

Subject: Building Services-I

Topic: Garbage

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SOLID WASTE IN INDIA

- 7.2 million tonnes of hazardous waste
- One sq km of additional landfill area every-year
- Rs 1600 crore for treatment & disposal of these wastes
- In addition to this industries discharge about 150 million tonnes of high volume low hazard waste every year, which is mostly dumped on open low lying land areas.

GROWTH OF SOLID WASTE IN INDIA

- Waste is growing by leaps & bounds
- In 1981-91, population of mumbai increased from 8.2 million to 12.3 million
- During the same period, municipal solid waste has grown from 3200 tonnes to 5355 tonne, an increase of 67%
- City like bangalore produces 2000 tonnes of waste per annum.
- Waste collection is very low for all indian cities.

WASTE COLLECTION IN INDIA

PRIMARILY BY THE CITY MUNICIPALITY

- No gradation of waste product. for example : Bio-degradable, glasses, polybags, paper shreds etc.
- Dumps these wastes to the city outskirts

LOCAL RADDIWALA / KABADIWALA

- Collecting small iron pieces by magnets
- Collecting glass bottles
- Collecting paper for recycling



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HOW SOLID WASTE AFFECTED US IN RECENT YEARS?

- In mumbai (2005) clogged the sewage line due to large no. Of plastic bags.
- Blast in the bhusan steel factory at noida, caused due to imported scrap from iran
- Reduction in the number of migratory birds due to consumption of contaminated foods
- Animals dying on streets and farmland due to consumption of plastic bags, which blocks the food movement in their stomach

IMPACTS ON HEALTH DUE TO SOLID WASTE

- Exposure to hazardous waste can affect human health, children being more vulnerable to these pollutants.
- Improperly operated incineration plants cause air pollution and improperly managed and designed landfills attract all types of insects that spread disease.
- Direct handling of solid waste results in chronic diseases with the waste workers.

The 3 R's

Reduce
Reuse
Recycle



- **REDUCE**

- You can help by *PRECYCLING*. 1/3 of all garbage is packaging.
- Buy things that are in packages that can be recycled or are made of recycled materials.
- When you buy something small, say no thanks to a bag.

- **REUSE**

- Many things can be reused before you throw them out.
- Use coffee cans and cottage cheese containers for storage
- Use backs of paper or backs of used envelopes for jotting notes
- Put leftovers in resalable containers instead of using wraps and foil
- Use old clothes as rags for cleaning instead of paper towels
- Have a garage sale or donate clothes, books or toys that you don't use anymore

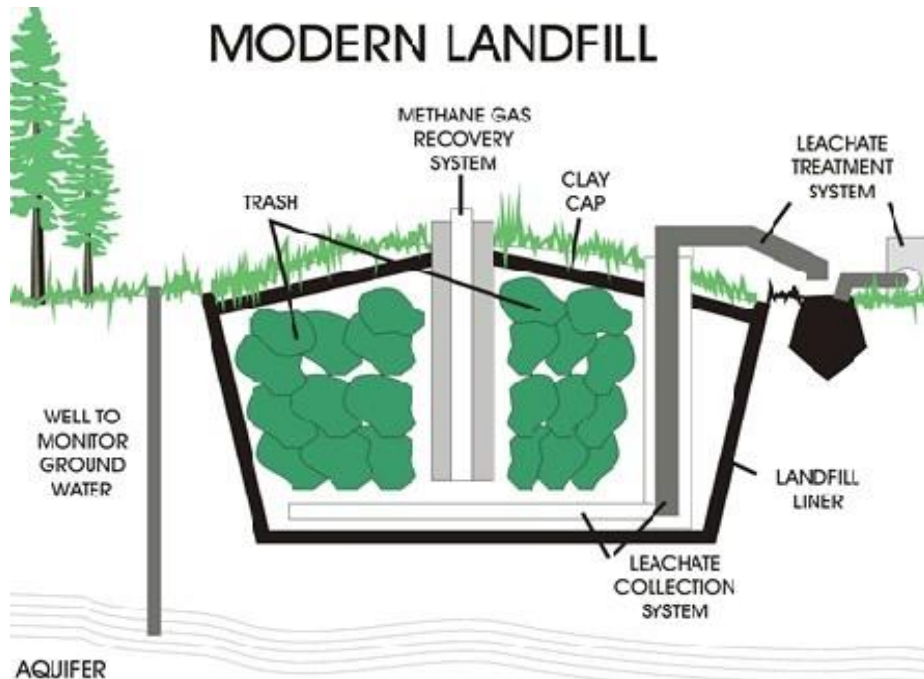
- **RECYCLE**

- Each year we use:
 - 25 billion plastic containers
 - 30 billion bottles & jars
 - 65 billion aluminum cans
 - 100 billion pounds of paper

TREATMENT OF GARBAGE

1. LANDFILL
2. INCINERATION
3. COMPACTION
4. PYROLYSIS

TYPES OF METHODS USED FOR TREATMENT OF GARBAGE



LANDFILL

- It is the most traditional method of waste disposal.
- Waste is directly dumped into disused quarries, mining voids or borrow pits.
- Disposed waste is compacted and covered with soil
- Gases generated by the decomposing waste materials are often burnt to generate power.
- It is generally used for domestic waste.



