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1. INTRODUCTION:

In contemporary society, many of the items used daily are designed to be used and discarded. Single-use packaging and the disposable items defines many of our consumer's patterns. With increased availability of the disposals it has added to the Problem of how to get rid of all these wastes. Solid waste management Solid waste is the unwanted or useless solid materials generated from combined residential, industrial and commercial activities in a given area. It may be categorized according to its origin (domestic, industrial, commercial, construction or institutional); according to its contents (organic material, glass, metal, plastic paper etc); or according to hazard potential (toxic, non-toxin, flammable, radioactive, infectious etc). Management of solid waste reduces or eliminates adverse impacts on the environment and human health and supports economic development and improved quality of life. A number of processes are involved in effectively managing waste for a municipality. These include monitoring, collection, transport, processing, recycling and disposal.

2. SOLID WASTE MANAGEMENT MEANING

- Higher standards of living, rapid population growth and urbanization in developing countries has resulted in the generation of enormous quantities of solid waste.
- If waste generation continues in this way, it would result in irreparable damage to the environment.
- The waste is normally disposed without proper treatment in open dumps, resulting in widespread environmental pollution and degradation.
- Solid wastes cause a major risk to public health and the environment. Therefore, solid waste management become very important in order to minimize the adverse effects of solid wastes.



3. TYPES OF SOLID WASTE

Solid wastes (waste which are neither liquid nor gaseous) can be classified into

- Urban or municipal wastes
- Industrial wastes
- Agricultural wastes
- Medical wastes
- Mining wastes
- Hazardous wastes

The problem of solid waste generation is increasing rapidly with urbanization and industrial development. Developed countries viz. USA, Canada, Japan, England, Germany and France are the main solid waste producers

4. SOURCES OF URBAN WASTE

- **Domestic wastes:-** It includes a variety of materials thrown out from homes

Food waste, Cloth, Waste paper, Glass bottles, Polythene bags, Waste metals, plastic containers, scrap, paints etc.

- **Commercial wastes:-** It includes wastes coming out from shops, markets, hotels, offices, institutions, etc.

Waste paper, packaging material, cans, bottle, polythene bags, etc.

- **Construction wastes:-** It includes wastes of construction materials.

Wood, Concrete, Debris, etc.

- Horticulture waste and waste from slaughter houses include vegetable parts, residues and remains of slaughtered animals, respectively.



- **Biomedical wastes:-** It includes mostly waste organic materials
- Anatomical wastes, Infectious wastes, glass bottles, plastic, metal syringe, etc.
- A large amount of solid waste is released from the mining activities.
- The increase in solid waste is due to overpopulation, affluence and technological advancement.

• **Classification Of Urban Wastes**

Urban wastes are classified into two categories:

1) **Bio-degradable wastes**

What is the Meaning of Biodegradable?

Definition

A biodegradable material or substance can be defined as a material that can be decomposed easily by bacteria or any other natural organisms and not become part of pollution.

Biodegradable wastes are the waste materials that are and can be easily degraded by natural factors like microbes (e.g. bacteria, fungi and a few others), abiotic components like temperature, UV, oxygen, etc. few examples of such wastes are kitchen wastes, food materials, and other natural wastes. Microorganisms and other abiotic elements work together to break down complex substances into simple organic matters which finally suspend and disappear into the soil. The whole process is natural which can be fast or slow. So, the environmental issues and risks caused by biodegradable wastes are very low.

Examples of Biodegradable Waste:-

But the giant dumping of waste can increase some threats to life sooner or later. To prevent this, some people practice composting. In composting, the biodegradable wastes are dumped into a big pit and covered for a time period. During this action of microbes, they will decompose and will be used as compost for cultivation purposes. This will reduce the quantity of waste at landfills.

What is Biodegradable Waste?

Biodegradable waste is a form of waste, originating naturally from plant or animal sources, which may be degraded by other living organisms.

Biodegradable waste can be usually found in municipal solid waste such as green waste, food waste, paper waste, and biodegradable plastics. Some of the sources contain human waste, sewage, slaughterhouse waste etc

2) Non-biodegradable wastes

What is the meaning of non-biodegradable?

Definition

Waste that cannot be decomposed or degraded by the biological process is known as "Non-biodegradable wastes". Most of them include the inorganic waste that is non-biodegradable

What Does Non-biodegradable Mean?

A Non-Biodegradable material can be defined as a type of material that cannot be broken down by natural organisms and serve as a source of pollution.

Unlike biodegradable wastes, non-biodegradable wastes cannot be easily taken care of. Non-biodegradable wastes are those which cannot be decomposed or degraded by natural agents. They remain on earth for thousands of years without any degradation or decomposition. Therefore, the threat caused by them is also more dangerous. An example is a plastic which is usually used in almost every area. To give these plastics a long-lasting outcome, better quality plastics are being used. This made them more temperature resilient and tougher even after the use. Other cases are cans, metals, and chemicals for agricultural and industrial uses. They are the chief causes of air, water and soil pollution and diseases like cancer.

