and water pollution and it save resources for future use [8].

Domestic waste can also be collected by the government while households pay for the commercial services to reduce the amount of municipal waste produce and increase the rate of recycling for marketing.

### Reuse

This is the action that should be taken to seek alternative uses of waste. Waste materials can be turned to raw materials for the purpose of making quality products for human use thus minimize waste potential so that its uses can be extended and world's limited resources can be fully optimized by avoiding unnecessary waste generation [9].

### Sanitary landfill

Landfill is the collection and burying of waste in low-lying open area located far away from human settlements and sites that are not accessible to flooding in order to avoid environmental challenges. This is an economical and easier method to get rid of household wastes. If landfill is not properly managed it creates intense health hazards and environmental threats to human. Landfill area must be well enclosed to avoid waste dispersal by wind, infestation of rats, mice or other dangerous creeping animals and the waste becoming messy when it rains. Leakages from waste can also be avoided by means of concrete and cements. Orfano, 2018 Landfill should be carried out in such a way that both surface and underground water will not be contaminated [9].

### The use of landfill gas

Landfill gas is a mixture of different (methane and mostly carbon dioxide) trace amount of volatile organic compound are also used at a very low quantity. Although these greenhouse gases have effects on climate change most especially methane which is 25 times more detrimental to the atmosphere and have a high influence on global warming. Monitoring techniques has been initiated in the U.S, under the Clean Air Act of 1990 to regulate and lower the concentration of gases used [10] Agency for Toxic substances & Disease Registry (Figure 2).

The disadvantage is that it can lead to diffusion or migration into the atmosphere and this could lead to an explosive hazard if the gas reaches sufficiently high concentrations in adjacent building. And this method of waste management cannot produce renewable power since all the trash is completely burnt [11]. There is an on-going project to control energy cost and reduce methane gas emission from landfills in a cost-effective manner

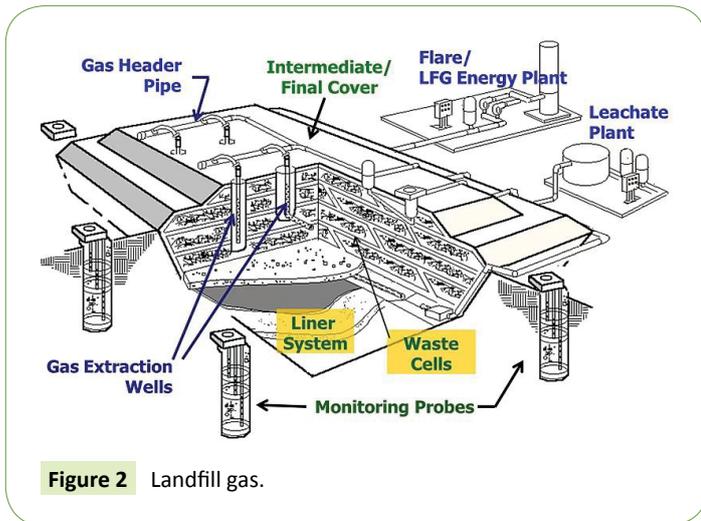


Figure 2 Landfill gas.

by encouraging the development of an environmental-friendly landfill gas to energy projects [12] EPA,2016.

## Conclusion

Generation of solid waste globally is attributed to man's daily activities and the effects are inevitable. However, there are measures that can be adopted to make our environment better and safe to live. Unlawful solid waste dumping in Nigeria must be stopped; markets for recycled materials should be encouraged and financially supported by both government and private stakeholders. There is urgent need for Nigeria government to implement policies that can promote measures to prevent generation of wastes. Human health and the environment need to be safeguard from unsanitary conditions caused by indiscriminate solid waste disposal that has always lead to pollution and outbreak of diseases.

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