LEARNING MATERIAL

On

ENVIRONMENTAL STUDIES

(For 3rd semester CSE)

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Ch-1

THE MULTIDISCIPLINARY NATURE OF ENVIRONMENTAL STUDIES

Defination :- 12

Environment → Environment is derived from a french word called "Environ" means "surrounding". "Environment" means "everything surrounding us". for may be "living or non-living things", then it be physical, chemical, etc.

Environmental Studies → The interaction between environment and the humans.

→ Environment depends upon two factors biotic (living) and abiotic (non-living). factor factor

Environmental Studies is the science which Studies the interaction between man and the environment emphasizing the links between different subjects related to this issue, including ecology, economics, politics, geographic, sociology.

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SCOPE OF ENVIRONMENT STUDIES

→ Developing an awareness and sensitivity to the total environment and its related problems.

→ Motivating people for active participation in environmental protection and improvement. (improvement)

→ Developing skills for active identification and development of solutions to environmental problems.

→ Imbibe and inculate the necessity for conservation of natural resources.

→ Evaluation of environmental programs in terms of social, economic, ecological factors.

IMPORTANCE OF ENVIRONMENTAL STUDIES

→ In the industrialised area that we live today, every component that we intake be air, water or food are contaminated by industrial activities.

"There is No Pollution". → Main Importance

"THERE IS POLLUTION"

→ To minimize this problem, knowledge of environment study is essential.

→ An interdepartmental studies of environmental studies will help us in the following ways —

* We will begin to appreciate and adopt the idea of development without destruction of environment.
* Knowledge about various types of environments and different environmental hazards.
* Having a "positive impact" on quality of life.
* Creating a concern and respect for the environment.

NEED FOR PUBLIC AWARENESS

→ Increasing population, urbanisation and poverty have generated. Pressure on the natural resources. That leads to degradation of environment. To prevent the environment from "further degradation". It is the necessary for public awareness.

→ The Supreme Court has ordered and initiated environmental protection awaress through government and non-government

agencies to take part in protecting our environment. Environment pollution cannot be prevented by laws alone. Public participation is equally important with regard to environmental protection.

→ Environmental education is a process of learning by giving an overall prospective of knowledge and awareness of the environment, it sensitizes the society about environmental issues and chalenges interested individuals to develop skills and expertise thereby providing appropriate solution.

Ch-2

NATURAL RESOURCES

INTRODUCTION

→ Everything in our environment that was not made by man like that sea, air, water, soils, forest, coal, etc, is called natural resources. and the basic life on earth.

→ Natural resources can be consumed directly or indirectly, for instance humans depend directly in forest for food, biomass, health, recreation and increased living comfort.

→ Indirectly forest acts as climate control, flood control, storm protection and nutrient cycling.

Natural resources are of two types ——

① Renewable Natural Resources

② Non-Renewable Natural Resources

Renewable Natural Resources	Non-Renewable Natural Resources
→ It can be used more than one time.	→ It can be used only one time.
→ Growing capacity is available.	→ Growing capacity is not available.
→ Unlimited amounts are present.	→ Limited amounts are present.
→ Lower carbon emissions.	→ Higher carbon emissions.
→ More expensive.	→ Less expensive.
→ It is an inexhaustable resources.	→ It is an exhaustable resources.
→ Don't cause pollution.	→ Cause pollution.
→ It have environmental impact.	→ It have environmental impact.
→ Non-conventional Energy resources.	→ Conventional Energy resources.
→ E.g. air, water, plastic, etc.	→ E.g. coal, petroleum, minerals, etc

NATURAL RESOURCES AND ASSOCIATED PROBLEMS

(i) Forest Resources And Associated Problems

* Forest Resource In India

→ In India, forest from 23% of the total land area. The word "forest" is derived from the latin word "foris" which means "outside".

→ Forest is natural, self-substaining community. Characterised by vertical structure created by presence of trees. Trees are large, generally single-stemmed and woody plants.

* Use And Over-Exploitation.

→ A forest is a biotic community mainly of trees, shrubs and other woody vegetation.

→ This invaluable renewable natural resources is beneficial to man in many ways.

* Direct benefits from the forest

(a) **Fuel Wood** :- Wood is used as a source of energy for cooking purpose and for keeping warm.

(b) **Timber** :- It mainly used for making furnitures, tools, railway sleepers, matches, bridge

boats..

(c) Bamboos :- These are used for making papers, matting, baskets, ropes, etc.

(d) Food :- Fruits, leaves, roots and tubers of plants. Meat of forest animals from the food of forest tribes.

(e) Shelter :- Insects, birds, reptiles, mammals and microorganisms are provided shelters by forest

(f) Paper :- Wood and bamboos are used for manufacturing paper.

(g) Rayon :- Bamboo and wood are also used for manufacturing rayon.

(h) Forest Products :- Rubber, drugs, gums, spices, honey, horns, ivory, tusks, hide, etc are provided by the flora and fauna of forest.

* Indirect Benefits of Forest

(a) Conservation of Soil :- Forest prevent soil erosion by binding the soil with the network of roots of the different plants. and reduce the velocity of wind and rain which are the chief

(b) **Soil Improvement** :- Fertility of soil increase due to the humus which is formed by the decay of forest liter.

(c) **Reduction Of Atmospheric Pollution** :-

By using of carbon dio xide (CO_2) and giving up oxygen (O_2) during the process of photosynthesis, forest reduce pollution and purify environment.

(d) **Control Of Climate** :- Transpiration of plants increase the atmospheric humidity which affects rainfall and cools the atmosphere.

(e) **Control Of Waterflow** :- In the forest the thick layer of humus acts like a big sponge and soaks rain water preventing run of water thereby preventing floods.

DEFORESTATION

Deforestation is the permanent destruction of forest and woodlands, the terms doesn't include the removal of industrial forest such as plantation of guns, Hora pins.

→ Deforestation has related in the reduction of indigenous forest to four-fifth of their pre-agriculture area.

Causes of Deforestation

1) Population Explosion / Increase :-

→ Population explosion poses a grave threat to the environment.

→ Vast area of forest land area are cleared off trees to reclaim. Lands for human settlement (agriculture, roads, railway track, housing).

2) Forest Fire :-

→ Fire in the forest may be due to the natural calamities or human activities.

→ Dried twigs and leaves may catch fire.

→ Human activity like clearing forest for agriculture, firewood, construction of road, railway tracks, etc.

3) Grazing Animal :-

→ Grazing of animals of forest is the great cause of deforestation (mainly effect on the soil erosion).

4) Pests Attack :-

→ Forest pest like insects, etc, destroy trees by eating of the leaves, boring of shoots.

Effects of Deforestation

Large scale deforestation has many reaching consequences —

* Habitant destruction of wild animals.
* Increase soil erosion.
* Reduction in the oxygen.
* Decrease in availability of forest product.
* Loss of bio-diversity.
* Scarcity of fuel wood and reduce in economy.
* Increase in pollution due to burning of wood.
* Loss of culteral.

(ii) WATER RESOURCES

→ Water resources are sources of water and that are mainly used in agriculture, household, recreational and environmental activities.

→ Without water, human cannot exist.

Water resources are of two types —

① Surface Water :— Surface water is a water that flow in surface like river, lake, freshwater. Surface water is naturally replenished by participation and naturally.

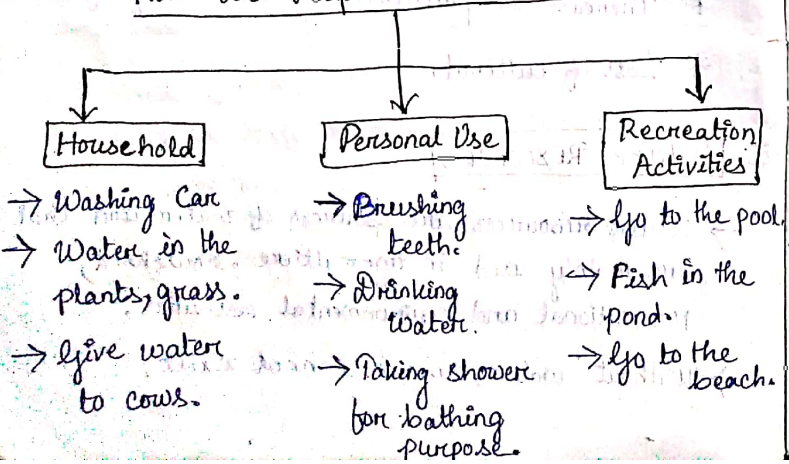
→ Surface water is a main source fresh water.

→ 71% of water of total land covers by it.

② Ground Water :— Ground water is also a fresh water located in the pure space of soil and rock.

* Resalination : In an artificial process by which saline water (generally sea water) in converted into fresh water.

How Do People Use Water Resources



Use Of Water :—

① Agriculture : It is estimated that 69% of world-wide, water used for irrigation, with (15 - 35)% of irrigation withdraws being unsustainable.

② Industrial : It is estimated that 15% of world-wide use water for industrial purpose. Distribution of industrial water usage varies widely, but as a whole is loder more than agricultural use.

③ Recreational Water : It is usually use in a very small amount but growing percentage of total water use. Recreational water is used in mostly dried reservoir.

④ Household : It is estimated that 15% of world-wide water used is for household purposes.

→ These include drinking water, bathing, cooking, washing, brushing, etc.

⑤ Environmental : It is estimated that only 1% of worldwide water is used for environmental purpose.

P.T.O

BAD USE OF WATER

① Dishwater : Dish washes can waste so much water if you run it when it is not in use.

② Brushing Teeth : Brushing teeth with the running water uses more water when we are brushing teeth at that time we wouldn't turnoff the tap.

③ Shaving : When we are shaving at that time we wouldn't turnoff the water tap.

* When they are like waiting to water get hot in shower they waste water.
* When we are washing the car at that time couldn't turn off the water tap.

PREVENTION OF BAD USE OF WATER RESOURCES

→ Spend the least amount of water and time in the shower.
→ Close the water tap while brushing teeth.
→ Don't use too many dishes.
→ Check pipes for leaks.
→ Water your lawn only when it needs.
→ Don't turn water pipe while washing a car.
→ Don't use the toilet as an waste basket.
→ Wash the floods and vegetables in one pan instead of washing separated.
→ When cleaning your fish tank don't through the water and give it to the plant.
→ Use brooms to clean the house not water pipe.

(iii) Mineral Resources

→ Mineral resources are natural resources and abiotic factor.
→ A naturally occuring substance that has a definite chemical composition in a mineral.
→ Mineral ore concentrated in particular area on rock formation.
→ Mineral can be identify on the basis of their colour, density, hardness and chemical properties.
→ Mineral ore created by natural process without any interface.

Minerals are of two types ——

(i) Metallic Mineral :— It contains metal. They are hard substance and that conduct heat and electricity. E.g. Iron ore, bauxite, manganese ore.

(ii) Non-metallic Mineral :- It don't contain metal but supplies the electricity.

E.g. limestone, etc.

Metallic Minerals are of two types —

* Ferrous : Ferrous minerals contain iron ores.

E.g. Iron ore, manganese.

* Non-ferrous : Non-ferrous minerals doesn't contain iron.

E.g. Gold, silver, etc.

USE OF MINERAL RESOURCES

→ Used in construction of building.
→ Bridges and housing settlement.
→ Development of industries and machinery.
→ Used for generation of energy mainly coal, petroleum and natural gas.
→ Used for development of defence equipment.
→ Used in the field of communication like telephone wires, cable, electronic devices, etc.
→ Used for formation of ornament like jewellery of gold, diamond, silver.
→ Used for synthesis of fertilizers.

NATIONAL MINERAL SCENARIO

India produces as many as (87) minerals which includes —

* Metallic (10).
* Non-metallic (47).
* Atomic Energy (3)
* Minor Mineral (33).

