# Quadrant II – Notes

**Programme: B. Sc. (Hons.) Agriculture**

**Subject:** Agricultural Entomology

**Course Code: ENTO-232**

**Course Title:** Insect Ecology and Integrated Pest Management

**Module Name: DEFINITION OF INSECT ECOLOGY, SCOPE; ENVIRONMENT AND IT'S COMPONENTS.**

**Module No: 1**

**Name of the Presenter:** Mr. Rajan T. Shelke

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**Notes:**

**Ecology:**

The term ecology is derived from the Greek term "oikos" meaning "house" combined with "logy" meaning "the science of" or "the study of". Thus, literally ecology is the study of earth's household comprising of the plants, animals, microorganisms and people that live together as interdependent components.

The term ecology was coined by a German biologist Ernst Haeckel (1869) though its first authentic use was made by **Reiter** in 1885.

**Definitions:**

**Ernst Haeckel**: Ecology is the study of the total relations of animal both to its inorganic and its organic environment including above all.

**Andrawartha**: Ecology is a scientific study of distribution and abundance of organisms.

**E. P. Odum:** Ecology is the study of structure and function in nature.

Insect Ecology may be defined as the understanding of physiology and behavior of insects as affected by their environment.

Ecology can be defined as a study of the relations of organisms or group of organisms to their environment. OR

The science of interrelations between organisms and their environment.

**Insect Ecology** can be defined as study of the relations of Insect to their Environment.

Ecology related terminology

**i. Habitat** is the place where the organism lives.

**ii. Population** denotes groups of individuals of any kind of organism. Insect populations are groups of individuals set in a frame that is limited in time and space.

**iii. Community** in the ecological sense includes all the populations of a given area. Community can also be defined as interacting 'web' of populations where individuals in a population feed upon and in turn are fed upon by individuals of other populations

**iv. Ecosystem**

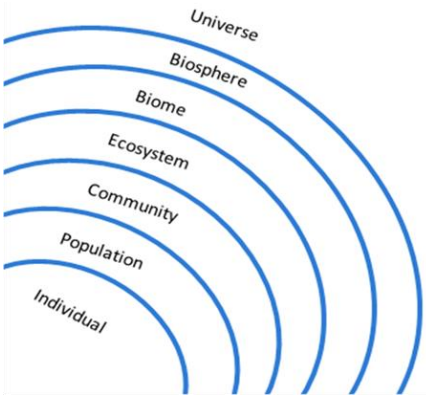
Ecosystem or ecological system is the functioning together of community and the nonliving environment where continuous exchange of matter and energy takes place.

Ecosystem is the ultimate unit for study in ecology as they are composed of living organisms and the non-living environment.

**v. Biome**- a large naturally occurring community of flora and fauna occupying a major habitat, e. g. forest or tundra.

**VI. Biosphere**- The **biosphere** is a global ecosystem composed of living organisms (biota) and the abiotic (nonliving) factors from which they derive energy and nutrients

Levels of Ecology



**Scope of Ecology:**

The ecology has a vast scope and covers a widespread biological field. As a relatively new discipline of biology, it has a bright future. Today everybody aware about the environmental science as indispensable tools for creating and maintaining the quality of human civilization. Consequently, ecology is rapidly becoming more and more relevant to everyday life of every man, woman, child of this earth. Ecology is helpful to

i. To find out behavior of insect in nature and multiplication.

ii. To know why certain organism thrive well in locality e.g.-Locust in desert.

iii. Different factors regulate no. of organisms or relation between individual and population.

**Agroecosystem** is largely created and maintained to satisfy human wants or needs. It is not a natural ecosystem but is manmade. Agroecosystem is the basic unit of pest management - a branch of applied ecology.

A typical agroecosystem is composed of

i. More or less uniform crop-plant population

ii. Weed communities

iii. Animal communities (including insects)

iv. Micro-biotic communities

v. And the physical environment the react with.

**Environment**

The environment refers to the surroundings of an organism or species or sum of everything that affects the organism, and is generally considered to consist of two categories of factors: Abiotic (Density independent factors) & Biotic factors (Density dependent factors)

**Components of Environment**

**Abiotic Factors**

1. Temperature
2. Rainfall/ Precipitation
3. Air current
4. Humidity
5. Solar radiation
6. Atmospheric pressure
7. Topography

**Biotic Factors**

1. Natural Enemies
2. Food/Competition