Environmental studies Note
3rd. sem EE, ETC & CSE
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Environment :-

→ Environment is the surroundings that is all biological and nonbiological things surrounding an organism.

→ Environment is the sum of total water, air and land, the interrelationship among themselfs and also with the human beings, other living organisms and also non living organisms.

* Importance of environmental studies :-

→ The environmental study helps us togather knowledge about environment and its components. it also helps us realise why its called earth as the only suitable place or habitat for man.

→ It indicates the existence of interrelationship between the organisms at population rise and also the society. it also helps to develop the awareness why the earth is called the suitable place for human beings

and to develop the sense to conserve the environment for the next generation.

→ It reveles how the organism are structurally and functionally adjusted to their physical environment. it helps to acquire knowledge about the cause, prevention and merits and demerits also for environmental diseases. The environmental study is also necessary for the development of public health and public awareness.

→ It helps to aquire the scientific knowledge about the eco system. it also helps us to aquire knowledge about the distribution and the bad effects of environmental and climatic disorders.

→ It helps to give an idea about the improvement of agricultural production with natural resources and environment.

→ It suggest to develop various policies for improvement of environment through effective environmental management.

Natural Resources :-

Introduction :-

→ Any material which can be transformed in a way that it becomes more valuable and useful termed as resource. Large number of things and services provided by the nature which are known as natural resources.

→ Water, air, soil, minerals, coal, forest and wild life that are the examples of natural resources.

Classification of natural resources :-

→ Depending upon the ~~available~~ availability of natural resources that can be divided into two catagories that are.

① Renewable Resources

② Non-renewable Resources

* Renewable Resources :-

→ The resources which can be refilled and can be always available for use are known as Renewable resources. they have the ability to renew such as recycling and replacement.

→ These resources can be generated continuously in nature and there also known as non-conventional resources and can be used again and again example :- Solar energy, wind energy, hydro power etc.

→ These resources can be reproduced and infinite in nature.

* Non-Renewable energy sources :-

→ These resources have accumulated in nature over a long period of time and these resources are finite in quantity and can't be reproduced.

Example :- fossil fuels such as :- coal, petrolium and natural gas etc.

→ These resources are also known as conventional resources.

* Causes and effects of deforestation :-

* Deforestation :→ It is defined as the destruction of forest by cutting of trees etc.

Causes :→

→ Trees have been cut to meet the increasing conservation of wood by the increasing population for cooking and making furniture etc.

water logging are generally processed by oxygen deficiency in the agricultural land.

④ Salinity Problem :-

→ The turmed is commonly used to refer the soluable salt content of the soil. When the soil salinity increases to the harmful levels plants are subject to reduced the potential of this solution and the specific toxic ion use such as :- sodium and chlorine.

⑤ Eutrophication :-

→ Enrichment of water by the input of organic materials containing nitrate and phosphates due to the use of chemical fertilisers. It leads to increases growth of aquatic plants and which have resulted in killing of fishes.

→ Imbalance in micro nutrient in soil.
→ Causes of various diseases like cancer and other lungs problems in human and other animals also.

* Merits and Demerits of Dams :→

→ Dams are build across rivers to store water for irrigation, hydro-electric power generation and flood control. The dams built to serve more than one purpose are called multipurpose dams. these dams are also called the temples of modern India.

* Merits of dams :→

→ Dams are built to control flood and store the flood water.
→ Some times dams are used for diverting part or all of the water from river into a channel and dams are mainly used for drinking and agricultural irrigation purpose.

→ Dams are built for generating electricity and navigation and fishery can be developed in the dam area.

→ Dams are also design to last many decades and contribute to the generation electricity for many areas. The dams can be used for water sports and often large dams becomes a tourist sports.

→ When in use electricity produced by dams systems and don't produce green house gases and they don't polute the atmosphere.

Demerits of Dams :-

→ It is of two types of problems arise due to dams.

① - Upstream dams

② - Downstream dams.

① Up stream Problems :-

→ Displacement of tribal people.
→ Loss of non-forest Land and Loss of forest.
→ Water logging and plant growth and it also causes earthquakes.

* ② Down stream problem :-

→ water logging and salinity due to over irrigation and the nutrients get deposited in the dam and the fertility of land along the river gets reduced. due to the structural de effect or faulty design of the dam failure leading to the destruction to the life and property.

* Other demerits of dams :-

→ Dams are extremely expensive to built and to be very high standard. the high cost of dams construction means that they

most operate to become profitable and flooding of Large areas of land means that the natural environment is destroyed.

→ People living in villages and towns that most move out these means that they there farms, angricultural Land and there own business also.

* Minerals Resources:-

→ Mineral resources or minerals are the naturally occuring inorganic substances (elements or compounds of two or more elements) having a definite chemical composition and characteristics physical properties.

Ex:- Iron ores, Bauxite, Lead, Manganese ores, etc and some metalic and non-metalic resources.

* Effect of mining on the environment:-

→ Human beings in this modern edge of development are overl extracting minerals from the body

* Rain water harvesting :-

→ Rain water harvesting (RWH) is a technic of collection and storage of rain water into natural water tanks or the infilteration of surface water into surface water tanks before it is lost the surface water. one important method of rain water harvesting is the roof top harvesting method. The rain water harvesting method is one of the simplest and oldest method of self supply of water for homes.

* Advantage :-

① Reduces flooding and erosion :-

→ Harvesting rain water can help the environment in a number of ways for status it can reduce the soil erosion in gardens and agricultural Land also. it can also control the storm water etc. So, the rain water doesn't produce the scale and corrosion with the collection and storage of rain water.

This may reduce flooding in certain areas etc.

② Reduces water bills :-

→ Rain water harvesting will not only help the individual safe their water bills but can cut the cost for the entire community. The cost of supply in the main areas and the overall water services can be reduced when many people in one community use the rain water having a source of water it can also reduce the dependance of municipal resources in case of water storage. So, the rain water can be used as the primary source of water as a backup source when needed.

③ Reduces demand on ground water :-

→ Source of ground water are increased in many areas and digging the deeper wells is not only

expensive but can cause the environmental damage such as- collapsing the soil. where the water is used. here the harvested rain water can be store and then used during the timpes of drouped and when the ground water supplies have been occure.

④ Can be used for non-drinking purpose:-

→ The majority of the water we need is used for non-drinking purpose. everything from washing and other requirements of large amount of water and rain water can be used for daily life. water necessities for which we use water

⑤ Can improve the plant growth :-

→ Rain water harvesting can also be used to improve the plants and gardens. using this harvested water we can use the rain water that

is free from several type of pollution and Pollutants and some man made pollutions and rain is also free from ~~Chloride~~ chlorination using water clean and ~~heating~~ healthy for plants and trees we can safes the overal maintenance and the growth of the environment.

* Why is ozone important ?

→ Ozone is a form of oxygen containing three oxygen atoms it is present in the air in the amount and its concentration increase reaching the maximum height of about 25 KM upward direction. In the stratosphere it plays a measure rule in preventing ultra violent radiations from reaching the earth.

* Acid Rain :-

→ Acid rain refers to several ways in which acids from the atmosphere are deposited on the earth surface.

Acid deposited includes wet and dry deposition. here, the deposition refers to the acid water received through rain, fog and snow. dry deposition relates to the wind blow acidic gases and particles in the atmosphere. which is settle on the ground. SO_2 about 60% of the acidity is due to sulphere gases and about 40% of nitrogen gases.

→ Nitrogen oxide and sulphere dioxide (SO_2) are produced during the combustion of ~~fuel~~ coal and petrolium etc. these gases are highly reactive in air they rapidly oxidized to the sulphuric or nitric acid which are quickly dissolved in water and washed out to the ground as acid rain.

Green house effect :-

→ When solar radiation arrives on earth atmosphere about half of the visible light is reflected back into the space otherwise the temperature of earth is too hot to support the life of human beings then it reaches the earth surface and causes global warming. The warm surface then radiate this energy as ~~bit~~ heat energy which falls on the earth surface. So, in this region ozone Layer, water vapor, methane gas and carbon dioxide (CO_2) present in the atmosphere to absorb some of this heat and warming the atmosphere creating the green house effect.

CHAPTER = 03

Ecosystem:→

* Structure of an ecosystem :-

→ Ecosystem is essentially a technical term for nature and ecosystem is the basic functional unit in ecology science which includes all the living organism in an area interacting with the physical environment. The complex system in which the interaction between the different component of environment occur is known as an ecosystem in other words any organisational unit which includes the living and non-living organisms interacting with each other and producing an exchange of materials between the two organisms is known as ecosystem.

The portion of the earth whose biotic components are called biosphere or ecosphere. The biosphere obtained its energy from sun or solar energy. The abiotic or non-living materials from soil (Lithosphere) water that is hydrosphere and air that is atmosphere.

→ The ecosystem is generally divided into two components on the bases of functional principles.

(1) Abiotic components or non-living components.

(2) Biotic components that is living components.

and humidity etc are constitute the physical components.

② Biotic components (living components) :

→ A large number of indivisual belong to different species which adjust and interact with each other and share the same general environment and resources form a biotic community or that is called the biosphere.

→ Based on the function in which the organisms obtained there food material within a biotic community can be divided into 3 types.

① Producers ② Consumers

③ Decomposers.

① Producers :→

→ The community of green plants called the primary producers. and they absorb carbon dioxide, mineral nutrients and water and other organic matere with the help of solare energy and release oxygen in this process without the producers life activity in the system shall have to run on organic materials imported from other systems. the mineral nutrients enter the biosphere through the green plants.

② Consumers :→

→ Producers are consumed by the animals that is called the primary consumers or ~~Hebi~~ Herbivorous. which are in turn consumed by the secondary consumers or these

③ Decomposers :→

→ Here, the excretory materials of plants, animals and there dead bodies or some dead particles are decomposed by the activity of bacteria, fungi and other small organisms, which live on a dead and other excretory mater. these constitute the community of decomposers which bring the constituent of the plants and animals bodies back to the surrounding medium or to the soil. these are known as decomposers.

* Ecological Pyramid :-

→ The graphical representation of trophic level or structure and function of an ecosystem starting with producers at the base level and then a successive trophic level forming the structure is known as an ecological pyramids.

→ The ecological pyramids are of 3 types :-

① Pyramid of numbers.

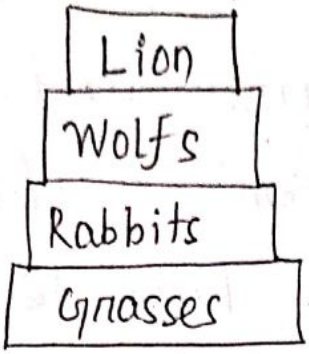
② Pyramid of biomass.

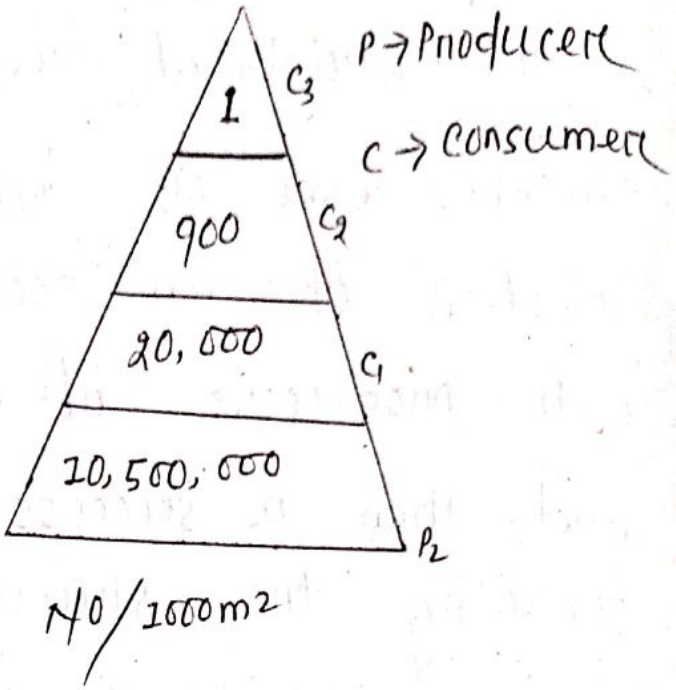
③ Pyramid of energy.

① Pyramid of numbers :-

→ It is a diagram that indicates the relative number of organisms at each trophic level in a food chain the length of each level

gives a measure of the relative number.



