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Mechanism of Environment and Ecology in Natural System: Concept and Its Functions

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Abstract

Environmental enquiry is highly intricate process where multiple components are functioning simultaneously. Therefore, to understand the basic concept and function of environment and ecology are required to be interpreted in a sequential order. It gives chain of functions and energy flow in environment to simplify its mechanism in natural system which is called environment. The paper starts with the basic conceptof environment and identified its influencing factors as biotic and abiotic. Further, it established its linkage with the structure and composition of atmosphere by interpreting the different horizontal layers of atmosphere.

Further, it simplified the concept and elements of ecology and tis typology. Subsequently, the concept of ecology, its types and component are interlinked with autotroph and heterotrophic components. The mechanism of primary producers and its secondary/tertiary consumer are interlinked.

The food-chain and its various types are simplified through energy flow. The ecological pyramid and its components are interpreted to understand the functions of environment.The mechanism of ecological succession, its causes, characteristics and various types are explained to understand the intricacies of environment and ecology.

Keywords: Edaphic, UV Radiation, Cirrus Clouds, Trophic, Sere, Climax Community, Metabolic Activity, NPP.

Edaphic

It is related to the natural character of soil. Edaphic qualities characterize the soil type, texture, and chemical properties as pH value, plant-communities and its organisms.

UV Radiation

Ultra-violet is the electromagnetic radiation with a wavelength ranging from10 nanometer to 400 nanometer.Ultra violet waves are shorter than the visible light waves and longer than the X-ray waves. It found approx. 10% in the sun-light. Suntan and sun-burn are the effects of UV radiation on skin.

Cirrus Clouds

It is the upper-most layer of clouds in Troposphere generally found at the height of 6 to 10 km. These clouds are characterized by thin, curling and wispy strands.

Trophic

Trophic level of an organism is the position it occupies in food chain. Trophic level of an organism is the number of steps it is from the start of the chain.

Sere

It is the natural succession of plant (or animal) communities, especially a full series from colonized habitat to the approximate climax vegetation.

Climax Community

In ecology, climax community or climatic climax is a historic term for a biological community of plants, animals and fungi which through the process of ecological succession in the development of vegetation in an area over time have reached a steady state or position.

Metabolic Activity

It is the part of metabolism which takes place in the body of an organism. It's the phenomenon which includes set of chemical reactions which are essential for a living organism to maintain its life form.

NPP

Net Primary Production (NPP) is the amount of carbon and energy that enters the ecosystem. It provides the energy that drive all biotic processes, including the trophic webs that sustain animal populations and the activity of decomposer organism that recycle the nutrients required to support the primary production.

Introduction

Environment means the sum total of surrounding of all living species which remain completely acclimatized and continuously interact and respond for their survival and maintain their entity. It is the combination of natural factors like sunlight, water availability, wind circulation and soil condition which determine the entity, reproduction, energy flow and metabolism of organisms. Therefore environment is the combination of all living and non-living substances surrounding the lithosphere which consists the inseparable whole system constituted by physical, biological and social elements which are inter linked in different perspective.

The natural environment of a living organism may be divided into three basic components:

Biotic Component

This includes all living organisms existing on lithosphere like human, wildlife, plants and micro-organisms.

Abiotic Component

This consists of all non-living components such as water, air, sunlight and soil etc.

Energy Component

Consists of solar energy, geothermal energy and all other energy released due to radiation.

Aim of the Study

Environmental study leads to understand the intricate mechanism of energy flow in combination of biotic and abiotic natural resources. It is inevitable to study the basic concepts, phenomenon, mechanism and circulation of energy in environment without simplifying it. The main objectives of the study are a). to qualify the various concepts of environment, ecology, ecosystem, atmosphere, food-chain and food pyramid etc. b). to establish the linkage among various functions taking place in environment simultaneously. c).to synchronizes the sequence of energy flow in environment for understanding the phenomenon with precision. d) to understand the inter-relationship between biotic and abioticresources and their inter-dependency. Studying the environment, its implications and role of human factors are instrumental therefore; the conceptual understanding of concepts are the basic tenets of study.

Factors Influencing Environment

The life of any living organism is influenced and control by series of external force like distribution of races on the earth and latitudinal or altitudinal zonation of vegetation along with the nature of wildlife which are influence by environment of factors.

These environmental factors are:

Physiographic Factors

Which include relief conditions like mountains, plateau, and plains etc. in the form of landforms.

Climatic Factors

It includes temperature, rainfall, and moisture in air, wind circulation and turbulence.

Edaphic Factors

This includes nutrients, moisture, bacterial action, thickness, horizons, texture, structure and humus in the soil.

Biotic Factors

Which includes nature of vegetation like rain forests, deciduous forests, shrubs, bushes, grass land, succulent vegetation of desert lichen and mosses of tundra.

