9. Environmental Management

- **Climate** is the average weather pattern of a particular location taken over a long period of time.
    - The climate of a place that receives very little rainfall and has high temperature throughout the year is hot and dry. Example: deserts
    - The climate of a place that receives plenty of rainfall is wet and humid. Example: the North-East region of India
- The various types of climates are-

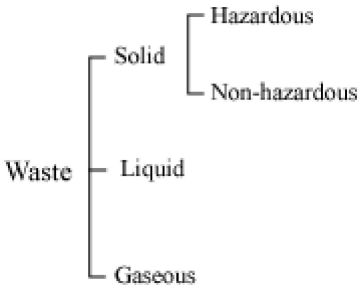
1. **Tropical climate**
2. Dry climate
3. Temperate climate
4. Continental climate

- Climate impacts the living world to a large extent as it influences the basic needs of humans like food, shelter and clothing. It also affects the health of people as climatic conditions impact the weather conditions.

- The branch of science that deals with the study of earth's atmosphere and majorly focus on the weather processes and forecasting is known as **meteorology**.
- It is used in the prediction of storms, heavy rainfall, tsunami etc.
- Indian Meteorological Department has 6 regional offices and is headquartered in **Pune, Maharashtra**.
- **Models**:
    - **Mathematical Model**: In this model, supercomputers are used to analyse complex data collected from observations and to find the optimal solution.
    - **Holistic Model**: In this model, the output from other models are also taken into consideration and then collectively final prediction is made.
    - **Statistical Model**: This model works on the principle of linear regression as it compares the current observations with the previous predictors. The data is analysed using statistical methods and the prediction is made for the current monsoon.

Waste, is any unwanted, unused, and rejected material. Waste can be categorized according to its source – municipal, agricultural, industrial etc.

In general, wastes are of three types **– liquid, gaseous, and solid.**



Management of solid wastes

Waste management includes collection, transport, processing, and disposal of waste materials.

Measures for waste management

- Separate bins (blue and green) can be used for disposing non-biodegradable and biodegradable wastes respectively.
- Reduction in the use of non-biodegradable products like plastic.
- Separation of material, which can be reused or recycled.

The 7 principles of solid waste management i.e. Reuse, Refuse, Recycle, Rethink Reduce, Research, Regulation and public awareness should be followed.

How can we reduce waste production?

Use of recyclable material reduces the generation of wastes to a large extent. Reduced usage of materials, reusing of materials, and using recycled material will reduce the generation of wastes.

- **Biodegradable wastes-**
  - Wastes that can be broken down by biological processes are called Biodegradable.
  - They are mainly produced mainly from plant and animal sources.

Decomposition of waste is accomplished by enzymes released by microbes in order digest this organic waste and consume it.

- **Non-biodegradable wastes**
  - Wastes that cannot be broken by biological processes.
  - They are usually man-made like plastic, metal etc.

1. **Waste:** Any unused or unwanted material is called waste. Waste material can be categorized as; biodegradable and non- biodegradable. These two different types of wastes should be separated for affective waste management.

2. **Biodegradable waste:** It includes wastes mainly from plant and animal sources, which can be broken down by living organisms.

3. **Non- biodegradable waste:** It includes wastes such as plastic, metal, broken glass etc., which cannot be broken down by living organisms.

4. **Difference between biodegradable and non-biodegradable waste:**

Biodegradable	**Non- biodegradable**
The wastes decompose naturally in the environment.	The wastes do not decompose naturally.
They are safe for the environment.	They are harmful to the environment and create pollution.
The wastes are made up of natural ingredients.	The wastes are made up of synthetic materials.
Biodegradable substances persist for small time interval in the environment.	Non biodegradable substances persist for longer time in the environment.
Example – waste papers, wood crumbles.	Example – plastic bags, cans, disposable bottles.

5. Methods of solid waste management
(i) Composting **:** Solid waste obtained from plants and animals when mixed with soil in a pit gets converted into a useful substance called manure or compost and its preparation is called (ii) Vermicomposting: It is a type of composting in which earthworms are in which earthworms are involved.
(iii) Landfills: A landfill is a specially designed facility for the burial of municipal solid waste.
(iv) Pyrolysis: It is another suitable municipal method for the solid waste management. It is the chemical

decomposition of solid waste by **heat**. The end products of pyrolysis are used to produce **steam** and **electricity**.
(v) Incineration: It is the method of burning the waste to reduce its volume and weight. The toxic substances are also removed in the process. The left over product contains ash that can be easily dumped into landfills.

6. Waste water management: The industrial and municipal effluents are first treated in effluent treatment plants and then disposed off into water bodies. This treatment involves primary treatment, which removes solid debris through sedimentation, secondary treatment, which uses microbes to decompose the organic matter present in the water, and tertiary treatment, in which dissolved metals and chemicals are removed. The secondary treatment produces sludge that can be used as manure. The treated water is now safe to be disposed into the water bodies or to be used for irrigation purposes.

7. Removal of air pollutants
(i) Through scrubbers: Gaseous and particulate air pollutants are removed by trapping in the wet packing material.
(ii) Through electrostatic precipitators: The particulate air pollutants are removed by attracting them to electrically charged plates.

Disaster management is the strategy and course of action to be executed at the time of any disaster to save as much life as possible. This includes:

- Improving tolerance
- Preventing losses and dangers
- Providing relief to the affected people
- Preparing for actions to be taken at the time of disaster
- Assessing the damage caused
- Arrangement of rescue for the affected
- Rehabilitation and rebuilding the affected area

First Aid: It is the emergency measures to be followed at the time of disaster before the medical help arrives.