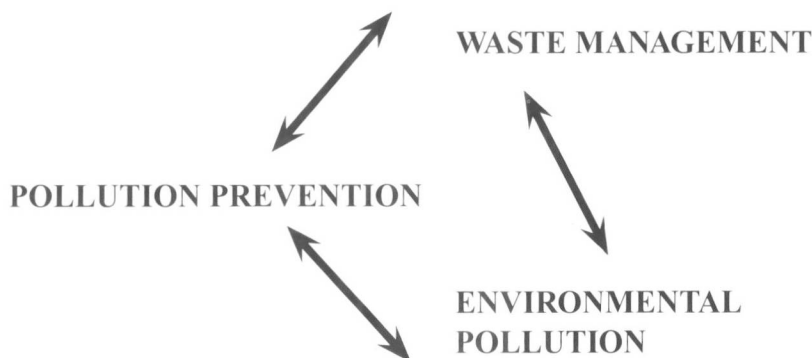


INTRODUCTION TO WASTE MANAGEMENT:

INTRODUCTION:

Environmental pollution is undesirable state of the natural environment, being contaminated with harmful substances as a consequence of human activities. Pollution prevention is source reduction, i.e. the deliberate decrease in the amount of any hazardous substance, contaminant or pollutant that enters the environment prior to recycling, treatment or disposal. Waste management is managing waste generated



by environmental restoration activities, which is providing safe, adequate treatment and, disposal facilities for future use. Some waste materials are biodegradable, some are reusable and, others are toxic. Perhaps most importantly of all, personal action in reducing, reusing, recycling and, recovery of materials can help decrease the waste we accumulate. The waste management involves a balancing act between the environment, the economy and, the political will of the people.

A. ENVIRONMENTAL POLLUTION:

Environmental pollution is adverse change of the atmosphere, hydrosphere and, lithosphere due to the act of contaminating. Pollutants can be categorized into,

- I. Atmosphere is polluted by gases, particulate matter and, radio active isotopes,
- II. Hydrosphere by sewage, organic phosphates and, excessive heating due to depleting oxygen levels and,
- III. Lithosphere by agrochemicals and, solid waste.

B. POLLUTION PREVENTION:

Pollution should be prevented by reduction

or elimination of the creation of pollutants or wastes at the source.

C. POLLUTION CONTROL:


It can be considered under the following;

- I. Waste minimization,
- II. Waste reduction & waste recycling and,
- III. Waste treatment.

D. WASTE MANAGEMENT:

Modern industrial society generates a large quantity of waste products. These wastes have been categorized into two distinct groups:



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- I. Solid waste and,
 - II. Hazardous waste.

- I. Solid Waste: food, wood & yard wastes, textiles, paper, plastics, glass and, metals.
 - i. Sources: agriculture industry, mining, milling, commercials enterprises and, households

- ii. Management techniques incineration, dumps, landfills, ocean dumping.

- II. Hazardous waste: it is any discarded substance that is

- Fatal to humans or other organisms at low quantities.
- Toxic, carcinogenic, mutagenic or, teratogenic to humans or other organisms.
- Ignitable with a flash point less than 60° C.
- Corrosive, explosive or highly chemically reactive.

- i. Sources: metal processing, mining, chemical production or the refining of petroleum.
- ii. Management techniques incineration, storage in lagoons & pits, discharge into streams or ocean for dilution, detoxification, recycled or, recovered and, injection into deep wells or salt caverns.

Waste Management is based on three principles, such as:

- I. Waste prevention,
- II. Recycling & reuse and,
- III. Improving final disposal & monitoring.

Waste Management functions:

The waste management program focuses on three major waste management functions, such as

- I. Storage,
- II. Treatment and,
- III Disposal.

I. Waste Minimization:

Driven at the community level and, using low energy or low technology resources. It achieved by the source reduction (product change), source control (input material changes, technology change and, good operating practices), recycling, use & reuse and reclamation.

II. Waste Reduction and, Waste Recycling:

Reduce the amount of waste generated in the first place and, reduce its hazardousness by reducing the presence of dangerous substances in products. Recycling is practiced in Sri Lanka, recyclable materials include paper, plastic glass, aluminium and, steel.