Elements of Environment

Considering the physical, chemical and biological components, the environment may be classified into four different elements.

1. Atmosphere (Air and Wind Circulation)
2. Lithosphere (Soil and Earth's crust)
3. Hydrosphere (Water)
4. Biosphere (Living organisms)

Atmosphere

It is the envelope in multi layered gasses encircling the lithosphere which sustain and protect the life from solar radiation. It maintains the energy flow in the ecosystem and heat balance through absorption of solar radiation and re-emitting it form the earth. Atmosphere helps the movement of matter between environment and an organism through different cycles of gasses like carbon cycle, nitrogen cycle, phosphorus cycle and water cycle. The atmosphere normally extendsup to the height of 1,600 km from the earth's crust. It is the source of oxygen which is essential for life on earth and also the source of carbon dioxide which is the essential for photosynthesis (plant life on earth). Environment supplies nitrogen through nitrification and nitrogen fixation to the soil and organisms.

Composition of Atmosphere

The atmosphere is composed of variety of gasses up to the height of 25km from the earth crust. The varieties of gasses are divided into three components.

1. Major components
2. Minor components
3. Trace components

Composition of Atmosphere (up to 25km. Height from crust)			
S. No	**Component**	**Gases**	**Volumein Percent**
1	Major Component	Nitrogen	78.08%
		Oxygen	20.94%
2	Minor Component	Argan	0.93%
		Carbon-dioxide (Greenhouse Gas)	0.03%
3.	Trace component	Neon	0.0018%
		Helium	0.000524%
		Ozone	0.000001%
		Hydrogen	0.00005%
		Krypton	0.000114%
		Xenon	0.0000087%
		Methane (Greenhouse Gas)	0.0002%
		Nitrogen oxide (Greenhouse Gas)	0.00005%

Structure of Atmosphere

Depending upon the physical characteristics of gases such as temperature, volume, circulation and density; the atmosphere is divided into five concentric layers in two broad categories of Heterosphere and Homosphere. These are:

(a) Troposphere; (b) Stratosphere; (c) Mesosphere; (d) Thermosphere or Ionosphere; (e) Exosphere.

Troposphere

The lower most layer of the atmosphere which is closest to the surface of the earth is known as troposphere. All the living organisms depend upon this layer for their survival. It ranges from 8kms. (near the pole) to 18kms. (near the equator). This zone contains mostly nitrogen (N_2), oxygen (O_2) and carbon dioxide (CO_2) along with traces of other inert gases.

Troposphere is characterized by a steady decrease in temperature with increase in height at the rate of about 6.5^0C per km. At the uppermost layer of the troposphere whose temperature is around -60^0C.A thin layer at the top of troposphere whose temperature is around -60^0C and which separates troposphere from stratosphere is known as tropopause.

Some important operations taking place in this sphere are as follows:

1. Movement of matter in between the environment and organism.
2. Changes in the weather and climatic conditions.

Stratosphere

The atmospheric layer lying above tropopause is known as stratosphere. The thickness of stratosphere is about 62 km. At the equator its 72 km. while over the poles and extends up to 80kms from the surface of the earth. The temperature of this layer varies between -55^0 C to 5^0 C and it increases with the increase in altitude. This layer is devoid of any water vapors, cloud and dust, however, sometimes thin cirrus clouds composed of tiny ice crystals may be seen. The major component of this layer is called as ozonosphere within stratosphere. Ozone is prepared by photo-chemical reaction of oxygen as per the equations given below:

O_2 + Solar energy → 2 O

$O_2 + O \rightarrow O_3$

The ozone layer acts as an umbrella and absorbs ultra-violet rays of sun and protects the living world from the harmful effect of UV radiation. Indeed the reason that stratosphere becomes warmer with increasing distance from the earth is that the UV-radiation absorbed by ozone is transformed into heat.

Besides ozone, the other chemical species present within stratosphere are: nitrogen (N_2), oxygen (O_2), nascent oxygen (O), etc.

Mesosphere

This layer is above stratosphere and extends up to 80-90 km. above the earth's surface. The temperature of this layer decreases with the increase in altitude and reaches the minimum of -95^0 C at the highest border. The layer at which the temperature becomes -95^0 C is known as **mesopause**. Lower temperature at **mesopause** is attributed to the lower magnitude of UV- radiation.

The chemical components present within mesosphere may be nitrogen (N_2), oxygen (O_2) nitric oxide (NO) etc.and this layer is also characterized by very low barometric pressure.

Ionosphere or Thermosphere

This layer is above the mesosphere and it extends up to 500 km. above the earth's surface. With increase in altitude, the temperature of this layer increases. The UV and cosmic radiation of sun causes **ionization** of the molecules or atoms present within this layer, giving a large number of ions such as oxygen molecule **cation** (O_2^+), oxygen atom cation (O^+), **nitrosoniumion**(NO^+), etc..

$O_2 + hv \rightarrow O_2^+ + e$

$O + hv \rightarrow O^+ + e$

$NO + hv \rightarrow NO^+ + e$

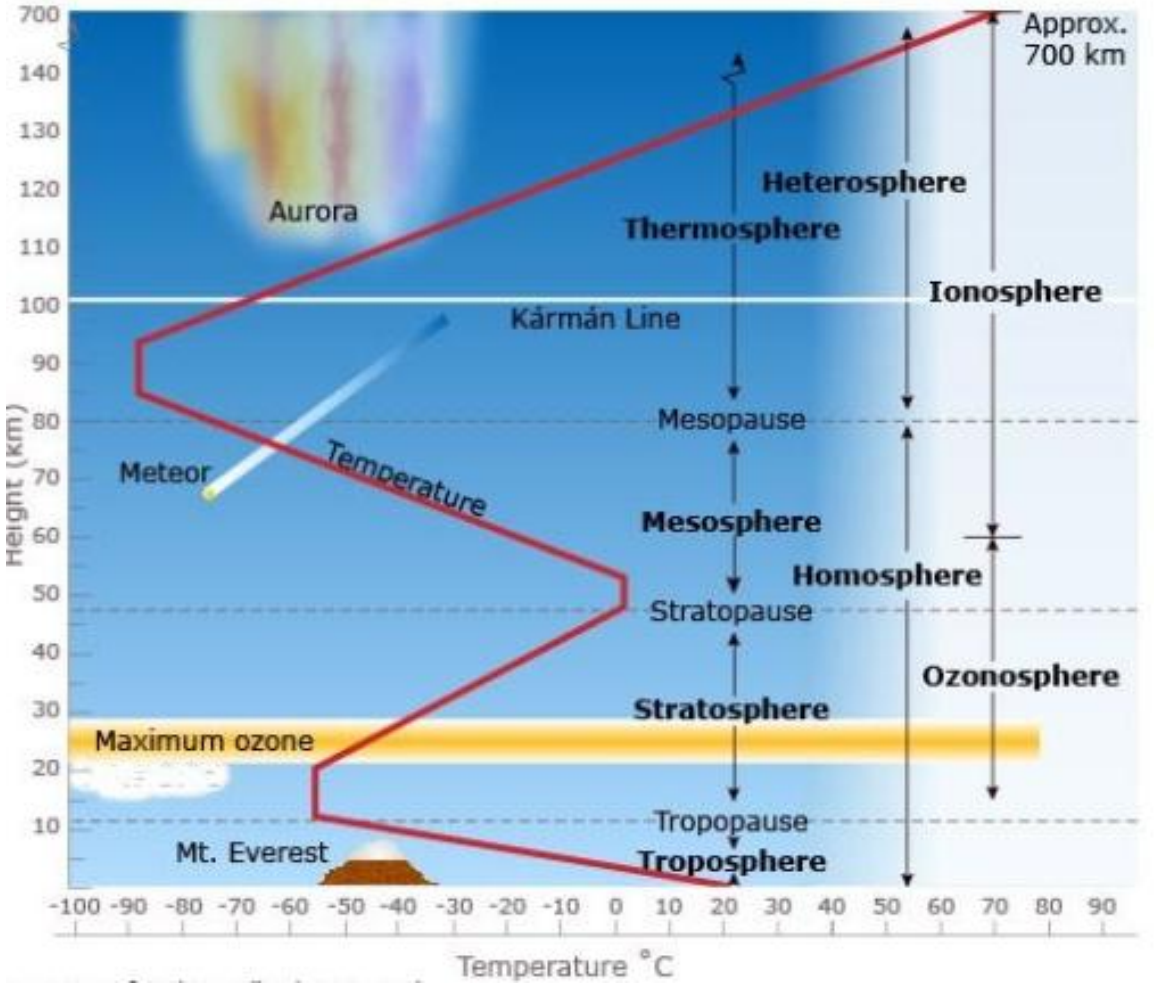
Since this layer contains a number of ions, it is known as ionosphere. The ions reflect radio waves back to earth surface and thus enable us to have wireless communication. Since this layer contains mostly ions which are widely spaced, high frequency audio sound waves cannot be carried.

Exosphere

The topmost (outermost) layer of the atmosphere above thermosphere is known as exosphere or outer space. This layer extends 1600 km. from the earth's surface. Since it is nearer to the

sun, therefore, its temperature is very high. It contains only atoms, like hydrogen, helium etc.

Major Divisions of the Atmosphere



Ecology

Ecology is the science of community (plant and wild life) which investigates the relation of all living organism with their respective environment. Therefore, the study of structure and function of natural life forms determines the ecology. The German biologist Ernest Haeckel in 1866 define ecology as the body of knowledge concerning the economy of nature the investigation of total relations of the animal, both to its organic and inorganic environment, including above all its friendly and animal relation with those animals and plants with which it comes directly or indirectly into contact. The study of ecological principles provides a vast knowledge for understanding the problems of depleting forests, soil, salinization of oceans and degrading the inland water.

Importance of Ecology

1. Understanding the localization and abundance of various organisms such as habitat community and bio-geography.
2. Temporal dynamics of abundance occurrence and activities of organisms (seasonal, annual and geological).
3. To understand the inter relationship between communities and organisms in population (population ecology).
4. To understand the functional adjustment and structural adaptation of organisms to their natural environment.
5. To observe the behavior of different organisms in different natural condition (ethology).
6. To study the biological productivity of nature and its relation with mankind.
7. To signify the importance of conservation and management of natural resources (applied ecology).

Sub-Division of Ecology

1. Auto ecology deals the ecological study of anspecie of organism.
2. Synecology which deals with the ecological study of entire eco system and whole plant and animal communities.
3. Habitat ecology deals with ecological study of different habitats and their effects on the organism living there.
4. Community ecology deals with the study of local distribution of animals in various habitats which relates the composition and succession of community units.

5. Population ecology deals with the study of the pattern of structure, growth and control of population organisms. It also deals with the inter-relation between populations of different species in the community. It also known as demecology.
6. Human ecology deals with interrelationship between men along with environment. Human effects on biosphere and its implication also studied in Human ecology.
7. Applied ecology deals with the application of ecological concept to human needs like wild life management, aquaculture, land use planning, agriculture, forestry conservation and management, application of insecticide and pesticide, horticulture and apiculture.
8. Pedologydeals with the study of soil specially its mineral content, typology, acidity, profile, formation process and their influence on organism.
9. Ethologyis the study of animal behavior under different natural habitat.

Eco-System

Ecosystem is the result of integration of all the living and non-living factors in the environment like how a particular component of environment like soil, water, temperature, effect the living organisms. For instance, availability of high temperature and irregular supply of water influence the rapid growth of plant in equatorial climate, while varied temperature and little water supply in desert restrict the plant growth. Organism species lives in the communities and groups and influence their respective growth. This structural and functional system of communities of their relationship with environment is called eco-systems or Ecological System. The green plants utilize the inorganic material like carbon dioxide, nitrate, phosphate, potash and water etc. along with the energy received from the sun and produces numerous organic substances. The plants grow now increase the weight as a result of organic production. Part of organic material so built is lost by green plant in the process of respiration. This left over organic matter is known as NPP (Net Primary Production). Like all animals including man consumes directly or indirectly the primary products in the form of food. The total quantity of solar energy converted into chemical energy by green plant is known as GPP (Gross Primary Production). The GPP becomes equal to energy required for metabolic activities. If the GPP is less than energy required for metabolic activity then biomass will go under degradation. If GPP is more than energy required for metabolic there will be increase of bio mass.

The term eco-system was first time coined byBritish botanist A. G. Tansley in 1935 and defined the eco-system as a set of inter dependent living (biotic or organic) and non-living (abiotic or inorganic) components. According, E.P. Odum ecosystem is the basic functional unit of organism and their environment interacting with one other and their own components.

Types of Ecosystem

1. *Terrestrial eco-system* i.e. forests, grass land, bush land, desert, tundra.
2. *Aquatic eco-systems* which can be divided into two sub division:

a. Fresh water (running fresh water and standing fresh water).
b. Marine/saline water ecosystem.

Components of Eco-System

1. Biotic components
2. Abiotic components

Biotic Components

The living organisms present in the natural environment system constitute the biotic components. The living organisms are distinguished on the basis of nutritional relationship i.e. food preparation and food dependency. Biotic components can be subdivided into two groups.

Auto-Trophic Components

Means self-food producing organisms. The members of auto-trophic components are green plants, bacteria etc. On the basis of size of producers they are divided into two types.

1. Micro producers (microscopic) like phytoplankton, algae etc.
2. Macro produces (macroscopic) like green plant, grasses etc.

The main function of producer or autotroph is toabsorb energy from non-living environment and make it available to all living organization. Besides the production of food, the function of producer is to convert the solar energy into chemical energy. Apart from producer the auto trophic components are also known as converter or transducer.

The large rooted plant (macro produces) not only produce food but also provides physical and metabolic supports for other organisms and plants. They can be further classified into following categories.

Epiphytes

These are the plants with aerated roots dependent on another plant for physical and metabolic support.

Phanero-Phytes

These are also aerial plants but their renewal buds are exposed on upright shoots.

Chamae-Phytes

These are the surface plants but their renewal buds are at the surface of grounds.

