

ENVIRONMENTAL → 5 June (Environmental day)

(1) Definition and Scope of environment studies

→ It is the combination of all living and non-living things which are found around us.

OR
All the conditions and their effects which affect the human life is called Environment.

OR
All the circumstances, object by which is surrounded by another.

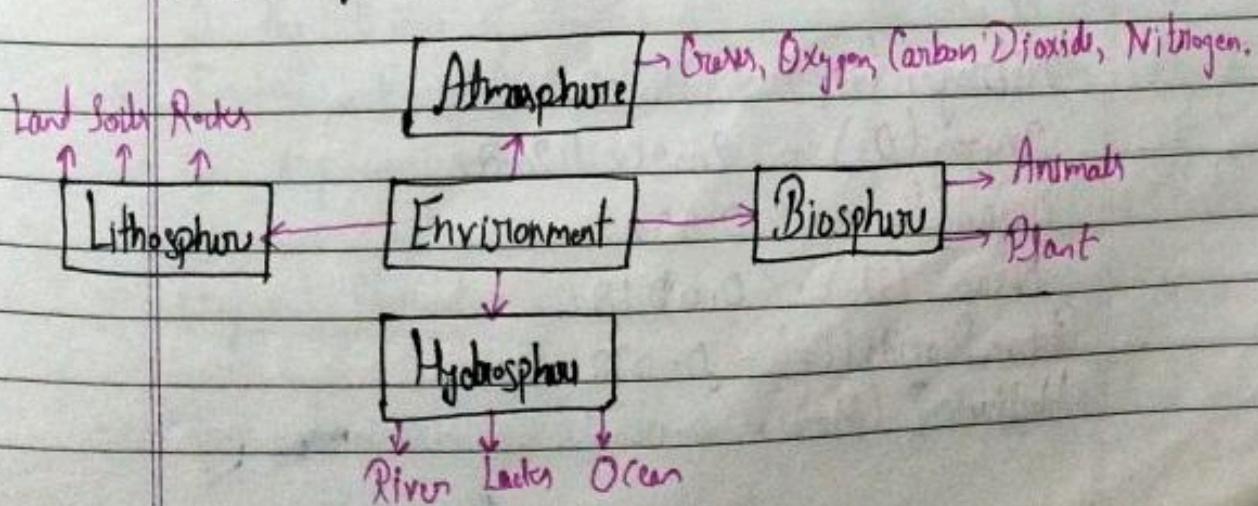
Living Things (Biotic)

→ Animals, Plants, Birds, Fish and Human Beings.

Non-Living things (Abiotic)

→ Water, Sunlight, Rock, Air, Soil, Desert.

Function of Environment



(Q)

Scope / Function of Environment

1. Provide's the Supply of Resources

⇒ Environment of Resources for Production its include both renewable and non-renewable resources.
Ex. Wood for Furniture, Soil, land.

2. Sustain Life

- ⇒ The environment includes Sun, Soils, Air which are essential for human life.
- ⇒ It also provides genetic and biodiversity.
(Creation)

Atmosphere

→ Atmosphere majorly contains troposphere & stratosphere.
→ Based of gases in environment are as follow in percentage.

3 Nitrogen (N_2) → 78.08%

$\frac{3}{2}$ Oxygen (O_2) → 20.95% / 20.8%

Oxygen (O_3) → 0.93%

Neon (Ne) → 0.0018%

Carbon Dioxide (CO_2) → 0.038%

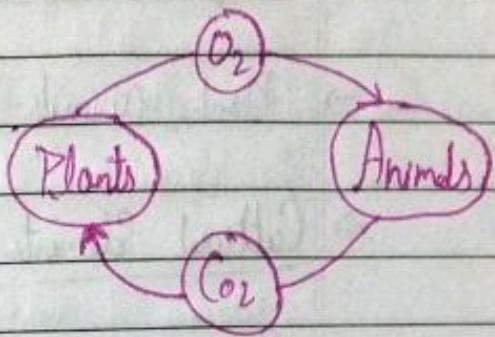
Helium (He) → 0.0005%

Methane (CH_4) \rightarrow 0.00017%

Q1. What are the process developing the Oxygen & Carbon dioxide

\rightarrow Oxygen Carbon dioxide Cycle

\rightarrow CO_2 Increase $\xrightarrow{\text{Global}}$
Warming Increase $\xrightarrow{\text{Global}}$



Photosynthesis Reaction

\rightarrow In the presence of Sunlight the plant absorb carbon dioxide & produce oxygen with the help of Water & energy.

