

Waste Generation and Management

Waste – Any substance which is discarded after primary use, or it is worthless, defective and of no further use.

Domestic Waste:

- Waste that is generated from domestic activities such as washing, bathing, cooking etc. is called domestic waste.
- Domestic waste includes fruit and vegetable peels, leftover food, waste paper, plastic, glass, rubber, metals etc.
- Sources: Kitchen Waste, Plastics, Glass, Rags, Paper.



Industrial Waste:

- Waste which is generated by industries is called industrial waste.
- Chemicals, paint residues, oil, ash, sludge and heavy metals etc. are some types of wastes which are generated by industries.
- The type of industrial waste depends on the raw materials used and the type of products manufactured.
- Sources: Mining Operations, Cement Industries, Oil Refineries, Construction Units.



Agricultural Waste:

- Waste such as animal manure, plant leaves, bark, flowers etc. which is generated from plants and animals is called agricultural waste, farm waste or garden waste.
- Farm waste includes animal wastes as well as residues of fertilizers, pesticides, insecticides and other chemicals which are used in agriculture to increase crop production.
- Sources: Agricultural Residue, Bagasse, Pesticides, and Fertilizers, Animal Waste.



Municipal Waste:

- Waste generated from domestic, industrial and commercial activities is called municipal solid waste or urban waste.
- Wastes such as garbage and plastic bags, glasses, metals, fibre, paper, rubber, discharge from hospitals, hotels etc. are all included under municipal wastes.



Electronic Waste:

- E-waste is mostly generated in large cities. However, due to fast improving lifestyles and standard of living, even smaller towns and cities are flooded with electronic devices, resulting in an increase in e-waste.

- The harmful substances found in e-waste include cadmium, mercury, lead etc., which are toxic in nature and hence harmful to human health. Copper, silver, gold etc. are some of the valuable materials found in e-wastes.



Segregation:

- Separation of wet and dry waste is an important step in the process of waste management.
- One should separate the degradable waste from the non-degradable waste.
- Proper segregation of waste helps the municipal authorities to decompose and dispose of the organic part of the wastes easily.
- Segregation involves separating the refuse into three main categories—reusable, degradable and nondegradable wastes.
- Reusable waste: Wastes such as paper, old books, discarded exercise books and used envelopes can be recycled. In the case of used metallic cans, the metallic components can be separated from the non-metallic components and reused.
- Degradable waste: Organic wastes such as vegetable peels, leaves, leftover food etc. can be decomposed into useful manure with the help of microorganisms. Such decomposition is called biodegradation, and the substances are called biodegradable substances.
- Non-degradable waste: Wastes such as plastic, pesticides etc. can be dumped or buried at far off places.

Dumping:

- Non-degradable wastes such as plastic, pesticides, fibres etc. can be dumped or buried in specially dug up pits at far off places away from human habitation.

Composting:

- The rotting and conversion of organic waste into manure is known as composting. The product formed after composting is called compost.

- Household garbage (e.g. fruit and vegetable peels, egg shells, waste food, tea leaves), as well as farmland wastes (e.g. dried leaves, husk and parts of crop plants from fields after harvesting), can all be converted into useful compost.

Drainage/ Sewer System;

- A sewer system is a channel of pipelines, which carries sewage from houses, offices, hospitals etc. through drainage pipes, from where it flows to the sewer mains of the city.
- Sewage flows easily through the sewers because the drainage system has a slight slope.
- Manholes are holes with covers in a road or pavement. Through a manhole, a person can enter a drain or a sewer to fix a faulty pipe if there is a leakage or blockage in any of the pipes.
- Sewer mains flow into progressively larger pipes until they finally reach the wastewater treatment plant.
- Storm drains are drains through which rainwater flows before it reaches a water body. They are most often separate from the sewerage system of the cities.

Incineration:

- Incineration is a method in which waste is burnt at very high temperatures.
- Hazardous bio-medical wastes, such as discarded medicines, toxic drugs, human anatomical wastes, blood, pus, microbiological and biotechnological wastes etc., are usually disposed of by incineration.

Effluent Treatment Plants;

- Municipal and industrial wastewater is treated in wastewater treatment plants or effluent treatment plants before they are released into the water bodies.
- Treatment of wastewater involves various physical, chemical and biological processes.

Scrubbers;

- Scrubbers are devices used to remove both gaseous and particulate matter.
- Air is passed through either dry or wet packing material. Gaseous pollutants get dissolved in wet packing.
- Air passing out of a scrubber is dust free, clean and free of gaseous pollutants.
- Wet scrubbers are used in chemical, metallurgical and mining industries to trap sulphur dioxide (SO₂), ammonia (NH₃), metal fumes etc.

Electrostatic Precipitator:

- In an electrostatic precipitator, gas or an air stream containing dust, smoke soot, and other particulate matter is passed through a chamber containing electrically charged plates.

- The particles may get charged naturally when they pass through the charged plates.
- The electrically charged particles stick to the charged metal plates inside the precipitator.
- Knocking on the plates drops the particles into a hopper tray for disposal. Clean gas or air passes out of the precipitator.

Disposal of E- waste:

- Rag pickers and waste dealers collect discarded electronic gadgets. They remove the usable components and extract secondary raw materials.
- Most electronic goods contain a variety of materials and metals which can be recycled for future use.

