Lecture 3

ECOSYSTEM

A small puddle at the back of your home has all sorts of living things, from microorganisms to insects and plants. These microorganisms and plants depend on non-living things like water, sunlight, temperature, pressure and nutrients in the water for life. We ourselves need air, water and temperature to live. So, every living organism on earth needs basic things like air, water, sunlight etc., to survive. The amount, form or kind of these needs vary from organism to organism.

Another example is that we all need air (oxygen) to live as we breathe. Without oxygen we cannot breathe. This indicated that for the living organism to live, there should be an interaction, relationship with a non -living thing. Likewise water is also a non- living thing. This type of relationship/ interaction of living with non-living is known as ecosystem.

Thus, living organisms cannot live isolated from their non-living environment i.e. A stable system in the environment comprise the interaction between a biotic community and its surroundings. This natural self-sufficient unit is known as an **ecosystem**. Study of ecosystem is known as **ecology**. The word ecosystem was coined by **Sir Arthur Tansley** in the year **1935**.

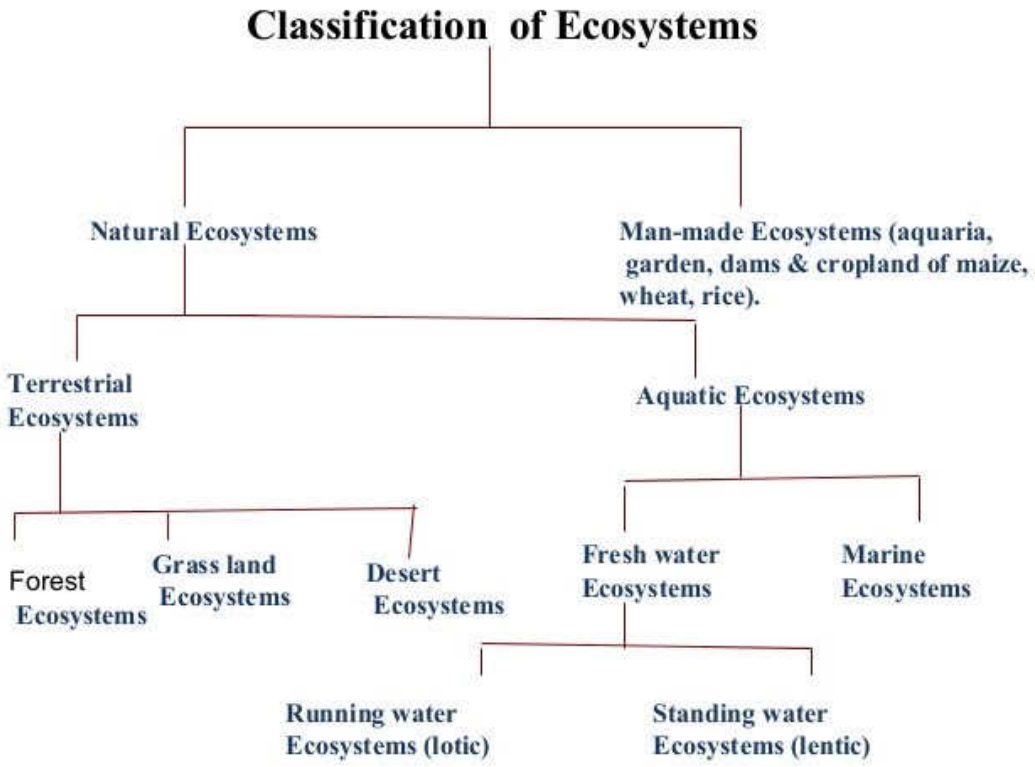
Definition: An ecosystem is, therefore, defined as a natural functional ecological unit comprising of living organisms (biotic community) and their non-living (abiotic or physicochemical) environment that interact to form a stable self-supporting system. A pond, lake, desert, grassland, meadow, forest etc. are common examples of ecosystems.

In simple words: relationship or interaction between living and non - living components is ecosystem.

TYPES OF ECOSYSTEM

- Natural - occurring in nature. Ex: Forest ecosystem, Desert ecosystem
- Artificial - made by man. Ex: Aquarium, Zoo
- Temporary - Ex: Pond until it gets dries up.
- Permanent - exits in the environment permanently. Ex: Forest Ecosystem
- Terrestrial – ecosystem occurring on land. Ex: Forest ecosystem

- Aquatic - ecosystem occurring on water. Ex: Pond ecosystem



Courtesy: https://www.pmfias.com/environment-ecosystem-components-ecosystem/

Figure1: Classification of ecosystem

STRUCTURE AND FUNCTION OF ECOSYSTEM

Each ecosystem has two main components: (1) Abiotic (2) Biotic

(1) Abiotic Components:

It comprises the non-living factors or the physical environment present in the ecosystem forms the abiotic components. No matter they are non – living still they have a strong influence on the structure, distribution, behaviour and inter-relationship of organisms.

Abiotic components are mainly of two types

(a) Climatic Factors: that includes soil, rain, temperature, light, wind, humidity etc.

(b) Edaphic Factors: Which include soil, pH, topography minerals in the form of carbon, Oxygen, etc.

The functions of abiotic components

Soils provide nutrients, water, a home, and a structural growing medium for organisms. The vegetation growing on surface of the soil is closely linked to this component of the ecosystem through nutrient cycling.

The atmosphere provides organisms found within ecosystems with carbon dioxide for photosynthesis and oxygen for respiration.

Light in the form of solar radiation is used in ecosystems to heat the atmosphere and to evaporate and transpire water into the atmosphere. Sunlight is also necessary for photosynthesis. Photosynthesis provides the energy for plant growth and metabolism, and the organic food for other forms of life.

Water is the soil by which mineral nutrients enter in to the roots and are trans-located through the stem and other parts of the plants. It is also essential for photosynthetic reactions and maintains the leaf turgidity. Water stored beneath the surface of the earth is the source for plants and animals.

Wind helps in carrying away the pollens onto the stigma for fertilization and thus new plants are grown.