III. Waste Treatment:

In general waste must be treated to prepare it for disposal. Treatment methods reduce a waste's toxicity and, volume, change its physical form or make it safer to dispose in compliance with environmental regulations. Selection of treatment methods depends on the quantity and, form of the waste material. Some waste after being treated can be disposed as non - hazardous waste. Other wastes require more elaborate

treatment methods. Liquid and, semi-liquid radioactive wastes can be solicited by techniques such as verification and, calcining. Other wastes such as hazardous and, mixed wastes can be reduced in volume through processes such as compaction or incineration.

While waste water treatment involves;

- i. Domestic wastewater treatment, such as primary, secondary and, tertiary.
- ii. Industrial wastewater treatment, such as physical, chemical and, biological.

Waste Prevention:

This is a key factor in any waste management strategy. It is closely linked with improving manufacturing methods and, influencing consumers to demand greener products and, less packaging. Making product last longer.

Recycling and, Reuse:

If waste cannot be prevented as many of the materials as possible should be recovered preferably by recycling. The aim being to reduce their overall environmental impact this includes packing waste, end-of-life vehicles & batteries and, electrical & electronic waste.

Improving Final Disposal and, Monitoring:

The waste cannot be recycled or reused should be safely incinerated with landfill only used as a last resort. Both these need close monitoring because of their potential for causing severe environmental damage.

Waste Storage:

This is an interim measure. To store radioactive waste temporarily prior to treatment or until disposal sites can accept the waste. Storage methods, which include containment in tanks, metal drums and, above - ground concrete vaults are determined by waste type.

Waste Disposal:

The final step in the waste management process the safe and, secure isolation of waste to dispose of high-level and, transuranic wastes in deep geologic repositories located thousands of feet below ground. The disposal method used for mixed waste depends on the treatment applied and, the resulting waste characteristics.

Techniques Involved in Waste Management:

I. Recycling:

This will include recycling & reuse of domestic, commercial & industrial waste wherever possible. The aim of recycling is to save raw materials and, reduce the volume of waste to be disposed of by other means.

II. Incineration:

This is the oxidative degradation of waste at high temperatures. The main advantage of the process is that it reduces the waste. The main disadvantage is that it can be extremely expensive unless energy recovery techniques are also used. Incinerations are used to improve the management of both municipal and, industrial solid waste and, the process is capable destroying any hazardous components in the waste.



III. Composting:

Aerobic decomposition of organic matter into a nutrient-rich stable humus material by microorganisms such as bacteria and fungi. Where optimum temperature, optimum moisture content, aeration and, microorganisms (in early stages of composting thermophilic bacteria, such as *Bacillus* & *Pseudomonas*, in curing stages fungi, such as *Mucor*, *Penicillium* & *Aspergillus*).

IV. Anaerobic Digestion:

This is a biological process in which organic material is broken down by the action of micro-organisms. Unlike composting the process takes place in the absence of air. The residue remaining after digestion can be use as a soil conditioner and, the process generates a biogas, which can be used as a fuel for domestic or industrial use.

V. Encapsulation:

The encapsulation of offshore oil & gas rigs, jetty piles, pipelines and, similar structures. The process is of particular use on gas pipelines, where conventional welding technique present obvious hazards.

VI. Sanitary Land Fills:

Waste that cannot be recycled or reused should be safely incinerated with landfill only used as a last resort. Sanitary land fills are specially engineered sites for disposing of solid wastes on land. Improving final disposal and, monitoring methods need close monitoring because of their potential for causing severe environmental damage.



DISCUSSION:

Four major man made global environmental problems we are facing today are acid rain, the green house effect, the destruction of the rain forest and, damage to the ozone layer. Environmental

conservation includes maintenance, to continue preservation of ecological balance and, careful utilization of resources. Policies and, laws especially proper legislation related to natural resource management are enforced community and, the country to achieve this target. There is a whole culture of waste management that needs to be put in place - from the micro - level of household and, neighborhood to the macro levels of city, state and, nation. Waste management covers the social, economic, technology, political and, administrative dimensions.

REFERECES:

- I. Website: [http// www.google.com](http://www.google.com).
- II. CHU 3122 – Environmental Chemistry. Part I, II and, III (The Open University Publication).
- III. Environmental Organic Chemistry. – Monograph 11.
- IV. Chemistry in Sri Lanka – 2000.
- V. Environmental Chemistry. Stanley E. Manahan.
- VI. Waste Treatment and, Disposal.
- VII. Environmental Science Earth as Living Planet. Daniel B. Botkin, Edward A. Keller.

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