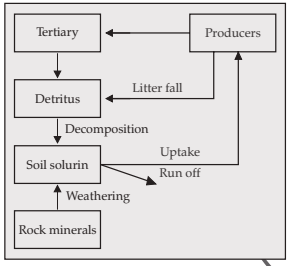
MIND MAP : LEARNING MADE SIMPLE

CHAPTER - 14

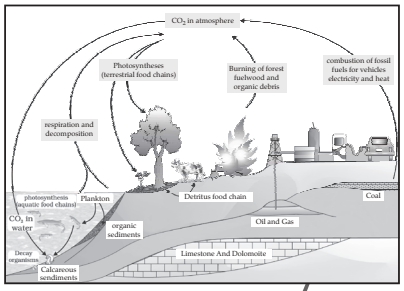
Ecosystem

Nutrient Cycling

Phosphorus Cycle



Carbon Cycle



Ecosystem services

- Purify air and water.
- Mitigate droughts and flood.
- Cycle nutrients.
- Generates fertile soil.
- Provide wildlife habitat.
- Maintain biodiversity.
- Pollinate crops.
- Provide storage site for carbon
- Provide aesthetic, cultural and spiritual values.

Structure and function Ecosystem

Comprises

- Biotic: Autotrophs, Herbivores and carnivores
- Abiotic: Pond, lake, river, estuary

Distribution of different species at different levels

Stratification

- (i) Tall emergent trees
- (ii) Canopy trees
- (iii) Understoreys trees
- (iv) Shrubs
- (v) Herbs
- (vi) Grasses

(i)–(iii): Top most layers; (v)–(vi): Bottom layers

Functional Components of Ecosystem

Productivity

- Primary: NPP= GPP-R
- Secondary: Rate of formation of new organic matter by consumers

Process of Decomposition

- Fragmentation
- Leaching
- Catabolism
- Humification
- Mineralisation

Energy Flow

Food chain shows energy pathways. Energy passes from producer (plants) to Plant-eaters, to Animal-eaters and to tertiary consumer.

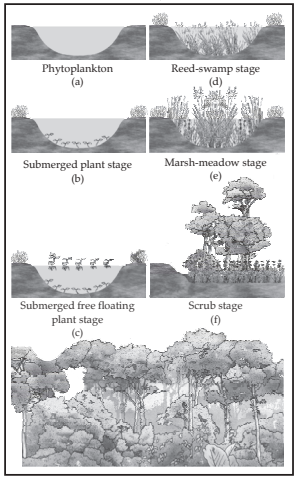
- **Ecological Pyramid**
  - Pyramid of No.
    - Upright e.g. in grassland
    - Inverted e.g. in tree ecosystem
  - Pyramid of Biomass
    - Upright e.g. in grassland
    - Inverted e.g. in pond
  - Pyramid of energy
    - Always upright because energy is lost as heat at each step
- **Trophic level**: Specific place occupied by an organism in the food chain in an ecosystem.
- **Food chain**
  - Grazing food chain: Begins with producers, present at the first trophic level.
  - Detritus food chain: Begins with detritus such as dead bodies of animals or fallen leaves.
- **Ten percent Law**: During transfer of energy from one trophic level to another, only about 10% is stored at higher levels; remaining 90% is lost in respiration (heat).

Ecological Succession

Two Types

- Primary: Takes place in areas where no living organisms ever existed. E.g. newly cooled lava, bare rock, newly created pond or reservoir.
- Secondary: Takes place in areas which have lost all life forms due to destructions and floods. E.g. abandoned farm lands, burned or cut forests, lands that have been flooded

Succession in plants

- Hydrach Succession: Takes place in water areas. The successional series progress from hydric to the mesic conditions
- Xerarch succession: Takes place in dry areas. The series progress from xeric to mesic conditions

Primary succession