Hemi-Cryptophytes

Hemi-Cryptophytes are the tussock plants and their buds are just below the soil surface.

Geophytes or Cryptophytes

Geophytes or Cryptophytes are the earth plants their buds are below the surface on a rhizome or bulb.

Thero-Phytes

Thero-phytes are known as annuals and comprises life cycle of seeds in one vegetation period.

Heterotrophic Components

These are the living organisms which are unable to manufacture their own food and consume and decompose the material prepared by producers they may be herbivores or carnivores and also known as macro consumers.

Hetrotrophsare of Two Types

1. Consumer

2. Decomposer/Transformer

Consumer

The living organisms which consume the food prepared by producers are known as consumers. On the basis of dependency consumers may be classify into following categories.

Primary Producer or First Order Consumer

These are herbivore animals which are dependent on green plants like cow, goat, rabbit, dear, rodent etc. of terrestrial eco system and molluscs and crustaceans etc. of aquatic ecosystem.

Secondary consumer or second order consumer

Secondary consumer or second order consumer are carnivorous and omnivorous like fox, dog, snake etc.

Tertiary Consumer or Third Order Consumer

These are the carnivorous top on food pyramid which feed/pray on carnivorous, omnivorous, herbivorous for example lions, tigers, hawks, vultures etc.

Parasites, Scavengers and Saprobes

Parasites are the plants and animal feed/ pray on living tissues of different plants and animals while scavengers and saprobes consume dead animals and plants as their food.

Decomposes and Transformers or Reducts

These are the heterotrophic organisms which constantly decompose organic substances in dead organisms and derive food and energy from them. Decomposers break down the complex compound of dead protoplasm absorbs some of the product and release simple compound of dead protoplasm absorbs some of the product and release simple compound usable by producers are called decomposers. They are also known as micro consumers. The transformers convert the simple organic matters into inorganic form that are suitable to reuse by producers, which maintain the dynamics nature of ecosystem.

Abiotic Component

The non-living substances which enter into the body of living organisms and participate in different physiological activity and finally return to the environment are the abiotic component of eco-system. They can be further sub divided into three parts:

1. Physical components are the various environmental factors like sun light temperature, humidity etc.
2. Inorganic component are the variety of basic inorganic substances like soil, water, oxygen, carbon dioxide, calcium carbonate, phosphate etc.
3. Organic components: The variety of organic substances usually by-product of different organic activity likes proteins amino acids, carbohydrate, lipids and substances etc. which are synthesized by the biotic counterpart of an eco-system.

There exists a direct link in between biotic and abiotic component. The constituents are in continuous cycle from the environment into the living organism and from theorganism by decay into the environment. This cycle is known bio geo-chemical cycle.

Food Chain

The green plant (autotrophs) synthesizes food using solar energy and different inorganic constituents like water, carbon dioxide. The food manufactured by the green plants is utilized by themselves and also by herbivorous (primary consumer). The herbivores are consumed by some carnivore animals. Therefore one form of life is supported by the other form. The food from one trophic level reaches the other trophic level and a chain in established which is known as food chain. For example aquatic grass is consumer by grass hopper, grass hopper is consumer by shrew and shrew is consumed by marsh hawk. So the relationship of food supply and number of community is established.

Types of Food Chain

Grass or Predator Food Chain

Its starts from green plant (producer) and passes through herbivorous (primary consumer) and ends with carnivorous (tertiary and secondary consumer). The total energy acquired by green plant is subjected to following processes.

a. It may oxidize through respiration.
b. It may decay / die.
c. It may be consumed by herbivorous.

Grazing food chain may be explained in terms of trophic level as shown below:

Autotrophs----→ Herbivorous ---→ PrimaryCarnivorous ---→ Secondary Carnivorous ---→Tertiary Carnivorous ---→Decomposer etc.

Parasitic Food Chain

This food chain starts from herbivorous but food energy passes from larger to smaller organism without outright decay or killing as in case of predator. Therefore the larger animals are considered as hosts and smaller animals which fulfill their nutritional requirements from the host are considered as parasites.

Detritus or Saprophytic Food Chain

In this food chain the dead organic matter or organic waste (metabolic wastes orextrudates) of ecosystem go to micro-organisms and finally to detritus feeding organisms known as detrivores. The energy stored in detritus serves as a source of energy for detrivores. The organisms of detritus food chain include algae, bacteria, fungi, protozoa, mites, insects, rottifers, nematodes, slime, moldes, actinomyoetes and some vertebrates. They ingest pieces of partially decompose organic matter, digest them partially and after extracting chemical energy for their metabolism and excrete the remainder in the form of simpler organic molecules. Gradually the complex organic molecules are broken into simpler molecule like carbon dioxide and water. This process continues till humus is formed.

Ecological Pyramid

Since a lot of potential energy is lost as heat at each step in the food chain, the organisms in each trophic level dissipate lesser energy to the next trophic level than they actually received. Because of such a tapering off of available energy in food chain, the trophic structure and function of successive trophic levels may be represented graphically by

means of ecological pyramids. In other words, an ecological pyramid may be defined as diagrammatic representation of data pertaining to standing crop at each trophic level in an ecosystem. In pyramids, the producer level forms the base and successive levels form the tires which make up the apex. The higher the steps in the ecological pyramid, lower the number of individuals and larger their size. The concept of ecological pyramid was suggested by English zoologist Charles E. Elton in 1927 in his classic book Animal Ecology.

Ecological Pyramids are of Three General Types

Pyramid of Numbers

It shows the number of individual organisms at each level.

Pyramid of Biomass

It shows the total dry weight and other suitable measures of the total living matters.

Pyramid of Energy

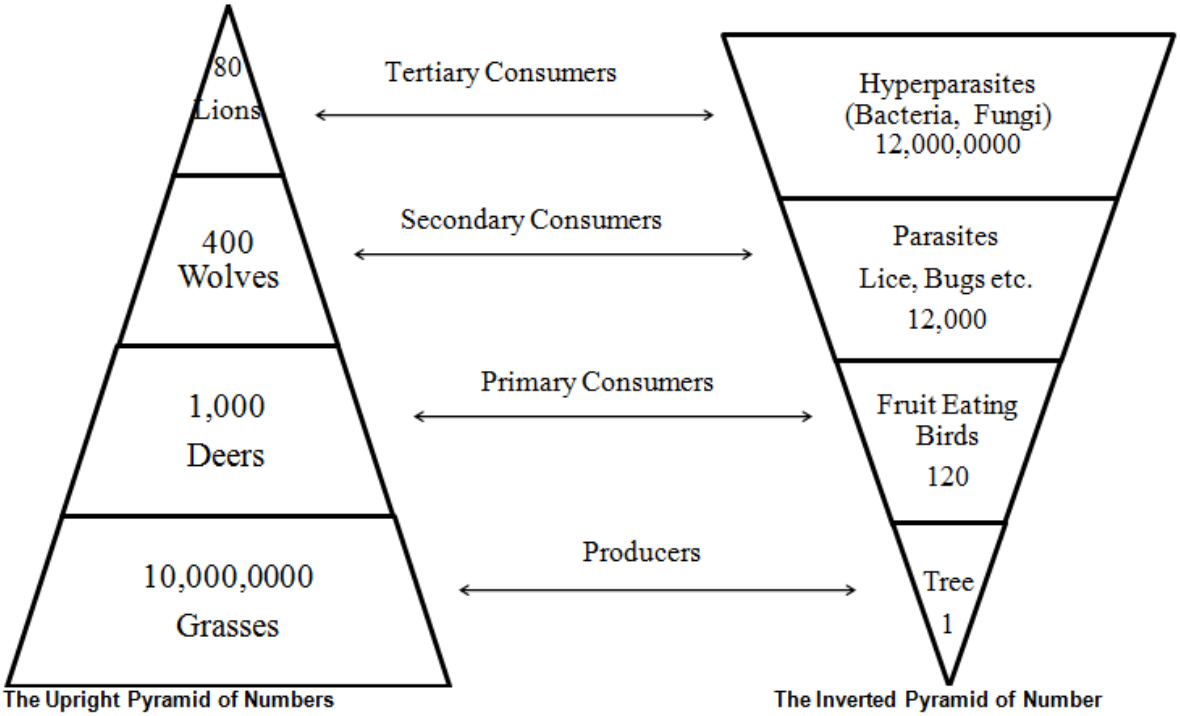
It shows the rate of energy flow and/or productivity at successive trophic levels.

Pyramid of Number

It depicts the relationship between the producers and different orders of consumers at successive trophic levels in terms of their number. The base of pyramid is represented by large number of producers and in successive levels of consumers; the number of organisms goes on declining sharply. The pyramid numbers indicate that a large number of producers are consumed by a smaller number of primary consumers. These primary consumers are ingested by relatively lesser number of secondary consumers, which are subsequently eaten by only a few tertiary consumers.

In a grassland eco-system, the producers are large number of grasses. The number then shows a decline towards the apex, as the primary consumers(herbivore) like rabbit, mice, etc. are lesser in number than the grasses. The secondary consumers, snakes, lizards, etc. are lesser in number than the rabbits and mice. Finally, the top (tertiary) consumer hawks and other birds, are least in number. Thus, the pyramid becomes upright. In a forest ecosystem, the pyramid of number is somewhat different in shape. The producers, which are mainly large sized trees, are lesser in numbers and form the base of the pyramid. The herbivore, fruit eating birds, deer's, elephants, etc. are more in number than the producers. Then, there is gradual decrease in the number of successive carnivore, thus making the pyramid again up-right.