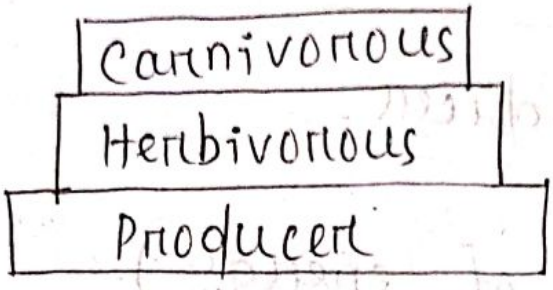


(Pyramid of number in grass land ecosystem)

② Pyramid of Biomass :→

→ An ecological pyramid of biomass is the graphical representation of the relationship between biomass and trophic level by the quantity or the amount of biomass present at each trophic level. Biomass is the quantity of dry organic material in an organism (population). a particular trophic level or an ecosystem.

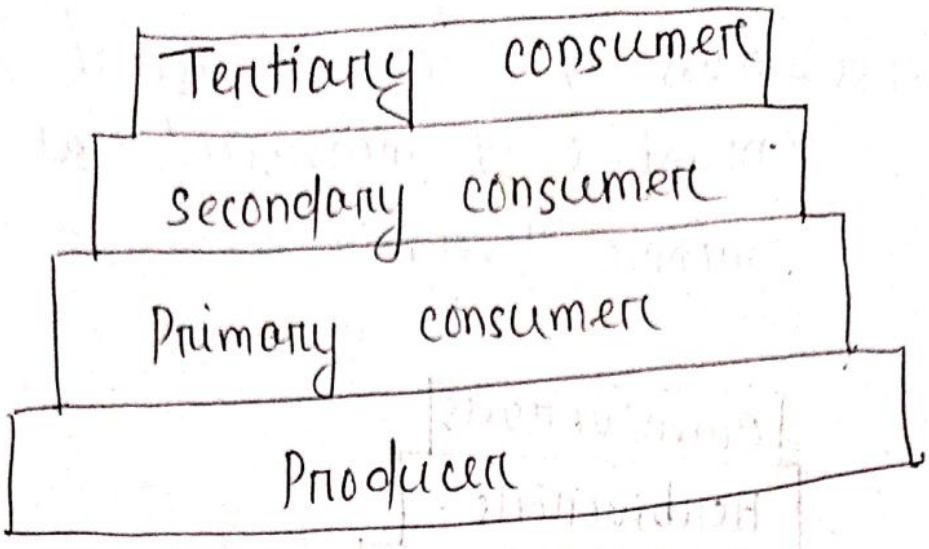
Biomass = mass of each individual X number of individual at each trophic level.



(Pyramid of forest ecosystem).

③ Pyramid of energy :-

→ The total amount of energy present at each trophic level is considered as pyramid of energy. The pyramid of energy gives the representation of the trophic level relationship. According to ~~relase~~ research only 10% of energy is converted at each trophic level



(Pyramid of energy).

* Function of food chain and food web in ecosystem :-

→ The animals of the biotic componen of an ecosystem may feed on the plants or may it another animals and may be eaten by another animals. then the food energy get transformed from one living organisms to the other organisms this linkage between the living organisms (Plants and animals) for the transfer of food energy is known as food chain.

→ The food chain is devided into two types.

