



SOLID WASTE MANAGEMENT

HAZARDOUS WASTE MANAGEMENT

E – WASTE MANAGEMENT



# SOLID WASTE MANAGEMENT

## DEFINITION :

Solid waste management states that "solid waste" means any garbage or refuse, sludge from a wastewater treatment plant, water supply treatment plant, or air pollution control facility and other discarded material, resulting from industrial, commercial, mining, and agricultural operations, and from community activities.



# CLASSIFICATION OF SOIL WASTE

Diagram 1

## Classification of solid waste

According to nature of waste

### Biodegradable

- Vegetable waste
- Kitchen waste
- Garden waste
- Agro-waste
- Cattle dung....



### Non Biodegradable

- Plastic
- Paper
- Cloth
- Glass
- Metal

This classification is important for selection of technology



## Classification of Solid Waste

Biodegradable and recyclable	Non-biodegradable	
	Recyclable	Non-recyclable
Kitchen waste	Plastics – carry bags, milk covers PVC pipes etc. Syringes, Glucose bottles etc. Cotton and nylon cloth Tires & Tubes	Nitrogen sealed packing for chips
Food	Shampoo	Tetrapacks
Cow dung/animal waste	Bottles	Thermo cal
Agricultural	Glass	Carbon paper
Leaves	Books/notebook	Plastic coated visiting cards
Egg cells	Wires	Sachets
Henna paste	Caps of mineral water bottles	Modern packing materials (plastic) for food packing
Vegetable	Plastic	PET mineral water bottles
Peels, meat, bones	Tin can	
Dead animals	Metal	
Paper	Ash/dirt	
Wood		



# SOLID WASTE MANAGEMENT



Solid waste refers to non-liquid, non-gaseous waste materials that include items such as paper, plastics, metals, glass, food waste, and more. key components of solid waste management:

- a. **Source Reduction** : Encouraging the reduction of waste generation at the source through practices like recycling, composting, and buying products with minimal packaging.
- b. **Collection**: The organized collection of waste from households, businesses, and industries. Proper segregation of waste at the source is important.
- c. **Transportation**: Safe and efficient transportation of collected waste to treatment facilities or landfills.
- d. **Treatment and Disposal**: Waste is treated through methods such as incineration, composting, or landfilling, depending on the waste type and regulations.
- e. **Recycling and Recovery**: Promoting recycling of materials to reduce the need for raw resource extraction and reduce the environmental impact.



# ADVANTAGES

1. \*Environmental Protection:\* -Proper solid waste management helps prevent pollution of air, soil, and water, reducing the negative impact on ecosystems and preserving biodiversity.
2. \*Resource Conservation:\* -Recycling and proper disposal of solid waste enable the recovery of valuable resources, such as metals and paper, reducing the need for raw materials and promoting sustainability.
3. \*Public Health Improvement:\* -Adequate waste management minimizes health risks associated with improper disposal, preventing the spread of diseases and protecting the well-being of communities.
4. \*Energy Recovery:\* -Some solid waste management methods, like waste-to-energy technologies, allow for the recovery of energy from waste, contributing to renewable energy sources and reducing dependency on fossil fuels.
5. \*Reduction of Landfill Usage:\* -Efficient waste management practices, including recycling and composting, decrease the volume of waste sent to landfills, thereby conserving valuable land space and mitigating environmental impact.