India is rich in coal, manganese, iron, chromites and mica but efficient in the gold, silver, nickel.

ENVIRONMENTAL EFFECTS OF EXTRACTING AND USING MINERAL RESOURCE :-

Steps	Environmental Effects
① Mining (Exploitation, Extraction)	* Distributed land mining accident health hazards, mine waste, dumping, Noise, heat.
② Processing (Transportation, purification, Manufacturing)	* Solid waste, radio active materials, air, water and soil pollution, noise safety and health hazards heat ugliness.
③ Use (transportation, transmission to individual users.)	* Noise, pollution of water, air and soil, heat, safety and health hazards.

(iv) **FOOD RESOURCES**

CHANGES CAUSE BY AGRICULTURE AND OVER-GRAZING

Impact Of Overgrazing :-

→ Land Degradation : Removes the green cover and soil becomes weak.

→ Soil Erosion : Removal of top layer of soil.

→ Loss of Usefull Species : Due to overgrazing root stucks thus soil lose its regenerating capacity.

EFFECT OF MODERN AGRICULTURE :-

Impact related to yielding varieties sources monoculture.

FERTILISER RELATED PROBLEM :-

* Nitrate Pollution : If concentration of nitrates in water exides 25mg per litre cause "blue baby syndrome" which affect infants and cause death.

→ Mostly see in the India, Dema, England.

* Water Logging : Land where water stand for most of the year cause water logging. That directly affect on production of "food".

* Salinity :

Cause of Salinity :- Rising of sea water by consumption of fresh water, etc. lack of rain.

→ Insufficient use and wastage of water by farmer root.

(v) **ENERGY RESOURCES**

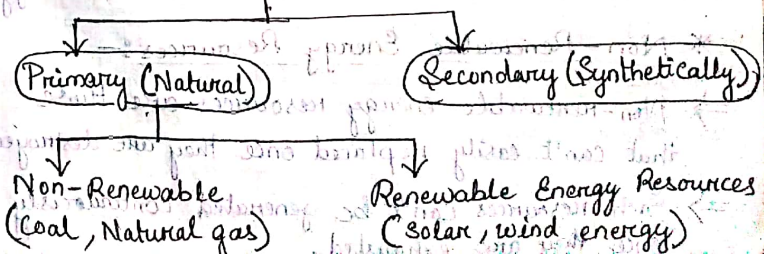
Material which provides energy are called energy resources. Such as sun, sea and wind, coal, fossil fuel.

Energy :- Energy may be defined as any property which can be converted into work.

Development Of Energy :-

Wood → Coal → Oil → Alternate Energy (Solar, wind, tidal energy)

Types Of Energy Resources :-



GROWING ENERGY NEED :-

→ Energy is essential to existance of mankind all industrial process like mining, transport, lighting, heating, cooling in building need energy.

→ With growing population the world is facing and energy deficit life style change from simple to complex.

→ Almost 95% of commercial energy is available from fossil fuel like coal and natural gas.

* Renewable Energy Resources :-

⇒ Renewable energy resource are those which are constantly available, or can be resonable or recovered.

⇒ These resource can be generated continuously and inexhaustable.

E.g. Wood, Solar Energy, wind energy, tidal energy

* Non-Renewable Energy Resources :-

⇒ Non-renewable energy resources are those that can't easily replaced once they are destroyed.

⇒ Each resources can't be generated continuously once they are exhausted.

E.g. Petroleum, Natural gas, nuclear fuels, etc.

Renewable Energy Resources	Non-Renewable Energy Resources
→ Unlimited amount	→ Limited amount.
→ Can be used more than one.	→ Can be use only one.
→ Growing capacity is available.	→ Growing capacity is not available.
→ Lower Carbon Emission.	→ Higher carbon emission.
→ More expensive to create.	→ Less expensive to create.
→ Have environment impact.	→ No environment impact.
→ Non-conventional energy resource.	→ Conventional energy resources.
→ Don't cause pollution.	→ Cause of pollution.
→ E.g. Water, sun, wind.	→ E.g. Coal, oil, etc.

USE ALTERNATIVE ENERGY RESOURCE :-

① Hydroelectric Energy : Potential energy are stored in the water held in dams by is made to drive water turbine and generator which produce electric power this form of energy generation is called "hydroelectric power".

Advantages :-

→ The source of hydroelectric power generation i.e, free of cost.

→ Dams can provide virtually continuous electricity generation.

→ Water used for power generation can be put to use again.

→ There is no chemical process involved in the power production process, therefore, the power generated is clean and doesn't harm the environment.

② Solar Energy : The solar power generation is done by using a series of photovoltaic cells where the solar rays are converted into electricity apart from electricity production. Solar energy is also used for heating water, cooking food, etc.

Advantages :-

→ Source of energy absolutely free.

→ Solar power which is generated in day time can be stored to be made available in the night time as well.

→ Solar power generators can be used to generate power in rural and remote areas where there is no rich of the conventional form of energy.

→ Solar power generation is quite and absolutely.

→ Solar energy is a renewable form of energy will not deplete till thousands of year.

③ Wind Energy : The power of the wind is harnessed to propell the blades of the wind. Turbine attached to an electric generator to generate wind energy.

Advantages :-

→ Wind is a clean form of energy the source of power generation i.e., wind is free of cost.

→ Wind energy is a renewable source of energy.

④ Bio-Mass Energy : This is the energy developed from the wastes of various human animal activities like by the products and wastes from industry agricultural yields, muncipal solid waste, etc.

Advantages :-

→ It is an environmental friendly way of energy production in which the bio-logical mass is recycled and reused so it is considered as renewable source of energy.

⑤ Geo-thermal Energy: This is the energy tapped from the heat inside the earth.

→ Hot rocks residing in the core of earth heat water which emits the surface of earth with pressure and as steam.

→ The pressurized steam can be used to run steam turbine to generate electricity.

Advantages :-

→ Geo thermal energy source is free of cost.

→ With a proper power generation system in place no harmful by-products are produced.

⑥ Tidal Power Energy: Tidal in water rise and fall due to the gravity of sun and moon, this rise and fall of tides can be utilised by setting up small dams and passby water through the turbine to generate power.

Advantages :-

→ The sources of power generation is free and renewable.

→ The power generated is clean and doesn't cause any pollution.

Q) Why we Use 'Alternate Energy Resources'?

→ Alternate energy resources are available free of cost and don't tax the environment for their usage.

→ Power generation through alternate sources of energy is "clean and green".

→ If we shift to use power generated from these sources then carbon dioxide emission from the conventional energy will be greatly reduced.

→ The problem of global warming will be solved in few years. So, air pollution will be reduced.

Case Studies Of Energy Resources :-

1) Steel & Energy: To produce one tonne of steel, India spends '9.5' billion kilo calories but in Italy it spends '4.3' billion kilo calories and for Japan it only spend "4.1" kilo calories.

2) Cement Industry: Over 2 billion kilo calories to use to produce 1 tonne of cement in India, in Germany it '0.82' million kilo calories used in USA '0.92' million kilo calories.

3) Vehicles: Lighter material should be used for cars instead of steel we should use aluminium, fibre glass or plastic these lighter material can reduce the weight 15% and increases the fuel

economy (6-8)%.

4) Increase In Refrigeration : Better technology reduce the annual energy needed by a typical danish 200L refrigerator (with no freezer) from 550 KW hour to 90KWh!

→ 18W modern compact fluorescent lamp, can replace a standard 15 watt incandescent lamp.

(vi) LAND RESOURCES

→ Land is the most important valuable resources for mankind.
→ It provides food, fibre, medicine.
→ It is a mixture of inorganic material and organic material.
→ To construct building.
→ Acts as a dustbin for the most of waste created by modern society.

Land Degradation :-

→ It is a process of decrease of land and loss of fertility is called "land degradation".
→ It has been estimated that more than 5000 million tonnes of top soil is decreased annually along with 5 million tonnes of nutrients.
→ About 1/3rd of this is lost in sea while the most in reservoirs and reverse leading to field.

Effect Of Land Degradation :-

→ Soil texture and soil structure are destructed.
→ Loss of soil fertility.
→ Loss of valuable nutrients.
→ Increase in water log.
→ Salinity.
→ Alkanity.
→ Loss of economic, social and bio-diversity.

Cause Of Land Degradation :-

→ Population Increase.
→ Urbanization.
→ Fertilizer and pesticides.
→ Damage of stock soil by natural process.
→ Water logging.
→ Soil Erosion.

(2) Soil Erosion :- It is the process of removal of super visual layer of the soil from one place to another.

Harmful Effects of Soil Erosion :-

→ Soil fertility is lost because of loss of top soil layer.

→ Loss of ability to hold water and sediment.
→ Sediment runoff can polute water and kill aquatic life.

Types Of Soil Erosion :-

1) Normal Soil Erosion : Removal of top soil by the natural process (rain, flood).
→ The rate of erosion is slower.

2) Accelerated Soil Erosion : It is caused by man-made activities.
→ The rate of erosion is much faster than the rate of the formation of soil.

DESERTIFICATION :- Progressing destruction or degradation of arid or semi-arid that convert to desert.

Harmful Effects Of Desertification :-
→ Around 80% of the productive land in the arid and the semi-arid region are converted into desert.
→ Around 600 million people are threatened.

① Deforestation
② Overgrazing
③ Mining
④ Climate Change
⑤ Water management.

ROLES OF INDIVIDUAL IN CONSERVATION OF NATURAL RESOURCES :-

① Conservation Of Forest :
→ Use non-timber product.
→ Plant more trees.
→ Grazing must be control.
→ Minimize the use of paper.
→ Avoid the construction of dam, road in forest area.

② Conservation Of Mineral Resources :
Use alternate resources of like solar energy, hydroelectric energy, wind energy, tidal energy, geo-thermal energy, etc.
→ Use biogas as a fuel for cooking of non-renewable sources of energy.
→ Reuse and recycle the minerals and their product.
→ Using mineral is a planted.
→ Avoid over-exploitation of mineral resources.

③ Conservation Of Water Resources :
Spend the least amount of times in the shower.

④ Conservation Of Food Resources:

→ Cook required amount of food.
→ Don't waste the food, if it is to someone before spoiling.
→ Don't stored large amount of food, grains and protect them from damaging insects.

⑤ Conservation Of Energy Resources:

→ Switch off light, fan, etc when not in use.
→ Solar heater should be use for cooking.
→ Dry the cloth in the sunlight instead of driers.
→ Use always pressure cookers.
→ Grow trees near the house to get cool breeze instead of using AC and air cooler.

⑥ Conservation Of Land Resources:

→ Grow different types of lands i.e, tree herbs and shrubs.
→ In the irrigation process using storage flow of water should be avoided.
→ Soil erosion can be prevented by sprinkling irrigation.
→ Use green manures in the garden.
→ Use mix croping.

Equitable Use of Resources for Sustainable Life styles :-

→ The basic cause of un-sustainability are over population in poor countries and over consumption of resources reach countries generate waste.
→ Reach countries lower than their consumption level.
→ Poor countries fulfill by providing them resources.

Ch-3

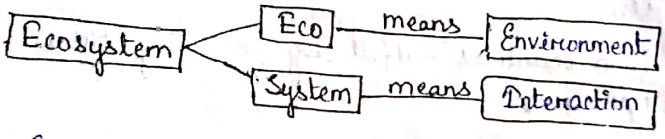
SYSTEM

Eco-System → The term ecosystem was first used by A.G. Tansley in 1935.

