Solid waste management

Solid Waste

Any material that is thrown away as unwanted is considered as solid waste.

Classification of solid waste

1. Municipal Waste
2. Industrial Waste
3. Agricultural waste
4. Medical waste
5. Mining waste
6. Sewage sludge

Sources of solid waste (causes)

I. Urban wastes

Urban wastes consists of medical waste from hospitals, municipal solid wastes form homes, offices, markets, horticulture wastes from parks, gardens, orchards etc.

II. Industrial wastes

- It includes materials including factory rubbish, packaging materials, organic wastes, acids, alkalis and metals etc.
- Nuclear power plants generate radioactive wastes.
- Thermal power plants produce fly ash in large quantities.
- Chemical industries produce large quantities of hazardous and toxic materials.

Effects of solid wastes

- The domestic wastes from houses produce foul smell and breed various types of insects.
- Industrial solid wastes are sources of toxic metals and hazardous wastes, which affect the productivity of soils.

- The toxic wastes percolate into the ground and contaminate ground water.
- Burning of wastes containing cans, pesticides batteries etc. produces dioxins, furans and polychlorinated biphenyls which are cancerous in nature.

Management of solid wastes (Control Measures)

I. Stress is made on ―three R's – reduce, reuse and recycle. The process of reducing, reusing and recycling saves money, energy, raw materials, land scope and also reduces pollution.

(i) Reduction in use of raw materials: (REDUCE)

Reduction in the use of raw materials will decrease the production of waste.

(ii) Reuse of waste material:- (REUSE)

The refillable containers discarded after use can be reused.

Making of rubber rings from discarded cycle tubes.

(iii) Recycling of materials:- (RECYCLE)

Recycling is the reprocessing of discarded materials into new useful products.

E.g: Glass bottles are melted to recast into new bottles.

Preparation of automobiles and construction materials from steel cans.

II. Methods for discarding waste

a) Sanitary Landfill

b) Composting

c) Incineration

a) Sanitary Landfill

Solid wastes are placed in sanitary landfill system in alternate layers of 80cm thick refuse, covered with selected earth fill of 20cm thickness. After two or three years, solid waste volume shrinks by 25-30% and the land is used for parks, roads and small buildings.

Advantages of landfill

1. Simple & Economical
2. Segregation of waste not required.
3. Land filled areas can be reclaimed and used for other purposes.

Disadvantages

1. Large area is required.
2. Bad odour arises, if landfills are not properly dealt with.
3. It may become a source of mosquitoes and flies if not properly done.
4. It may cause fire hazards due to the formation of methane during wet weather.

b) Composting

In the process, the solid wastes are decomposed by bio chemical bacteriological process under controlled conditions.

1. Aerobic decomposition – decomposition in the presence of air.
2. Anaerobic decomposition - decomposition in the absence of air.

The end product is known as humus. Humus is a good quality, nutrient rich, environmental friendly manure which improves soil conditions and fertility.

Advantages

1. No harm to the environment.
2. Manure obtained can be sold and the cost of disposing is reduced.

Disadvantages

1. The non-degradable wastes have to be disposed separately.
2. Use of compost manure has not yet caught up with farmers and hence no assured market.

c) Incineration

It involves the burning of solid waste at high temperature between 850°C – 100°C

- It is a hygienic way of disposing solid wastes.

- The combustible substances are separated from non-combustible substances

Before incineration.

- Only 10-20% of ash is obtained.
- The heat produced during burning is converted to electrical energy.
- The solid wastes should be dried up before burning.

Advantages

1. Requires little space.
2. It is a hygienic and safe method.
3. Power is generated.
4. It occupies less space.

Disadvantages

1. The initial cost is very high.
2. Leads to air pollution due to the emission of smoke, dust and ash.