

Aquatic Ecosystem

Definition:

Deals with water bodies and biotic communities present in them-Classified as fresh water and marine ecosystems. Fresh water systems are classified as lentic and lotic ecosystems.

Types:

1. Pond ecosystem: Small fresh water ecosystem – seasonal in nature – organisms: algae, aquatic plants, insects, fishes etc. Ponds are very often exposed to anthropogenic pressure like cloth washing, bathing, cattle bathing, swimming etc.
2. Lake ecosystem: Big fresh water ecosystem – Zonation or stratification, especially during summer is a common one.

Top layer – shallow, warm, prone to anthropogenic activities – Littoral zone

Second layer – enough sunlight, high primary productivity – Limnetic zone

Third layer – very poor or no sunlight – Profundal zone

Eg. Dal lake in Srinagar, Naini lake in Nainital

Organisms: planktons – phytoplankton eg. Algae – zooplankton eg. Rotifers

Nektons – that swims in water eg. Fishes

Neustons – that float on the surface of water

Benthos – that attached to sediments eg. Snails

Types of lakes : Many types- oligotrophic lakes – with less nutrient content – eutrophic lakes – with very high nutrient content due to fertilizer contamination – desert salt lakes – that contains high saline water due to over evaporation – volcanic lakes – formed by water emitted from magma due to volcanic eruptions – dystrophic lakes – that contains highly acidic water (low pH) – endemic lakes – lakes that contain many endemic species – etc.

3. Streams: fresh water ecosystem where water current plays a major role. Oxygen and nutrient content are uniform. Stream organisms have to face extreme difference in climatic conditions but they do not suffer from oxygen deficiency as pond and lake organisms. This is because large surface area of running water provides more oxygen supply. The animals have very narrow range of tolerance towards oxygen deficiency. Thus stream are worst victims of industrial pollution.

River ecosystem: large streams flowing from mountain highlands are rivers.

Three phases: 1. mountain highlands – rushing down water fall of water – large quantity of dissolved oxygen – plants attached to rocks and fishes that require more oxygen are found. 2. Second phase – gentle slopes of hills – warmer – supports the growth of plants and fishes that require less oxygen are seen. 3. Third phase: river shapes the land – lots of silts, nutrients are brought – deposited in plains and delta – very rich in biodiversity.

- Oceans: Gigantic reservoirs of water covering >70% of earth surface – 2,50,000 species – huge variety of sea products, drugs etc. – provide Fe, Mg, oils, natural gas, sand etc. – major sinks of carbon di oxide – regulate biochemical cycles.

Two zones: coastal zone – warm, nutrient rich, shallow – high sunlight – high primary productivity. Open sea – away from continental shelf – vertically divided in to 3 zones.

- euphotic zone – abundant sunlight
- bathyal zone – dim sunlight
- abyssal zone – dark zone – world’s largest ecological unit.

Estuary: coastal area where river meet ocean – strongly affected by tidal actions – very rich in nutrients – very rich in biodiversity also – organisms are highly tolerant – many species are endemic – high food productivity – however to be protected from pollution.

Characteristics:

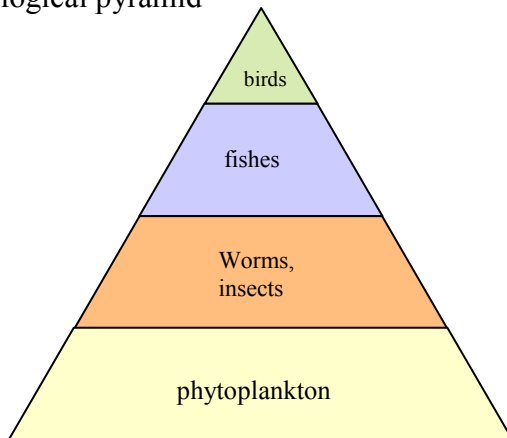
Structural Components:

Abiotic: pH, nutrients, D.O, temp, climatic conditions, etc.

Biotic: Phytoplankton, fishes, snails insects, birds, etc.

Functional components:

Ecological pyramid



Energy flow:

