

SOLID WASTE MANAGEMENT

Management of solid waste is very important to minimize adverse effect of solid waste.

Types of solid waste

Urban waste and industrial waste.

Sources of urban and industrial wastes

Sources of urban waste: domestic waste like food waste, waste paper, glass bottles, polythene bags etc

.Commercial waste like packing materials cans, bottles, polythene bags etc

Construction wastes like concrete, wood, debris etc .Biomedical waste like Anatomical waste, infectious waste etc

Classification of urban waste:

1. Biodegradable wastes – urban solid waste materials that can be degraded by micro organisms are called biodegradable waste. E.g. food, vegetables, Tea leaves, dried leaves etc.
2. Non biodegradable waste. Urban solid wastes that cannot be degraded by microorganisms are called non biodegradable wastes.

SOURCES OF INDUSTRIAL WASTES

The main source of industrial waste is chemical industries, metal and mineral processing industries.

E.g.

1. Nuclear power plants generate radioactive wastes
2. thermal power plants produce fly ash in large quantities
3. Chemical industries produce toxic and hazardous materials.

4. other industries produce packing materials acid, alkalis, scrap metals, rubber, plastic, glass wood etc

EFFECT OF SOLID WASTE

1. Biodegradable materials in the disposed municipal waste undergo decomposition. This produces foul smell and breeds various types of insects which spoil land well.
2. Industrial waste containing toxic metals and hazardous waste affect soil characteristics.
3. Toxic substances name percolate into the ground and contaminates the ground water.
4. Burning of some industrial waste or domestic waste produces furan, dioxins and poly chlorinated biphenyls which are harmful to human beings.

STEPS INVOLVED IN SOLID WASTE MANAGEMENT

Reduce, reuse and recycle: if the usage of raw materials is reduced the generation of waste also gets reduced.

Reuse of waste materials: discarded refillable containers can be reused. Waste generation during manufacture of rubber bands is reduced by making rubber bands from discarded cycle tubes.

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

Ex. Old aluminium cans glass bottles are melted into new cans and bottles.

Preparation of cellulose insulations from paper.

Preparation of fuel pallets from kitchen wastes.

