WASTE MINIMIZATION TECHNIQUES

PRESENTED BY

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WHAT IS WASTE ?

- *Waste is the unwanted or useless solid materials generated from combined residential, industrial and commercial activities in a given area*

- *It may be categorized according to its origin (domestic, industrial, commercial, construction or institutional)*

- *according to its contents (organic material, glass, metal, plastic paper etc);*

- *according to hazard potential (toxic, non-toxin, flammable, radioactive, infectious etc).*

WHAT IS WASTE MINIMIZATION ?

- *The reduction of waste; and*
- *the reuse, recycling, and recovery of waste and diverted material.*

Waste on earth

HOW MUCH WASTE IS CREATED BY INDIA CITIES ?

- *About 0.1 million tonnes of municipal solid waste is generated in India every day. That is per capita waste generation in major Indian cities ranges from 0.2 kg to 0.6 kg.*

Urban India generates 188,500 tonnes per day (68.8 million tonnes per year) of municipal solid waste at a per capita waste generation rate of 500 gm./ person/ day.

- ***KOLKATA generates 12,060 tons per day is the highest generator with a per capita generation of 660 gm./ day.***

- ***PORT BLAIR, the capital city of Andaman and Nicobar Island generates 760 gm. Of waste per person per day , the highest among Indian cities .***

WASTES AND POSSIBLE RESOURCES

WASTES	*RESOURCES*
Fly ash from power plant	*Raw material for cement or brick manufacture*
Bagasse wastes from sugar manufacture	*Fuel for boiler*
CO2 release from ammonia plant	*Raw material for Urea manufacture*

WASTE MINIMIZATION TECHNIQUES

AVOID

- *Disposal of an item must be considered before you purchase it.*
- *The most easier method of waste management is to reduce creation of waste materials thereby reducing the amount of waste going to landfills. Waste reduction can be done through recycling old materials like jar, bags, repairing broken items instead of buying new one, avoiding use of disposable products like plastic bags, reusing second hand items, and buying items that uses less designing.*

REDUCE

- Source Reduction of waste – Stopping waste before it starts – way to enhance environmental cleanliness:
- Source reduction, also known as waste prevention or pollution prevention, is the elimination of waste before it is created. Source reduction is decreasing the amount of materials or energy used during the manufacturing or distribution of products and packages.Source reduction means stopping waste before it happens.

IT IS TWO TYPES

- Good Housekeeping
- Process Change

***GOOD HOUSEKEEPING** - Systems to prevent leakages & spillages through preventive maintenance schedules and routine equipment inspections. Also, well-written working instructions, supervision, awareness and regular training of workforce would facilitate good housekeeping.*

Process Change *- Under this head, four techniques are covered:*

- *Input Material Change*
- *Better Process Control*
- *Equipment Modification*
- *Technology Change*

REUSE

- *2nd hand goods, refillable containers, choose pre-loved items. Repair an item and extend its life. Make an old item into something useful in a new way.*

EXAMPLE

Reuse of bulbs

Plastic bottles (with LED lights) repurposed as a chandelier during Ramadan in the Muslim Quarter, Jerusalem

Reusable glass bottles collected in Bishkek, Kyrgyzstan. Deposit values (0.5-2 Kyrgyz som) are posted next to the sample bottles on the rack

RECYCLE

- *Recycling is the process of converting waste products into new products to prevent energy usage and consumption of fresh raw materials.*
- *Recycling is the third component of Reduce, Reuse and Recycle waste hierarchy.*
- *The idea behind recycling is to reduce energy usage, reduce volume of landfills, reduce air and water pollution, reduce greenhouse gas emissions and preserve natural resources for future use.*

IT IS OF TWO TYPES:o

- ***ON SITE RECYCLING:-*** *Reuse of wasted materials in the same process or for another useful application within the industry.*

- ***OFF SITE RECYCLING*** *Modification of the waste generation process in order to transform the wasted material into a material that can be reused or recycled for another application within or outside the company.*

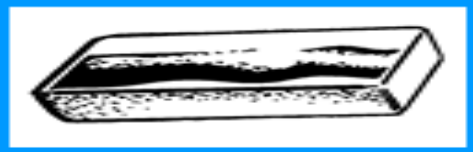
EXAMPLE OF RECYCLING

ALUMINUM *cycle*

1. You enjoy your favorite beverage in an aluminum can

2. You are a good "sort." You put the aluminum can in a bag for recycling.

3. Recycling company takes the cans to a recycling plant. The aluminium is shredded and melted.



4. The molten aluminum is gradually hardened into ingot form.

5. Ingots are made into aluminum sheets or other desired forms.

6. The aluminum is made into new cans, and the cycle begins again.

RECOVER

Resource recovery is the process of taking useful discarded items for a specific next use. These discarded items are then processed to extract or recover materials and resources or convert them to energy in the form of useable heat, electricity or fuel.