① Grazing food chain

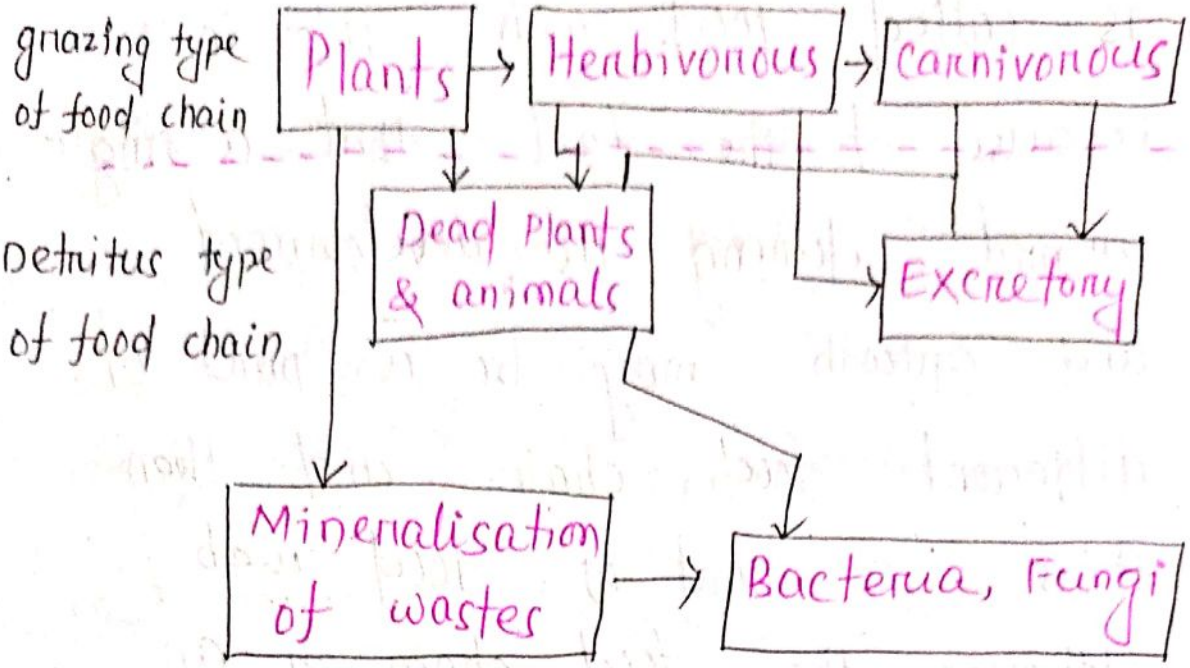
② Detritus food chain

→ The grazing food chain starts with a green plant which will be eaten by a plant eating animal (Herbivorous) or primary consumer. The herbivorous will eaten by a flesh eating animal (carnivorous).

Plant ⟶ Herbivorous → Carnivorous
(grass) (Insect) (Lizard/Frog/Bird)

→ An insector or a grasshopper feeding on a particular plant and a bird or frog on that insect can be the example of a simple grazing food chain.

→ The detritus food chain ~~begins~~ begins with the organic materl resulting from the waste of animals and dead plants and animals etc. this organic materl is decomposed by the micro organisms which are called the decomposers or dead particles. here the dead leaves, plants. dead wood or dead animals or there organic waste will be decomposed by the decomposers. The decomposers like bacterial and fungi will generate there food by decomposing such organic waste this is known as a detritus food chain.



[Simple grazing & Detritus food chains & their inter-relationship]

→ However in most of the ecosystem the food chains are not show simple an insect may feed on different plants instead of only one single plant. Similarly a frog may eat several insects then the food chain don't remain simple. Sequence and alot of intere locking of food chain don't take place. such type of food chain

is called food web. this is because of the fact that a single animal during its development and growth may be a part of different food chain and then it is a part of food web although the food chain in an ecosystem are generally complex and then it is called a food web the two food webs involving the same number of steps are said to be the same trophic level.

(i) Grass → Grasshopper → Frog → Snake

(ii) Tree → Beetle → Lizard → Bird

(Example of food web)

* Producer → Primary consumer → secondary consumers → Tertiary consumer
(Plants) (Herbivorous) (carnivorous) (large carnivorous of upper level)

→ In both these food webs the grasshopper and beetle both occupy the same trophic level and both are directly using the plants as food. So, they are called as the primary consumers. the plants that is the grass and tree both are the producers. the frog and lizard occupy the same level and this are the secondary consumers similarly both the snake and bird are the tertiary consumers So, it is however not necessary that one animal will always occupy one trophic level but it can occupy one or more than one trophic levels depending upon the food webs used by it.

* How is the food chain different from food web ?

Ans ⇒ Food chain differs from food web are in the following way.

① The food chain transfer of food energy (that is chemical energy) from the source in producers through a series of organism that is the consumers with the repeated stage of eating and being eaten by other organisms but the food web is a network of food chains where different types of organisms are connected at different trophic levels. So, that there are a number of options of eating and being eaten at each trophic level.

→ In the food chain their is only one chain exist but many inter connection exist within the food webs.

→ Food chain is simple in nature where as the food web is complex.

→ The energy and nutrients flow takes place in uni direction in food chain where as in food web these flow takes place in cycle system.

→ The food webs are helpful in explaining how the description in populations due to overe hunting, global warming and habitat. destruction result in the food scarcity leading to the food chain doesn't indicate so,

* Feasibility of sustainable development six. to stike a balance between the economic progress and environment protection.

Ans⇒ The sustainable development is achieve the economic development through the use of natural resources without damaging permanently the environment on ecological balance.

→ The developed countries having the natural resources to impose the view element of science and technology where as the developing ~~contri~~. countries need ~~to~~ not blindly follow this rule of develop countries but they can develop the environmental condition or friendly with the development process.