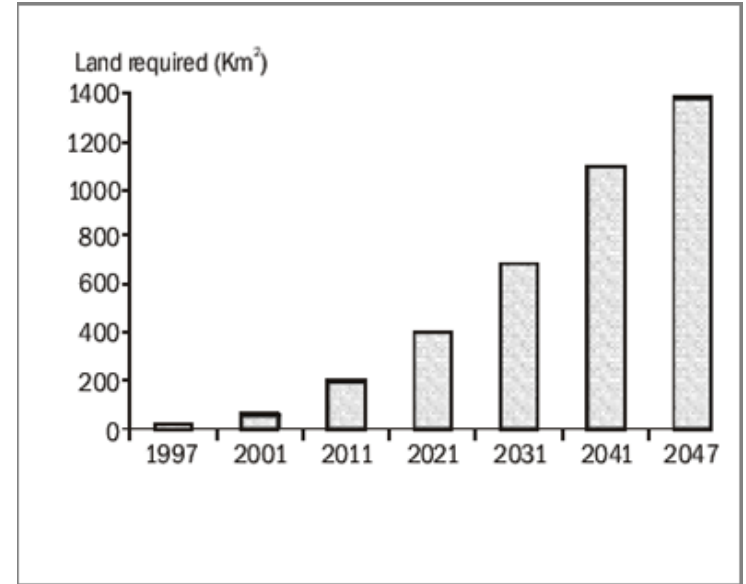
LANDFILL

ADVANTAGES

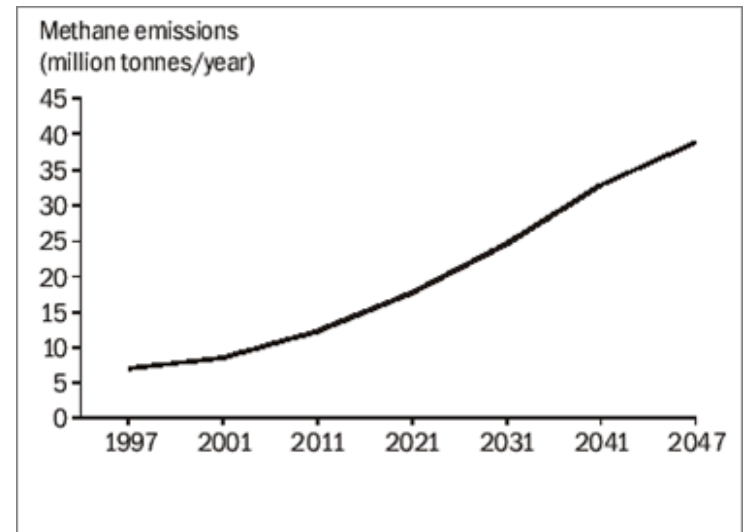
- Landfill site is a cheap waste disposal option for the local council.
- Jobs will be created for local people.
- Lots of different types of waste can be disposed of by landfill in comparison to other waste disposal methods.
- The gases given off by the landfill site could be collected and used for generating power.

DISADVANTAGES

- The site will look ugly while it is being used for landfill.
- Dangerous gases are given off from landfill sites that cause local air pollution and contribute to global warming.
- Local streams could become polluted with toxins seeping through the ground from the landfill site.
- Once the site has been filled it might not be able to be used for redevelopment as it might be too polluted.



