NARAYANA
COLLEGE OF NURSING

DISPOSAL OF WASTE

PRESENTED BY

MANASA, M.Sc(N)

TUTOR

DEPARTMENT OF MEDICAL & SURGICAL NURSING

NARAYANA COLLEGE OF NURSING

CHINTHAREDDY PALM

NELLORE

Disposal of wastes is now largely the domain of sanitarians and public health engineers. However , health professionals need to have a basic knowledge of the subject since improper disposal of wastes constitutes a health hazard.

WASTE

Def: It is defined as waste (also known as rubbish, trash, trash, garbage, junk) is any unwanted or useless materials.

TYPES OF WASTE

- Solid waste
- Liquid waste
- Gaseous waste
- Animal by products
- Chemical waste
- Business waste
- Biomedical waste

SOLID WASTE

- It is defined as

  " non liquid, non-soluble materials ranging from municipal garbage to industrial wastes that contain complex & sometimes hazardous substances"

- Solid waste also include
  - Garbage
  - Rubbish
  - Demolition products
  - Sewage treatment residue
  - Dead animals
  - Manure and other discarded material.

    -- Per capita solid waste out put 0.25-2.5 Kg/day

SOURCE

- Agriculture
- Fisheries
- Household
- Commerce and industry

TYPES

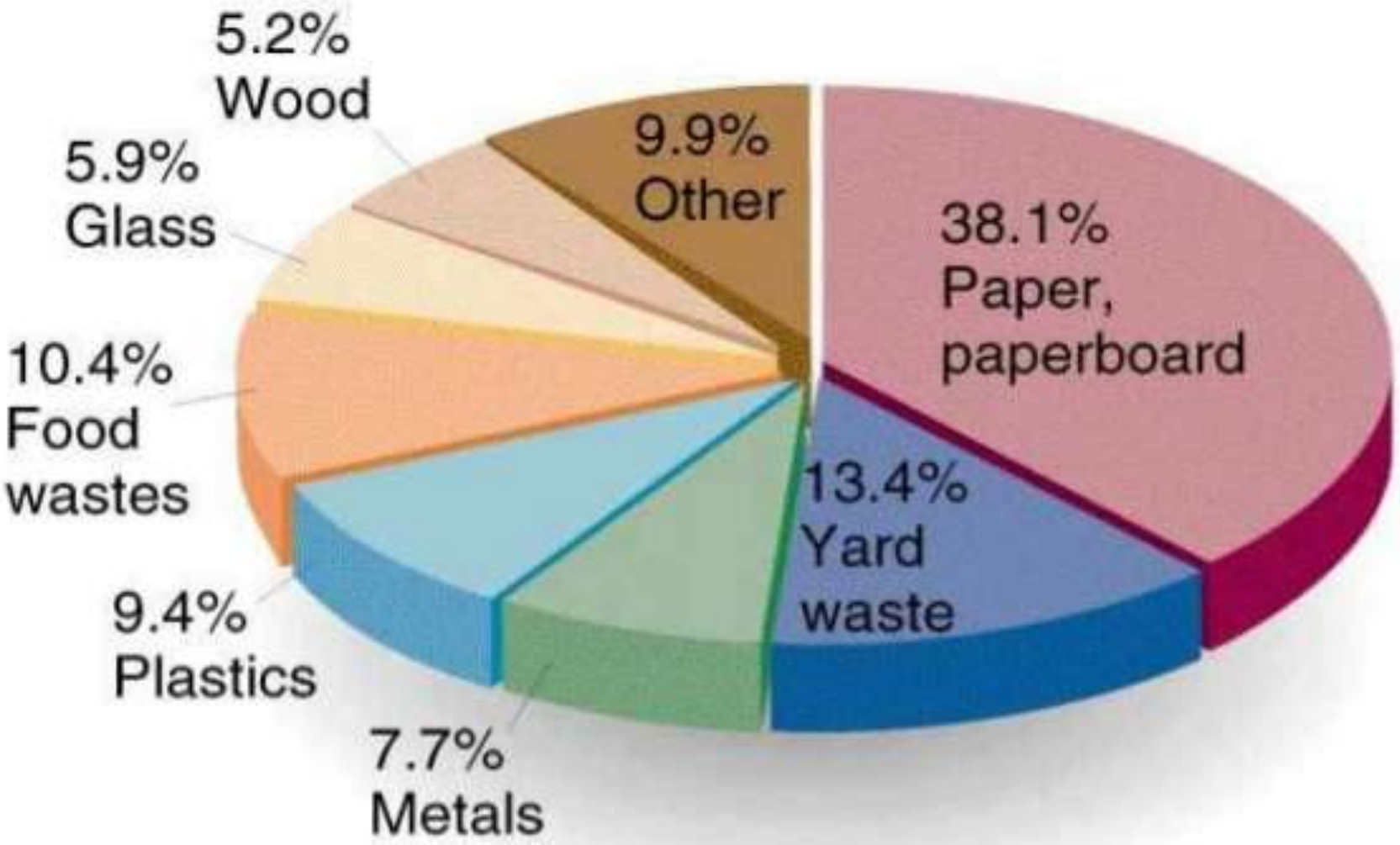
Broadly there are 3 types of waste which as follows