EXAMPLE OF RECOVERY

Incineration involves the burning of the solid waste at very high temperature.

Manlove, Alliott & Co. Ltd. 1894 destructor furnace. The use of incinerators for waste disposal became popular in the late

WASTE TO ENERGY RECOVERY

Anaerobic digestion component of Lübeck mechanical biological treatment plant in Germany, 2007

TREATMENT

Waste is treated prior to disposal to reduce its hazardous nature eg Clinical waste, regulated waste, stabilise organic waste.

TYPES OF TREAT

- Land treatment;
- Physical treatment;
- Chemical treatment;
- Biological treatment

LAND TREATMENT

- ***The best method of land treatment is landfill.***

- ***Landfill- The disposal of hazardous and toxic wastes, after appropriate treatment, to landfills is the most common method of disposal .***

BIOLOGICAL TREATMENT-

- *It is form of disposal in which the final state of the waste is mediated by microbial intervention.*

- *For some wastes like domestic sewage and certain wastes from food processing, the biological treatment is firmly established as the standard method of waste treatment.*

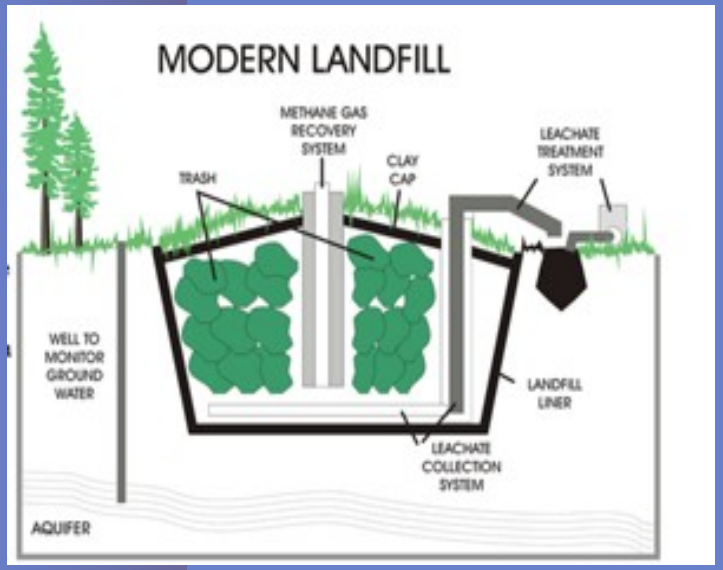
PHYSICAL TREATMENT

These methods are used to remove separate and concentrate hazardous and toxic materials. They are considered to be conventional technologies and are commonly used throughout the world.

CHEMICAL TREATMENT

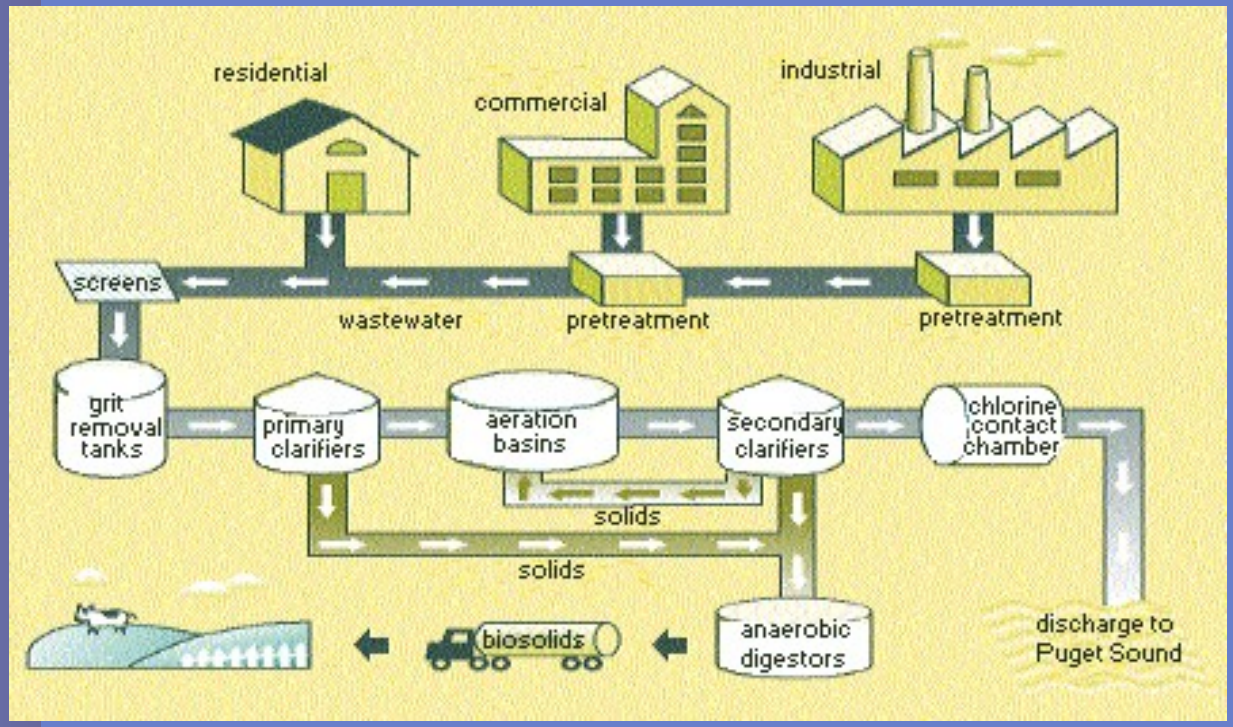
This treatment would assist in the application of physical treatment technologies, and lower the toxicity of a hazardous waste by changing its chemical nature, often yielding essentially non-hazardous substances such as carbon dioxide, water and salts.