Since non-biodegradable wastes are not at all Eco-friendly, they need to be replaced or substituted. As a part of the growth of alternatives, scientists have brought forward many innovative ideas like biodegradable plastics, etc. They combined some biodegradable materials with plastics and made them easily and speedily degradable. But this is quite a costly procedure. Non-biodegradable wastes which can be recycled and can be used again are known as "Recyclable

waste" and those which cannot be used again are known as "Non-recyclable waste".

5. SOURCES OF INDUSTRIAL WASTE

Industrial waste is an all-encompassing term used to describe material considered to be no longer of use after a manufacturing process has been completed.

There are many sectors of industrial manufacturing that produce waste, including:

- Various types of factories
- Mining
- Textile mills
- Food manufacturing
- Consumer goods
- Industrial chemicals
- Printing and publishing



Below we'll explore different types of industrial waste, as well as what you should know about properly disposing of it to ensure you meet all federal and state regulations.

Types of Industrial Waste

Industrial waste can be hazardous or non-hazardous. Both, however, can cause substantial damage to the environment if not properly managed. Below are some common types of industrial waste that can be hazardous to human life and the environment.

- **Solid Waste**

Though the term "industrial waste" includes several different types, one of the most common is **industrial solid waste**. Each year, American industries generate and dispose of about 7.6 billion tons of industrial solid waste.



According to the Resource Conservation and Recovery Act, solid waste can be generated by manufacturing processes such as:

- Electric power generation
- The use of agricultural chemicals and inorganic chemicals
- Iron and steel manufacturing
- Water treatment
- Plastics and resins manufacturing
- Many of the other manufacturing processes outlined above

- **Toxic Waste**

Industrial waste can also be **toxic or hazardous waste**. If not managed properly, this type of industrial waste can cause harm to humans, animals and the environment by contaminating waterways, such as rivers and lakes.

This type of industrial waste is generally a byproduct of other materials generated at factories, hospitals and manufacturing facilities.

It's important to note that waste laws can vary from state to state. For example, in many states, asbestos is not considered a hazardous waste. However, in California, it is. If the waste weighs more than 50 pounds in total, transportation by a certified hazardous waste disposal company is required.

If your company's manufacturing process produces and transports less than 50 pounds of asbestos to a disposal facility, you are not required to follow the same procedures as you would if you accumulated more than 50 pounds. These include manifest requirements.

- **Chemical Waste**

Chemical waste mostly contains harmful chemicals. This does not mean, however, that it is classified as hazardous.

For it to be considered hazardous, it must have an ignitability, corrosivity, reactivity or toxicity characteristic, according to the U.S. Environmental Protection Agency.

- **Secondary Waste**

The EPA's Sustainable Materials Management effort also has placed an emphasis on reusing **secondary materials** that are considered to be non-hazardous, such as scraps and residuals that result from the production process.

Examples of secondary types of waste include:

- Coal combustion
- Spent foundry sand
- Construction materials when infrastructure is demolished

How To Dispose Of Industrial Waste

Improperly handling industrial waste can have harmful consequences to both your company and the community. If not properly disposed of, harmful waste can be released into the air, soil and water.

This carelessness can also pose a threat to your company's reputation and bottom line, and expose you to costly fines and publicity that your company may struggle to recover from for years to come.

Southern California is home to several facilities where you can drop off your industrial waste. Before you go, however, it's important to check what materials the facility accepts, since not every facility accepts every type of industrial waste. Very few accept hazardous waste, while others only accept certain kinds of solid waste.

Hazardous waste disposal companies offer a safer and more convenient option, and they can help with the process of disposing of industrial waste.

Regulations for industrial waste vary. For example, **hazardous industrial waste** dictates a "cradle to grave" regulation. This means if you generate hazardous waste, you are legally and financially responsible for it from the time it is created to the time it is disposed of, whether it is on your property or not.



This is why many industrial waste generators work with a reputable disposal company to help them manage this process and alleviate any issues that may arise from the transportation and disposal of their waste - especially once it leaves your facility.

If your company produces **industrial wastewater**, several counties including Los Angeles County require that you obtain an industrial waste disposal permit.

You can read more about the importance of knowing what to look for in a waste disposal company in our article, [How Industrial Waste Disposal Is Managed](#).

6. HARMFUL EFFECTS OF SOLID WASTES

- Inappropriate disposal of municipal solid waste on the roads and surroundings, results in the production of foul smell and spread of diseases/respiratory problem, due to the decomposition of biological matter
- Toxic metals like mercury and lead are released into the environment due to inappropriate disposal of industrial solid wastes. Hazardous solid wastes released by industries also cause soil pollution and affect the productivity of soils.
- Contamination of groundwater takes place because of toxic substances release from solid wastes.
- Burning of industrial or domestic wastes (cans, pesticides, plastics, radioactive materials and batteries) produce carcinogenic chemicals like dioxins and polychlorinated biphenyls.
- Water contaminated due to improper disposal of solid waste causes diseases like diarrhoea, dysentery, typhoid, cholera, plague, etc.
- Solid waste modifies the physiochemical and biological properties of plants and soil..
- Groundwater gets contaminated.
- It enhances air and water pollution.
- Provides breeding sites of insects and infectious organisms are produced.
- Solid waste management involves waste collection, transportation, segregation of wastes and disposal techniques

7. SOLID WASTE MANAGEMENT STEP

Solid Waste Management important steps involved in solid waste management

- Reduce, Reuse and Recycle of Raw Materials
- Discarding wastes
- if usage of raw materials is reduced, the generation of waste also gets reduced
- Plastic bottles, metal containers, clothes and many other household items can be reused many times before discarding them. Rubber rings, and other useful items can be made from discarded cycle tubes.