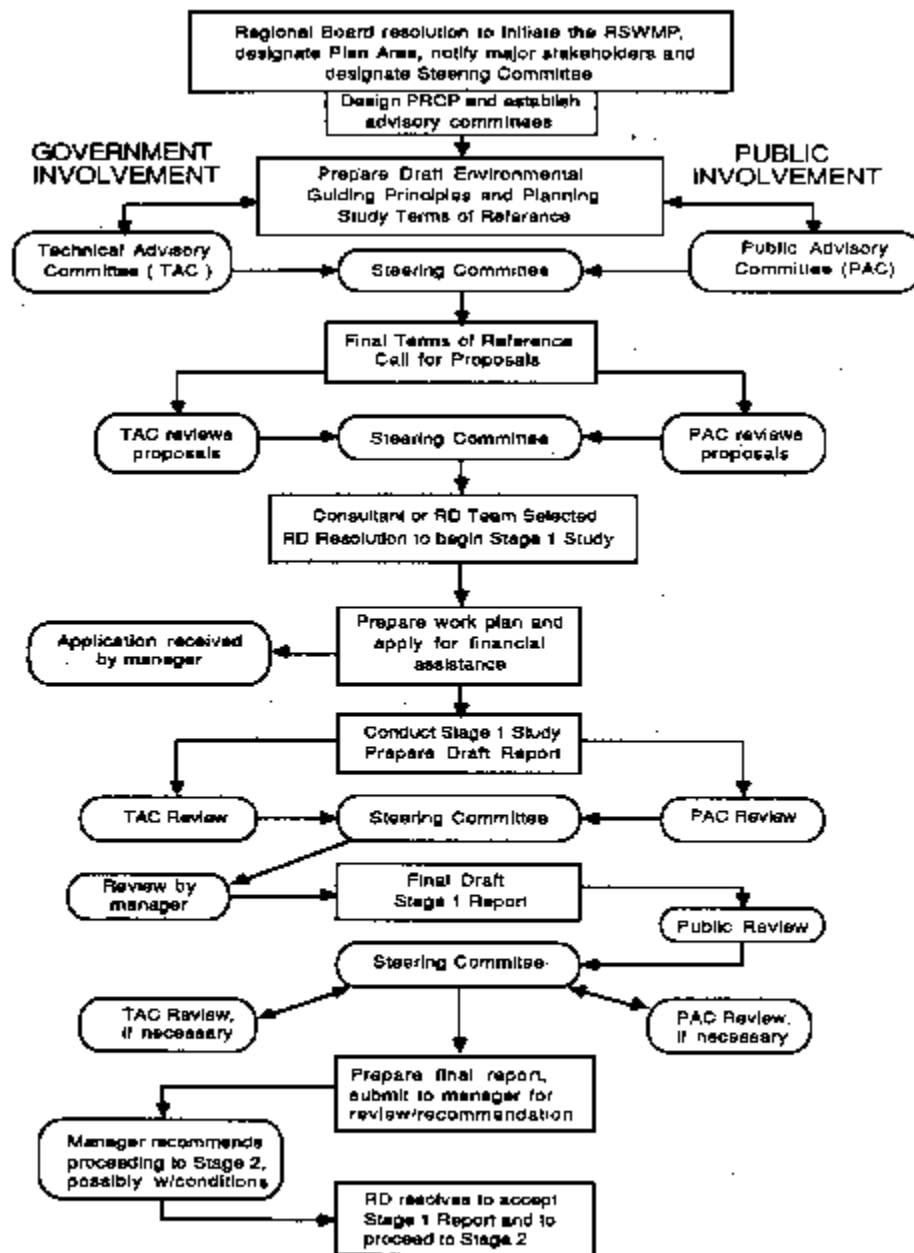


Figure 1
STAGE 1: WASTE MANAGEMENT SYSTEM / OPTIONS

METHODS OF DISPOSAL OF MUNICIPAL SOLID WASTES

Land Fill: Solid wastes are placed in sanitary land fill system in alternate layers of 80cm thick refuse covered with selected earth fill of 20cm thickness. After 2 or 3 years solid waste volume shrinks by 25-30% and the land is used for parks, roads and small buildings.

Waste disposal is dumping in sanitary land fill which is employed in Indian cities. This method involves spreading the solid waste on the ground. Compacting it and then covering it with soil at suitable intervals.

Advantages: 1 Simple and economical. Segregation is not required. Natural resources are returned to soil and recycled. Converts low lying, marshy waste land into useful areas.

Disadvantages: Large area needed. Bad odour. High transportation cost. Sources of mosquito, flies. Insecticides and pesticides are to be applied at regular intervals. Causes fire hazard due to methane formation in wet weather

INCINERATION

In this method the municipal solid wastes are burnt in a furnace called incinerator. The combustible substances such as rubbish, garbage, and dead organisms and non combustible matter such as glass, metals are separated before feeding into incinerator. The non combustible can be left out for recycling and reuse. The left out ashes and clinkers from the incinerator may be about 10-20 % which is disposed by land fill or some other methods.

The heat produced in the incinerator during burning is used as steam power for generation of electricity through turbines. The wet solid waste is dried in pre heaters and then taken into large incinerating furnaces called destructors which incinerate 100- 150tons per hour. The temperature maintained is about 700 ° C and increase to 1000° C when electricity is to be generated.

Advantages:

1. Requires little space
- 2 .Hygienic point of it is safest.
3. Incinerated plants of 300 tons per day capacity generate 3 MW of power.

Disadvantages:

1. Capital and operational cost is high.
2. Needs skilled persons.
3. Formations of smoke, dust and ash causes air pollution.

COMPOSTING:

In this method bulk organic waste is converted into manure by biological action. Compostable waste is dumped in underground trenches in a layer of 1.5 meters and is finally covered about 20 cms and left for decomposition. Microorganisms like actinomycetes are added for active decomposition.

Within two to three days biological action starts. The organic matter decomposed by actinomycetes and a lot of heat is liberated. The temperature of the compost increases by 75°C and finally the refuse is converted to a brown coloured powder known as humus and is used in agricultural fields. The compost contains N, P and other minerals.

Advantages:

Recycling occurs.

Number of industrial solid wastes can also be treated by this method.

Role of an individual in the prevention of pollution:

A small effort made by each individual at his own place will have pronounced effect at the global level. It is aptly said –“Think globally; Act locally”

Each individual change his life style in such a way has to reduce environment pollution.

Individual participation:

Planting more trees.

Use water energy and other resources efficiently.

Purchase recyclable, recycled and environmentally safe products.

Use CFC free refrigerators.

Reduce deforestation.

Increase use of renewable resources.

Remove NO_x from motor vehicular exhausts. Use of eco friendly products.

Case studies related to pollution:

Bhopal gas tragedy: In Bhopal M.P on 3rd December 1984 world's worst industrial accident occurred. It occurred at Union Carbide India Ltd this manufactures carbamate pesticides using methyl isocyanate.

Source : <http://nprcet.org/e%20content/eee/EVS.pdf>