1. Household waste as municipal waste
2. Industrial waste as hazardous waste
3. Biomedical waste or hospital waste as infectious waste

1. MUNICIPAL SOLID WASTE

- Municipal solid waste consist of---
  - household waste
  - construction and demolition debris
  - sanitation residue
  - waste from streets
- With rising urbanization and change in life style and food habits ,the amount of municipal solid waste has been increasing rapidly and its composition changing.

CHARECTERIZATION OF MUNCIPAL SOLID WASTE



HAZARDOUS WASTE

- Industrial and hospital waste is considered hazardous as they may contain toxic substances
- Hazardous waste could be highly toxic to humans, animals and plants. They are
  - corrosive
  - highly inflammable or explosive
- In the industrial sector the major generators of hazardous waste are the metal' chemical' paper, pesticide, dye and rubber goods industries.
- Direct exposure to chemicals in hazardous waste such as mercury and cyanide can be fatal

HOSPITAL WASTE OR BIOMEDICAL WASTE

- Bio-medical waste means “Any waste which is generated during the diagnosis, treatment or immunization of human beings or animals or in research activities pertaining thereto or in the production or testing of biological”

  -Bio-medical waste rules ,1998

- It may includes wastes like sharp waste, pathological waste, pharmaceutical waste, genotoxic waste, chemical waste, and radioactive waste etc.

SOLID WASTE MANAGEMENT

Waste management is the

- storage
- collection
- transport and handling
- recycling
- disposal and monitoring of waste materials.

STORAGE

- Storage:
  - Galvanized steel dust bin
  - Paper sack
  - Public bins

COLLECTION

- Collection
  - House-to-house collection
  - Collection from the public bins

WASTE HANDLING AND TRANSPORT

- Waste handling and separation involves activities associated with waste management until the waste is placed in storage containers for collection. Handling also encompasses the movement of loaded containers to the point of collection.
- waste is transferred from a smaller collection vehicle to larger transport equipment

METHOD OF DISPOSAL

1. Dumping
2. Controlled Tipping or Sanitary Landfill
3. Incineration
4. Composting
5. Manure pits
6. Burial

OBJECTIVES

- Public hygiene and health.
- Reuse, recovery and recycle
- Energy generation
- Sustainable development
- Aesthetics

1. DUMPING

- Low lying areas.
- Mainly for dry refuses
- Kolkata disposes by this
- method and reclaimed land given for cultivation.
- Unsanitary method
  - Exposed to flies and rodents
  - Nuisance
  - Dispersed by wind
  - pollution of surface water