Ecosystem consist of two words —

→ Eco

→ Work



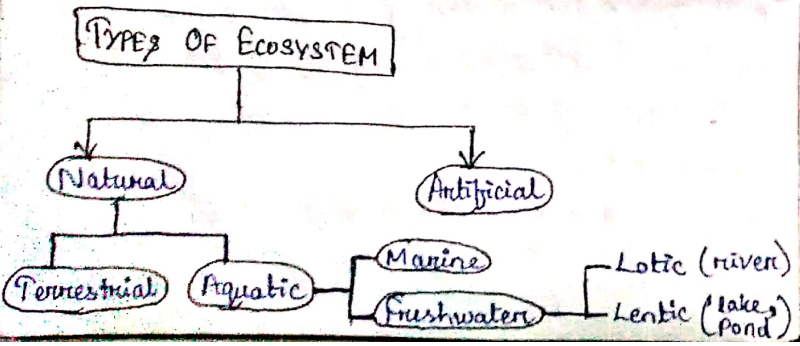
So, that the ecosystem is the 'interaction' among 'living things' and 'non-living things'.

(OR)

Ecosystem is "the inter-relationship between living thing and non-living things".

(OR)

The combination of living things and non-living things is called ecosystem.



Lotic :- Water move from one place to another.

E.g: River, rainfall.

Lentic :- Water which is still.

E.g: pond, well, lake.

Ecology → Study of the distribution and interaction of organisms, the flow of energy and materials between abiotic and biotic components of ecosystem.

What are the Causes, The Ecosystem to be Change ?

① By The Natural Process :-

→ Drought
→ Disease
→ Virus
→ Fire
→ Over population

② By Human :-

→ Water Pollution
→ Air Pollution
→ Land pollution
→ Construction

How Can Human Help To prevent Changes In Ecosystem ?

→ Use resources.

→ Laws that control pollution.
→ Clean up litter.
→ Keep rivers and lakes clean.

STRUCTURE AND FUNCTION OF ECOSYSTEM

Structure Of Ecosystem :-

→ The structure of ecosystem is basically a description of the organism and physical feature of environment including the amount and distribution of nutrients in a particular habitat.

→ It also provides information regarding the range of climatic conditions prevailing in the area.

From structure point of view, All ecosystem consist of the following components :-

① **Biotic Components** (With Life) → Biotic components include all living organisms present in the environmental system such as animal and plants.

② **Abiotic Components** (Without Life) → Abiotic components of ecosystem include basic inorganic elements and compounds such as soil, water, oxygen, calcium carbonate, carbon, nitrogen, etc.

From nutrition point of view, The Biotic Componen can be grouped into two basic components —

(i) Autotropic → Autotropic components includes all green plants which fix the radiant energy of sun and manufacture food from inorganic substances.

→ "Autotropic means self-dependent to take on food".

(ii) Heterotropic → It includes non-green plants and all animals which take food from autotrops.

→ "Heterotropic means dependent on to take the food

Biotic Components Of An Ecosystem Can be Describ under the following three heads —

1) PRODUCERS (Autotropic Components) :-

→ The producers are autotropic elements chiefly green plants.

→ The use of radiant energy of sun is photosynthetic process where Co_2 is received and light energy is converted into chemical energy.

→ The chemical energy is actually locked of in the energy rich in carbon components.

→ This is used in representation by all living things and other hydroxide, grasses, trees of

The forest are the examples of producer.

2) CONSUMERS :— Those living member of ecosystem which consume the food synthesis by producers are called "Consumers."

→ There are different types of Consumers such as—

* Consumer of first order (Primary Consumers)
* Consumer of second order (Secondary Consumer)
* Consumer of third order (Tertiary Consumer)
* Parasites, Scavengers & Supprubs

* Primary Consumer : These are purely herbivorous animals that are dependent for their food to producer or green plants such as cow, goat, buffalo, rabbit, rodents, deer are common herbivorious animal in the ecosystem.

* Secondary Consumer : These are carnivorous and omnivorous. Carnivorous are flesh eating animals and omnivorous are the animal that are adopted to consume both flesh and plants.

E.g. Dog, cat, snake, crow, wolves, fox

* Tertiary Consumer : These are top carnivorous which prey upon carnivorous, omnivorous and herbivorous.

E.g. Lions, tigers, Hawk, bear, etc are considered as tertiary or top carnivorous.

* Parasites, Scavengers & Supprubs :

→ It is also included in the consumers, the parasites and the animals utilize the living issues of different plants and animals.

→ Scavengers and supprubs utilize dead remains of animals and plants as their food.

3) DECOMPOSER :— Decomposers and transformers are living components of the ecosystem and they are fungi and bacteria.

→ Decomposer attack the dead remains of producers and consumers and degrade the complex organic substances into simpler compounds.

→ The simple organic matters are then attacked by another kind of bacteria, the transformer which change the organic compounds to inorganic forms that are suitable like producer and green plants.

→ The decomposer and transformer play a very important role in maintaining the dynamic nature of ecosystem.

Function of Ecosystem :-

→ Ecosystem is a descript structural functional and life substaining environment system.

→ The environment system consist of biotic and abiotic components.

Biotic components includes living thing.

E.g. plants, animals, microbes.

Abiotic components includes non-living thing.

E.g. water, minerals, salts.

Following Functional Components —

> Inorganic components (air, water & minerals).

> Organism (Plants, animals, microbes).

> Energy input which enters from outside (Sun).

INORGANIC COMPONENTS

Inorganic components are of constituents are synthesized into organic structure by the green plants through auto synthesis and the solar energy is utilized in the process. Green plants becomes the source of energy which in term becomes source of energy for flesh eating animals.

E.g. Air, water, etc.

ORGANISMS

Organisms are known as secondary producers all the living plants or animal in a ecosystem have a define life.

E.g. plants, animals, etc.

Energy Input Which Enters from Outside

These organisms are known as decomposer during the process of decomposition of organic molecules, the energy which kept the inorganic compound bound together in the form of organics.

→ Thus, in a ecosystem energy from the sun, the input is fixed by plants and transfer to animal components.

PRINCIPLE STEPS IN THE OPERATION STEPS OF ECOSYSTEM

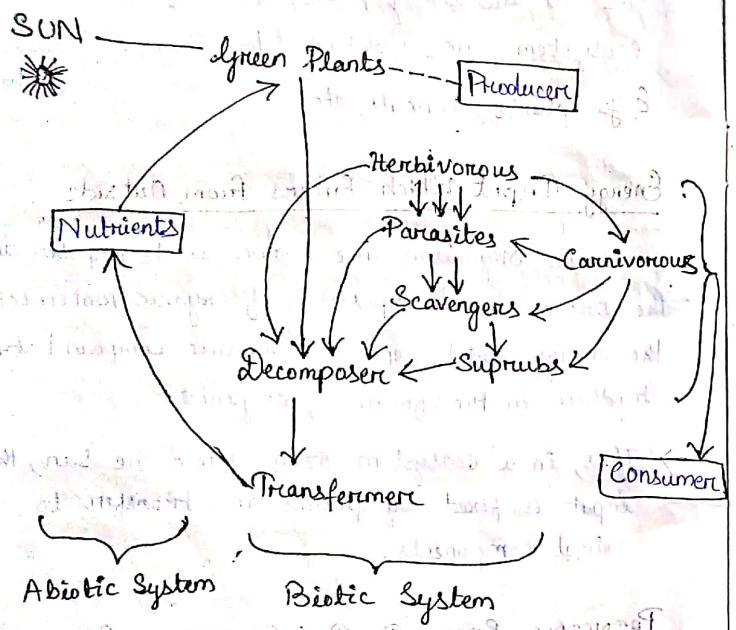
→ Receiving of radiant energy.

→ Manufacture of organic material from inorganic once by producer.

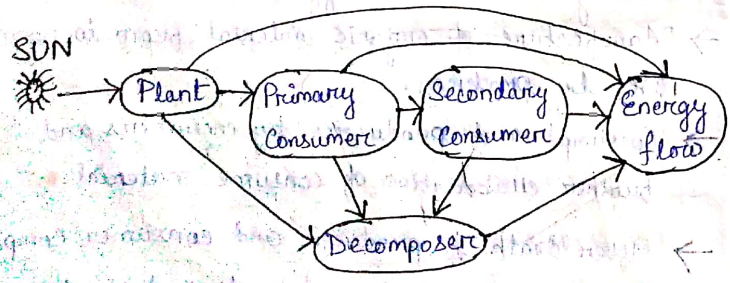
→ Consumption of producers by consumers and further ellaboration of consume material.

→ After death of producer and consumer complex organic compounds are degrade and finally converted by decomposer and converts into

Such forms are suitable for recutilization by producer.



ENERGY FLOW IN ECOSYSTEM :-



→ All organism must obtained of a supply of energy and nutrients from their environment in order to survive.

→ The transformation of energy in an ecosystem begins first with the input of energy from the Sun.

→ Because, it is the first step in the production of energy for living things it is called primary producer.

PHOTOSYNTHESIS

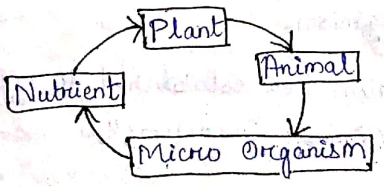
→ Chemical reaction where green plants use water and CO_2 to store the sun energy in glucose.

→ Energy is stored in form of glucose. Glucose is stored as starch in plants.

→ Energy contained within producer and consumer is ultimately passed to the decomposer that are responsible for constant of nutrients.

→ Energy flow can't occur in reverse direction.

NUTRIENT CYCLE



ECOLOGICAL SUCCESSION

Eco (Biotic, Abiotic) | Logical (Energy) | Succession (Step)

→ Natural gradual changes in the biotic community towards a stable or climax condition.

→ The changes are progressive and predictable.

→ The occurrence of sequence of communities over a period of time in the same area is termed "ecological succession".

It has two types based on the nature of habitat —

① Primary Succession (Begins in a place without soil)

→ "Primary succession" is defined as initial establishment and development of an ecosystem, which occurs on a site previously unoccupied by living organism.

→ The organism that established that first are called "Pioneer Organisms".

→ Gradual arrival of more complicated and larger plants as the habitat changes.

② Secondary Succession (Begins in a place with soil)

→ If succession starts on area previously colonized and soil is organically include to improve the biotic things is called as "secondary succession".

→ It is defined as the reestablishment of ecosystem at a site where community was existing earlier but disrupted by natural or artificial means like storm, fire, flood or human activity.

E.g. Loss of trees after diseases, fire, wind, deforestation.

→ It is more rapid than primary succession.

Difference Between Primary & Secondary Succession

Primary Succession	Secondary Succession
→ No soil exist to improve biotic things.	→ Soil exist to improve biotic things.
→ Pioneer Species.	→ Seeds have suitable condition.
→ Wheathering & decomposition	→ Occur faster.
→ Climax Community.	→ Climax Community.

It has two types based on the organism—

① Autotropic Session :- It begins in a importantly organised environment characterised by early and continued dominance of autotropic organisms like green plants.

② Heterotropic Session :- It begins in a importantly organism environment characterised by early dominance of heterotropics like animal, bacteria, fungi, etc.

PROCESS OF SUCCESSION

→ Nudeation
→ Invasion
→ Migration
→ Colonisation
→ Ecesis
→ Aggregation
→ Competition & Reaction
→ Climax & Stabilization

* Nudation :- The process of formation of bare area is known as "nudation."

CAUTION : Industrial / agriculture
Climate change
Biotic Disturbance

* Invasion :- The process of successful establishment of new species in the bare area is known as "Invasion."

* Migration :- The process of movement into the bare area is known as "migration."

→ The seeds, sports of the species invade to the bare area by the agents such as air and water.

* Colonisation :- Colonisation of the bare area by first or pioneer community is "colonisation."

* Ecesis :- After reaching the bare area, the new species start to establis themselves in it.

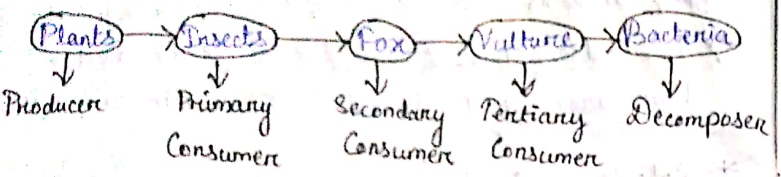
* Aggregation :- The final stage of invasion by pioneering group is called "aggregation."

* Competition & Reaction :- After establishment various species compete among themselves for space, light and nutrients.

* Climax & Stabilization :- This is the final stage in the process of ecological succession. The climax community becomes more or less stabilized for a long period of time.

→ It can maintain itself in equilibrium with the climate of that area.

FOOD CHAIN



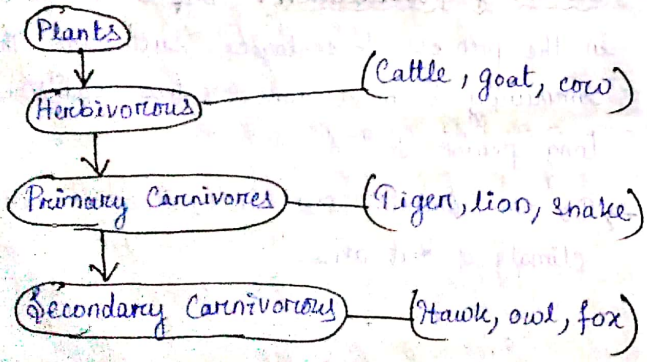
→ Transfer of energy and nutrients from one feeding group of organisms to another.

→ The producer, consumer and decomposer are main parts of the food chain.

→ Food chain show where the energy is transfer from one to another.

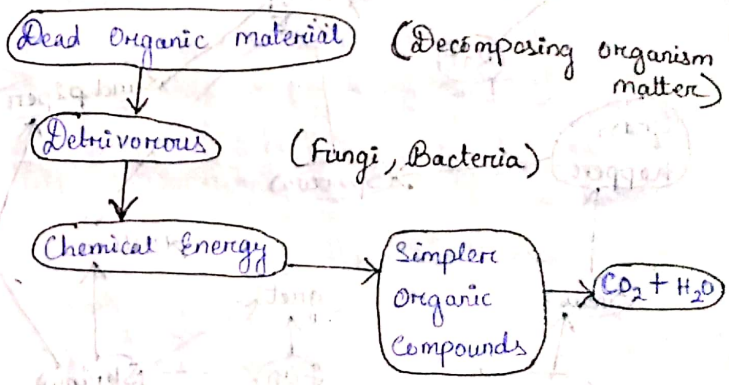
TYPES OF FOOD CHAIN

① Grazing Food Chain :-



Grazing food chains are to be eatable for of grazing animals like that herbivorous, primary carnivorous, secondary carnivorous that directly/ indirectly depends upon the plants in a chain of food.

② Detritus Food Chain :-



→ This organism waste and dead matter derived from grazing food chains are called "Detritus".

→ After that grazing food chain will become "detrivorous food chain."

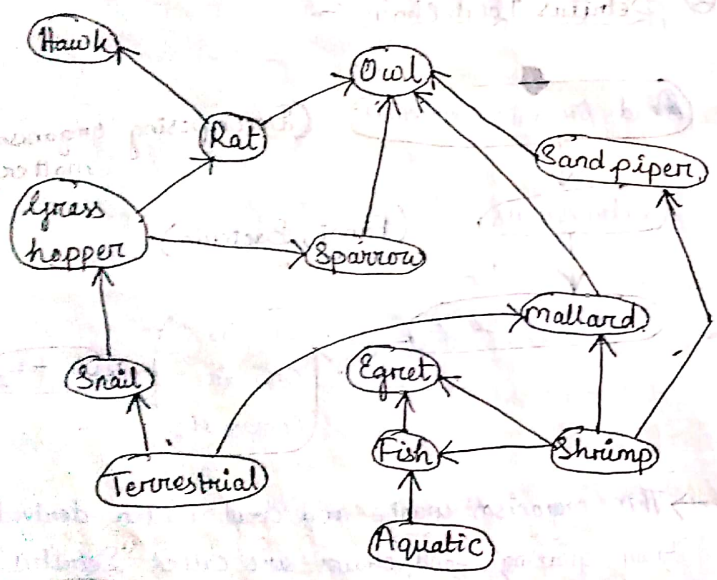
Bio-Magnification

To control the food chain in equation.

Ecological Balance → Maintaining and regulating the population size.

→ In addition at each tropic level the concern of food chain keep on increasing.

FOOD WEBS



→ In ecosystems, some consumers feed on a single species but most consumers have multiple food sources.

→ Hawk is both mouse and snail but sandpiper is only shrimp.

→ In this way, individual food chains becomes inter-connected to form the area.

→ Maintaining the stability of an ecosystem.

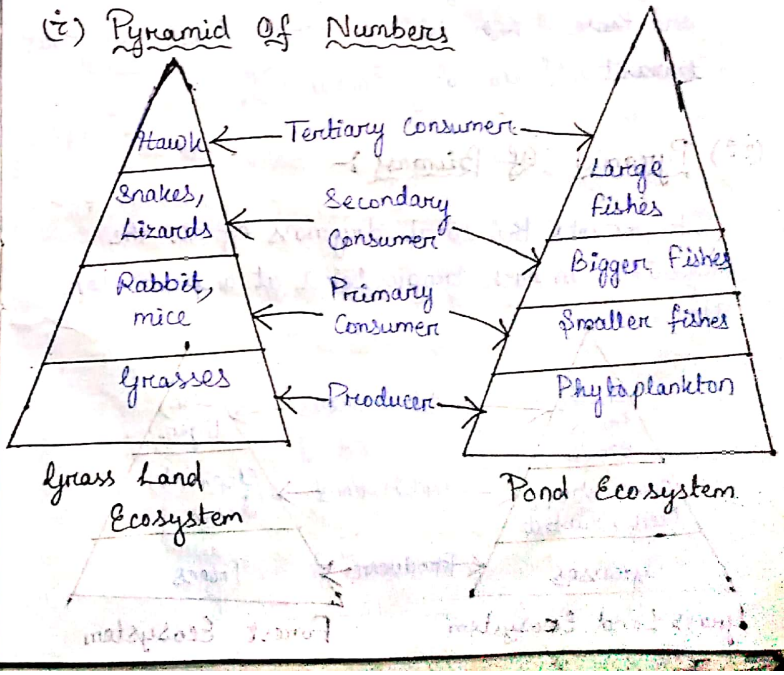
ECOLOGICAL PYRAMIDS

Ecological pyramids shows that the relationship between producer and consumer at different tropic level in ecosystem.

In "Ecological pyramid", it is a graphical representation that shows the relative amount of energy or matter contain within each tropic level in a food chain or food web.

TYPES OF ECOLOGICAL PYRAMID

(i) Pyramid of Numbers



→ If grass land, pond ecosystem,

Producer → Primary Consumer → Secondary consumer → Tertiary consumer.

→ Hence the pyramid is upright. (Δ).

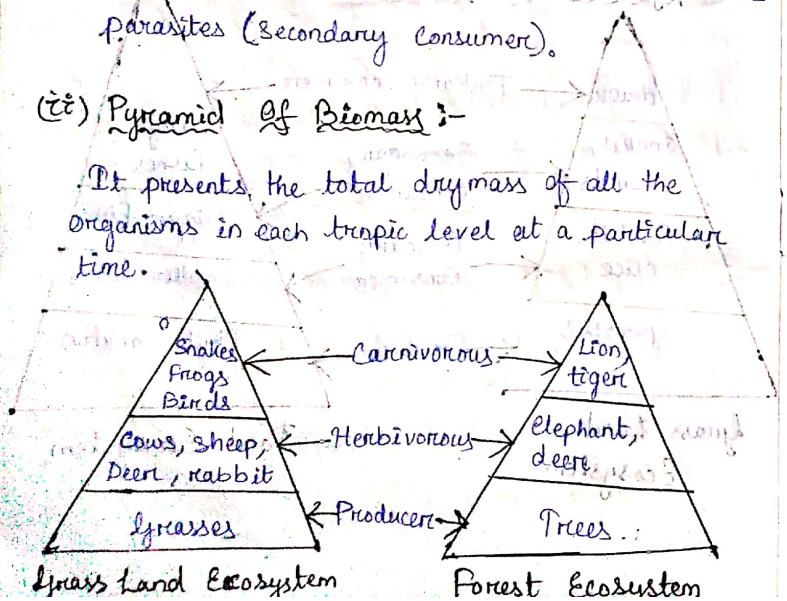
→ If producer ← primary Consumer ← Secondary Consumer ← tertiary Consumer then pyramid is "inverted pyramid."

E.g: of inverted pyramid

* Tree Ecosystem :- A single tree harbours many fruit eating birds (primary consumer) and those birds in their terms host numerous parasites (secondary consumer).

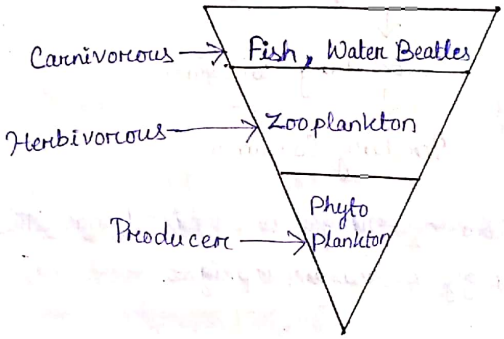
(ii) Pyramid of Biomass :-

It presents the total drymass of all the organisms in each tropic level at a particular time.



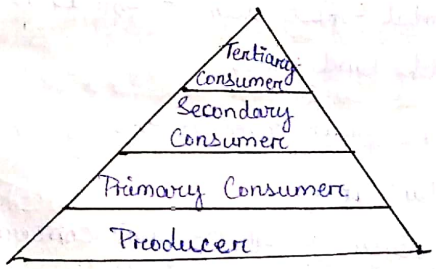
Producer → Herbivorous → Carnivorous.
So, it is called as a "upright pyramid".

Inverted Pyramid



If producer ← Herbivorous ← Carnivorous.
Hence it is called "inverted pyramid".

(iii) Pyramid of Energy :-



It represents the rate of energy flow or productivity are at successive tropic level. The pyramid of energy are always upright not

inverted pyramid.

Amount of energy decreases from

Producer
↓
Primary Consumer
↓
Secondary Consumer
↓
Tertiary Consumer

Since, the flow of energy is on directional, the pyramid energy is always upright.

FOREST ECOSYSTEM

→ It is a type of terrestrial system.
→ A forest is an area with a high density of trees.
→ World total land area is 13076 million hectares of which total forest account for about 31% of the worlds land area.
→ In India, the forest cover is roughly 19% of the total land area.
→ The forest ecosystem are of great concern from the environmental point of view.
→ It provides the numerous environmental service like —

* Nutrients cycling
* Maintaining Biodiversity
* Providing wild life habitat.
* Regulating stream follow.
* Storing water.
* Reducing flood.
* Preventing soil errosion.
* Reclaiming degraded and many more.

STRUCTURE & FUNCTION OF FOREST ECOSYSTEM

Two types of components are used in the structure and function of forest ecosystem that are —

① Biotic Components :—

Producer Organisms : In a forest, the producers are mainly trees.

Consumer Organisms : In a forest, consumers are mainly of 3 types —

* Primary Consumer → These are herbivorous which feed directly on producer.

E.g. ants, beetles, bugs, spider, etc.
Large animal such as elephant, deer, giraffe, etc. grazing on shoots and on fruits.

* **Secondary Consumer** → These are carnivorous and feed on primary consumer.

E.g: Birds, lizards, frogs, snakes and foxes.

* **Tertiary Consumer** → These are secondary consumers and feed on secondary consumer.

E.g: Lion, tiger.

Decomposer: These include wide verity of saprophytic micro organisms like bacteria, fungi.

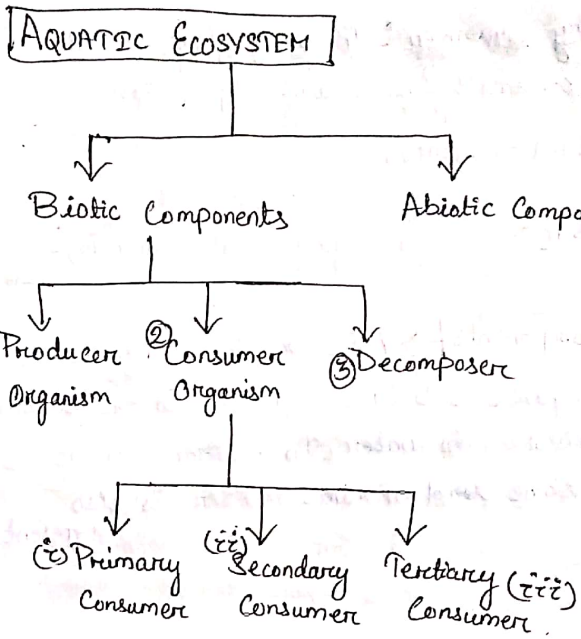
→ They attack the dead or decayed body of organisms and thus decomposition takes place.

→ Therefore, nutrients are released for reuse.

② Abiotic Components :–

→ These include basic inorganic and organic components presence in the soil.

→ In addition, dead organic debris is also found littered in the forest.



① **Producer Organism** :– It include submerged, free floating amphibious, microphytes (like hydrilla, Wolfia, azolla, typha, etc). and minute floating and suspended lower phytoplankton.

E.g: phytoplankton.

② **Consumer Organism** :–

(i) **Primary Consumer** : These are smaller fishes eating the phytoplanktons.

(ii) **Secondary Consumer** : These are carnivorous like insects, bigger fishes and feeding on herbivorous.

E.g: Bigger fishes.

(iii) Tertiary Consumer :- These are largest fishes feeding on small fishes and bigger fishes.

E.g. Largest fishes.

(3) Decomposer :- Micro organism like bacteria, fungi, etc.

Abiotic Components → These are the inorganic as well as organic substances present in the bottom soil or dissolved in water. In addition, to the mineral some dead organic matter is also present.

Ch-4

BIODIVERSITY AND ITS CONSERVATION

INTRODUCTION :-

→ The word biodiversity means
Bio – Life, Diversity – Variety.

→ The term bio-diversity was first coined by Walter G. Rosen in 1986.

→ The biosphere comprises of a complex collection of innumerable organisms known as biodiversity, which constitute the vital life support for survival of human race.

→ Biological diversity abbreviated as biodiversity, represent the total of various life forms such as unicellular, fungi, protozoa, bacteria and multicellular organisms such as plants, fishes, mammals at various biological level including genes, habitats, ecosystem.

DEFINATION :- Biodiversity is the variety of life forms on earth and the essential interdependence of all living things.

Benefits / Advantages Of Biodiversity

(i) Food (ii) Water (iii) Fuel (iv) Medicine
(v) Better Crop Variety (vi) Industrial Material

* Non-Consumptive Value :-

> Recreation
> Education and research
> Tradition Value.

* Ecological Service :-

> Balance of Nature
> Biological Productivity
> Regulation of Climate
> Degradation of Weast-
> Cleaning of air and water
> Cycling of Nutrients.
> Control of potential pest and disease causing Species
> Stabilization of land against erosion.
> Maintainance of soil fertility.

Types Of Biodiversity

> Genetic Diversity
> Species Diversity
> Ecosystem Diversity.

1) Genetic Diversity :-

→ It is the variety present at the level of genes.
→ Genes made of DNA are the building blocks that determine how an organism will develop and what are the traits and ability will be.
→ Genetic diversity can be measured at many different level including population, species, community.

2) Species Diversity :-

→ It refers to the different types of living organism on at.
→ This include many types of birds, insects, plants, bacteria, fungi, mammals and more.
→ A species can be defined as a group or population of similar organisms that reproducing inter-breeding with the group.

3) Ecosystem Diversity :-

→ Ecosystem level deals with species distribution and community pattern.
It is the variety of different habitats or ecosystem in a particular area (wet land,

wood land, grass land).

→ The ecosystem of the world are maintained by their biodiversity.

→ Ecosystem diversity can't defined itself like genetic and species diversity ecosystem. Diversity need many complex measurement to be taken over a long period of time.

BIOGRAPHICAL CLASSIFICATION OF INDIA

→ India is a mega diversity country having different types of climate and topograph in different parts of the country.

→ These variation have induced much variability in flora and fauna. India occupies 10th position among the plant country of the world.

→ It is very important to know and study the distribution, evolution, environment relationship with animals in time & space.

→ In order to know about the distribution and environmental interaction of flora and fauna of our country.

→ Each of the zone has its own characteristics climate, soil and biodiversity.

INDIA'S MAJOR BIOGRAPHICS HABITATS

Sl. no	Biographics Zone	Biotic Providents	Total Area of Biomass
1.	Trans – Himalayan	Upper region	186200
2	Himalayan Mountain	North-west Himalayan	6900
		West Hima-layan	72000
		East Himalayan	123000
		Central Hima-layan	83000
3	Desert (Arid area)	Kutch, Thar	45000
			18000
		Ladakh	NA
4	Semi-Arid	Central India	107600
		Rajwar – Gujurat	404400
5	Western Ghats	Malbar Coast	59700
		Western Ghat	99300

VALUE OF DIVERSITY

→ Biosphere, is a life supporting system to human being. It is the combination of different organisms, each organisms in the biosphere has its own significant.

→ Biodiversity is vital for healthy biosphere. Biodiversity is most for the stability and proper functioning of the biosphere.

CLASSIFICATION AND IMPORTANCE

* Conservative Value :-

These are direct used values, where the biodiversity product are harvested and consumed directly.

E.g. Food, drugs, fuel.

> Food : A large no. of wild plants are consumed by human being as food nearly (80-90)% of our food crops have been domesticated only from the tropical wild plants.

→ A large no. of wild animals are consumed as food.

> Drug/Medicines : Around 70% of modern medicine are derived from the plant and plant extract 20,000 plant species are believed to used medicinally, particularly in the traditional system of Ayurveda, Siddha.

→ Germany alone uses more than 2500 species of plants for medicine purpose in homeopathy and other system of medicine but India uses 3000 species of land as homeopathy and ayurveda a medicine.

→ According to research about 85% of global community use plants for primary health care.

> Fuel : Fire woods are directly consumed by villagers, tribals. The fossil fuel like coal, petroleum and natural gas are also pre-products of fossilised biodiversity.

* Productive Value :-

Biodiversity products have obtained commercial value. These product are marked and sailed, These product may be derived from animal and plants.

> Animal Product :

Animal Product	Animals
Silk	Silkworm
Wool	Sheep
Musk	Musk Deer
Tusk	Elephant
Leather	All animal
Food	Fish & animals

> Plant & Animal Product For Various Industry :

Plant/Animal Product	Industry
Wood	Paper & pulp, industry plywood, Railway sleeper.
Cotton	Textile Industry
Fruit, vegetable	Food Industry
Leather	Leather Industry
Ivory	Ivory Industry
Pearl	Pearl Industry

Rich account for 22% of the croped area and other accounts for 39% of the croped area.

In oilseed production, it helps in saving large amount for exchange spend on importing edible oils.

* Social Value :—

Social Value of biodiversity refers to the manner in which the bio resources are used to the society. These values are associated with the social life and spiritual aspects of the people.

> Holy Plants : Many plants are considered as a holy plant in our country.

→ The leaf, fruits of the plant are used to worship God.

→ Our rich heritage teaches us to worship plants, animals, rivers and mountains.

E.g: Tulsi, peepal, lotus, etc.

> Holy Animals : Many animals are also considered as holy animal in our country.

E.g: Cow, snake, bull, mouse, etc.

* Ethical Values :—

→ Every species has some moral rights to exist in the world.

→ It involves ethical issues like "All life must be preserved".

→ In India and in other country biodiversity is considered to have great value in religious and cultural basis.

→ The river Ganga is consider as Holy river.

→ Tulsi, Vembu are some of the trees worship by families.

* Aesthetic Values :- The beautiful nature of plants and animals insist us to protect the biodiversity. The most important aesthetic value of biodiversity is eco-tourism.

> Eco Tourism : People from far place spend a lot of time for money to visit the beautiful areas where they can enjoy the aesthetic value of biodiversity.

→ These type of tourism is known as eco-tourism.

→ The pleasant music of wild birds, colour of butterfly, colour of flowers, colour of peacock are very important for their aesthetic value.

* Optional Value (Optimum Value) :-

→ The optional values are the contentials of biodiversity that are presently unknown and need to be known.

→ The optional values of biodiversity suggest that any species may prove to be valuable species after some day.

→ The growing bio-technology field is searching a species for causing the disease of cancer and AIDS.

→ Medicinal plants and herbs play a very important role in our Indian economic growth.

BIODIVERSITY AT GLOBAL LEVEL

→ Conservative estimate of the existing bio-diversity is 10 million species, but if estimate for insects are correct then it could be around 30 million species, we have till now n listed about 14 million species.

→ It includes among other about 98% birds, 95% reptiles and amphibians. 90% fish and about 85% higher plants known to exist on this earth.

BIODIVERSITY AT NATIONAL LEVEL

India is second largest Nation containing 5% of world bio-diversity and 2% of earth surface.

> Rank of India In Biodiversity

It has been estimated that India get —

① 6th rank among the centres of diversity and origin of cultural crops.

② 10th rank among the plant rich countries of the world.

③ 11th rank among the Endemic species of the world.

→ India is a agricultural country and its economic growth depends on the production of many crops.

→ Among several developing nations, India is considered as "Mega diversity Nation" because it is rich in both Flora and Fauna.

→ There is high demand for Indian species in abroad.

BIODIVERSITY AT LOCAL LEVEL (OR) MEASUREMENT OF BIODIVERSITY

Based on their special distribution, biodiversity at local level is categorised into 4 types —

(i) Point Richness / Point Diversity :—

It refers to the no. of species that can be found at a single point in a given species.

(ii) Alpha Diversity :—

→ It refers to the no. of species found in a small homogenous area.

→ It is strongly co-related with physical variables.

E.g. Chilika.

(iii) Beta Diversity :—

→ It refers to the rate of change in species composition across different habitats. It means that the no. of species increases are more heterogenous habitats are taken into the consideration.

(iv) Gamma Diversity :—

It refers to the rate of change across large landscape.

THREATS TO BIODIVERSITY

1) Habitat Loss :- Humans are moving into wilderness are causing a loss of animals habitats.

The main cause of habitats loss are mining / development of human settlement, industry, agricultural activity, etc.

Solution :-

→ Reduce human population and expansion of urbanization and industry.

→ Educating the public about the importance of natural habitat and biodiversity.

→ Solution to habitat loss can be include planting trees, planting more gardens so as to reduce need for man to need large land for agriculture forms which leads to habitat loss.

2) Poaching Of Wild Life :-

Poaching is the hunting and harvesting, taking a wild plants or animal such as through hunting, harvesting, fishing or trapping.

Q) Why poaching is Done?

→ Poaching is done for large profits gained by the illegal sale or trade of animals parts, means pets.

→ Exist because their is a demand for their product caused by a lack of education on this regraded for the law against the buyer.

Q) How Does Poaching Affects The Environment?

→ Poaching or illegal hunting causes animals endangered of being extinct. If more animal become extinct there is a disruption in the food chain and that will cause major problem in our ecosystem.

Solution :-

→ Educating the public about the importance of biodiversity.

→ Intensive monitoring & tracking.

→ Demand reduction.