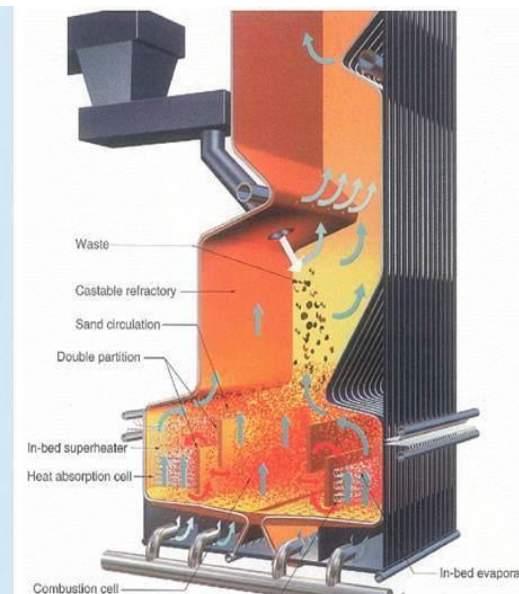
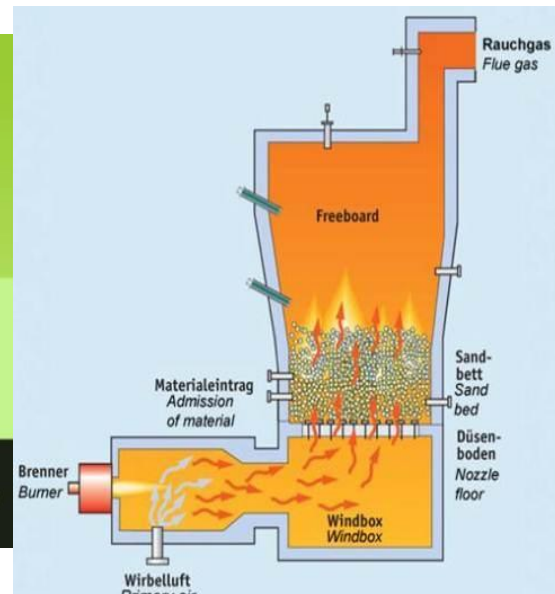
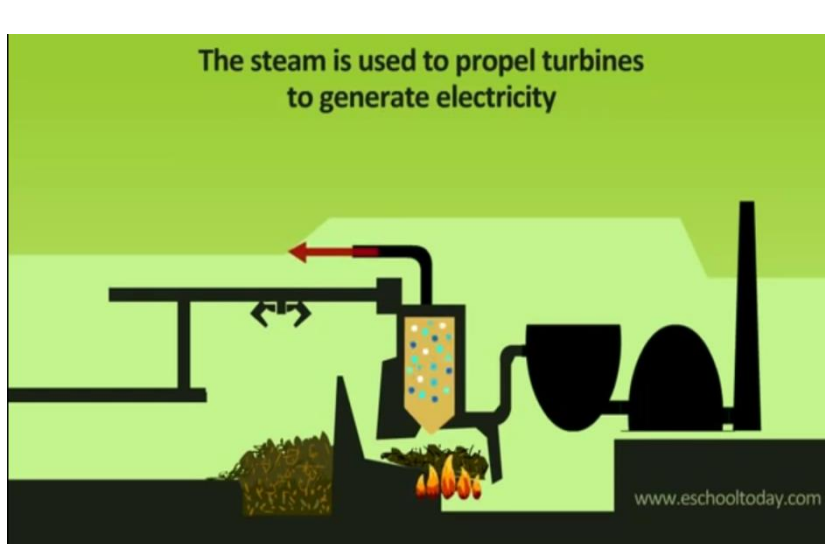
LAND REQUIRED FOR DISPOSAL OF MSW



EMMISSION OF METHANE FROM LANDFILL

2. INCINERATION

- INCINERATION IS A WASTE TREATMENT PROCESS THAT INVOLVES THE COMBUSTION OF SOLID WASTE AT 1000C.
- WASTE MATERIALS ARE CONVERTED INTO ASH, FLUE GAS, AND HEAT.
- THE ASH IS MOSTLY FORMED BY THE INORGANIC CONSTITUENTS OF THE WASTE AND GASES DUE TO ORGANIC WASTE.
- THE HEAT GENERATED BY INCINERATION IS USED TO GENERATE ELECTRIC POWER.



INCINERATION

ADVANTAGE

- MINIMUM OF LAND IS NEEDED COMPARED TO OTHER DISPOSAL METHODS.
- THE WEIGHT OF THE WASTE IS REDUCED TO 25% OF THE INITIAL VALUE.
- NO RISK OF POLLUTING LOCAL STREAMS AND GROUND WATERS AS IN LANDFILLS.
- INCINERATION PLANTS CAN BE LOCATED CLOSE TO RESIDENTIAL AREAS.
- GASES ARE USED TO GENERATE POWER.

DISADVANTAGES

- EXPENSIVE
- REQUIRED SKILLED LABOUR.
- THE CHEMICALS THAT WOULD BE RELEASED INTO THE AIR COULD BE STRONG POLLUTANTS AND MAY DESTROY OZONE LAYER (MAJOR DISADVANTAGE).
- HIGH ENERGY REQUIREMENT.