(3) Multidisciplinary Nature of Environment Studies

\Rightarrow Environment Studies is multi-disciplinary because it comprises various branches of studies like chemistry, physics, medical science, life science, agriculture and public health. It is the science of physical phenomena in the environment.

\rightarrow Environment studies deals with every issue that affects an organism.

\Rightarrow Physical Element -

\rightarrow Space, landforms, water bodies, climate, soil, rocks and minerals

They determine the variable character of human habitat
in opportunity as well as limitation.

→ Biological Elements

→ Plant, Animals and human being, the biophere

→ Cultural Elements

→ Economic, Social and Political elements are essentially
manmade features.

Sope of E.S (Environment Studies)

→ The scope of environment studies is wide and
with area like.

i) Conservation of natural resources

ii) Pollution of the surrounding

iii) Controlling pollution

iv) Social issue and many more.

1) Developing an awareness and sensitivity to the total
environment and its related problem

2) Motivating people for active participation in environmental
protection and improvement

3) Developing skills for active identification and development of
solution to environmental problems.

(ii) Evaluation of Environmental Programs in term of social, economic, ecological and arithmetic factors.

(iii) Sustainability

- It is the ability to the maintain certain Rate of balancing or labour balancing.
- It is the combination of three pillars
- 1. Environment 2. Social 3. Economy.

Environment

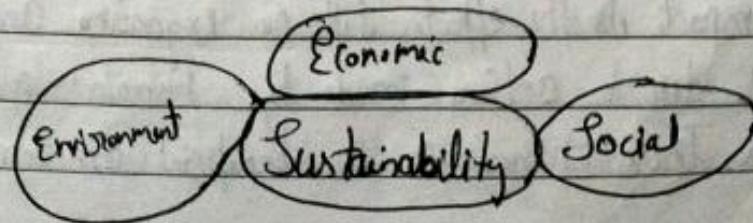
- Environmental protection laws 1986 all the biotic & abiotic reaction are found to developed the life cycle

Social

- Social equality is the key of developing Social Culture / environment

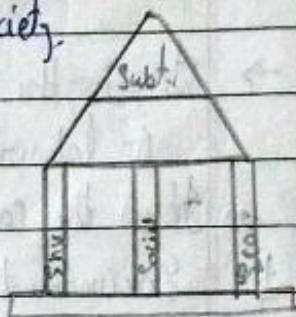
Economy

- For the development of economy of the country there are infrastructural development of cities, development of industrial infrastructure of effect of lab sustainability.



(5) Principle of Sustainability Development

- 1> Conservation of the eco-system or the environment.
- 2> Conservation of biodiversity of the planet.
- 3> Sustainability development of the society.
- 4> Conservation of human resources
- 5> Population control & Management.



Example of Sustainability

- ↳ Wind Energy, Solar Energy, Crop Rotation, Efficient water Resources, green space ability.

o Ecology and Environment

↳ Ecology is the study of organism and how they interact with environment around them.

→ Ecology is the study of inter-relationship of organisms with physical as well as biotic environments.

↳ A branch of Science concerned with the interrelationship of organisms and their environments.

Effect

→ Ecological impact is the effects left on organisms and their environment due to actions made by humans and natural occurrences. These changes can be beneficial or adverse to the

Ecosystem. An example of ecological impact can be seen in the case of invasive species.

Two main branch of Ecology

i) Autecology

→ Autecology is the ecology of an individual species and is also called species ecology.

2. Synercology

→ Synercology is the ecology of a population or community with one or more species and also called as community ecology.

Two type of Synercology

i) Aquatic Ecology

→ Deals with aquatic ecosystem examples Freshwater, Marine, etc.

ii) Terrestrial Ecology

→ Deals with the terrestrial ecosystem examples Forest, grassland desert, etc.

3) Applied Ecology

→ Wild-life management etc.

4) Ecology → Species, Cards, Ecosystem.

5) System Ecology.

- Concept of an ecosystem its structure and functions

→ An ecosystem is a structural and functional unit of ecology where the living organisms interact with each other and the surrounding environment. In other words, an ecosystem is a chain of interaction between organism and their environment.

