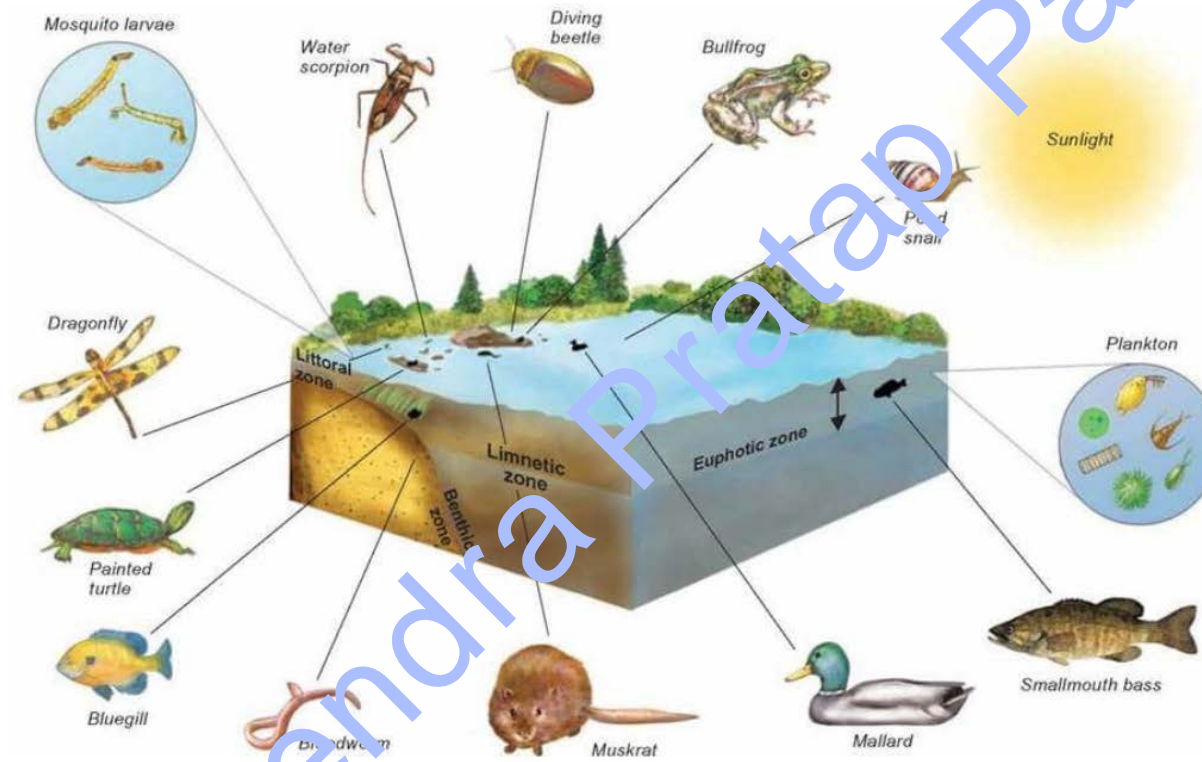


ECOSYSTEM



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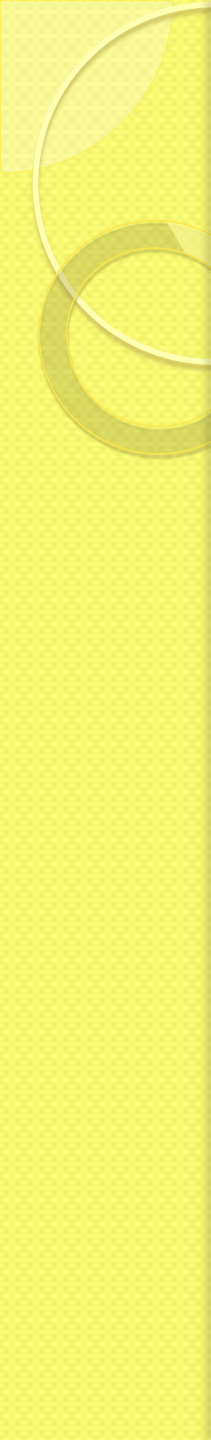
Veer Kunwar Singh University, Ara

Components of Ecosystem

At any given point of time do you find yourself to be surrounded by nature, with all its beauty in the form of trees, plants, lakes, rivers, animals, insects etc.? Do you think there is some form of contact or collaboration between the living and the nonliving components of ecosystem? Read along to know more.