EXAMPLE OF WASTE TREATMENT



LAND TREATMENT

BIOLOGICAL TREATMENT



PHYSICAL TREATMENT OF WASTE

DISPOSAL OF WASTE RESPONSIBLY

- ***Dispose of waste in a responsible manner.***
- ***For those things that cannot be reduced, reused or recycled, we ensure that they are disposed of responsibly.***
- ***We are currently working on a process to allow for safe disposal of:***
  - ***batteries***
  - ***mobile phones***

Cont.

Rapid industrialization has resulted in the generation of huge quantity of waste , both solid & liquid , in industrial sector such as sugar ,pulp & paper , fruit & food process, distilleries, dairies, poultries, etc. Despite requirements for pollution control measures, these waste are generally dumped on land or discharge into water bodies, without adequate treatment, and thus become a large source of environmental pollution and health hazard.

Thousand of small scale &bigger industrial unit simply dump their waste more often toxic & hazardous in open space & near by water source cover the three decades many cases of serious & permanent damage to environmental by their industries.

EFFECTS OF WASTE

ENVIRONMENTAL EFFECT

Surface water contamination:

Waste that end up in water bodies negatively change the chemical composition of the water. Technically, this is called water pollution. This will affect all ecosystems existing in the water. It can also cause harm to animals that drink from such polluted

Soil contamination:

Hazardous chemicals that get into the soil (contaminants) can harm plants when they take up the contamination through their roots.

Pollution:

Bad waste management practices can result in land and air pollution and can cause respiratory problems and other adverse health effects as contaminants are absorbed from the lungs into other parts of the body.

Economic Effects

Municipal wellbeing:

Everyone wants to live and visit places that are clean, fresh and healthy. A city with poor sanitation, smelly and with waste matter all over the place do not attract good people, investors and tourists. Such cities tend to have poor living standards.

Recycling revenue:

Cities that do not invest in recycling and proper waste control miss out on revenue from recycling. They also miss out on job opportunities that come from recycling, composting and businesses that work with them.

Health effects of pollution

Air pollution

Water pollution

Headache
Fatigue

Respiratory illness

- Bacteria
- Parasites
- Chemicals

CO

Nerve damage

Particulate matter

Ozone

Lead

Cardio-vascular illness

SO_2
NO_X

Volatile organic compounds

Gastroenteritis

Cancer risk

Pesticides

Nausea

Skin irritation

Soil contamination

SIGNIFICANCE OF WASTE MINIMIZATION

- *Cost savings that go directly to the bottom line (reduced raw material consumption, reduced waste disposal cost savings due to reduced volumes and recovered value of wastes);*
- *Competitive advantage;*
- *Reduced impact on the environment;*
- *Improved public perception;*
- *Development of new and more sustainable processes; and*
- *Development of new products.*

REFRENCE:

- *NIIR PROJECT CONSULTANCY SERVICE (AN ISO 9001: 2008 COMPANY).*
- *BOOKS & DIRECTORY >> WASTE MANAGEMENT AND RECYCLING > PRODUCT FROM WASTE (Industrial & agro waste 2nd edition)*
- *Published in 2004.*
- *Publisher –national Institute of industrial research usually ships with in 3 days.*

- *Reducing your waste –Modern Bay – regional council.*

- *Promoting Excellence in the Creation , design production , manufacturing and marketing of plastic products in NewZealand .*

- *PARTHA DAS SHARMA"S Weblog On keeping World Environment Safer and Greener .*
- *Published in – Jan. 1, 2009.*
- *Posted by –PARTHA DAS.*

- *Sustainable solid waste management in India .*
- *Guardian Environmental network.*
- *Responsible waste disposal – property – Macquarie University htm.*


THANK


YOU