Concept

→ An ecosystem is a geographic area where plants, animals, and other organisms, as well as weather and landscape, work together to form a bubble of life. Ecosystems contain biotic or living parts, as well as abiotic factors, or nonliving parts. Biotic factors include plants, animals and other organisms.

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Structure

→ Ecosystem structure is a network of interactions b/w abiotic and biotic components of the system. The biotic structure of the ecosystem is characterized by the composition of the biological community including species.

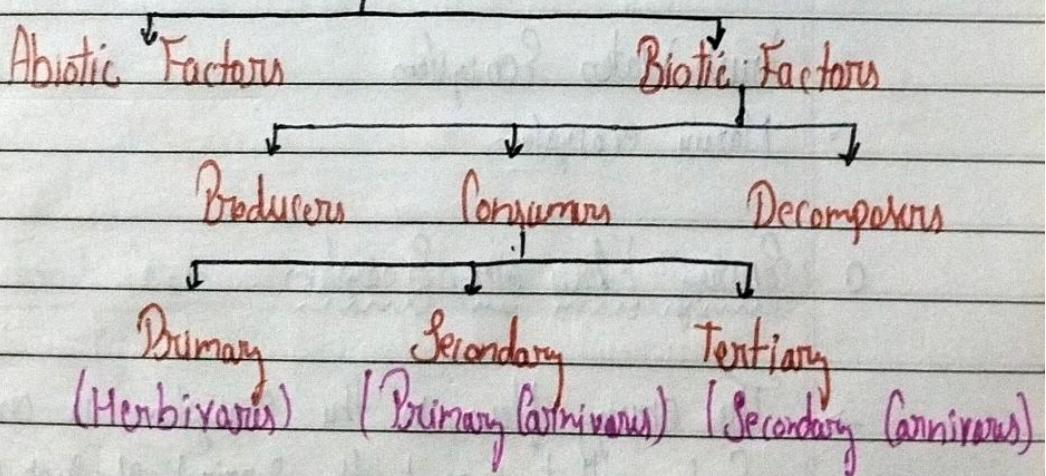
numbers, biomass, life-form, life-history and spatial distribution of species.

Function

- It provides an environment for producers to trap Sun's energy and provide food. It is responsible for the cycling of nutrients between biotic and abiotic components. The ecosystem supports life through bio-geochemical cycles and other biogeochemical processes.

‘Sir Arthur G. Tansley coined the term ecosystem in 1935’.

Structure of Ecosystem



Types of Ecosystem

- 1) Terrestrial Ecosystem
- 2) Aquatic ecosystem

1) Terrrestrial Ecosystem

- Terrrestrial ecosystem are exclusively land based ecosystems. There are different types of terrestrial ecosystem distributed around various geological zones.
- Forest ecosystem
 - Grassland ecosystem
 - Tundra ecosystem
 - Desert ecosystem

2) Aquatic Ecosystem

- Aquatic ecosystem are ecosystem present in a body of water.
- Fresh Water Ecosystem
 - Marine ecosystem

3) Energy Flow in Ecosystem

- The energy flow in the ecosystem is one of the major factors that support the survival of such a great number of organisms. For almost all organisms on Earth, the primary source of energy is Solar energy. It is amazing to find that we receive less than 50% of the Sun's effective radiation on Earth. When we say effective radiation, we mean the radiation, which can be used by plants to carry

out photosynthesis.

→ The energy flow takes place via the food chain and food web. During the process of energy flow in the ecosystem, plants being the producers absorb sunlight with the help of the chlorophyll and a part of it is transformed into chemical energy in the process of photosynthesis.

o Food Chain & Food Web

Food Chain → A Food chain describes how energy and nutrients move through an ecosystem.

Food Web → Food web is formed by many food chain operating together

→ Crores → Deer → Hawk ⇒ Food Chain
Producers Herbivores Carnivores

↳ Five Food Chain are possible in this Food Web

1. Grass → Grasshopper → Frog → Hawk
2. Grass → Grasshopper → Rat → Fox.
3. Grass → Rabbit → Fox
4. Grass → Rat → Snake → Hawk
5. Grass → Rat → Hawk.

o Ecological Pyramid and Ecological Succession

→ It is a graphic representation of the relationship between organisms at various trophic level in a food chain.