Pyramid of Numbers



The Upright Pyramid of Numbers — The Inverted Pyramid of Number

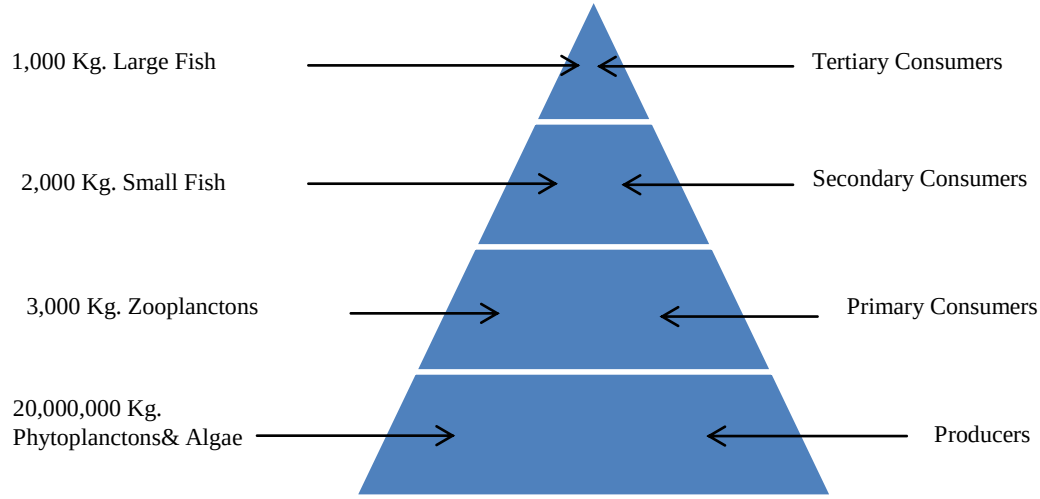
However, in a parasitic food chain starting from tree as producer, the pyramids are always inverted. A tree may support the growth of many herbivores and each herbivore in turn, may provide nutrition to a number of parasites. Subsequently, each parasite supports the survival of a number of hyper parasites. Thus, the numbers of organism gradually show an increase making the pyramid in inverted shape.

Pyramid of Biomass

Biomass is the total living organic material (dry weight) of an organism. The pyramid of biomass describes the qualitative relationship between the producers and consumers. It indicates the decrease of biomass in each trophic level from base to apex. The total biomass of producers consumed by herbivore is more than the total biomass of the herbivore and the total biomass of the secondary consumer will be lesser than that of herbivore and so

on. In grassland eco-system, there is a gradual decrease in biomass of organisms at successive levels form the producers to the top carnivore. Thus, the pyramid is upright

However, in pond eco-system, the producers are smaller organisms having lower biomass and the value of biomass shows an increasing trend towards the apex of pyramid. Thus, the pyramid becomes inverted in shaped.

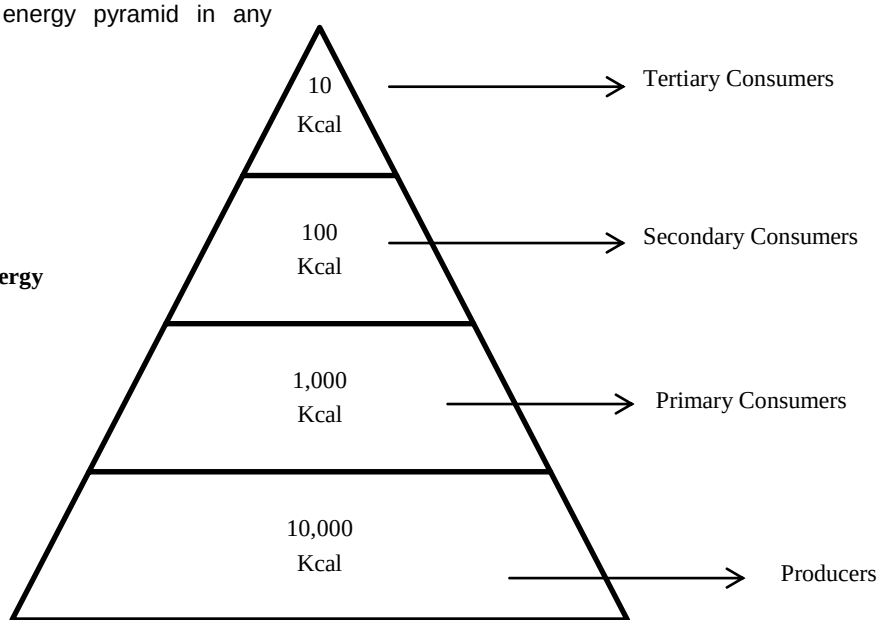


Pyramid of Biomass

Pyramid of Energy

The pyramid of energy describes the total amount of energy utilized by the organisms at each trophic level of food chain and actual role of various organisms in energy transfer. It also gives a picture of the rates of passage of food mass (producers) through the food-chain. When energy passes from a lower trophic level to higher **trophic** level (consumer)only about ten per cent of the potential energy is being transferred and the rest is lost as heat. Hence the energy pyramid in any ecosystem will be always an upright one. With regard to energy flow process, two important conclusions can be derived from the pyramid of energy.