# DISADVANTAGES

1. **\*Environmental Pollution:\*** -Improper disposal of solid waste can lead to environmental pollution, contaminating air, soil, and water resources and harming ecosystems.
- . **\*Health Hazards:\*** -Inadequate solid waste management can pose health risks as it may attract disease vectors, result in the spread of infections, and expose communities to harmful substances.
2. **\*Aesthetic and Nuisance Issues:\*** -Accumulation of solid waste in public spaces can create unpleasant odors, visual blight, and attract pests, affecting the quality of life for nearby residents.
4. **\*Landfill Overflow:\*** -Overreliance on landfills for waste disposal can lead to their saturation, causing overflow and potential leakage of harmful substances into the surrounding environment.
3. **\*Resource Depletion:\*** -Failing to implement recycling and resource recovery strategies in solid waste management results in the depletion of valuable resources that could be salvaged from waste.
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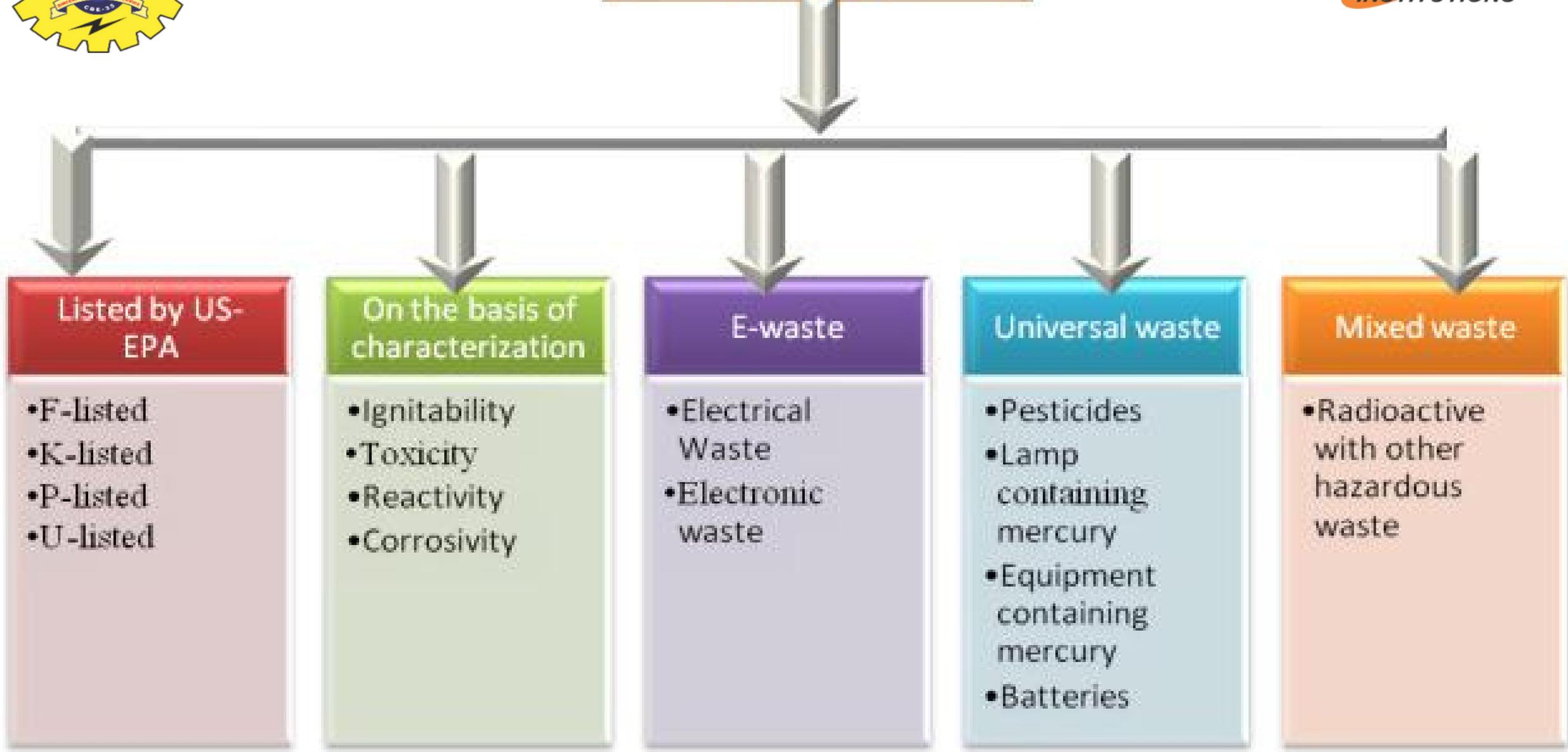
# HAZARDOUS WASTE MANAGEMENT

## DEFINITION :

a hazardous waste is a waste with properties that make it dangerous or capable of having a harmful effect on human health or the environment.” Hazardous waste also includes different physical forms, including: solids, liquids, and gases. The definition “hazardous waste” is also defined by different organizations including the United States Environmental Protection Agency (EPA).



# Hazardous waste





1. Simply put, the F-list includes any wastes that have a nonspecific source, but are produced from manufacturing and industrial processes. Because they can be generated in various sectors of industry and manufacturing, their ultimate source becomes nonspecific.

2. Unlike F-list wastes, K-list wastes are specific wastes that have specific industry sources. Particular production and treatment processes generate certain types of wastewater and sludge that become distinguishable as hazardous wastes

3. P-list and U-list wastes are specific commercial chemical products that are disposed of, but unused. To be considered as one of these wastes, they must meet certain criteria and be commercial grade formulations of specific unused chemicals

## F -list

- Wood-preserving wastes
- Spent solvent wastes
- Petroleum refinery wastewater treatment sludges
- Dioxin-bearing wastes

## K -list

- Petroleum refining
- Inorganic pigment manufacturing
- Explosives manufacturing
- Iron and steel manufacturing

## P And U -list

- It must contain one of the chemicals identified in the [P or U list](#)
- The waste's chemical must be unused
- The waste must be in a commercial chemical product form



# ADVANTAGES

1. \*Environmental Protection:\* -Proper management prevents hazardous waste from contaminating air, water, and soil, protecting ecosystems and biodiversity.
2. \*Human Health Preservation:\* -Appropriate handling and disposal minimize the risk of exposure to hazardous substances, safeguarding the health of communities.
3. \*Resource Recovery:\* -Some hazardous waste can be treated and processed to recover valuable resources, reducing the demand for new raw materials.
4. \*Technological Innovation:\* -Managing hazardous waste often drives the development of new technologies and methods for safe disposal and remediation.
5. \*Regulatory Compliance:\* -Adhering to hazardous waste management regulations ensures legal compliance and reduces the likelihood of fines or legal actions.



