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## MODERN TREND IN COMMUNITY FOR WASTE DISPOSAL MANAGEMENT

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### I. INTRODUCTION OF WASTE

Waste (also known as rubbish, trash, refuse, garbage, junk, litter etc) is unwanted or useless materials. In biology, waste is any of the unwanted substances or toxins that are expelled from living organisms, metabolic waste; such as urea and sweat.

Or

"Wastes are materials that are not prime products (that is products produced for the community) for which the generator has no further use in terms of his/her own purposes of production, transformation or consumption, and of which he/she wants to dispose. Wastes may be generated during the extraction of raw materials, the processing of raw materials into intermediate and final products, the consumption of final products, and other human activities. Residuals recycled or reused at the place of generation are excluded."

Examples: Domestic washings, Chemicals, Oils, Waste water from ponds, Manufacturing Industries and other sources

➤ **Disposal means:**-Any operation which may lead to resource recovery, recycling, reclamation, direct re-use or alternative uses.

➤ **Kinds of Wastes**

(1) **Solid wastes:** wastes in solid forms, domestic, commercial and industrial wastes

Example :plastic, Styrofoam containers, bottles, cans, papers, scrap iron, and other trash **According to EPA regulations, SOLID WASTE is**

- Any garbage or refuse (Municipal Solid Waste)
- Sludge from a wastewater treatment plant, water supply treatment plant, or air pollution control facility
- Other discarded material
- Solid, liquid, semi-solid, or contained gaseous material from industrial, commercial, mining, and agricultural operations, and from community activities.

(2) **Liquid Wastes:** wastes in liquid form

### II. Classification of Wastes according to their Properties

(A) **Bio-degradable :-**Can be degraded (paper, wood, fruits and others)

(B) **Non-biodegradable:-**Cannot be degraded (plastics, bottles, old machines, cans, Styrofoam containers and others)

### III. Classification of Wastes according to their Effects on Human Health and the Environment

(1)**Hazardous wastes:-**

- Substances unsafe to use commercially, industrially, agriculturally, or economically and have any of the following properties- ignitability, corrosivity, reactivity & toxicity.

(2)**Non-hazardous wastes:-**

- Substances safe to use commercially, industrially, agriculturally, or economically and do not have any of those properties mentioned above. These substances usually create disposal problems.

### IV. Classification of wastes according to their origin and type

- ❖ **Municipal Solid wastes:** Solid wastes that include household garbage, rubbish, construction & demolition debris, sanitation residues, packaging materials, trade refuges etc. are managed by any municipality.
- ❖ **Bio-medical wastes:** Solid or liquid wastes including containers, intermediate or end products generated during diagnosis, treatment & research activities of medical sciences.
- ❖ **Industrial wastes:** Liquid and solid wastes that are generated by manufacturing & processing units of various industries like chemical, petroleum, coal, metal gas, sanitary & paper etc.
- ❖ **Agricultural wastes:** Wastes generated from farming activities. These substances are mostly biodegradable.

- ❖ **Fishery wastes:** Wastes generated due to fishery activities. These are extensively found in coastal & estuarine areas.
- ❖ **Radioactive wastes:** Waste containing radioactive materials. Usually these are byproducts of nuclear processes. Sometimes industries that are not directly involved in nuclear activities, may also produce some radioactive wastes, e.g. radio-isotopes, chemical sludge etc.
- ❖ **E-wastes:** Electronic wastes generated from any modern establishments. They may be described as discarded electrical or electronic devices. Some electronic scrap components, such as CRTs, may contain contaminants such as Pb, Cd, Be or brominated flame retardants.

#### V. Magnitude of problem: Indian scenario

- ❖ Per capita waste generation increasing by 1.3% per annum
- ❖ With urban population increasing between 3 – 3.5% per annum
- ❖ Yearly increase in waste generation is around 5% annually
- ❖ India produces more than 42.0 million tons of municipal solid waste annually.
- ❖ Per capita generation of waste varies from 200 gm to 600 gm per capita / day.

#### VI. Impacts of wastes if not manage wisely

- ❖ Affects our health
- ❖ Affects our socio-economic conditions
- ❖ Affects our coastal and marine environment
- ❖ Affects our climate
- ❖ GHGs are accumulating in Earth's atmosphere as a result of human activities, causing global mean surface air temperature and subsurface ocean temperature to rise.
- ❖ Rising global temperatures are expected to raise sea levels and change precipitation and other local climate conditions.
- ❖ Changing regional climates could alter forests, crop yields, and water supplies.
- ❖ This could also affect human health, animals, and many types of ecosystems.