1. Energy flow is unidirectional and irreversible, that is, the energy captured by autotrophs from the sun, passes through different heterotrophs at various trophic levels in an irreversible manner.
2. There happens a gradual decrease in energy level at each trophic level which is due to the energy dissipation as heat in metabolic activities.



Pyramid of Energy

Ecological Succession

The term ecological succession refers to the changes in the biotic communities over a period of time at a particular place. The changes are due to climatic or physiographic conditions. When there happens a change in environment, due to biological activities, the modified form of environment may not be suitable for the existing community. Such a process induces the formation of a new and developed community in place of old ones, one after another over the same area. The process continues and successive communities develop one after another over the same area until a relatively stable community is established. This relatively stable

community is known as climax community which has potentiality to tolerate the changing environment. Thus, the sequential change of communities with the modification of environment over a period of time in the same area is known as ecological succession.

Causes of Succession

A number of causes induce together in the process of succession. Some important causes may be outlined as below:

Climatic Causes

The climatic causes include temperature, rainfall, light intensity, gaseous composition and wind etc.

Biotic Causes

In a community, there is competition amongst different members for their existence. In such process, some of the members are not found suitable conditions and thus are gradually replaced by new ones.

Ecesis Causes

The soil condition is also changing by the process of invasion, migration, competition and reaction of the population.

Stabilising Causes

Succession is taking place in order to attain the climax stage.

Ecological succession has the following characteristics

1. It results from modification of the physical environment of the community.
2. It is an orderly process of community development.
3. It involves changes in species structure and it increases diversity.
4. Nutrient variation determines the settlement of new community.
5. Succession cumulates in a stabilized ecosystem.

Types of Succession

Some basic types of successions may be outlined as below:

Primary succession

This type of succession begins in a sterile area or barren land or in an inorganic environment. When a bare or nude area is colonized by organisms for the first time and subsequently the communities are changed in a successive form, the process in known as primary succession.

Secondary Succession

The community development on area previously occupied by another well-developed living community amidst the interruption due to adverse conditions like natural calamities, biotic intervention etc. is designated as secondary succession. The natural calamities include forest fire, disease, flood, overgrazing etc.

Autotrophic succession

When the population of autotrophs (plants) dominates the population of heterotrophs, the succession caused is known as autotrophic succession.

Heterotrophic succession

It is characterized by early dominance of heterotrophs like bacteria, fungi, and some animals in an organic environment. Since the environment is dominated by heterotrophs, the succession is called heterotrophic succession.

Autogenic succession

Due to the continuous interaction of community with environment, there happens a modification of the later.Such a modification of environment causes the replacement of an old community by a new one which is known as autogenic succession.

Allogenic succession

When the replacement of a community is caused by any other external condition and not by the existing organisms, the course of succession is known as allogenic succession

Habitat Succession

Successions are also named differently basing upon the type of habitat from which the phasic replacement starts.

Hydrosere

The succession starting from aquatic habitat is known as Hydrach and the series of changes occurring in the vegetation ofhydrarch are called Hydrosere.

Mesarch

The succession starting from a habitat where adequate moisture condition are present.

Halosere

The succession occurring at saline water or soil is known as halosere.

Xerosere

The succession taking place in xeric habitat like sand or rocks where moisture is present at minimal amount is known as xerosere. Xeroseres can further be subdivided into:

1. Psammosere: Where the succession starts on sandy habitat.
2. Lithosere: Where the succession starts on the surface of rocks.

Oxylosere

The succession starting on acidic soils in known as oxylosere.

Conclusion

The paper deals with the mechanism of environment and its functions. Therefore, the entire study is synchronized in a sequence of various concepts, terms and inter-relation among various parameters. It simplified the concept of environment, factors and elements of environment. The entire paper is based on lithosphere hydrosphere, biosphere and atmosphere based elements of environment.

The structure of atmosphere, functioning of ecology, types and components of ecosystem are elaborated. The biotic and abiotic components of ecosystem as types of autotrophs and heterotrophs are interpreted. The food-chain, its types and ecological pyramid are illustrated in sequence. The pyramid of numbers, pyramid of biomass and pyramid of energy further simplified to understand the energy flow of environment. Ecological succession, its types and causes are described in such order to overcome the complexity of studying the environment.

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