



WASTE MANAGEMENT AND ITS DISPOSAL METHODS

S.Manicka Vasuki

*Assistant Professor, Department of Business Administration, ThassimBeevi Abdul Kader College for women,
Kilakarai, Ramanathapuram (Dt)*

Abstract

In the modern world, humans cannot simply bury their trash. While primitive humans produced very little waste, and that which was produced would biodegrade quickly, modern humans produce large amounts of waste, much of which is not biodegradable. Additionally, many types of garbage may be damaging to the soil, ground water and surrounding habitat. To address this problem, modern waste management professionals place garbage in lined holes and use bacteria to help facilitate rapid decomposition of the garbage. In this paper an attempt has been made to address the waste management issues and its disposal methods.

Introduction

Americans alone are responsible for producing a whopping 220 million tons of waste a year. This number is far more than any other nation in the world. Because of this fact both the government and environmental associations have developed numerous methods of dealing with the problem. Waste management is that solution, a rather complex issue that encompasses more than 20 different industries.

Waste management is the process of treating solid wastes and offers variety of solutions for recycling items that don't belong to trash. It is about how garbage can be used as a valuable resource. Waste management is something that each and every household and business owner in the world needs. Waste management disposes of the products and substances that you have use in a safe and efficient manner.

Methods of Waste Disposal

There are a number of treatment and disposal methods for solid waste, although when most people think about solid waste management, it is typically the landfill which comes to mind. A variety of elements is involved in the creation of an optimal integrated solid waste management (ISWM) system. For example, treatment techniques act to reduce the volume and toxicity of solid waste, transforming it into a more convenient form for disposal.

Generally, waste treatment and disposal methods are selected and used based on form, composition and quantity of waste materials.

Here are the major waste treatment and disposal methods:

- **Thermal Treatment**

Thermal waste treatment refers to the processes that use heat to treat waste materials. Following are some of the most commonly used thermal waste treatment techniques:

- **Incineration**

It is one of the most common waste treatments. This involves combustion of waste material in the presence of oxygen. The incineration process converts wastes into ash, flue, gas, water vapor and carbon dioxide. This thermal treatment method is commonly used as a means of recovering energy for electricity or heating. This method has a number of advantages such as it quickly reduces waste volume, lessens transportation costs and decreases harmful greenhouse gas emission.

- **Gasification and Pyrolysis**

These two similar methods both of which decompose organic waste materials by exposing wastes to low amounts of oxygen and very high temperatures. Pyrolysis uses absolutely no oxygen while gasification allows very low amount of oxygen in the process. Gasification is particularly more advantageous as it allows the burning process recover energy without causing air pollution.

- **Open Burning**

It is another common thermal waste treatment which involves burning waste materials in a way that causes smoke to be released into the open air directly without passing through a stack or chimney. This particular method is regarded very harmful, environmentally, as the incinerators used in such process have no pollution control devices. The harmful gas released by this method of waste treatment include hexachlorobenzene, dioxins, carbon monoxide, particulate matter, volatile organic compounds, polycyclic aromatic compounds, and ash. Still this method is

practiced by many local authorities to reduce volume of wastes very quickly, without spending much collection and transportation costs.

Dumps and Landfills

- **Sanitary landfills**

These are used as the most common waste disposal fields. These landfills are desired to eliminate or reduce the risk of environmental or public health hazards due to waste disposal. These landfills are placed usually in the areas where land features work as natural buffers between the environment and the landfill.

For instance, the landfill area can be comprised of clay soil which is quite resistant to hazardous wastes or is characterized by an absence of surface water bodies or a low water table, preventing the risk of water pollution. Use of sanitary landfills presents the least health and environmental risk but the cost of establishing such landfills are comparatively higher than other waste disposal methods.

- **Controlled dumps**

This method is more or less the same as sanitary landfills. These dumps comply with almost all the requirements for being a sanitary landfill but generally lack one or two. These dumps may have a well-planned capacity but no cell-planning, there may be no or partial gas management, basic record keeping, or regular cover. These dumps too have reduced chances of harming the natural environment. Initial costs for establishing such dumps are low and operating costs are moderate.

- **Bioreactor Landfills**

These are the result of recent technological research. These landfills use superior microbiological processes to speed up waste decomposition. The actual controlling feature is the continuous addition of liquid to sustain optimal moisture for microbial digestion. The liquid is generally added by re-circulating the landfill leachate and when the amount of leachate is not adequate liquid wastes for example sewage sludge are used.

Biological Waste Treatment

- **Composting**

It is another most frequently used waste disposal or treatment method which is the controlled aerobic decomposition of organic waste materials by the action of small invertebrates and microorganisms. The most common composting techniques include static pile composting, Vermin-composting, windrow composting and in vessel composting.

- **Anaerobic Digestion**

It is almost similar to composting as it also uses biological processes to decompose organic materials. The main difference is Anaerobic Digestion uses an oxygen and bacteria-free environment to decompose the waste materials where composting must have air to enable the growth of microbes. While we have included biological waste treatments in our discussion of disposal, such approaches help divert material from landfills, promoting organics recycling and energy creation.

Conclusion

Waste is not something that should be discarded or disposed of with no regard for future use. It can be a valuable resource if addressed correctly, through policy and practice. With rational and consistent waste management practices there is an opportunity to reap a range of benefits. Proper waste disposal system is considered to be a key priority in achieving sustainable development.

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