#### VII. Sources of human exposures

Exposures occurs through

- ❖ Ingestion of contaminated water or food
- ❖ Contact with disease vectors
- ❖ Inhalation
- ❖ Dermal Points of contact
- ❖ Soil adsorption, storage and biodegrading
- ❖ Plant uptake
- ❖ Ventilation
- ❖ Runoff
- ❖ Leaching
- ❖ Insects, birds, rats, flies and animals
- ❖ Direct dumping of untreated waste in seas, rivers and lakes results in the plants and animals that feed on it

#### VIII. Categories of waste disposal

- (1) **Dilute and disperse(ATTENUATION)** Throw it in the river / lake / sea/Burn it :-  
Basically this involves spreading trash thinly over a large area to minimize its impact
- (2) **Concentrate and consent(ISOLATION)** Waste dumps, landfills

#### IX. Useful optionsOf Waste Disposal

- ❖ Resource recovery
- ❖ Composting
- ❖ Vermicomposting
- ❖ Energy recovery
- ❖ Incineration
- ❖ Pyrolysis
- ❖ Gasification

- ❖ Bio-meth nation or anaerobic digestion

#### **X. Impacts of waste on health**

- ❖ Chemical poisoning through chemical inhalation
- ❖ Uncollected waste can obstruct the storm water runoff resulting in flood
- ❖ Low birth weight
- ❖ Cancer
- ❖ Congenital malformations
- ❖ Neurological disease
- ❖ Nausea and vomiting
- ❖ Increase in hospitalization of diabetic residents living near hazard waste sites.
- ❖ Mercury toxicity from eating fish with high levels of mercury

#### **XI. Effects of waste on animals and aquatics life**

- ❖ Increase in mercury level in fish due to disposal of mercury in the rivers.
- ❖ Plastic found in oceans ingested by birds.
- ❖ Resulted in high algal population in rivers and sea.
- ❖ Degrades water and soil quality.

#### **XII. Impacts of waste on Environment**

- ❖ Waste breaks down in landfills to form methane, a potent greenhouse gas
- ❖ Change in climate and destruction of ozone layer due to waste biodegradable

#### **XIII. What should be done**

##### **(1)Reduce Waste**

- ❖ Reduce office paper waste by implementing a formal policy to duplex all draft reports and by making training manuals and personnel information available electronically.
- ❖ Improve product design to use less materials.
- ❖ Redesign packaging to eliminate excess material while maintaining strength.
- ❖ Work with customers to design and implement a packaging return program.
- ❖ Switch to reusable transport containers.
- ❖ Purchase products in bulk.

##### **(2)Reuse**

- ❖ Reuse corrugated moving boxes internally.
- ❖ Reuse office furniture and supplies, such as interoffice envelopes, file folders, and paper.
- ❖ Use durable towels, tablecloths, napkins, dishes, cups, and glasses.
- ❖ Use incoming packaging materials for outgoing shipments.
- ❖ Encourage employees to reuse office materials rather than purchase new ones.

#### **XIV. Donate/Exchange**

- ❖ Old books
- ❖ Old clothes
- ❖ Old computers
- ❖ Excess building materials
- ❖ Old equipment to local organizations

#### **XV. Employee Education**

- ❖ Develop an “office recycling procedures” packet.
- ❖ Send out recycling reminders to all employees including environmental articles.
- ❖ Train employees on recycling practices prior to implementing recycling programs.
- ❖ Conduct an ongoing training process as new technologies are introduced and new employees join the institution.

- ❖ Education campaign on waste management that includes an extensive internal web site, quarterly newsletters, daily bulletins, promotional signs and helpful reference labels within the campus of an institution.

**XVI. Conduct outreach program adopting an ecologically sound waste management system which includes**

- ❖ waste reduction
- ❖ segregation at source
- ❖ composting
- ❖ recycling and re-use
- ❖ more efficient collection
- ❖ more environmentally sound disposal

**XVII. Residents may be organized into small groups to carry out the following**

- ❖ construction of backyard compost pit
- ❖ construction of storage bins where recyclable and reusable materials are stored by each household
- ❖ construction of storage centers where recyclable and reusable materials collected by the street sweepers are stored prior to selling to junk dealers
- ❖ maintenance of cleanliness in yards and streets
- ❖ greening of their respective areas
- ❖ encouraging others to join

**REFERENCE**

1. *Internet based materials*
2. *TERI book on e waste*
3. *E Waste Handling Rule 2012*
4. *Lecture notes available in net.*