→ Poaching deterioration.

→ Subsitence Commercial.

3) Man Wild Life Conflicts :-

→ Increase in man wild life conflicts is due to resource limitation. (i) space (ii) Food

→ It is also due to increase in population of human being loss of forest decreases in quality of forest and development activity.

Solution :-

→ Reduce human population and expansion of urbanisation and industry.

→ Educating the public about the importance of biodiversity.

BIODIVERSITY OF CONSERVATION

In situ	Ex-situ
→ Protected Area (e.g.: a) National Park, b) Sanctuaries, c) Biosphere)	→ Seed Banks (e.g.: a) Genes Banks)
→ Sacred Forest & Lakes	→ c) Animal Translocation (e.g.)
→ Conservation and protection of biodiversity is natural habitats.	→ Botanical garden → Zoological garden → Conservation of selected plants and animals outside their habitats.
→ Helps in recovering population helping to develop their distinctive features.	→ Helps in recovering population in order to prevent the estimation.
→ The endangered species are protected from predators.	→ The endangered species are protected for all adverse factors.

Ch-5

ENVIRONMENTAL POLLUTION

Pollution → When harmful substances contaminate into the environment is called pollution.

(i) Air Pollution :-

When a harmful substance contaminate into the air is called air pollution.

(OR)

Air pollution is the introduction of chemicals, particulate matter or biological material that cause harm or discomfort to humans or other living organisms or damages the natural environment into atmosphere.

AIR POLLUTION CAUSED BY :-

→ Industries
→ Automobile & Domestic Fuels
→ Fire
→ Smoking
→ High proportion of undesirable compounds
  * Carbon dioxide (CO_2)
  * Sulphur dioxide (SO_2)

Effects Of Air Pollution :-

→ Human Health → Acid rain
→ Animals → Respiratory Problem.
→ Plants

Q) How To Control Air Pollution ?

→ Maintain the distance between industry and residental area.
→ Plant more trees near about the industry.
→ The chimneys should be constructed tall in size so that the emission must be higher off in the environment.
→ The automobile must be design with emission control system.
→ The coal fuel should be replaced with gas fuel

(ii) Water Pollution :-

→ When any harmful substances contaminate into the water is called water pollution.
→ Water pollution is the contamination of water. This generally refers to the adverse changes in water quality usually as a result of human activity.

Water Pollution Caused By :-

→ Industrial Waste
→ Sewage
→ Mainly from household
→ Nuclear Waste
→ Oil pollution
→ Under ground storage leaks.

Effects Of Water Pollution :-

→ It affects the marine life and cause various diseases to aquatic life or kill them.
→ It causes water-borne diseases are typhoid, cholera, dysentry, jaundice.
→ Oil spill cause the major effect by killing the aquatic animals.

Control

→ Reduce your plastic consumption and reuse or recycle.
→ Properly disposal of chemical cleaners and not letting them to down the drain.
→ Nuclear waste must not be thrown in the water bodies.

(iii) Noise Pollution :-

Noise Pollution Caused By :-

→ Sound Box
→ Take off and Landing of Aeroplane
→ Bursting of Crackers
→ Sound of machines in the areas of industry and mining.

Noise Pollution Effects :-

→ Hearing Loss
→ High Blood pressure
→ Stress will be high
→ Sleep disturbance
→ Colour blindness

Q) How To Control Noise Pollution :-

→ Maintain the distance between airport and residental area.
→ No horn boards should be put on near school area.
→ We should talk less and work more.
→ The government should ensure the new machine are noise prove.

(iv) Soil Pollution :-

→ When harmful substances contaminate into the soil is known as soil pollution.

(OR)

It is the destruction of earth land substances through misuse of land resources by human activity.

→ Polluted land has deposit of liquid and solid waste such as garbage, paper, glass and plastic object.

Soil Pollution Caused By :-

→ Accidental Spills → Agricultural Particles
→ Industrial Waste → Oil and Fuel Dumping

→ Burried Waste

Soil Pollution Effects :—

→ Cause problems in the human respiratory system.
→ Cause problem in the skin.
→ Cause various kinds of cancer.
→ Agricultural production will be loss.
→ Reduction of economy.
→ Toxicity will be more.

a) How To Control Soil Pollution ?

→ Don't throw the garbage, paper, glass and plastic objects to the soil.
→ Tree should be planted everywhere.
→ Avoid using more fertilizer & pesticides for farming.
→ Water logging should be disposed immediately and avoid drilling land or underground water.
→ More and more land should brought under farming.
→ Reduction of population.

(V) Marine Pollution :—

→ When the harmful substances contaminate with the ocean is called marine pollution.

(OR)

The presence of undesirable material in the ocean environment directly / indirectly by human that adversely affect biological resources and human beings is called marine pollution.

Marine Pollution Caused By :—

→ Oil & petroleum
→ Toxic chemical
→ Hazardous Waste
→ Raw Sewage
→ Agricultural run-off
→ Air Pollution.

Effects Of Marine Pollution :—

→ Oxygen depletion
→ Toxicity
→ Higher Acidity
→ Effects on sea life.
→ Effects on animal.
→ Effects on human being — Health, Business

Q) How To Control Marine Pollution?

→ Introduction of sewage treatment plants to reduce BOD (Biological Oxygen Demand) of final product before discharging into sea.

→ Be carefull with the chemicals.

→ Don't flash away harmful particles.

→ Ensuring no garbage is released into the oceans.

→ Load on top systems reduce oil pollution clean with high pressure jets of camera.

(vi) Thermal Pollution :-

Thermal pollution is an excess heat that create undesirable effects over long period of time.

(OR)

Thermal pollution is the increase of temperature caused by human activity.

→ Include in the thermal pollution should also be increase in temperature in areas labs of concrete or vehicles generally in cities.

Cause of Thermal Pollution :-

→ Industrial Effluents → Automobiles
→ Coal Fire power plants
→ Nuclear power plants
→ Hydro-electric power plants
→ Domestic sewage.

Effects of Thermal Pollution :-

→ Change dissolved oxygen.
→ Economic and environment damage.
→ Decreate in productivity of water body.
→ Death of animals.
→ Increase in toxicity.

Q) How To Control Thermal Pollution ?

→ Burn less coal, oil or gas.
→ Plant as many trees are possible.
→ Reduce ~~machine~~ machine friction.
→ Reduction of increase in population.
→ Cooling tower → this is used as coolant wet cooling tower, dry cooling towers.

(vii) Nuclear Hazards :-

→ The radiation comes from ultra-violet ray, visible cosmic rays, microwave radiation.

→ The hazards comes from x-ray amount for 95% of out radiation expose other than cosmic rays.

→ In US about 53 powerplants were canceled between 1980 & 1984 due to enormous radiation danger.

Causes of Nuclear Hazards :-

The source of radio activity are both natural & manmade.

* The Natural Sources Include :

→ Cosmic rays from outer space the quantity depends on altitude and latitude. It is more at higher altitudes and latitudes.

→ Emission from radioactivity materials from the earth crust.

* Man-made Sources Include :

→ Mining and processing of radioactivity areas.

→ Rise of radioactive material in nuclear power plant.

→ Use of radio active is touch in medical, industrial and research application.

→ Use of radioactive materials in nuclear weapons.

Effects of Nuclear Hazards :-

→ Internal bleeding and blood vessel damage, show red spots in the skin.

→ Unborn children are vunerable to brain damage or mental retardation affects at early prenancy, eye sight.

→ Accute radiation, sickness in mark by vomiting, bleeding of gums, mouth cancer.

Q) How To Control Nuclear Hazards ?

→ Nuclear devices should never be exp.. in air.

→ In nuclear reactor, closed cycle coolant system with gaseous coolant may be used.

→ Containments decreases may be employed to decrease the radioactive emission.

→ Production of radioisotopes should be minimized.

→ Minimum no. of instalations should be commissioned.

→ Use of high chimney, Ventilation at working place where radiation is high.

SOLID-WASTE MANAGEMENT

Defination :- Waste which is affective and comes from the city, Town or village as domestic and biomedical waste is termed as solid waste.

Solid Waste Management :-

The process of transportation, storage, collections and processing solid waste in a protective and economic manner is termed as solid waste management.

Solid waste Causes :-

1) Overpopulation : Pollution natural increases with the growing no. of portions produce more waste.

2) Packaging : Packaging of most of the gifts is considered as the source of solid waste pollution as most of these are non-biodegradable.

3) Poor implementation of environmental protection laws, urbanization.

4) Lack of awareness & lack of participation from the public, the problem of solid waste has increased at the highest level.

5) Growth in consumption leads to consumption of items or other hand waste production.

Solid Waste Pollution Effects :-

1) Contaminates water and air, resulting into desires of human beings.

2) Mosquitoes born in the stagnant water due to waste chocked in the drains.

3) Decomposition of solid waste spreads obnoxious odour in the air, thus polluting it.

4) Burning of waste especially plastic, obnoxious fumes in the air.

5) Garbage and decomposed waste helps many harmful species to born in them.

6) The infected water supply also leads to large scale epidemic.

Control Majors of Urban & Industrial Waste

→ The main purpose of solid waste management is to minimize the adverse effects on the environment.

→ The steps involved are —

a) Collection of Solid Waste :- Collection of waste includes gathering the waste, transporting it to centralise location and then moving it to the side of disposal.

b) Disposal of Solid Waste :- Before the final disposal of solid waste, it is process to recover the usable resources solid waste disposal system.

c) Utilisation of Solid Waste :- A solid waste can be properly utilised to collect the benefits such as —

* Conservation of Natural Resources
* Economic development.
* Generate many useful products.
* Employment opportunities.
* Control of air pollution.

Role of Individual in Prevention of Pollution

* We should plant more trees.
* Reduction of increase in population.
* Reduce deforestation.
* Use natural gas than coal.
* Use less fertilizer and pesticides.
* Try to avoid asking for plastic carry bag.
* Don't litter on the roads and surrounding.
* Use water, energy resources efficiently.
* Recycle all news paper, glass, aluminium and other items accepted for recycling.
* Use echo-friendly products.

DISASTER MANAGEMENT

Disaster :- Disaster is an event which is —

→ generally unpredictable, happens instantly or without giving enough time to react.

→ Affecting a large no. of people disturbing normal life and loss of life and property.

→ Disaster classified into two types —

(i) Natural Disaster — Floods, Earthquake, Cyclone, Drought, Landslides

(ii) Manmade Disaster

→ Disaster occur in varying from
* Some are predictable in advance.
* Some are annual or seasonal.
* Some are sudden and unpredictable.

Time Evaluation of Natural Disaster :-

Earthquake	Second
Cyclone	Day
Floods	Day
Drought	Month / Year

(i) Earthquake

Causes :-

→ Soil failure.
→ Ground Shaking : Back and forth motion caused by the passing of hybrotory webs.
→ Surface fault raptures such as cracks, vertical shifts.
→ Effect on Building : Due to vibration on surface plate move the earth building, set in motion may occur damage to the building.
* Each building response differently according to its construction.

Protection Measures

→ The building should have a simple rectangle plan.
→ Long walls should be separated by main reinforced concrete columns.
→ Large building having plants with shape like T, U
→ Doors and window opening in walls, probably in small more centraly located.

(ii) Landslides

Land slide occurs because of the interplay of several factors i.e., —

a) Natural Factor :- Intensity of rainfall, poor drainage, steep slopes.

b) Manmade Factor :- Deforestation leads to soil errosion.

Effects :-

→ They block the roads and lead to problem of communication. They cause disruption of communication.
→ Landslides are very harmful for life and property.
→ Economical Losses.
→ Landslides are often blocks reverse and

result in dangerous floods.
→ Landslides also affect production of crops.

Protection Measures / Landslide Management

→ Public awareness should be necessary.
→ Mining process should be reduce.
→ Soil can be hardened using thermal treatment.
→ Accumulated water should be properly drained.
→ Reduction of deforestation.
→ Resident should not be build closed to hanging mass of hill.