# DISADVANTAGES

1. **\*Health Risks:\*** -Exposure to hazardous waste poses serious health risks to individuals, leading to acute or chronic health conditions.
2. **\*Environmental Contamination:\*** -Improper disposal or accidental releases can result in long-term environmental contamination, affecting ecosystems and wildlife.
3. **\*Cost of Cleanup:\*** -Remediation and cleanup of hazardous waste sites can be extremely expensive, and the costs may be borne by governments or responsible parties.
4. **\*Social Stigma:\*** -Communities near hazardous waste sites may face social stigma, affecting property values and the overall well-being of residents.
5. **\*Complexity of Management:\*** -Hazardous waste management requires specialized knowledge and technologies, making it more challenging and expensive than managing non-hazardous waste.



# HAZARDOUS WASTE MANAGEMENT



Hazardous waste is waste that poses a significant risk to human health or the environment due to its chemical, physical, or biological properties. Examples include chemicals, solvents, pesticides, and radioactive materials. Key aspects include:

- a. **Identification and Classification:** Accurate identification and classification of hazardous waste according to regulatory guidelines.
- b. **Storage:** Safe and secure storage of hazardous waste in designated containers and areas.
- c. **Transportation:** Strict regulations for transporting hazardous waste to approved treatment, recycling, or disposal facilities.
- d. **Treatment and Disposal:** Hazardous waste should be treated or disposed of in specialized facilities capable of handling its dangerous properties.
- e. **Environmental Monitoring:** Regular monitoring of the environment around hazardous waste sites to detect and mitigate any contamination.



## E – WASTE MANAGEMENT

### DEFINITION :

E-waste management refers to the systematic collection, recycling, and disposal of electronic waste, including discarded electronic devices and components. The goal is to mitigate environmental impact, reduce health hazards, and promote the sustainable handling of electronic waste.



# E-WASTE MANAGEMENT

Why E-Waste Management?





# ADVANTAGES

- 1 **\*Resource Recovery:\*** -Enables the extraction and reuse of valuable resources, such as metals and rare earth elements, from electronic waste, reducing the need for raw materials.
- 2 **\*Environmental Conservation:\*** -Minimizes environmental pollution by preventing the improper disposal of hazardous materials present in electronic devices, safeguarding ecosystems and water sources.
- 3 **\*Energy Conservation:\*** -Reduces the energy required for manufacturing new electronic products by promoting the reuse of components and materials through recycling and refurbishment.
- 4 **\*Job Creation:\*** -Generates employment opportunities in the e-waste management industry, including collection, recycling, and related activities.
- 5 **\*Data Security:\*** -Ensures secure data destruction, protecting sensitive information from unauthorized access during the disposal or recycling of electronic devices.



# DISADVANTAGES

- 1 \*Complexity and Cost:\* -E-waste management involves intricate processes and can be costly to implement, particularly for advanced recycling technologies and secure data destruction methods.
- 2 \*Lack of Infrastructure:\* -Many regions lack proper infrastructure for efficient e-waste collection, recycling, and disposal, making it challenging to implement effective waste management systems.
- 3 \*Informal Recycling Practices:\* -In some cases, informal or unregulated recycling practices may lead to environmental and health hazards, as workers may not have adequate protection or follow proper procedures.
- 4 \*Global Trade of E-Waste:\* -Illicit international trade of e-waste, often to developing countries with less stringent regulations, poses environmental and health risks due to improper disposal methods.
- 5 \*Economic Disincentives:\* -The economic value of recycling may not always be sufficient to incentivize proper e-waste management, especially in regions where disposal costs are lower.



# E – WASTE MANAGEMENT



Electronic waste, or e-waste, consists of discarded electronic devices and equipment like computers, smartphones, TVs, and appliances. E-waste contains hazardous materials such as lead, mercury, and cadmium, which can harm both the environment and human health. E-waste management includes:

- a. **Collection**: Organized collection of e-waste from households and businesses.
- b. **Segregation**: Separation of different types of electronic waste to facilitate recycling and proper disposal.
- c. **Recycling**: Recovery of valuable materials from e-waste while safely managing hazardous components.
- d. **Disposal**: Safe disposal of e-waste, especially for items that cannot be recycled, to prevent contamination.
- e. **Awareness and Education**: Educating the public about the proper disposal of e-waste and the importance of recycling electronics.