

Quadrant II – Transcript and Related Materials

Programme: Bachelor of Arts/Commerce/Science (First Year)

Subject : Ecology

Paper Code : GEG 103

Paper Title : Fundamentals of Ecology

Unit : II

Module Name: Ecosystems: Concept and Characteristics

Module No : 14

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Notes

Ecosystems

Concept of an Ecosystem

A system that includes all living organisms (biotic factors) in an area as well as its physical environment (Abiotic factors) functioning together as a unit.

The biotic factors and abiotic factors interact as a system and are linked to one another via nutrient cycles and energy flows.

The nature of the ecosystem is based on its geographical features such as hills, mountains, plains, rivers, lakes, coastal areas or islands. It is also controlled by climatic conditions such as the amount of sunlight, the temperature and the rainfall in the region. The geographical, climatic and soil characteristics form its non-living (Abiotic) component. These features create conditions that support a community of plants and animals that evolution has produced to live in these specific conditions. The living part of the ecosystem is referred to as its biotic component.

Ecosystems are divided into terrestrial or land based ecosystems, and aquatic ecosystems in water. These form the two major habitat conditions for the Earth's living organisms. All the living organisms in an area live in communities of plants and animals. They interact with their non-living environment and with

each other at different points in time for a large number of reasons. Life can exist only in a small proportion of the earth's land, water and its atmosphere. At a global level the thin skin of the earth on the land, the sea and the air, forms the biosphere.

Characteristics of Ecosystems

- The ecosystem is a major structural and functional unit of ecology.
- The structure of an ecosystem is related to its species diversity; the more complex ecosystems have high species diversity.
- The function of the **ecosystem** is related to energy flow and material cycling through and within the system.
- The relative amount of energy needed to maintain an ecosystem depends on its structure. The more complex the structure, the lesser the energy it needs to maintain itself.
- Ecosystems mature by passing from less complex to more complex state. Early stages of such succession have an excess of potential energy and a relatively high energy flow per unit biomass. Later (mature) stages have less energy accumulation and its flow through more diverse components.
- Alterations in the environments represent selective pressures upon the population to which it must adjust. Organisms which are unable to adjust to the changed environment must necessarily vanish.

Glossary of terms/words:

- **Biosphere:** the part of the earth's crust, waters, and atmosphere that supports life.
- **Ecosystems:** a biological community of interacting organisms and their physical environment
- **Ecological Succession:** is the process that describes how the structure of a biological community (that is, an interacting group of various species in a desert, forest, grassland, marine environment, and so on) changes over time.
- **Ecology:** the branch of biology dealing with the relations of organisms to one another and to their physical surroundings.