(iii) Floods

The flood is an overflow of water that submerge or down land.

Causes :- Heavy rainfall
→ Poor Natural Drainage
→ Landslides

Effect :- Loss of life
→ Damage To Infrastructure
→ Economical losses
→ Problems related to power transmission.
→ Loss of Communication.

Protection Measures of Flood Management

→ Public awareness.
→ Dams can be built and maintain over time.
→ Flood forecasting station around the river.
→ Disaster management programme in flood given area.
→ Water ways given to floods are often managed carefully.

(iv) Cyclone

Cause :- Cyclones are caused by atmosphere disturbance around a low pressure area distinguished by swift/sudden and often destructive air circulation.

Effects :- Communication & transportation will be loss.
→ Economical Losses.
→ Destroyed crops.
→ Infrastructure destroyed.
→ Damage of Building and property.

Protection Measures of Cyclone Management

→ Public awareness
→ Tree plantation on coastal belts.
→ Installation of better warning system.
→ Construction dams, dykes and wind breaks.

Selected Questions

Unit – I

Q) Difference between environment and environmental studies. 2

V.I Q) Describe the scope and importance of environment studies. 5

Q) Describe about the need for public awareness in environmental studies. 5/7

Unit – II

Natural Resources

Q) Define natural resources. 2

Q) Difference between renewable and non-renewable resources. 5 or 7

Q) Describe about the natural resources and associated problems. 5

Q) Define deforestation. 2

Q) Describe about the deforestation and its cause and effect. 5 or 7

V.I Q) Describe about the world food problems. 5

Q) Describe about the alternate energy resources. 5 or 7

Q) Define Soil erosion. 2

Q) Describe about the soil erosion and its cause and effect. 5 or 7

Q) Define desertification. 2 (with causes).

Q) Describe about the role of individual in conservation of natural resources.

Ch – 3

System

Q) Define ecosystem. 2

Q) Define ecology. 2

V.I Q) Describe about the structure and function of ecosystem. 5 or 7

Q) Describe about the producer, consumer and decomposer. 5 or 7

Q) Define ecological succession. 2

Describe about the types of ecological succession. 5 or 7.

Q) Describe about the food chain (diagram). 5 or 7

V.I Q) Describe about the ecological pyramid. 5/7

Q) Describe about the structure & function of forest ecosystem. 5/7

Ch-4

BIODIVERSITY & ITS CONSERVATION

Q) Define Biodiversity. [2]

V.I.

Q) Describe about the value of biodiversity. [5 or 7]

V.I.

Q) Describe about the threats to biodiversity. [5]

Q) What do you mean by poaching of wildlife. [2]

V.I.

Q) Difference between In-situ and Ex-situ. [5]

C.W. 24/8/19

Ch-5

ENVIRONMENTAL POLLUTION

Q) What is pollution? [2]

V.I.

Q) Describe about the air pollution, causes, effect and how to control air pollution? [5 or 7 or 10]

Q) Describe about the soil pollution, causes, effect and how to control air pollution? [10]

Q) Describe about the nuclear hazards, causes, effects and how to control nuclear hazards? [10]

Q) Describe about the water pollution, causes, effects and how to control water pollution. [10]

Q) Define solid-waste management. [2]

V.I.

Q) Describe about the role of individual in prevention of pollution. [5 or 7]

Q) Define disaster management. [2]

Q) Define earthquake. [2]
(Causes, effects)

Q) Describe about the landslides. [2]

Q) Define flood, causes and effect. [2]

Ch-6

Social Issues And Its Environment

① Sustainable Development
② Unsustainable Development.

Imp
Q) Difference between ① and ② L2

Important Questions

1) Difference between sustainable and unsustainable development. L2
V.Imp
2) Describe about rain water harvesting. L5 or 7
3) Define watershed management. L2
4) Describe about the global warming. L5
5) Define acid rain. L2
6) Describe about the depletion of ozone layer. L5 or 7
7) Describe about the air (prevention & control) Act.
8) Describe about the water (prevention & Control) Act. L5 or 7

Sustainable Development

The sustainable development is a process of betterment of life in all sectors of society i.e., social, economic, educational, health, national security, food, etc.

Objectives :-
→ Reduction of population increases.
→ It should increase forest cover.
→ It should prevent pollution.
→ It should prevent soil erosion.
→ It should protect our biodiversity.
→ It should eliminate poverty and slums.

Unsustainable Development

The unsustainable development is a process of without betterment of life in all sectors of society i.e., social, economic, educational, health, national security, food, etc.

From Unsustainable To Sustainable Development

The development thinking about it affect on the biotic and abiotic factors leads to sustainability.

Progress or improve in sustainable development process.

e.g. Use of coal and fossil fuel in proper manner.

URBAN PROBLEM RELATED TO ENERGY :-

→ Cities are the main centres of economic growth, trade, education, employment and now 50% population lives in urban areas. So, densely populated consume more resources need more energy.

→ In modern housing, the use of brick, concrete, alluminium and glass makes building hot and requires large no. of fans, or huge air conditioning unit so high rise building consume huge amount of electricity to operates lifts, pump water and illumination.

→ Modern cooking is done with kerosene, natural gas, LPG or electricity. This consume large no. of fossil fuel.

→ Urban transport causes excess no. of cars to be on the road, congestion waste of time and air pollution and respiratory diseases.

WATER CONSERVATION

→ Spend the least amount of times in shower.

→ Close the water tap while brushing yours teeth.

→ Don't use too many dishes.

→ Don't turn water pipe while washing a car.

→ Use brooms to clean the house not the water pipe.

→ Wash the foods and vegetables in one pan instead of washing separately.

RAIN WATER HARVESTING

> Rain water harvesting is a process of collecting conveying and storing water from rainfall in an area is called rain water harvesting.

> Rain water is stored in tanks, reservoirs, underground storage water.

Advantages :-

→ Rain water harvesting captured stored for direct use (irrigation, production, washing, drinking water.)

→ Recharging ground water.

→ Potentially provide improved quality of water.

→ Domestic and live stock consumption.

→ Improve living condition.

→ Reduce soil erosion risk.

→ Reduce flood risk.

Disadvantages :-

→ In terms of complex construction, there is a requirement for high cost trained professional.

→ Maintenance cost may be the monitary burden.

→ If not maintain properly then it can cause various problem in terms of algal or bacterial growth.

→ Tanks if not constructed properly might result in leakage and metal tanks may also lead to problem such as corrosion harms the water quality.

→ All these factors might prove harmful and result in various kind of health issues.

WATER SHED MANAGEMENT

Watershed :— A watershed is defined as any spatical area from which rain or irrigation water is collected and drained through a common point.
A watershed can be very large or very small such as 20acre watershed that draines to a pond.

Watershed Management :—
The process of creating and implementing plants programs and projects to sustain and enhance watershed functions that affect the plants, animals and human communities within a water shed boundry.

Objectives of Watershed Management :—

→ Reduce erosion risks.
→ Reduce flood risk.
→ Manage and utilise the run off water for useful purpose (irrigation production, washing, drinking water).
→ Recharge ground water.
→ To increase infilteration of rain water.

RESETTLEMENT AND REHABILITATION OF PEOPLE

ITS PROBLEM & CANCERN

① Large projects like mines, high ways or even the notification of a national park. Dams will display large no. of people.
② It is expected that such people would be even good and land for resettlement.
③ In an over populated country such as ours there is never enough arable land available.
④ Resettlement seldom take place in practise and some time take decades often only waste land is offered.
⑤ Large dams have been great behind the eviction of people.
⑥ Basically tribal people are often the most significant victims of eviction.

ENVIRONMENT ETHICS : ISSUES & POSSIBLE SOLUTIONS

> Environment Ethics deals with issues that are related to how we utilised and distribute resources.
> In environment ethics, a portion is banned to cut trees.

> From this we can say that a person who makes an effort for keeping the environment clean and stainless can only be consider as a person of environment ethics.

> It is quite clear that man misuses and destroys the natural resources and pollutes the environment lavishly than any other living organisms.

> For controling the environmental pollution we must have some rules and regulation which are known as rules for environmental protection.

Climate Change :—

Some change in weather / climate condition is badly / bestly.

It may be affected or may not be affected.

GLOBAL WARMING

Causes :—

> Human activities involving industrialisation and population growth has greatly increase energy demand in the last 100 year.

> This has resulted in massive increase is fossil fuel conservation i.e., petroleum, coal, etc.

> Burning of fossil fuel result in carbon dioxide emission and other greenhouse gases have increased by 31% in this period.

> With increasing deforestation this CO_2 has now where to go.

> This is the main reason behind global warming and rise in earth temperature.

HOW TO CONTROL GLOBAL WARMING

> Reduction of population increase.
> Reduce deforestation and plant more trees.
> check the over use of CO_2.
> Clean development mechanisms in industries.
> Use alternative sources of energy.

ACID RAIN

Causes :—

> Burning of fossil fuel result in oxide of sulphur (SO_x) and nitrogen (NO_x).

> These react with water vapour in the air to form sulphuric and nitric acid they are carried of in the atmosphere and returned to the earth in the form of acid rain.

Effects :—

> Acid rain dissolves and washes away nutrients in the soil.

> Acid rain affect reverse and wet land, aquatic land, disturbs and destroy entire ecosystem.

How To Control Acid Rain?

> Reduce coal by natural gas.
> Reduce emission at the source itself.
> We use low Sulphur Coal.

Depletion Of Ozone Layer

Causes :-

> Ozone (O_3) is a poisonous and danger pollutant at ground level.
> A layer of ozone (is the mixture of oxygen) exist in the stratosphere (22-50) km above earth surface.
> Ozone molecules reflects the ultra-violet rays coming from the sun and protects life on the earth.
> Chemical such as chlorofluoro carbon from refrigerator and erosal, propellants release Chlorine that combines with ozone. Thus, only oxygen is left in the ozone layer and there is nothing to stop ultra-violet rays.
> The main cause of depletion ozone layer is chlorine.

Effects :-

This causes skin cancer, cataracts and other diseases, damage to plants, destruction of life & affect the natural resources.

How To Control ?

→ Minimize the use of iron and halogen.
→ Use CFC free chemical.
→ Reduce use of AC & refrigerator.

AIR (Prevention & Control Of Air Pollution)

> The government passed this act in 1981 to clean up our air by controlling pollution.
> Sources of our pollution such as industries, vehicles, power plant, etc. are not permitted to release particulate matter lead, carbon, monoxide, sulphur dioxide, nitrogen oxide, volatile organic compound or other toxic substances beyond a prescribed level.
> This act is created to take appropriate steps for the preservation of natural resources on the earth which among other things include the preservation of high quality air and ensure controlling the level of air pollution.

The Main Objectives of The Act :-

> To provide for the prevention, control of air pollution,
> To provide for the establishment of central and state boards with a view to implement the act.

> To confirm on the boards, the power to implement for provisions of the acts and assign to the boards, function relating to pollution.

WATER (Prevention & Control Of Water Pollution)

This act aims to prevent and control water pollution and maintain whole someness of water by establishing central and State pollution control board to monitor and enforce the regulation.

Main Objectives :—

→ Prevention & control of water pollution.
→ Maintaining the whole someness of water.
→ Establishment of boards for the prevention & control of water pollution.

Function Of Central Board

→ To promote clearness of streams and wells
→ Resolve disputes between state.
→ Provide technical assistant and guiding.
→ Organise comprehensive program.
→ To establish laboratories.

Function of State Board

→ Planning a comprehensive program.
→ Conducting investigation and research.
→ Inspecting waste water treatment plants.
→ Prescribing standards for sewage.
→ To establish laboratory.

Ch-7

HUMAN POPULATION & THE ENVIRONMENT

→ Population and environment are related.

→ Finally it is the people who consumed the natural resources.

→ The increase in population have distributed the balance in the environment.

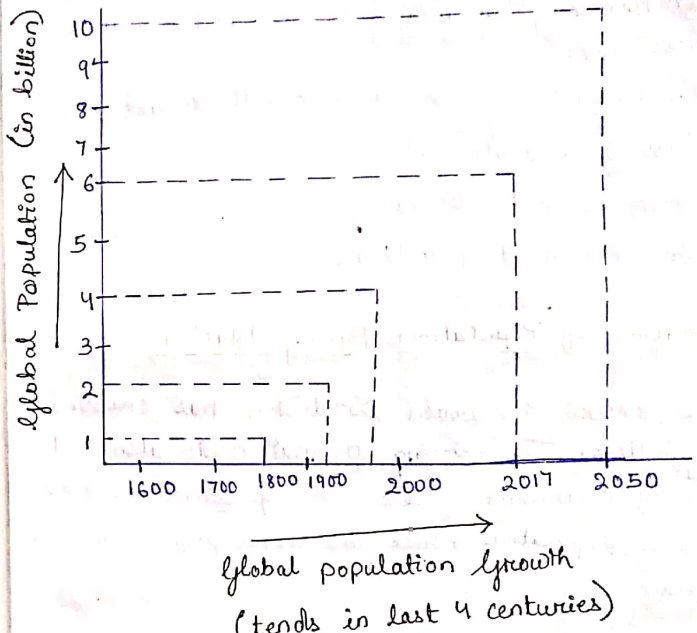
POPULATION GROWTH (World)

→ The rapid growth of the global population for the past 100 years results from the difference between the rate of birth and death.

→ In 1800, the global population was about 1 billion, it took 130 year (1930) to reach 2 billion but the population list to 4 billion within 45 years (1975).

→ Now we have already crossed 6 billion and may have to reach about 10 billion by 2050 as per the world bank calculation.

GLOBAL POPULATION GROWTH TRANDS



CAUSES OF RAPID POPULATION GROWTH

→ It is due to the decreases in death and increases in birth.

→ Valiability of antibiotic, immunization increase food production, clean water, air, etc decrease the famine related death and infant mortality related to help their parent.

→ In agricultural based country the children are related to help their parent in the field

EFFECTS OR PROBLEMS OF POPULATION GROWTH

→ Increasing demands for food and Natural resources.
→ In adequate housing and health issues.
→ Loss of agricultural land.
→ Unemployment increases.
→ Environmental pollution.

Variation Of Population Among Nation :—

→ At present the world population has crossed 6 billions. The existing population is also not evenly distributed, less develop countries have 80% population while the developed countries have only 20%.

→ Lesser develop countries (Africa, Asia, Saudi Arabia, India, Pakistan, etc). have 80% of the total population and less than 20% of the total land area.

→ In the more developed countries (USA, Japan, UK, Australia, Cannada, France, Itali, etc). the population increases at the rate of less than 1% per year but in the lesser developed country it is greater than 1% per year. but in the lesser developed country it is greater than 1% per year.

→ Kenya is the fastest population growing country where 20 million people are residing.

→ China and India population was above 1000 million in 2000 year. It shared about 1/3rd of world population.

→ Europe and north America accounts for 14% of the world.

The rapid increase in population due to low death rate and high birth rate is termed as population explosion.

The human population is not increasing at a uniform rate in all part of the world.

Lesser Developed Country		More Developed Country	
Country	Dubbing Time	Country	Dubbing Time
India	28 years	USA	87 years
Turkey	28 years	UK	231 years
Nigeria	27 years	Italy	99 years
Saudi Arabia	25 years	France	117 years
Pakistan	25 years	Japan	58 years

CAUSES :—
→ It is due to the decrease in death and increase in birth.

FAMILY WELFARE PROGRAMME

→ It was implemented by the govt. of India as a voluntary program.

→ It provide educational and clinical services that help couple to choose how many children to have and when to have them.

→ It provides the information on birth spacing, birth control and health care for pregnant women and infants.

→ It also have reduced no. of illegal abortion per year and decrease the risk of health from pregnancy.

OBJECTIVES

→ Slowing down the population explosion by reducing the fertility.

→ Pressure on environment due to over-exploitation of natural resources.

Environmental & Human Health

⇒ Human health and environment are two inseparable entity. Generally a physically fit person, not suffering from any disease, is called healthy person.

→ If environmental will decrease then more human health problem increases.

Factors Influencing Human Health :-

① Nutritional Factors
② Biological Factors
③ Chemical Factors
④ Psychological Factor

→ The environmental degradation is caused by increase in the world population.

→ Millions of people die every year due to the illness caused by environmental pollution.

Chemical Hazards and Their Health Effects :-

Sl. No.	Chemical Hazards	Health Effects
1.	CO_2, oxygen of sulphur, Nitrogen.	Asthma, Lung diseases
2.	Industrial Effluents	kill cells cause cancer and death.
3.	DDT (Dichloro Diphenyl Trichloro-ethane.	Affect of Food chain
4.	Heavy metals like Hg (mercury), Pb, Fluoride and nitrate	Contaminate water causing various diseases.
5.	CFC (Chloro Fluoro Carbon)	Skin Cancer.

Prevention Measure Of Health Effects :-

→ Always wash your hand before sitting for food.

→ Cut short and clean your nails systematically.

→ Maintaining the skin, teeth, hair of our body

→ Drinking chemically treated and filtered water.

→ Eat food always while it is in hot condition

→ Before cooking, wash the vegetables and with clean water.

→ Do physical exercise to have proper blood circulation in the body.

Human Rights

→ Human rights are the fundamental rights which are process by the all human being irrespective of their caste, nationality, sex and language.

→ This right cannot be taken away by any legislature or any govt. at every citizen must enjoy certain rights and also have certain duty towards the country.

Universal Declaration Of Human Rights (UNDHR)

It was established in the year 1948 by UN. Some of the main declaration of human rights which are globally accepted as follows —

> Human Rights To Freedom

* Freedom to express his views.
* Freedom to assemble to express their view.

> Human Rights to Property

* Rights to earn property anywhere.

> Human Rights To Freedom Of Religion

* All religion are equal before law. So, any one can follow any religion according to his wish.

> Human Rights To Culture & Education

* Minerality communities like Christian, Muslims have their own rights to conserve the culture, language and to establish their educational institution.

> Human Rights To Constitutional For Remedies

* Any one can go to the court for their rights.

> Human Rights To Equality

* All are equal before the law, no discrimination on the ground of the religion, sex, place of birth

, equal opportunity for employment.

> Human Rights Against Exploitation

* Human rights to get sufficient healthy food, safe drinking water and healthy food.

> Human Rights To Good Health

Physical and mental health.

Value Of Education :-

→ Education is nothing but learning through which knowledge about a particular thing can be acquired.

→ It should be necessary for the protection of the environment.

Concept Of Value Education

→ Why and how can we use less resources and energy?

→ Why do we need to keep our surrounding clean?

→ Why should we use less fertiliser and pesticide in farm?

→ Why should we save water and keep our water resources clean?

→ What is the necessarity to separate the garbages into degradable and non-degradable.

All these issues are linked to the quality of light and go beyond simple economic growth. They till with a love and respect for nature.

Objectives Or Need Of Value Education

→ To improve integral growth of human being

→ To create attitude and improvement towards sustainable life style.

→ To increase awareness about our national history, our culture, heritage, constitutional rights, National integration, community development and environment awareness.

→ To create and develop awareness about the values and their significant role.

→ To understand about our National environment in which how land, air, water are interlinked.

Protection Role Of Information Technology In Environment

→ Information technology means collection, processing, storage and dissemination of information.

→ A number of software has been developed to study about the environment.

→ The internet facilities, information through satellites www and GIS provide us upto data information of various aspects of environmental and weather.

Softwares For Environment Education

> Remote Sensing :-

→ Remote sensing refers to any method, which can be used to gather information about an object without actually coming in contact with it.

→ Force field like acoustics, gravity, magnetic, electromagnetic, etc. could be used for remote sensing.

→ Presently the term 'remote sensing' is used more commonly to denote identification of earth surface by detecting the characteristics of the EMR, is reflected / emitted by the earth.

> Remote Sensing System For Resource Management

→ Remote sensing data / images have been used to derive thematic information on various Natural resources and environment.

→ The type of level of information extracted depends on the expertise of the analyst and what he is looking in the data.

→ E.g:- To derive information on vegetative cover, water bodies, land use, etc.

Application of Remote Sensing

1) In Agriculture :-

→ India being agriculture based country require judicious and optimal management of both land and water resources along with the use of high yielding variety seeds, optimal fertilizer input etc, RS can provide valuable information for land and water management.

2) In Forestry :-

→ Sustainable forest management requires reliable information on the type, density and extent of forest cover, wood volume and biomass, forest fire, pest and disease, enroachment etc, RS provides all such info Clearly.

3) In Land Cover :-

Spatial info on land use is required at different scales depending on use RS data is converted to map the spatial resolution plays a role on the scale of mapping.

4) Water Resources :-

RS data has been used in many applications related water resources such as surface water body mapping, ground water targetting wet land, flood monitoring, run off modelling, snow cover monitoring, irrigation water management, etc.

Database

Database is the collection of inter-related data on various subjects. In the computer the information of the data base is arranged in a systematic manner that is easily manageable and can be very quickly retrieved.

Application Of Database

1) Ministry Of forest and environment :-

→ They are compiling the database on various biotic communities.

→ Databases is also available for diseases like HIV/AIDS, malaria, fluorosis, etc.

2) National Management Information System :-

They compiled a database on R&D projects along with information about research scientist and personnel involved.

3) Environmental Information System :-

It functions in 25 centres all over the countries. They generate a network database in areas like pollution control, clean technologies, remote sensing, biodiversity, environment management, desertification, etc.

Graphical Information System (GIS)

GIS is a technique of super imposing various thematic maps using digital data on a large number of inter-related aspects.

Application Of GIS :-

→ Different thematic maps containing digital information on various aspects like water resources, soil type, forest land, crop land, grass land are

supposed to impose on a layer form in computer using software.

→ Interpretation of polluted ones, degraded lands can be made based on GIS.

→ GIS can be used to check unplanned growth and related environmental problems.

Satellite Data

→ Satellite data helps in providing correct and reliable information about forest eco-system.

→ Provides information like monsoon, ozone layer, depletion, smog, etc.

→ Info about new reverse of oil, mineral, etc can be discovered.

World Wide Web (www)

More current data is available on WWW.

Importance on line learning centre.

1. www.mmhe.com/environmentalscience
2. Multimedia digital content manage (DCM) in the form of CD-ROM.

Application :-

→ These online learning centre provides the current and relevant information on principles, problems, queries on application of ES.

→ It has digital files of photos, powerpoints lecture presentation, animations, web exercises.

They are useful to both student and teachers of environment studies.

Role of IT in Human Health Protection

IT plays a key role in human health. It has changed the human life style. The health service technology mainly involves three system.

They are —

1. Finance & Accounting
2. Pathology
3. Patient administration : Clinical System.

Application of IT in Health Services

→ The data regarding birth and death rates, immunization and sanitation program are maintained more accurately using IT package.

→ It helps the doctor to monitor the health of the people effectively.

→ The information regarding the outbreak of epidemic diseases can be conveyed easily.

→ On line help of expert doctors can be consulted to provide better treatment and services to the patient.

→ With a control system the hospital can run effectively.

→ Drugs and its replacement can be administered efficiently.

Important Questions (Ch-7)

Q) What are the causes and effects of population growth. [2]

Q) What do you mean by human rights. [2]

Q) Describe about the value of education in environment. [5]

Q) Describe about the role of IT in human health protection. [5]

Q) Describe about the protection role in IT in environment. [5]