- **Recycling**

Recycling is the reprocessing of discarded materials like glass, old paper cans, newspapers, tin, plastic, rubber, into new useful products.

Old aluminum cans and glass bottles can be recycled to produce new ones. Waste paper can be recycled to make fresh paper. Metals like steel and aluminum can be easily recycled. Lead is widely recycled. Reduce, Reuse & Recycle (3R's) help in saving money, energy, raw materials and thereby help in reducing pollution.

Regarding the waste reduction effort that ended in the TPA/landfill, along time, the existing 3R concept developed into the 5R reversed triangle concept (Reduce-Reuse-Recycle-Recovery Disposal) with the following details:

1. **Reduce**-reduce waste generation from the start by bringing your own shopping bags, using products that can be used repeatedly, and so on
2. **Reuse**-reuse materials that can and are safe to be reused, one of them is by making handicrafts or through the upcycling process
3. **Recycle** - recycling waste by melting, chopping to be re-formed into new products that most likely to experience a decline in quality
4. **Recovery**-when it cannot be recycled, then find a way to produce energy or new material by processing the non-recyclable waste (residue)

5. Disposal-waste byproducts from the recovery process which are generally in the form of ash or other waste material are taken to the landfill to be processed so as not to damage the environment

The following methods are adopted for discarding wastes: Landfill Incineration and Composting

6. Landfills

In sanitary landfills waste is dumped in many layers of 80 cm thick refuse which is covered with soil of 20 cm thickness.

The decomposition of solid wastes generates toxic gases.

Solid waste volume shrinks by 25-30% after 2-3 years. This is the most common and cheapest method of waste disposal and is mostly employed in big cities.

Advantages It is simple and economical Segregation of wastes is not required. Landfilled areas can be reclaimed and used for other purposes. Converts low-lying waste-land into useful areas



Hazardous waste Hazardous waste is solid waste that has hazardous waste characteristics or is a listed hazardous waste.

Hazardous substance may exhibit one or more of the following hazardous characteristics: ignitability, or something flammable, corrosivity, or something that can rust or decompose., reactivity, or something explosive, toxicity, or something poisonous.

Examples Batteries containing toxic metals (zinc, lead or mercury) Radioactive materials. Wastes from hospitals & pathology Labs. Toxic Chemicals

7. Incineration.

It is a hygienic way of disposing solid waste. It is suitable if waste contains more hazardous material and organic content. This process is the most effective process for completely destroying plastic waste and pathogenic medical waste. It is expensive process, compared to other methods of waste disposal. Municipal solid wastes are burnt at high temperature in big furnaces called incinerators.



Combustible substances such as plastic materials, rubbish, garbage, dead organisms are separated for burning in incinerators. The non-combustible materials can be left out for recycling and reuse. About 10 % solid material and ash remains after combustion which can be disposed off by other means.

Incineration. The heat produced in the incinerator during burning of refuse is used for generation of electricity through turbines

8. Composting

It is a popular method used for the disposal of biodegradable wastes. During composting microorganisms like bacteria and fungi decompose the plant and animal waste into organic manure.

Waste needs to be separated into biodegradable and non-biodegradable wastes before composting. Biodegradable wastes is dumped in underground trenches and covered with earth/old manure and left for decomposition. Organic matter is decomposed by bacteria and the refuse is finally converted into powdery brown coloured mass



called compost which can be used in agriculture.

- Methane gas is also released during the process of composting, which can be utilized by composting the waste in a biogas plant.

In several parts of India compost plants are in operations, e.g. in Ahmedabad, Calcutta, Mumbai, Chennai, Delhi, Pune, and Hyderabad.

Composting Advantages Waste is converted into useful manure which enhances the productivity of soil.. Industrial solid wastes which are biodegradable, can be composted. Manure can be sold easily, thereby reducing cost of waste disposal

8. CONCLUSION:

Urban solid waste management is an essential social service for protection of environment and health of the citizens. Therefore, a least cost most appropriate technological option for safe management should receive the needful funding. Industries, institutions, nongovernment agencies and individual citizen should all co-operate with the municipal authorities in ensuring safe management. As society moves waste to the forefront of public policy, it is more apparent that what we discard annually contains a multitude of valuable and recoverable materials. An *integrated* waste management system entails a careful analysis of what is in the waste stream and offers ideas on practices to recover the various materials At the point of highest value. The best strategy for a community is to match its unique position with the mix of activities that will best serve it now and far into the future.