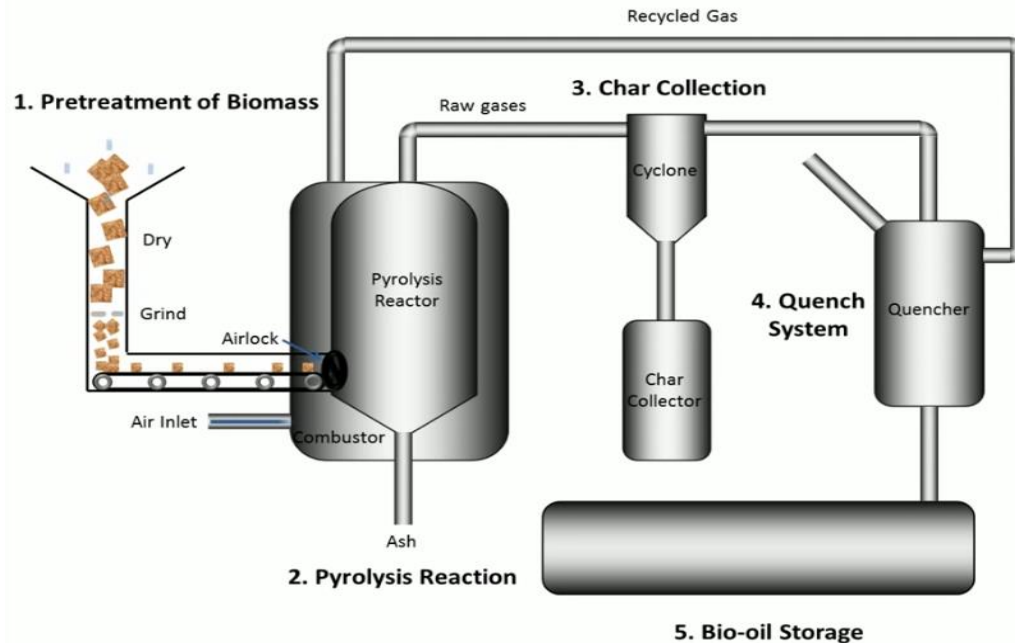
COMPACTION:

- The waste is compacted or compressed. It also breaks up large or fragile items of waste.
- This process is conspicuous in the feed at the back end of many garbage collection vehicles. Deposit refuse at bottom of slope for best compaction and control of blowing litter.

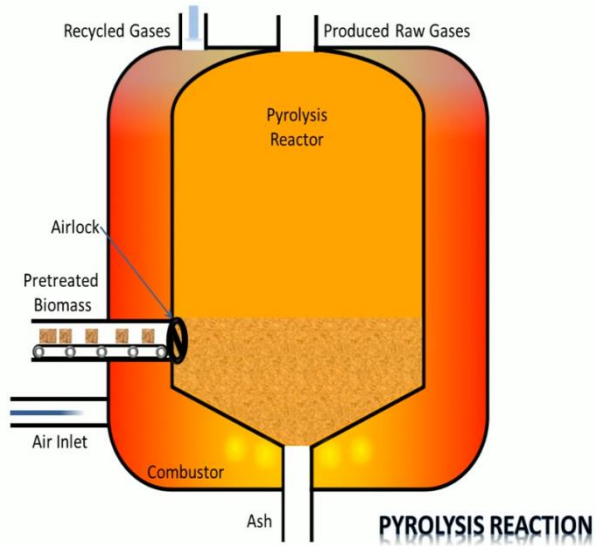


PYROLYSIS

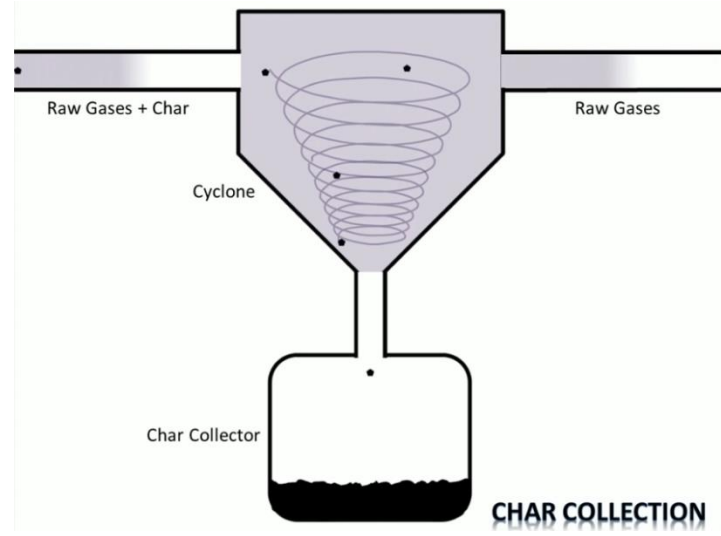
- PYROLYSIS IS DEFINED **AS THERMAL DEGRADATION OF WASTE** IN THE ABSENCE OF AIR TO PRODUCE CHAR, PYROLYSIS OIL AND SYNGAS, E.G. THE CONVERSION OF WOOD TO CHARCOAL ALSO IT IS DEFINED AS DESTRUCTIVE DISTILLATION OF WASTE IN THE ABSENCE OF OXYGEN. EXTERNAL SOURCE OF HEAT IS EMPLOYED IN THIS PROCESS.



1



2



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PROCESS OF PYROLYSIS