What is an Ecosystem?

Living organisms seem to interact amongst themselves and with the physical environment. This, in short, can be called an ecosystem. There can be different types of ecosystems. The biosphere, for example, can be a global ecosystem. It all depends on the different components and the extent to which you want to define the space, to consider it as an ecosystem. And hence to be able to learn more about them, ecosystems are generally divided into smaller forms.



Ecology or environmental biology is the field that studies this complex set of relationships between the living organisms and their surrounding **environment**. The scope of this field is very large and covers things like **global warming**, environmental **pollution**, **plant** and **animal** extinctions etc.

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ECOSYSTEM

Interaction of biotic and abiotic factors



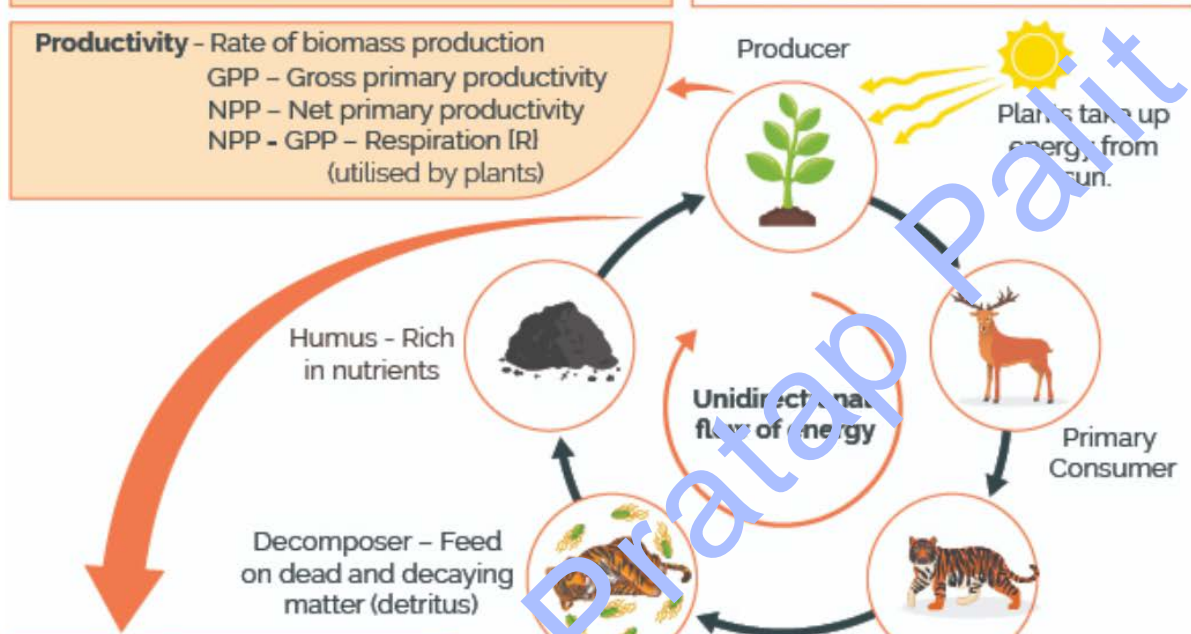
Biotic community is dynamic - Changes constantly, reaches an equilibrium called climax community.

