

## Chapter 04: Introduction to Agrosystems:

### 1-Definition of agrosystem:

An agrosystem is an ecosystem supporting the food production systems in farms and gardens. It is defined as a set of plant and animal communities that interact with the physical and chemical environment and are used by humans to produce food, fibre, fuel, and other products for human consumption and processing. Agroecosystems are natural communities that occupy about 40% of a global land surface and which have been modified by humans for agricultural purposes and transformed to cultivable lands and grasslands.



### 2-Components of Agroecosystems:

The components of an agroecosystem are variables depending on the specific type of agricultural system. However, some common components of agroecosystems include:

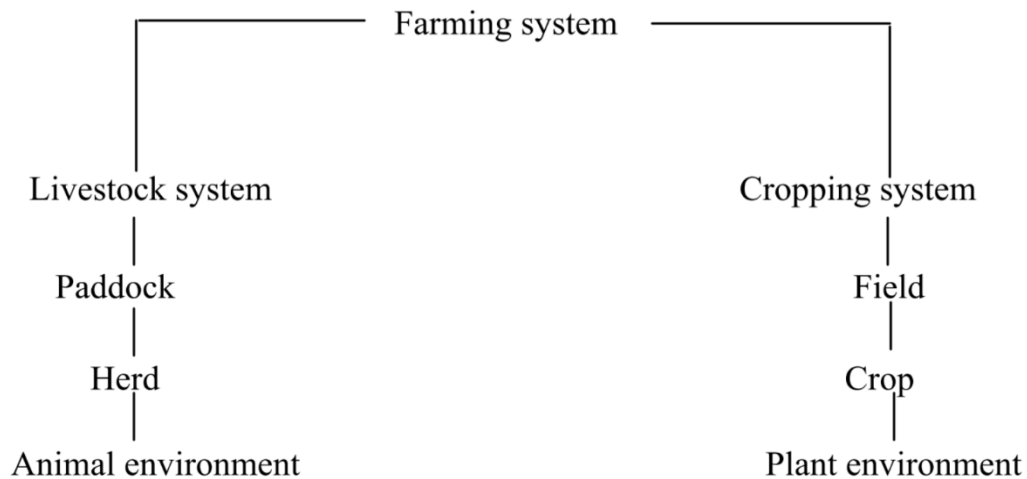
#### ❖ Abiotic Components :

- Climate (Temperature, light intensity, day length, CO<sub>2</sub> ....).
- Resources (Water availability, nutrient supply.....).
- Landscape (Topography and relief).
- Soil (Fertility, salinity and pH levels).

#### ❖ Biopic Components :

- Pests (Parasites, herbivores.....).
- Competition relationships between plants.
- Symbiotic relationships (Subterranean organisms and pollinators).
- Farmers (Including their management of natural factors).

- Livestock (Raising of livestock, such as cows, chickens, or pigs, for the production of meat, milk, or other products).
- Crops (Cultivation of crops for human consumption or other purposes, such as animal feed or industrial use).



### 3-Agroecosystem food chain elements:

Components of agroecosystem food chain are:

#### 3-1- Producers (Autotrophs):

Producers are also called autotrophs because they make use of abiotic factors, to produce their food using the energy from the sun along with water and carbon dioxide. In agriculture, producers are green plants and algae.

#### 3-2-Consumers (heterotrophs):

Dependent components of an Agroecosystem, they do not make their food but rather depend on the autotrophs for food. In the food chain, they are referred as secondary or tertiary organisms. For Agroecosystems, consumers are human beings that eat crops, vegetables, fruits, or other animals' products. They can also be predators or parasites.

#### 3-3-Decomposers (Saprotrophs):

Organisms that feed on death and decayed plants and animal materials. They break down organic matter into inorganic components (carbon and nitrogen). The inorganic matter broken down by these organisms will return to the soil as nutrients for plant use (bacteria, fungi, earthworms).



#### **4-Agroecosystem types:**

There are many different types of agroecosystems:

##### **4-1-Small-scale subsistence farming:**

It involves the production of crops or livestock for the purpose of feeding a family or small community. These systems are often found in developing countries and are characterized by low levels of inputs and technology.

##### **4-2-Large-scale commercial agriculture:**

It involves the production of crops or livestock for sale on a larger scale (For export). These systems are typically characterized by high levels of technology and inputs and are found in many developed countries.

##### **4-3-Intensive horticulture:**

It deals with the production of high-value crops (Vegetables and fruits), using intensive growing techniques. These systems are found in urban areas and are characterized by a high level of inputs and technology.

##### **4-4-Agroforestry:**

It deals with the integration of trees and shrubs into agricultural systems in order to provide a range of benefits, including increased productivity, soil conservation, and carbon sequestration.

##### **4-5-Regenerative agriculture:**

It's about the use of techniques such as cover cropping, composting, and crop rotation in order to improve soil health and increase resilience to environmental stresses.

#### **5-Agroecosystems importance:**

Agroecosystems are important for a number of reasons:

**5-1-Food production:** Agroecosystems play a vital role in global food production, providing the crops and livestock that feed the world's population. According to the Food and Agricultural Organization of the United Nations (FAO), agriculture is responsible for the livelihoods of approximately 1.3 billion people globally.

**5-2-Economic development:** Agroecosystems represent an important source of economic development in many countries. In developing countries, agriculture is a key sector of the economy, and the success of agroecosystems can have a significant impact on the prosperity of all the nation.


**5-3-Biodiversity:** Agroecosystems can support a wide range of plant and animal species, and the management of these systems can play a role in conserving biodiversity.


**5-4-Environmental benefits:** Agroecosystems can provide a number of environmental benefits, such as carbon sequestration, soil conservation, and water management.


**5-6-Cultural significance:** Agriculture is an important part of the cultural heritage of a community and plays a central role in traditions and practices.

**3 Reasons Why Agriculture Is Important**

Agriculture impacts society in many ways, including the following:

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Supporting livelihoods through food, habitat, and jobs
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Providing raw materials for food and other products
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Building strong economies through trade