Environment and Ecosystem

Ecology

- Ernst Haeckel coined term Ecology.
- Latin word;Oikos=Home;Logos=study
- Ecology is the study of the structure, behavior and interactions of the natural systems that comprise the biosphere.
- Ecology is the study of all the organisms, all the interactions and all the environment.

- Ecology is science of all organisms to all their environment. (Taylor)
- Ecology is interaction of forms, functions and factors.(R.Mishra)

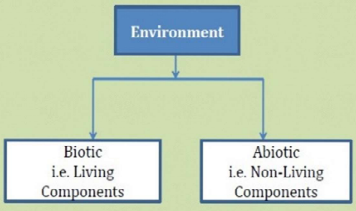
Environment

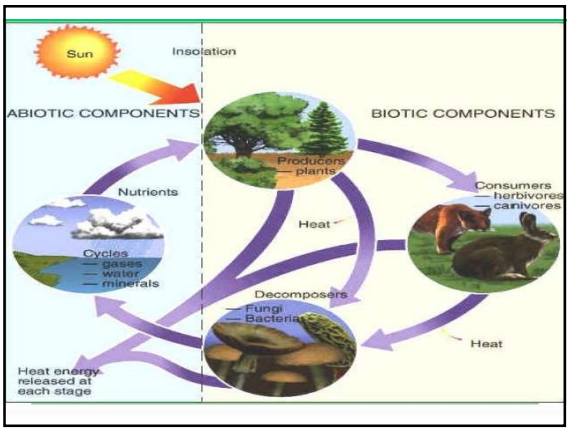
- It means surrounding.
- Complex of so many things which surround an organism.
- Any substance or condition which surrounds and affects the life of an organism becomes a factor of its environment.

- Environmental factors
- Living factors = biotic factors
- Nonliving = Abiotic factors

Components of Environment

- Environment can be divided into following Components





Abiotic Factors

- Abiotic factors includes;
  1) Climatic Factors
     - Light
     - Temperature
     - Rainfall
  2) Topographic Factors
     - Structure and property of area

3) Edaphic Factors
   - Formation of soil
   - Physical and chemical property

Biotic Factors

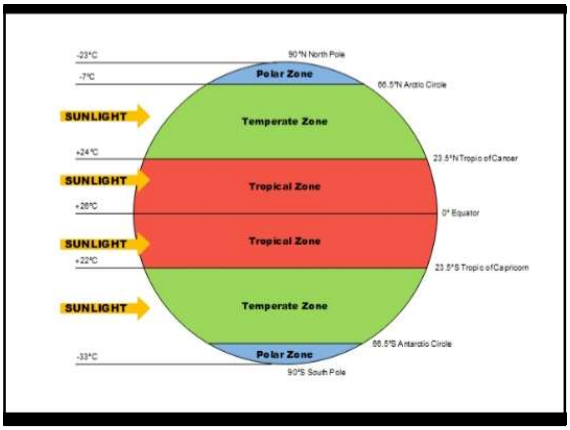
- Biotic Factors includes;
  1) Plants
  2) Herbivores
  3) Carnivores
  4) Omnivores
  5) Microbes

Abiotic factors

1) Climatic Factors:-
   - Light
     - Form of energy
     - Affects both plants and animals
     - Heliophytes= light loving plants
     - Sciophytes= Shade loving plants
     - Photosynthesis

- Transpiration
- Respiration
- Metabolism
- Pigmentation

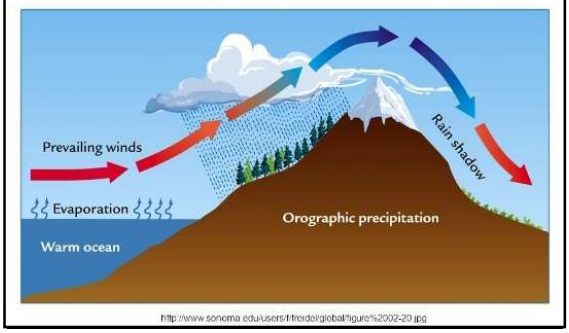
- Temperature
  - Form of energy
  - Development and growth
  - Metabolism
  - In animals; Endotherm:Ectotherm



- Rainfall
  - Main source of water
  - Hydrophytes
  - Mesophytes
  - Xerophytes
  - Hydrocoles
  - Mesocoles
  - Xerocoles

2) Topographic Factors
   - Structure of Area; Altitude and lattitude ; presence or absence of mountains
   - Physiographic factors

Factors That Affect Climate…
Topographical Effects



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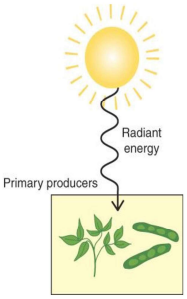
3) Edaphic Factors
   - Soil characters
   - Soil particle size
   - Nutrient status
   - Soil pH

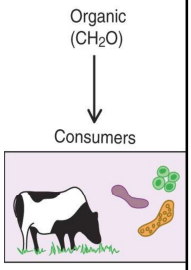
Biotic Factors

- Classification of biotic factors based upon feeding habit
  - # Producers
  - # Herbivores
  - # Carnivores
  - # Omnivores
  - # Devomposers

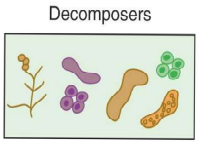
- Primary producers
  - Primary producers are autotrophs
  - Convert carbon dioxide to organic materials
  - Include
    - Photoautotrophs
      - Plants
      - Algae
      - Cyanobacteria
      - Anoxygenic phototrophs
      - All use sunlight for energy
    - Chemoautotrophs
      - Oxidize inorganic compounds for energy
  - Primary producers serve as food source for consumers and decomposers



- Consumers
  - Consumers are heterotrophs
  - Rely on activities of primary producers
  - Herbivores eat primary producers
    - Termed primary consumers
  - Carnivores consume herbivores
    - Termed secondary consumers
  - Carnivores that eat other carnivores
    - Termed tertiary consumers
  - Chain of consumption called food chain
  - Interaction between food chains called food webs



- Decomposers
  - Decomposers are heterotrophs that digest remains of primary producers and consumers
    - Partially decomposed organic matter of other trophic levels termed detritus
  - Decomposers specialize in digestion of complex material
    - Convert them into small molecules
      - Molecules more readily usable by other organisms
  - Complete breakdown of organic molecules to inorganic molecules is termed mineralization



microbial diversity and habitats

- habitat diversity
  - unique C and E sources
  - metabolic strategies
    - fermentation ↔ respiration
    - heterotrophy ↔ phototrophy
    - symbioses
      - ruminants
      - mycorrhizae
  - extreme environments
    - pH
    - temperature
    - salinity
    - pressure