The basic of an ecological pyramid is biomass, energy and number. Just as the name suggest, ecological pyramid are in the shape of a pyramid.

Type of Ecological Pyramid

1) Ecology Pyramid of Number

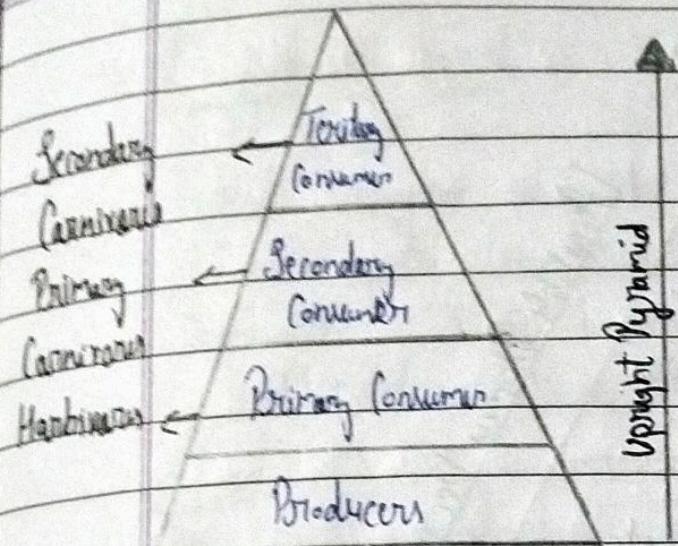
→ The important factor is the number of organisms is each trophic level. As we go up the levels of the pyramid the number of organisms decrease.

2) Ecology Pyramid of Energy

→ The energy pyramid is an upright pyramid that represent the flow of energy from the producer to the final consumer.

3) Ecology Pyramid of Biomass

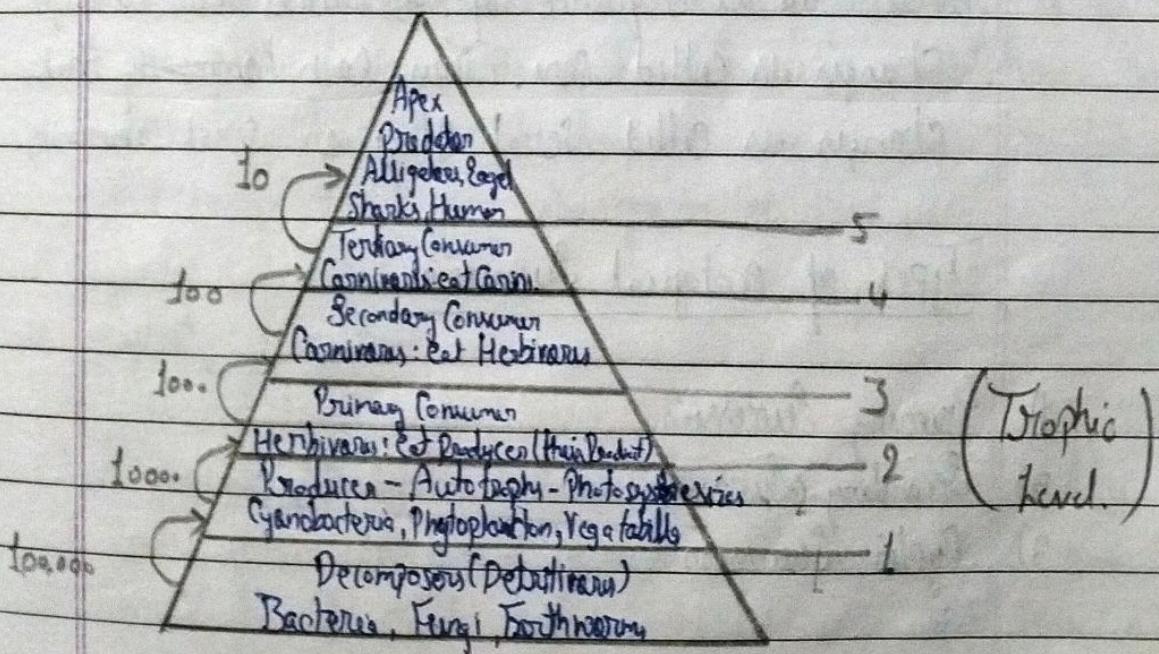
→ This pyramid represent the amount of the biomass of the organisms present at each trophic level. Biomass is nothing but the weight of the organism.



