

Basic ecological concept

[Environment](#), [Ecology](#)



Basic Ecological Concept

Levels of Organization

Cells- are composed of Cell Membrane, Nucleus and Protoplasm. Tissue-is an aggregation of cells performing a common function or functions. Organs- is the aggregation of tissues usually forming a definite shapes, and performing a definite function within an organ system. Organ System-is a group of organs that perform coordinated functions together to keep the organism alive and functioning well. The scope of the biology includes the study of all these and may extend to the level of the organism such as behavior, and the organism mechanism for interacting with its environment.

Ecology started from the study of the organism-a group of organisms that is similar in appearance, behavior and genetic make up belong to the same species. The biological species concept state that members of a species are those individual that are genetically related enough to be able to interbreed and produce fertile offspring. Population The group of the individuals belonging to one species and is found together in a define area at a certain time.

A population possesses characteristics that more empirically describe the group such as: population Density, Dispersion, Natality, Mortality, Growth, Age Distribution, and Reproductive potential. Population Density Describe the degree of crowdedness of a population in a given area. Crude Density may be computed from the number of individuals or the total population biomass per unit space. Ecological or specific Density describes the number or biomass per unit of space that is actually available to the population.

Dispersion The distribution of organisms over the space where they are found.

Three patterns have been observed: clumped, random, and uniform. The clumped Distribution is the most common type of pattern since the soil or medium on which organisms are found in nature are not uniform. Random Distribution is rare in nature, occurring only where the soil is generally rich so that the plants can grow and thrive anywhere. Uniform Distribution is found in artificial cultivated areas. **Natality/Mortality** Natality corresponds to what is termed in humans as birth rate or the number of new individuals produced in the population for a period of time.

Mortality is known as death rate in human demographics, or the number of deaths in a given time period. Growth is an important feature of a population since the increases or decreases of population size determines its interaction with other populations in the community and its impact on the environment.

Age Distribution is classified the population according to age brackets or to general age groups such as prereproductive, reproductive and postreproductive. **Reproductive Potential**

The Reproductive potential of a population is its theoretical capacity to produce the maximum number of offspring in ideal conditions. **Community**

The community has properties that may be used to further clarify its composition and its interaction with the environment. Like species dominance, diversity, relative abundance, species richness and evenness.

Dominance is attained by a species in a community by virtue of a greater number of individuals, or by size such as the overwhelming sizes of sequoia

trees, or any other attribute that enables the species to control the community. Diversity

Diversity is the opposite of dominance, a case where no single species has greater number or biomass or other relative importance than other species in the community. Ecosystem The basic unit of ecology because it includes the living and nonliving components. The setting includes necessary nonliving components such as soil, water, air, and the cycles that keep and renew them, which are collectively called the biogeochemical cycles. Bioenergetics Energy is necessary for maintaining the life processes of organisms. The sun is the source of all the energy that goes into the ecosystem.

The solar system is radiated on to the earth where a tiny fraction of it is tapped by plants and used in photosynthesis. Solar energy released in the form of light waves called photons. Herbivores are organism that feed on plants. Carnivores are organism that feed on other organism. Omnivores are organism that consume both plants and animals. FoodChain The sequence of eating and being eaten may be described by food chain. It also indicates the role, the feeding mode and rank of each organism. Food Web A food web shows the various possibilities of the sequence of eating and being eaten in the ecosystem.

There are two major types of food webs in the ecosystem: the grazing food web is the more conspicuous type because it is usually composed of large plants and animals that are familiar. Law of Energy First law of thermodynamics stated that energy is never created nor destroyed but is transformed from one form to another. Second law of thermodynamics

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states that as energy is transformed it degrades or diminishes. Biogeochemical Cycles Substances that organisms need to survive are called nutrients such as water, carbon, oxygen, nitrogen, and sulfur.

Nutrients move through the ecosystem in cycles called biogeochemical cycles where bio refers to the living organism, geo refers to the inorganic molecules such as those found in rocks, air, and water, and chemical refers to the interactions of the elements between them. Water cycle Evaporation- the heat of the sun, or solar energy makes water vapor, which is water in gaseous form, continually rising from water bodies and from the land. Condensation-it brings water into the atmosphere where the water molecules clump together. Precipitation-the clumps get too big and too heavy, they fall back down to the earth.

In the form of rain, snow, hail or sleet. Water cycle is the movements of several chemical substances through the ecosystem. Carbon cycle-During photosynthesis plants use up carbon dioxide, combining it with water to form sugars particularly glucose. Consumption of these sugars breaks them down releasing CO₂. Nitrogen Cycle-Nitrogen is an important component of proteins, the building block of all living matter. Fixation- the process of converting nitrogen from the gaseous state, N₂ to the usable ammonia, NH₃, and nitrate NO₃.

Mineralization or ammonification-involve the breakdown of dead organisms and their proteins and nucleic acids are further broken down into amino acids. Nitrification-where the bacteria such as the nitrosomonas use ammonia to produce their energy needs by converting it. Denitrification- is the process by which nitrogen is returned to the atmosphere. Phosphorus cycle-the

sedimentary rocks which contain phosphorus in the form of the mineral apatite comprise a pool phosphorus. Phosphorus is released when these rocks weather naturally, which takes along time, or when human mines these rocks to release phosphorus which is used to fertilizers soap.

Sulfur cycle- a basically sedimentary nutrients cycles through air, soil and water. The sulfur cycle involves the three spheres as it cycle through the soil, waterway, and atmosphere. It originates from the crust and mantle of the earth and is spewed out during volcanic eruptions. It is found in the volcanic rocks and many minerals. Limiting Factors and the Law of Tolerance Law of the Minimum- states that when there is not enough of a certain nutrient in the environment, the growth of organism that needs that nutrient will be severely limited.

Studies also show that too much of any nutrient will likewise limit growth, giving rise to the Law of limiting Factors. Sunlight and Temperature are two important physical factors that limit the distribution and abundance of organism. Species Interactions The population of two species may positively or negatively affect the existence of one another in the community. Mutualism- refers to the interaction between two species where both are benefited. Competition- is an example of a positive negative interaction when two species of the same species strive to obtain the same limited resource.

Predation- is an example of a positive negative interaction wherein the predator eats the prey. Parasitism- is another type of positive negative interaction wherein the hosts provide nourishment to the parasite. Commensalism- is a form of positive zero interaction wherein in the

commensal also referred to as hitchhiker attaches itself to the host while the host is neither help nor harmed by the interaction. Amensalism- is an example of a negative zero interaction wherein one organism is inhibited while the other is not affected.