Principles of Ecology (Biol 2051)

Cr. Hrs= 3

Contact Hrs = 6 hrs/week

Batch = Second Year

❖ **Definition of ecology?**

➢ The term ecology was derived from two Greek words:-

✓ **Oikos** meaning "house" or "dwelling place" and

✓ **Logos** meaning "the study"

✓ Therefore, ecology is the study of organisms '**at their home'**

❖ Ecology is the study of the relationships between living organisms and their environment

❖ Ecology is also deals about the **distribution and abundance of living organisms on their environment**

Different authors defined Ecology in different ways:

- **Odum (1963)= Ecology** is the study of **structure and function of nature**
- **Haeckel (1865)=** define **Ecology** as a total relationship of the animal to both its **organic and inorganic environment**
- **Andrewartha (1961)=** defined it as the study concerned with the distribution of organisms
- **Clematis (1905)= ecology** as a science of community

❖ Terminology of ecology

- **Population-** is a group of individual of the same species
- **Community-** is a group of individual of different species in a given area
- **Factor-** any external force, substance or condition that affects organisms
- **Environment -** the sum of all factors constituted
- **Climax community -** the final or stable stage of succession
- **Ecosystem -** living things + non living things
- **Biogeochemical cycle-**the circular pathways of chemical elements in the biosphere from environment to organism and back to the environment

- **Habitat**- the place where an organisms are lives
- **Succession**- is different group or communities colonize over a period of time in a definite sequence
- **Biome**- a large naturally occurring community of flora and fauna occupying a major habitat, e.g. forest or tundra.
- **Conservation**- the wise use of resources
- **A biotic** – non-living component or physical factors e.g. **soil, rainfall, sunlight, temperatures**
- **Biotic** – living component factors such as **predators, parasite, disease and microorganism**

- **Productivity** - refers to the amount of biomass produced in a given or during a given time
- **Primary Producers** – organisms who can able to prepared their food

  e.g plants
- **Consumers** – organisms who do not photosynthesize their meal, they get their energy by consuming other organisms e.g animals
- **Food web-** is series of interconnected food chains in an ecosystem

  or -organisms have multiple food sources
- **Food chain** = a linear feeding relationships

1.2. Branches of Ecology

- Ecology is divided into several types based on different criteria
- These criteria are:

    A. Taxonomic groups

    B. Habitat

    C. Nature of study

    D. Levels of organization

A. Based on taxonomic groups

- Plant ecology
- Animal ecology
- ✓ Insect ecology
- ✓ Bacteria ecology
- ✓ Avian ecology

B. Based on habitat

- Based on habitat ecology can be divided into several types
- These different types of habitats are:

1.Fresh water: - It deals the relationship between organism and freshwater environment.

- The study all aspects of fresh water (physical, chemical, and biological) is termed **limnology**

2. **Marine water**: - It deals the relationship between organism and freshwater environment

- The study all aspects of marine water (physical, chemical, and biological) is termed as **oceanology**

3. **Grassland**: It deals the relationship between organism and grassland environment.

4. **Forest**: It deals the relationship between organism and forest environment.

5. **Arid land**: - It deals the relationship between organism and arid land environment

C. Based on nature of study

1. Autecology:-is the study of individual organisms/species and its ecological relationships

✓ It is also known as **population ecology**

❖ **Example:-** the study tree and its relation with environment

2. Synecology: - is the study of group of organisms of different species which are associated together as a unit in the form of community and its ecological relationships

✓ It is also known as **community ecology**

❖ **Example:-** the study of forest and its relation with environment

D. Based on level of organization

- **Level of organization in ecology**

1. Organism= deals with a single individual

2. Population = deals with group of individuals of the same species

3. Community = deals with two or more populations of different species and their interaction with environment

4. Ecosystem = it deals with the living and non living components of nature interacting each other, **e.g. soil, rain, temperatures, etc**