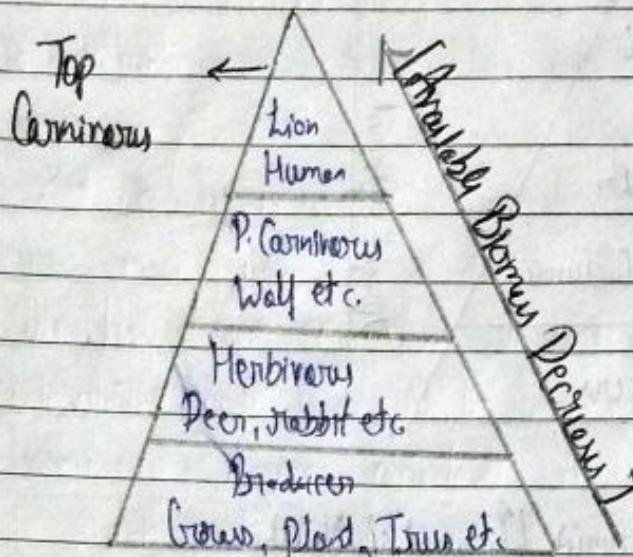
Ecology Pyramid / Pyramid of Number

- Ecology Pyramids are graphical representation of the trophic structure ecosystem.
- Trophic Level are the feeding positions in a food chain such as Primary producer, herbivores, Carnivores, Primary Carnivores etc.

Pyramid of Energy



Pyramid of Biomass



Upright pyramid of biomass in a terrestrial ecosystem

Ecological Succession

→ Ecological Succession is a series of changes that occur in an ecological community over time.

In an area, the sequence of communities that undergo changes is called Sere. Thus, each community that changes is called serial stage or serial community.

Types of Ecological Succession

- 1) Primary Succession
- 2) Secondary Succession
- 3) Cyclic Succession

Ecosystem of Forest

→ Forest ecosystem are areas of the landscape that are dominated by trees and consist of biologically integrated communities of plants, animals and microbes, together with the local soils and atmospheres with which they interact.

Types

- 1) Tropical Mangroves Forest
- 2) Temperate Rainforest
- 3) Seasonal Rainforest
- 4) Semievergreen forest
- 5) Moist / dry deciduous forests

Grassland Ecosystem

→ Grasslands are areas dominated by grass. They occupy about 20% of the land on the earth surface. Grasslands occur in both in tropical and temperate regions where rainfall is not enough to support the growth of trees.

Aquatic Ecosystem

→ An aquatic ecosystem include freshwater habitats like lakes, ponds, rivers, oceans and streams, wetlands, swamp etc and marine habitats include oceans, intertidal zone, reefs, seabed and

So on. The aquatic ecosystem is the habitat for water-dependent living species including animals, plants & microbe.

Desert Ecosystem

→ The hot desert ecosystem is basically found in Central America, South Asia, North America, Africa, Australia etc. There are extreme variations in temperature and soil is rough and harsh. This desert ecosystem is quite similar to the Hot & Dry desert ecosystem.

o Land Degradation

→ Land degradation is the reduction or loss of the biological or economic productivity and complexity of rain-fed cropland, irrigated cropland, or range, pasture, forest or woodlands resulting from natural processes, land use or other human activities and habitation patterns such as land contamination.

Causes

→ Including extreme weather conditions, particularly drought.

o Soil erosion & Desertification

→ Soil erosion is the process of wearing away of the surface layer or topsoil by the transportation of the surface particles

UNIT - 2Natural Resources

Oil, Coal, Natural Gas, Metals, Stone and Sand are natural resources other natural resources are Air, Sunlight, soil & water.

Renewable and Non-Renewable Resources

(i) Renewable Resources

→ Renewable resources are resources that are replenished by the environment over relatively short periods of time.

Ex- Trees, Animals Populations, Groundwater, Solar energy, Wind Energy.

Advantage

- Clean, Safe and Efficient.
- Provides job for your local community.
- Stable Costs
- Gives our country energy independent

(ii) Non-Renewable Resources

→ There are four major types of non-renewable resources Oil, Natural Gas and Coal are collectively called fossil fuels

Ex- Petroleum, Hydro Carbon Gas Liquids, Natural Gas, Coal and Nuclear Energy.