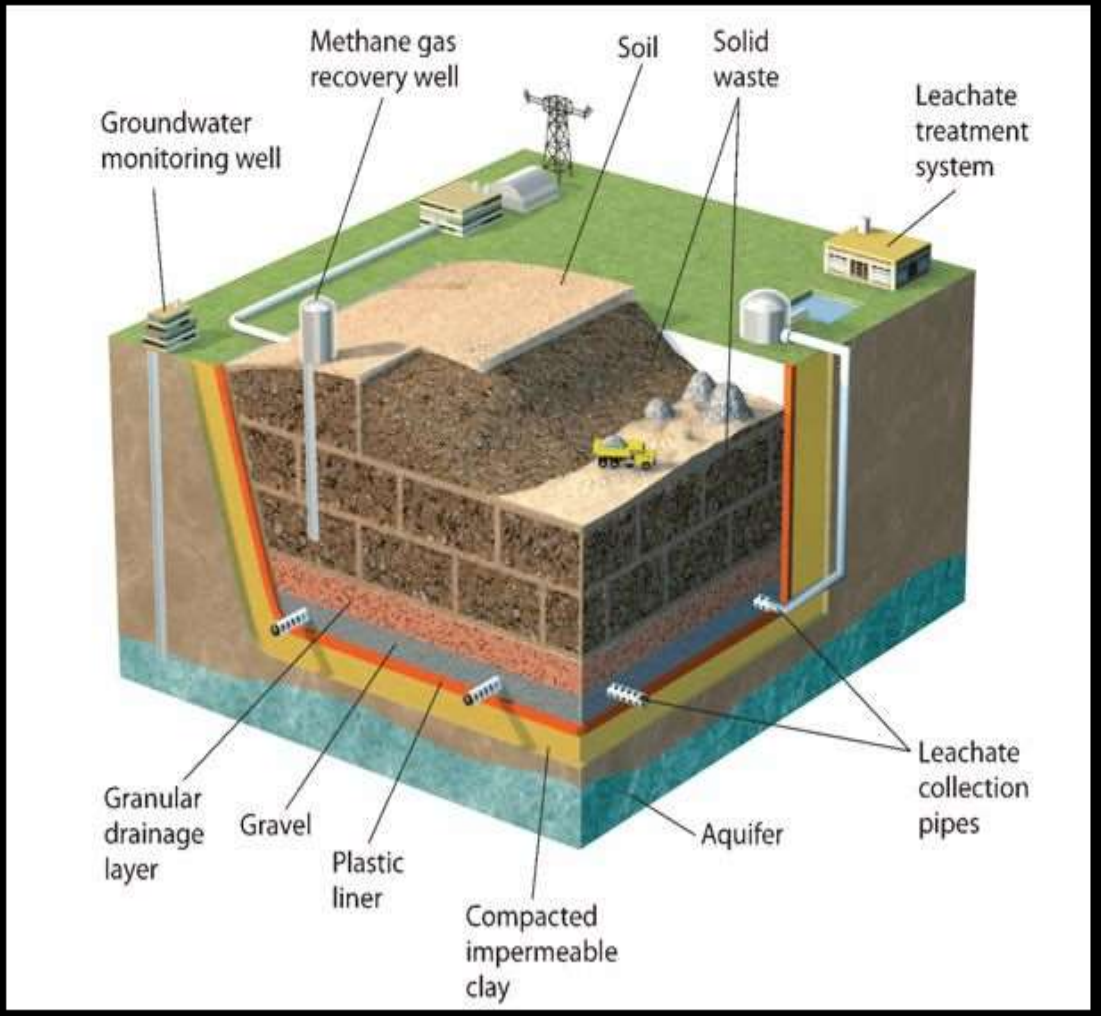
2. CONTROLLED TIPPING/ SANITARY LANDFILL

- Satisfactory method
  - Material placed in a trench
  - compacted with earth at the end of the working day.

- Modified sanitary land fill-where compaction and covering are accomplished once or twice a week.

Solid Waste Disposal: Sanitary Landfills

- Waste is buried in the ground or carefully piled into mounds.
- Designed to prevent groundwater contamination and minimize soil and air pollution.



- 3 Methods
    1. Trench method
    2. Ramp method
    3. Area method

Refuse is compacted on its exposed surface with excavated earth (30 cm).

TRENCH METHOD

- Long trench of 6-10 feet deep and12-36 feet wide.
- Refuse is compacted and covered with excavated earth.
- Refuse is filled up to 6 feet.
- It is estimated one acre of land per year for 10,000 population.
- ***RAMP METHOD:*** suited where the terrain is moderately slopping.

AREA METHOD

- Used for filling land depressions, disused quarries and clay pits.
- Refuse is deposited, packed and consolidated in uniform layers for 6-8 feet.
- Each layer is sealed with a mud cover at least 12 inches.
- Sealing prevents infestation by flies and rodents.
- Prevents nuisance of smell and dust.

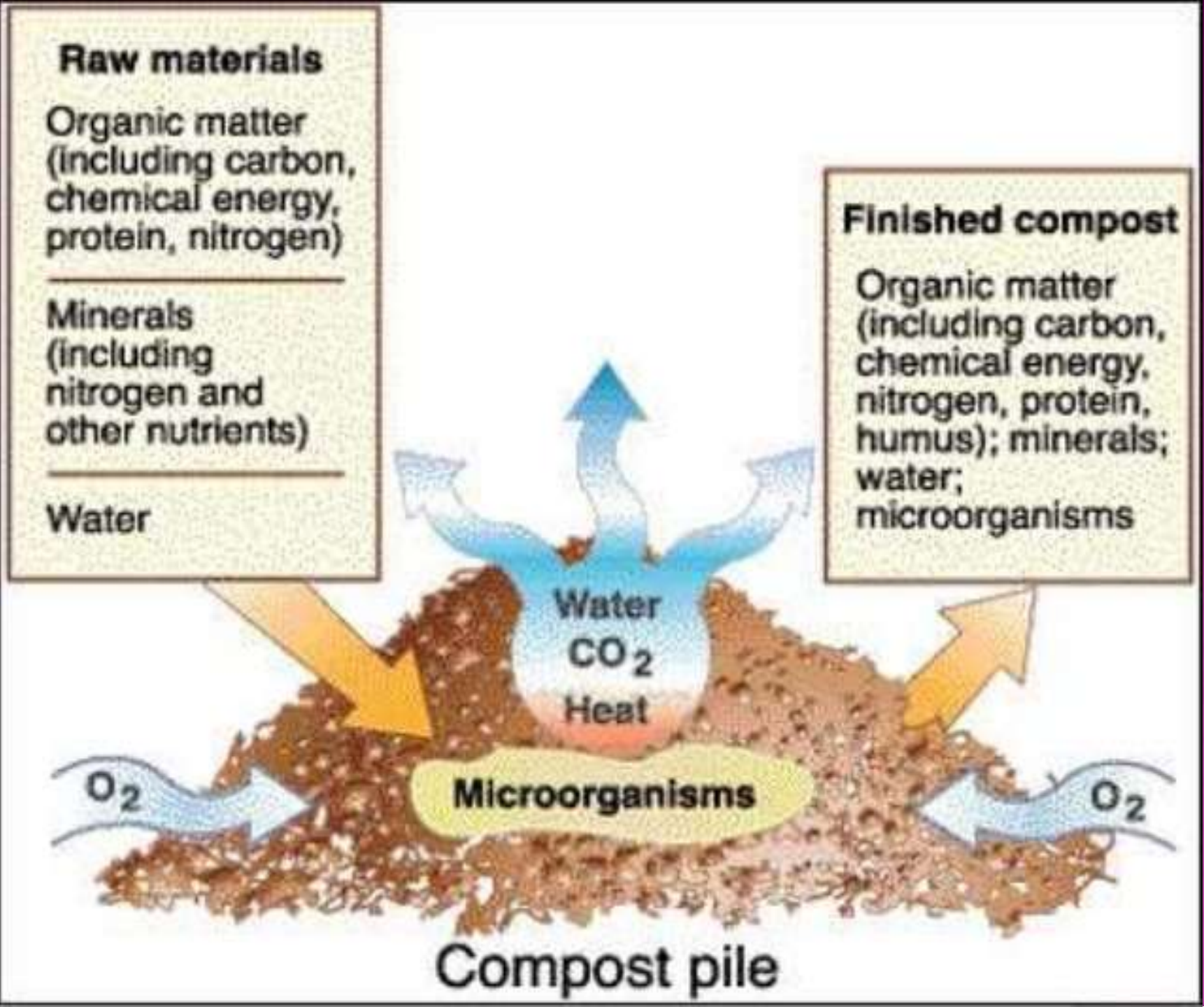
3. INCINERATION

- it is a disposal method in which solid organic wastes are subjected to combustion so as to convert them into residue and gaseous products.
- This process reduces the volumes of solid waste to 20-30% of the original volume.
- Also described as thermal treatment

- Where land is not available
- Hospital waste

4.COMPOSTING

- Method of combined disposal of refuse and night soil/ sludge
- Principal by products are: CO_2 , Water and heat
- End product- compost
- Methods
    a. Bangalore method
    b. Mechanical composting
    c. Vermicomposting


Raw materials
Organic matter (including carbon, chemical energy, protein, nitrogen)
Minerals (including nitrogen and other nutrients)
Water
Finished compost
Organic matter (including carbon, chemical energy, nitrogen, protein, humus); minerals; water; microorganisms
Water
CO_2
Heat
Microorganisms
O_2
O_2
Compost pile

A. BANGALORE METHOD (HOT FERMENTATION PROCESS/ ANAEROBIC METHOD)

- IISc- Indian Council of Agricultural Research.
- Trenches are dug 3ft deep, 5-8ft broad, 15-30ft long.
- Composting procedure
  - 1. Layer of Refuse- 15 cm
  - 2. Layer of Night soil - 5 cm

Physical, chemical and biological changes takes place

B. MECHANICAL COMPOSTING (AEROBIC METHOD)

- Compost manufactured by processing raw materials.
- 1. Screening
- 2. Pulverization (<2inches)
- 3. Mixing
- 4. Incubation

Process completed in 4-6 week

C: vermicomposting :It is a method of disposal of kitch*en and* plate wastes, which serves the dual purpose of disposing off the garbage as well as proving eco-friendly.

5.MANURE PITS

- Mostly used in rural areas
- Digging “manure pits” is to prevent the refuses thrown around the houses.
- The garbage, cattle dung, straw, and leaves should be dumped into the mannure pits and covered with earth.
- Two pits will be needed
- In 5-6 month’s time the refuse is converted into manure which can be returned to the field.

BURIAL

This method is suitable for small camps.

A trench of 1.5m wide and 2 m deep is excavated, and at the end of each day the refuse is covered with 20 to 30 cm of earth.

When the level in the trench is 40 cm from ground level, the trench is filled with earth and compacted , and new trench is dug out.