

WASTE MANAGEMENT

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- Solid waste management is the collection, transport, processing, recycling or disposal and monitoring of solid waste materials.

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The objectives of the solid waste management are to;

- Minimize waste generation;
- Maximize the collection efficiency of waste;
- Reduce the volume of waste requiring disposal and maximize the economic value of waste; and
- Develop and adopt environmentally sound treatment and disposal methods.

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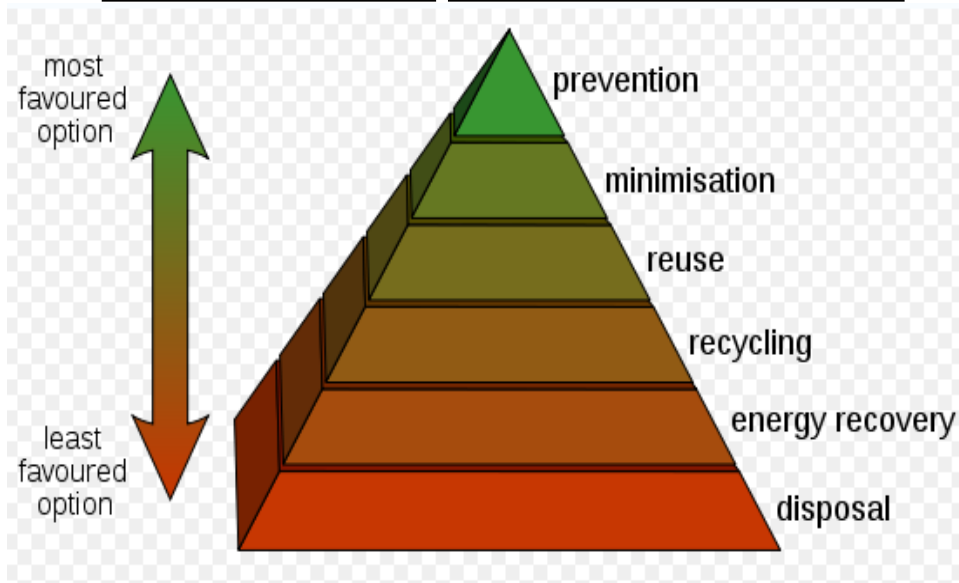
Waste Management systems

A waste management system should ideally consist of environmentally acceptable waste management practices that are aimed at minimizing waste generation from both domestic and industrial/commercial activities.

Further, the system must provide for the protection of human health and the environment.

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HIERARCHY OF WASTE MINIMIZATION



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Waste Prevention

- This means avoiding the potential for waste generation in the first place. It is usually linked with manufacturing industry, and is synonymous with :-
 - Reductions in resource use,
 - Resources Selective,
 - Avoiding certain types of resources, especially hazardous wastes

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Waste Minimization

- Waste minimization strategies include all actions to reduce the quantity of waste requiring disposal.
- Waste minimization include
- Reducing waste at source
- Reusing materials
- Recycling waste materials
- Reducing use of toxic or harmful materials

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Waste minimizations has the following advantages:

- Reduced volume of waste for disposal
- Reduced costs of collection and disposal
- Longer life of disposal sites
- Reduced environmental and health impacts
- Reduced costs through more efficient use of resources

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Waste Re-Use

- This refers to the re-use of discarded items without any additional processing.
- In manufacturing industry, for example, this may refer to packaging materials such as wooden pallets or cardboard boxes used to transport products from factory to warehouse to retail outlet.
- In office or household terms it may involve the use of glass cups rather than paper/plastic cups and Refillable bottles.

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Recycling

- Recycling involving the utilization of discarded material to produce another product of the same grade or lower.

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RESOURCE **RECOVERY** THROUGH WASTE PROCESSING

This is biological or thermal treatment of waste can result in recovery of useful products such as compost or energy.

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Biological process

- Biological treatment involves using micro-organisms to decompose the biodegradable components of waste.

Two types of processes are used, namely:

- (a) **Aerobic processes:** Windrow (row of drying grass) composting, aerated static pile composting and in-vessel composting etc.
- (b) **Anaerobic processes:** Low-solids anaerobic digestion (wet process), high solids anaerobic digestion (dry process) and combined processes.

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Thermal process

- Thermal treatment involves conversion of waste into gaseous, liquid and solid conversion products with concurrent or subsequent release of energy

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Three types of systems adopted namely

- (a) Combustion system (incinerators):** Thermal processing with excess amounts of air
- (b) pyrolysis systems:** Thermal processing in complete absence of oxygen (low temperature)
- (c) Gasification systems:** Thermal processing with less amount of air (high temperature).

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Waste disposal

- The final functional element in the solid waste management system is waste disposal.
- Today the disposal of wastes are done by
 - Uncontrolled dumping.(Open dump)
 - Land filling

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Open dump

- An open dumping is defined as a land disposal site at which solid wastes are disposed of in a manner that does not protect the environment, are susceptible to open burning, surface and ground water contamination, detrimental to the natural beauty of the land, deteriorating soil quality and are exposed to scavengers

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Open dump

- **It is a predominant method of waste disposal in developing countries leading into;**
 - Illegal dumping problems
 - Groundwater contamination,
 - Air pollution,
 - Pest and
 - Health hazards

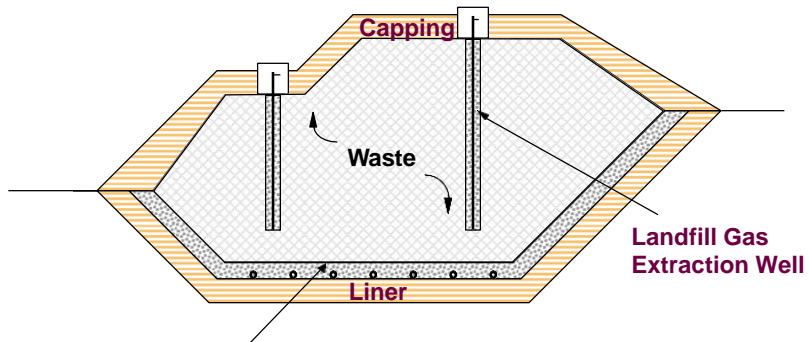
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Landfills

- Engineered Landfill sites as well as properly sited and constructed dumpsites are a pivotal component in a sound waste management system.
- It is important to note that despite active waste prevention and recycling, residues will always remain requiring final disposal. Waste should therefore be disposed of in such a way as not to cause harm to the environment and mankind.

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A Typical Containment Landfill



Leachate Collection System

Leachate: a liquid containing soluble material removed from a solid mixture through which the liquid has passed

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- Public awareness plays a vital role in changing people's attitude and ensuring the success of waste management programs.
- The success of waste management programmes will depend to a greater extent on awareness programmes. The awareness programmes will provide for sensitisation of communities on the existing environmental laws and by-laws.

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