Succession - Gradual change in biotic community to form a stable community (Climax)



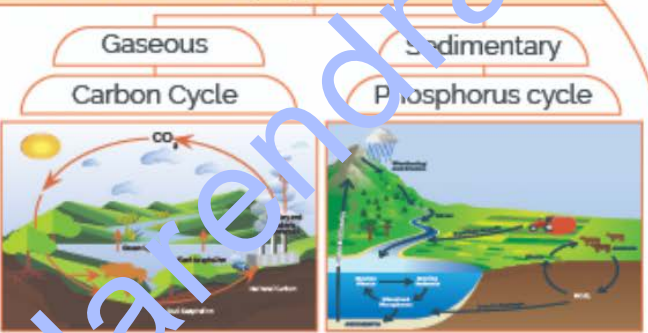
Dr. Narendra Pratap Pant

Productivity - Rate of biomass production
 GPP - Gross primary productivity
 NPP - Net primary productivity
 $NPP = GPP - \text{Respiration [R]}$
 (utilised by plants)



Nutrient cycling

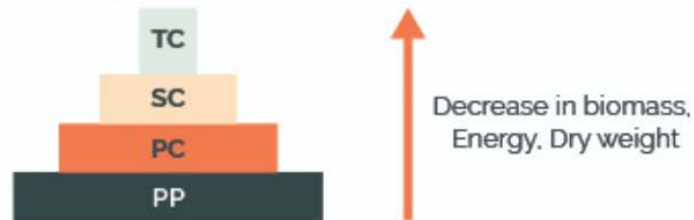
Nutrients from humus seep down into soil and are taken up by plants



Decomposition
Fragmentation
 Detritivores break down complex detritus into small particles.
Leaching
 Water soluble nutrients seep down in the soil to form salts.
Catabolism
 Bacterial & fungal enzymes degrade detritus.

PP - Primary Producer,
 PC - Primary Consumer
 SC - Secondary Consumer,
 TC - Tertiary Consumer

Ecological pyramid



Components of Ecosystem

There are two main components of an ecosystem which are in constant communication with each other. They are the biotic components and the abiotic components.