* Land Resources

→ The term Land resources encompasses the physical, biotic, environmental, infrastructural and socio-economic components of a natural land unit, including surface and near-surface freshwater resources important for management.

Ex- Water, Oil, Copper and Natural Gas etc.

* Land Use Change

→ Land use change is a process by which human activities transform the natural landscape, referring to how land has been used, usually emphasizing the functional role of land for economic activities.

Effect, On Air & Water quality, watershed functions, generation of waste, extent and quality of ~~wildlife~~ Wildlife habitat, climate and human health.

→ It is any way in which humans modify the natural landscape

Land Degradation

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under the mechanical action of agent like wind, water or even glacier.

→ Soil erosion is a major factor for desertification. It transforms habitable regions into deserts. Deforestation and destruction of land worsen the situation. This also leads to loss of biodiversity, degradation of the soil, and alteration in the ecosystem.

Impact of Soil Erosion

- i) Reduced ability of the soil to store water and nutrients.
- ii) Exposure of subsoil, which often has poor physical and chemical properties.
- iii) Higher rates of runoff, shedding water and nutrients otherwise used for crop growth.
- iv) Loss of newly planted crops.
- v) Deposits of silt in low-lying areas.

Cause

- Water as cause of soil erosion.
- Wind as cause by soil erosion.
- ~~if~~ Self (Human) as cause of soil erosion.

Desertification of Soil

- Desertification is the degradation process by which a fertile land changes itself into a desert by losing its flora and fauna.

this can be caused by drought, deforestation, climate change, human activities or improper agriculture.

Desertification is the process of degradation of the land

Causes

- Overgrazing.
- Deforestation
- Farming Practices
- Climate Change
- Stripping the land of resources
- Natural Disasters

o Deforestation

→ Deforestation is the purposeful clearing of forested land. Throughout history and into modern times, forests have been cleared to make space for agriculture and animal grazing, and to obtain wood for fuel, manufacturing and construction.

Deforestation has greatly altered landscape around the world.

Mining

→ Mining is the process of extracting useful materials from the earth. Some examples of substances that are mined include Coal, gold, iron, metal, oil, petrol.

Iron ore is the material from which the metal iron is produced.

Types of Mining

- 1) Surface Mining → They are often used for the recovery of less valuable resources which are located near the surface.
- 2) Underground Mining → Underground mining are usually more expensive and are often used to recover more valuable resources that are located thick the ground.
- 3) In-Situ Mining → It is used to obtain uranium or like
- 4) Placer → It is usually done in the river beds or beaches with the goal of separating precious out of the sand.

Causes of Mining

1) Population Growth

→ With an increasing population, the overall world consumption level also increase. There are several different kinds of mines, including coal, iron, and also diamond mines.

2) Income Growth

→ No generation had an overall global income that as higher than we have it today.

3) Increasing demand for Resources

- Not only the overall world consumption level is increasing, also on an individual level, consumption behaviour increases.
This is especially true in developing countries.

4) Importance for industrial processes

- Many resources extracted in mining processes are quite important for industrial processes.

5) Advantages/Advancements in technology

- Technological progress is also positively correlated with mining.

Impact of Mining

- 1) Injuries - Many miners get injured during their work.
- 2) Lung disease - There are several other lung disease workers in mines often suffer from.
- 3) Erosion - The extraction of metals and other resources deep under the surface it can lead to serious erosion.

- 4) Water Pollution - Mining can also lead to water pollution.
- 5) Air Pollution - For mining purpose big machines are often used in order to make the mining process more effective and to reduce the physical work for mineral.
- 6) Soil Pollution - In the extraction process large amount of material are moved.
- 7) Effect Animals - This may force these animals to move.
- 8) Effect on Plants - This PH-level in open altered through mining activities.
- 9) Effect on Aquatic life.
- 10) Deforestation.
- 11) Global Warming.

o Dam Building On Forest Bio-Diversity

- Dam have a multi-pronged impact on biodiversity by submerging forests, changing the natural hydrograph of a river, reducing sediment discharge in rivers, affecting groundwater recharge, increasing salinity, increasing pollution concentration etc.
- It forces the people to leave their home, which live in the forest.

