

Substantial Waste Management

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Abstract: Solid waste or non-hazardous waste is defined as any garbage, refuse, sludge from a waste treatment plant, water supply treatment plant and other discarded materials including solid, liquid, semi-solid or contained gaseous material resulting from industrial, commercial, mining and agricultural operations and from community activities.

Refuse use of combination of garbage,ashes,paper,wrappings,cigarettes,cardboard,cans,woodscraps,loose glass in any form, bedding, metal, household items, crockery, plastic, industrial wastes, pruning, grass clippings, weeds, leaves, general yard and garden wastes, cut or fallen trees and shrubs. Source reduction, recycling, composting are some of methods to manage the solid waste to some extent and can protect the environment. Moisture management also play an important role in curbing the effect. Apart from them, Landfills, combustion or Incineration, Disposal and Recycle options are also there to diffuse the impact of solid waste.US Environmental Pollution Agency (EPA) has ranked the most environmentally sound strategies for MSW. Source reduction is the most preferred method, followed by recycling and composting, and, lastly, disposal in combustion facilities and landfills.

There are several waste disposing methods in India which includes Land Dumping, Composting, Palletisation and Vermi composting. Due to lack of norms and methods in handling municipal wastes, it is the workers of municipality who were badly affected. At the dump sites in cities, workers were examined and surveyed. Most of them had eye problems and respiratory problems and several people suffered with gastrointestinal ailments. In addition to workers, rag pickers who operate informally for long hours among the waste also suffer from various occupational health diseases – respiratory illness from ingesting particulates to tetanus, hepatitis, HIV infection and headaches and nausea etc. Contaminated leachate and surface run- off from land disposal facilitates affecting down gradient ground and surface water quality, volatile organic compounds and dioxins in air-emissions increasing cancer incidence, psychological stress for those living near garbages. Incinerators or land disposal facilities are some of the problems associated with the disposal of MSW in India affecting the sanitary workers. The situation is different in most urbanized regions of many industrialized countries ,where land prices are often high, landfill space is limited, and environmental controls are more strictly applied.

Key Words: Refuse, pruning, palletisation, sludge, volatile etc.

I. Introduction

Solid waste is defined as “ any garbage, refuse, sludge from a waste water treatment plant, water supply treatment plant, or air pollution control facility and other discarded material, including solid, liquid, semi-solid, or contained gaseous material resulting from industrial, commercial, mining and agricultural operations and from community activities which does not include solid or dissolved material in domestic sewage”. Refuse means all decomposing and non-decomposing, combustible and non –combustible solid wastes including garbage, ashes, paper, wrappings, cigarette and cigar butts, cardboard, cans, wood scraps, loose glass in any form, bedding, metal, household items, crockery, plastic, industrial wastes, prunings, grass clippings, weeds, leaves, garden wastes, cut or fallen trees and shrubs. Hazardous waste is a solid waste that has hazardous waste characteristics. Municipal Solid Waste is commonly known as trash or garbage and consists of every day items such as packing products, furniture, clothing, bottles, foodscraps, news papers, appliances, paints and batteries etc., The problem of municipal solid waste management has got alarming dimensions especially over the last decade. As the waste could be easily disposed off in environment without any problem in earlier days, it was not a big problem at that time. But now the conditions have changed and become difficult to manage the waste due to urbanisation and industrialisation.

Illegal Dumping or Open dumping or Fly-dumping or Midnight dumping is the disposal of solid and dangerous waste in non-permitted areas like open areas, dumped from vehicles along roadside, dumping at late night. This type of dumping generally involves disposal fees or time and effort required for proper disposal. Disposals such as concrete, roof waste, construction waste and demolition waste, abandoned auto spares, furniture waste, yard waste, household trash, medical wastes such as syringes, cotton, bands etc.are dumped in public places. It is expensive for the disposal of scrap tyres, yard wastes, bulky items so they are illegally

dumped. Because of the accessibility and poor lighting, wastes like industrial wastes, abandoned materials are dumped in such places. Illegal dumping areas may create nuisance and divert land from productive uses.

II. Methods Of Solid Waste Management

There are several municipal solid waste (MSW) managements practises, such as source reduction, recycling, composting of materials from the waste stream. The incoming solid waste is shredded into pieces of equal size for further use. Source reduction involves altering the design, manufacture or use of products and materials to reduce the amount of waste thrown away which is a successful method. Practices such as backyard composting, two-sided copying of paper, and transport packing, reduction by industry have yielded substantial benefits through source reduction. Source reduction is having many environmental benefits like prevention of emission of many greenhouse gases, reduces pollutants, saves energy, conserves resources and reduces the need for new landfills and incinerators.

Recycling diverts items such as paper, glass, plastic, metals etc., which is more beneficial for the mankind. These materials are collected, sorted and processed and then manufactured, as new products. Typical materials that can be recycled and reused are batteries, paper and paperboard etc., Recycling prevents the emission of many greenhouse gases and water pollutants, saves energy, supplies valuable raw materials to industry, create jobs, stimulates the development of greener technologies.

1.Composting:

Composting decomposes organic waste, such as food scraps and yard trimmings, with micro organisms producing a humus- like substance. It is the biological decomposition of organic constituents of MSW such as leaves, grass and food scraps by micro-organisms under controlled conditions. Earthly-smelling, crumbly and soil like material is formed called compost, which greatly reduce the amount of waste that ends up in landfills. Moisture, Oxygen and temperature, carbon to Nitrogen ratio can control the composting process. Carbon and Nitrogen are the two most key elements in composting process. Carbon is the energy source for microorganisms which is inherent in their cells. Nitrogen, constitutes protein which is important for microbial population forms over 50% of dry bacterial cell mass. If nitrogen in excess ratio is lost, it causes odours and environmental pollution.

2.Moisture:

An equilibrium between two activities namely microbial activity and oxygen supply is essential for moisture management. As decomposition takes place in thin liquid films, moisture plays an important role in this process. Abundant moisture can fill the pores between particles with water thereby limiting the movement of oxygen. Decomposition becomes slow in mixtures under 40-50%moisture.MSW collection programs which include paper are often drier than this, and water or sludge is added to bring thick moisture. In decomposition process, oxygen and temperature are also blended and after fluctuation because of microbial activity, it generates heat by losing oxygen. Aeration is the process in linking oxygen and temperature which carries away heat. Decomposing wastes can use oxygen in no time and concentrates in the large pores. One of the by products of decomposition is heat and it is helpful in regulating temperatures.

3.Vermicomposting:

It is a process of composting, uses a container of food scraps and a special kind of earthworm. Later it is replaced with worm droppings and it makes the soil more manure. This method is the easiest method in terms of space and process involved.

4.Landfills:

Landfills are the areas where waste is placed into the land which usually have linear systems and other safety measures which helps in stopping contamination of groundwater. It is one of the stringent methods used in protecting the public health as well as environment. Landfills must also control run-off and run-on and landfills must be covered to control wind dispersal. All hazardous wastes shipped to landfills must be manifested so that regulators can trace the waste from cradle to grave. Checking of wastes to find out the dangerous elements, so that proper treatment can be done to avoid problems of waste compatibility after which it is checked for toxicity and leachability before they are placed in the selected area. Stabilization and neutralization are some of the earlier methods involved in landfills which consists of both hazardous and non-hazardous wastes like sludges, soils, slurries, liquids, powders and dusts.

5.Combustion/Incineration:

It is a method of another MSW disposal practice to reduce the amount of landfill space needed which involves the process of heating MSW at high temperatures. As a result, waste volume will be reduced and generates electricity. This process can lessen the waste upto 90% in volume and 75% in weight. It is useful for the landfills which are small in size. This method is more useful because it can destroy the harmful bacteria and viruses in medical wastes. This MSW incineration is suitable where the area is small because of high urbanisation and high water table, jurisdictional and political boundaries. High investments, high moisture and

low energy content, requirement of highly trained professional are some of the problems that make incineration difficult.

6. Disposal and Recycling Options:

Source reduction, recycling and composting are the few methods involved in recycling and disposal of waste.

Prohibited wastes like hazardous waste, radioactive waste, industrial process waste, infectious waste, pesticides, herbicides, automotive batteries, motor oil etc, are some of the prohibited wastes that causes health disorders to the people.

7. Waste Composition:

Plastics because of their peculiar properties of flexibility, high impact strength, resistance to corrosion, and rigidity have replaced the valuable natural resources like wood and metals. Waste disposal is the last method involved in waste management cycle. The waste collected by the authorities is dumped outside the towns and cities in low lying areas. As there is no provision of leachate there, heavy metals remain there and sink in the ground to lower levels and makes the water unfit for drinking.

III. Conclusion

Health Impacts:

In the process of MSW, it is the staff of the municipal department who were severely affected. They suffer from different ailments like respiratory, gastro-intestinal, eye sight problems and so on. Along with them, it was rag pickers who were effected, who work for long hours there gets problems like respiratory illness from ingesting particulates and bio-aerosols. Infections from direct contact with contaminated material, puncture wounds leading to tetanus, hepatitis, HIV infections, head aches and nausea etc.

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