

# ECOLOGY

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## Introduction

Ecology, also called ‘**bioecology**’, ‘**bionomics**’, or ‘**environmental biology**’ is the scientific study of interactions among organisms and between organisms and their environment.

"The word ecology was coined by the German zoologist *Ernst Haeckel*, who applied the term *oekologie* to the “relation of the animal both to its organic as well as its inorganic environment.” The word comes from the Greek *oikos*, meaning “household,” “home,” or “place to live.”” Thus, ecology deals with the organism and its environment. [Source: [britannica.com](http://britannica.com)]

Organisms are affected by their environment, and they in turn affect the environment. Green plants manufacture food by photosynthesis which other organisms obtain directly or indirectly.

Growth of plants is mainly affected by environmental factors such as soil and climatic factors, on the other hand, organisms modify the environment through various activities.

This interrelationship comprises the study of ecology, which is important in several fields of study such as agriculture and environmental studies.

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## Concepts of Ecology

### Ecosystem

The community and the abiotic or non-living environment together make up an *ecosystem or ecological* system.

In this system energy flow is clearly defined from producers to consumers and nutrient cycling takes place in paths that links all the organisms and the non-living environment.

## Habitat

This is the *place or "home"* that an organism lives or is found, e.g., forest or grassland.

## Niche

A niche is the functional unit in the habitat which includes not only the specific place in which an organism lives but also how the organism functions. To avoid or reduce competition, organisms are separated or segregated by their niches, *for example*, different species of birds make their nest on one tree, some at tips of terminal branches, and others feed on leaves, some on flowers and yet others on fruits of the same tree, i.e., food niche.

Yet others feed on same food, e.g., worms in the same place but at different times - time niche.

## Population

The term population refers to the total number of individuals of a species living in a given area at a particular time.

## Density

Density is used in relation to population to refer to the number of individuals of a population found in a unit area.

## Community

This is the term used to describe all the organisms living together in an area. During the development of an ecosystem, the species composition of a community changes progressively through stages.

Finally a steady state is reached and this is described as the climax community. This development of an ecosystem is termed succession. Each stage in development of an ecosystem is a sere.

(A seral community (*or sere*) is an intermediate stage found in ecological succession in an ecosystem advancing towards its climax community. In many cases more than one seral stage evolves until climax conditions are attained.)[Source: wikipedia.org].

Succession is primary when it starts with bare ground, and secondary when it starts in a previously inhabited area e.g. after clearing a forest.

### **Biomass**

This is the mass of all the organisms in a given area, ideally, it is the dry mass that should be compared.

Dictionary.com defines biomass as; ‘the amount of living matter in a given habitat, expressed either as the weight of organisms per unit area or as the volume of organisms per unit volume of habitat.’

### **Carrying capacity**

This is the maximum sustainable density in a given area e.g. the number of herbivores a given area can support without overgrazing.

### **Dispersion**

This is the distribution of individuals in the available space.

Dispersion may be uniform as in maize plants in a plantation; random as in cactus plants in the savannah ecosystem or clumped together as in human population in cities.

# Questions on Topic

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1. Define the following terms:

- a. Ecology
- b. Ecosystem
- c. Habitant
- d. Niche
- e. Population
- f. Density
- g. Dispersion
- h. Biomass
- i. Carrying capacity
- j. Community
- k. sere



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