o Dam Building in Tribal Population

- Dam construction is a menace to tribal people across the world. Once-stable river basins become flooded and river beds diverted as governments look for ways to increase electricity output. Local people usually suffer most, being forced off their land as the resources they depend on disappear or deteriorate.
- It also affects the wildlife habitat and due to dam construction animals migrate to another place.
- It also interferes with the natural flow of water which affects the growth of plant as well as animals.

o Energy Resources - Renewable & Non-Renewable Resources

- An energy resource is something that can produce heat, power life, move objects or produce electricity.
- Ex- Oil, Coal & Natural Gas.
- A Renewable resource can regenerate itself at the rate it is used, while a non-renewable resource has a limited supply.
- Renewable resources include timber, wind & solar while

Non-renewable resources include Coal and Natural Gas.

Energy Scenarios and use of alternative energy sources

→ The reference energy scenario should describe the energy source saving the equal function in the absence of bioenergy. Coal has a higher GHG intensity than natural gas, so displacing coal achieves greater GHG saving than displacing the same energy content of natural gas.

Alternative Use

- Solar Power. For example - is both renewable and alternative because it will always be abundant and it emits no greenhouse gases.
- Nuclear power, however, is alternative but not renewable.
- Uranium it uses Uranium a finite resource
- Wind energy, behind wind comes geothermal energy, hydropower, nuclear energy, and then solar power.

(6) Structure of Atmosphere1) Troposphere

→ It contains various atmospheric gases, cloud formation generally occurs up to the 18km from the earth surface.

2) Stratosphere

→ In this region ozone layer is found, plains are flying in this region. This region absorbs UV range taken plays by the ozone layer in this region it occurs 18km to 50km.

3) Mesosphere

→ In this region variation of temperature & pressure occurs due to the ideal condition of gas. It occurs from 50km to 85km above the earth surface.

4) Thermosphere / Ionosphere

→ It occurs 85km to 500km. In this region high concentration of the iron are found in this region, like as Telecommunication Waves, Radio waves etc.

5) Exosphere

→ This region occurs 500km to 1600 km above the thermosphere.

Lithosphere

Lithosphere mainly contain Crust, Mantle, Core.

↳ Crust

→ It is 50 km thick upper layer consist (Silicon + Aluminium)
bottom layer consist (Silicon + Magnesium)

↳ Mantle

→ It is 2900 km it consist hot rocks which have silicate
(Magnesi / iron)

↳ Core

→ It is 5000 km thickness found inside the Earth surface. It
contain inner core or outer core found in liquid state and
consist in majority of Nickel + Iron. It create Earth
magnetic field

Inner Core

By Inner core in solid state. It consist of solid Iron + Nickel

Ecology / Environment ^{of} ~~of~~ interaction living thing - Ecology

→ Ecology deals with the study of living things in their natural home interacting with their surroundings.

(Environment & living thing interaction on HII)
(Interaction with living thing in Environment is called ecosystem)

Ecology is also known as Ecosystem
"Note Study of Ecosystem is Ecology"

Biotic Components

→ It contains living things or organisms of an ecosystem
It have two parts

① Autotrophs → All the organisms which produce their own food in presence of Sunlight and source of energy is called Autotrophs

② Heterotrophs → All the consumer which depends on others is called Heterotrophs

Members of Biotic Component

1) Producers

→ Which depends on Sunlight and source of energy for preparing their own food is known as Producers
Ex. Green plant.

2) Primary Consumer

- All the consumer which are totally depend on green plants
is called Primary Consumer
Primary Consumer is also called **Herbivores**
Ex. Cow, Buffalo, Deer

3) Secondary Consumer

- All the consumer which depend upon Primary Consumer
Called Secondary Consumer
Secondary Consumer is also known as **Carnivores**
Ex. Lion, Tiger, etc

4) Tertiary Consumer

- All the consumer which depend upon plant as well as
animals is called tertiary consumer
Tertiary Consumer is also called **Omnivores**
Ex. Pig, etc

Decomposer

- Decomposers are those that get food from the broken
down death plant & animals
Ex- Earthworms

UNIT → 3POLLUTION

→ It can be define as any undesirable change in, physical, chemical, biological or any component of it like as water, air, soil, etc which can produce harmful effect on various forms of life or property.