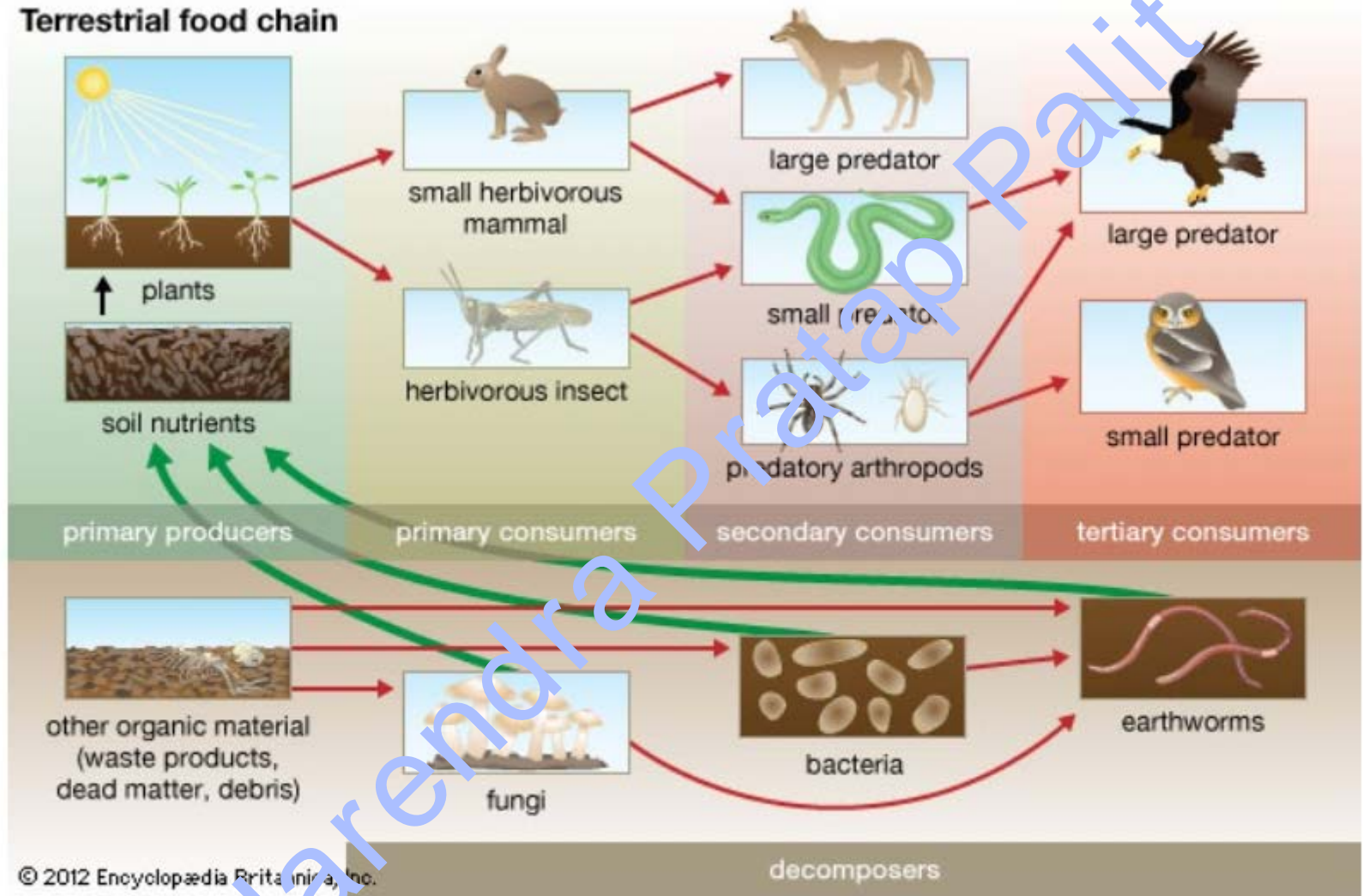
Biotic Components of Ecosystem

The living components of an ecosystem are called the biotic components. Some of these factors include plants, animals, as well as fungi and bacteria. These biotic components can be further classified, based on the energy requirement source. Producers, consumers, and decomposers are the three broad categories of biotic components.

Producers are the plants in the ecosystem, which can generate their own energy requirement through photosynthesis, in the presence of sunlight and chlorophyll. All other living beings are dependent on plants for their energy requirement of food as well

Consumers include herbivores, carnivores, and omnivores. The herbivores are the **living organisms** that feed on plants. Carnivores eat other living organisms. Omnivores are animals that can eat both **plant and animal tissue**.

Terrestrial food chain



(Source: Encyclopedia-Britannica)

Abiotic Components of Ecosystem

Abiotic components are the physical and/or the chemical factors that act on the living organisms at any part of their life. These are also called as the ecological factors. The physical and chemical factors are characteristic of the **environment**. Light, air, soil, and nutrients, etc. form the abiotic components of an ecosystem.

The abiotic factors vary from ecosystem to ecosystem. In an aquatic ecosystem, the abiotic factors may include water pH, sunlight, turbidity, water depth, salinity, available nutrients and dissolved oxygen. Similarly, abiotic factors in terrestrial ecosystems can include soil, soil types, temperature, rain, altitude, wind, nutrients, sunlight etc.

The herbivores are dependent on plants for the energy requirements. The carnivores, in turn, feed on the herbivores and other carnivores. At any level, microbes then decompose any dead and decaying organic matter. These decomposers, after various chemical reactions, release molecules back to the **environment** in the form of chemicals. The chemicals are again used by the producers, and the cycle starts again.

In conclusion, ecosystems have a complex set of interactions that happen between the biotic and abiotic components. The components of an ecosystem are linked to each other through the energy flows and nutrient cycles. Even though **ecosystems** do not have clear boundaries, these interactions get affected, even if one factor is changed or removed. This ultimately has the capacity to affect the entire ecosystem.



Thanks

Dr. Narendra Pratap Palit