

Introduction to Ecology

Study of interactions between organisms
and their environment

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Introduction

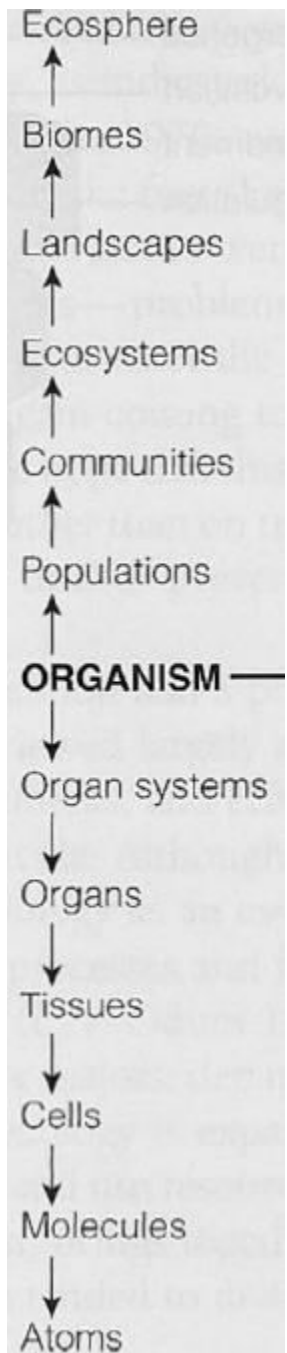
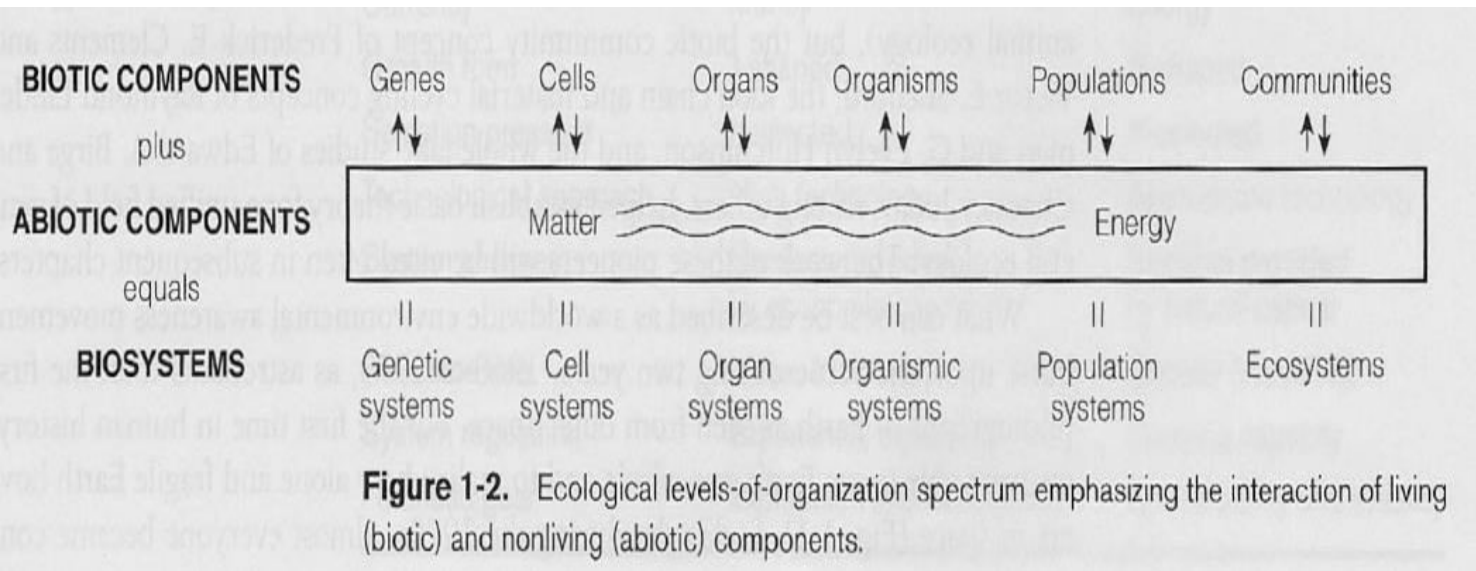
- **Ecology**= oikos (house/dwelling place) + logos(study of)
- Term ecology was first proposed by German biologist **Ernst Haeckel** in **1869**
- He defined ecology as “the study of the natural environment including the relations of organisms to one another and to their surroundings.”
- **Environment**= **Biotic factors**(other organisms) + **Abiotic factors**(temperature, moisture, respiratory gases, etc.

Historical background

- Indian writings- Agni, Jal, Vaayu, Desh
- Aristotle, Theophrastus wrote about habits of plants and animals
- Linnaeus & Buffon- 'Natural History'
- **Hilaire(1859)** used the term **Ethology**(study of relationships between organisms and environment.
- **Reiter(1868)** used term **oekologie** in literature.

- A G Tansley(1935) proposed a term **Ecosystem** for the set of organisms interacting with each other and their surrounding physical and chemical factors extant in a given space.
- Schroter(1896) introduced the terms “autecology” and “synecology”

Levels of organization hierarchy



- **Hierarchy**- an arrangement into a graded series
- **System**- regularly interacting and interdependent components forming a unified whole
- **Species**- closely related, physically similar beings that can interbreed freely.

- **Population**- group of individual organisms of the same species in a given area.
- **Community**- a group of populations of different species in a given area.
- Any ecological unit that includes all the organisms(in a given area) which interact among themselves and with the physical environment, so that a flow of energy leads to clearly defined trophic structure, biotic diversity and material cycle within the system, is known as **Ecosystem**.
- **Landscape**- heterogenous area composed of a cluster of interacting ecosystems that are repeated in a similar manner throughout.
- **Biome**- large regional system characterized by a major vegetation type, e.g. temperate deciduous forest biome.

- **Vegetation** is the sum total of plant population covering a region.

Major divisions of Ecology

- **Based on taxonomic groups**- plant ecology, animal ecology, insect ecology, etc.
- **Based on habitat**- freshwater, marine, grassland, etc.
- **Based on level of organisation**- Autecology, Synecology (population ecology, community ecology, ecosystem ecology)
- Behavioural ecology, physiological ecology, molecular ecology

- **Autecology** (ecology of individuals) - deals with relation of individual species to its environment.
- **Synecology** (ecology of group of individuals) - deals with relation of group of individuals (population, community, ecosystem) to environment.
- Ecology is a multidisciplinary science.
- Ecological tools and techniques-
 - Field
 - Laboratory
 - Mathematics

Significance of Ecology

- Environmental Conservation
- Resource allocation
- Energy Conservation
- Eco Friendliness
- Ecosystem services