Environment Pollution May be various types -

- (1) Air Pollution
- (2) Water Pollution
- (3) Soil Pollution
- (4) Noise Pollution.

"The harmful substances which are present in environment and they effect the living thing is known as Pollution".

(1) Air Pollution

→ It is an atmospheric condition change as due to ability of undesirable gases present in higher concentration as per standard is known as Air Pollution.

It mainly includes radioactive substances.

"The Harmful Substances include in air in excess amount in comparison to standard and they effect the Human life is known as Air Pollution".

Causes / Source of Air Pollution

Natural

- ① Forest Fire
- ③ Volcanic Activity
- ② Biological decay
- ④ Sea Salt Level

Human/Unnatural

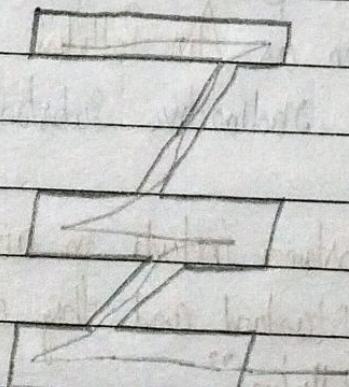
- ① Thermal Power Plant
→ In Thermal Power Plant If air SO_2 , CO_2 produce after burning of Coal.
- ② Industrial Unit
→ Iron or Steel, textile Plant, Chemical Foundry, Cement Industry are produce H_2S , SO_2 as produced.

Remedies of Air Pollution

- ① Use of Alternative Fuel in Power Plant.
- ② Construction & Management of the Plant should appropriate as



Water Tube
Fire Tube



Effect of Air Pollution,

Disease

→ Air Pollution has resulted in several respiratory disorder and heart disease among the human being.

This causes of lung, lung heart cancer increased in last few decades the children have living in pollutant area has more cases of Pneumonia and Asthma.

Many people die every year due to direct & indirect effect of Pollution.

Acid Rain

→ The burning of fossil of fuel releases harmful gases such as Nitrogen Oxide and Sulphur Oxide present in air. The water droplets combining with the pollutant become acidic and fall down with the rain which is known as Acid Rain.

Which is the effect on human life, Plant & Animal.

Global Warming

→ Due to the increase of greenhouse gases there is an imbalance in the gases composition of air. This has lead the increase of temperature on the earth surface. This increase in earth temperature is known as Global Warming.

This resulted in the melting the glacier and increase the sea level.

Ozone layer Depletion

- It take place due to presence of Chlorofluoro Carbon (CFC), Hydro-chloro-fluoro Carbon (HCFC) present in atmosphere. Cause of depletion ozone layer it prevent the harmful ultra-violet radiation to enter earth atmospheric. And protect the skin disease eye problem.

Ozone layer

- The Region in the earth stratosphere that contains high concentration of ozone and protect the earth ultra-violet radiation.

Air Pollution Control

- (1) Avoid use of Private Vehicle Unnecessary Vehicle

⇒ The People Should Avoid use of Vehicle for short distance they should prefer use of public transport from one place to another place.

- (2) Energy Conservation

⇒ A large Number of fossil fuel produce electricity on burning generate electricity. Then electrical energy are used for the functioning the home appliance, Industrial appliance.

Solid Waste

- Accesive use of resources which is harmful for the nature or human life.

Solid waste is define as the Accesive use of liquid, food, biomedical equipments, industrial waste is term as Solid waste

Solid Waste Management

- Solid waste management is a process of collecting, treating, disposing of Solid waste. Solid waste can be domestic, agricultural & industrial waste also.

Types of Solid Waste

- Waste can be broadly divided into liquid waste, industrial waste, solid garbage, radioactive waste, etc.

Industrial Waste

- Industrial waste generated chemical plant, cement industry, power plant, textil textile industry, food processing industry, petroleum industry. Each of these industries produce different type of waste product.

"Solid waste is useless and sometimes hazardous material with

Now liquid contain which include municipal garbage, sewage, agricultural and animal husbandry which effect the environment is called solid waste".

Municipal Solid Waste

→ It can be divided two biodegradable, recyclable & domestic waste include vegetables and food waste from the kitchen.

Recyclable waste include plastic, Metal, Bulb, Battery and electronic waste, etc.