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# Environmental studies notes

# Syllabus

Date.....

1. Basic of Ecology
2. Eco-System - Concept and Suitable development
3. Resources: Renewable and non-renewable

## Air pollution

1. Source of Air pollution
2. Effect of air pollution on human health.
3. Economy
4. plant, Animal
5. Air pollution Control Methods.

## WATER Pollution

1. Impurities in WATER
2. Cause of water pollution
3. Source of water pollution
4. Effect of water pollution on human health.
5. Concept of dissolved O<sub>2</sub>, BOD, COD.
6. Prevention of water pollution - water treatment processes
7. Sewage treatment
8. WATER quality standard

## SoIL Pollution

1. Source of soil pollution
2. Type of Solid waste - Household, hospital from Agriculture,
3. - Biomedical, Animal and human, excreta, sediments
4. E-WASTE
5. Effect of Solid waste
6. Disposal of Solid waste management

## Noise Pollution

1. Source of noise pollution
2. UNIT OF NOISE
3. Effect of NOISE Pollution
4. Acceptable NOISE Pollution Level
5. Different method of minimize noise pollution

## Environmental Legislation

1. introduction of water [prevention & control of pollution] Act 1974
2. introduction of air [prevention & control of pollution] Act 1981
3. Environmental protection Act 1986
4. Role and function of state pollution (Central Board of ~~Environmental~~)
5. NATIONAL GREEN TRIBUNAL (NGT)
6. Environmental Impact Assessment (EIA)

Date.....

## Impact of Energy Usage on Environment

1. Global Warming
2. Green house Effect
3. Depletion of Ozone Layer
4. Acid Rain
5. Ecofriendly Material
6. Recycling of Material
7. Concept of Green Building

# IMPORTANT Question

- ① what is ecology and Ecosystem
- ② Sustainable development [Define, diagram, point]
- ③ what are natural Resources [Renewable / Non-Renewable]
- ④ Discuss Solar Energy [Uranium, Solar panel, Diagram, Advantage, Disadvantage]
- ⑤ Tidal, geothermal [Classification and also write advantage / disadvantage]
- ⑥

## [UNIT 2]

- ① Define Air pollution [Control, Causes, Source] [Kerosene, biogas, oil, pollution]  
[Air pollution Act, PUC, Ashok plant]
- ② Discuss Any 3 air pollutants in detail [Sulphur dioxide,  $\text{NO}_2$ , vehicles -  
Photochemical Smog, Carbon monoxide, Combustion fuel  
Greenhouse Gas, Peroxy Acetyl Nitrate, ozone layer  
(Smoke + fog) ↳ [PAN]  $[\text{O}_3]$ ]  
Primary and Secondary Air pollutants
- ③ classify the pollution :- Primary and Secondary

Date.....

## [UNIT-3]

- ① Write note on waste water treatment [Sewage Treatment]
- ②
- ③ Give the concept of Dissolved oxygen, bod and COD
- ④ water quality standard [Limits of quality level by govt.] [why we need it] [chart/Table] [what if it is over than what happen]

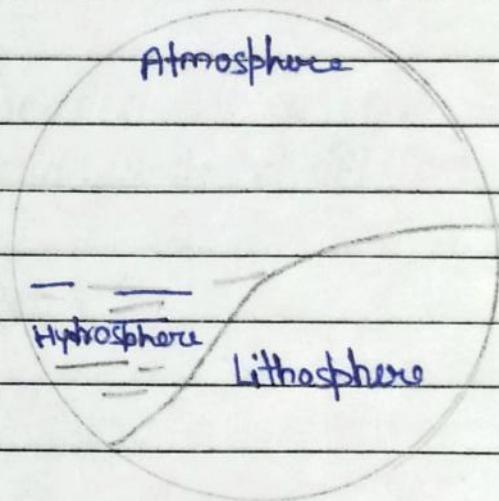
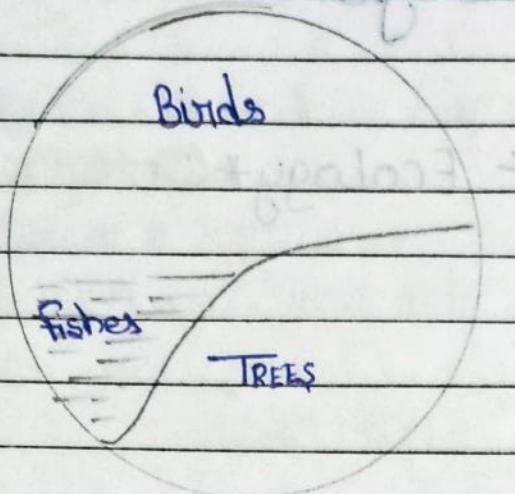
### \*Imp. TERMS\*

- ① EIA - Environment Impact Assessment
- ② PUC - Pollution under Control
- ③ BOD - Biological oxygen demand
- ④ SD - Sustainable Development
- ⑤ PAN -
- ⑥ CO - Carbon dioxide
- ⑦  $H_2SO_4$  - Sulphuric Acid
- ⑧  $HNO_3$  - Nitric Acid
- ⑨ CFC - Chlorofluoro Carbon

## Imp. Topics

- # Abiotic factor
- # Biosphere
- # Hydrosphere
- # Lithosphere
- # Atmosphere along with life
- # Sludge - Semi Solid waste
- # Name of (inoculant / coagulants)
- # food chain - transfer of food Energy from one to another from one trophic level to forming a chain of life manner
- # food web - Interlinking of food chain
- # abiotic factors

**Environment :-** Surrounding of any object It consist of Hydrosphere, Lithosphere, and Atmosphere (various gases)



Hydrosphere, Lithosphere and Atmosphere along with like form  
[Living factor]

→ **Multi-Disciplinary**:- Multi → Many  
Disciplinarily → Discipline

**Eco System**:- यह साथ रखकर ही Balancing रही है

Structural and functional unit of biosphere consisting of Community of living organisms and physical Environment

OR

All the organisms in an area together with non-living constituent of the environment constitute an ecosystem

\* Ecology \* (Interaction)

# ENVIRONMENT STUDIES

Date.....

**ENVIRONMENT**:- Surrounding of any object. It Consist of Hydrosphere, Lithosphere, and atmosphere (Various Gases)

Hydrosphere, Lithosphere and Atmosphere along with living form [Living factor]

→ **Multi Disciplinary**:- Multi → MANY  
Disciplinary → Discipline

[Eco-System]

Structural and functional unit of biosphere Consisting of Community of living organism and physical Environment  
OR

All the interacting organism in an area together with non-living Constituent of the Environment Constituent an Ecosystem.

OR

An Ecosystem is a self-contained unit of Living things (Plant, animal and decomposers) and their non living environment (Soil, air and water).

An ecosystem need only the input of Sunlight Energy for functioning

The Examples of ecosystem are : a grassland, a desert, a mountain, a pond, a lake, a river and sea.

### [ECO-LOGY]

Ecology is the interaction between living and non living thing or Biotic and Abiotic things.

Ecology = system of Ecosystem

PLANT ← HUM → microflora & fauna ←  
soil & water ← microflora

[contd - 02]

To protect woodpecker to live longer & has long life  
know about living in mangrove point to whom

priv. condition suggest who go at mangrove forest to eat 11A  
Polymer as fuel & to remove 13 cell to tree 100?

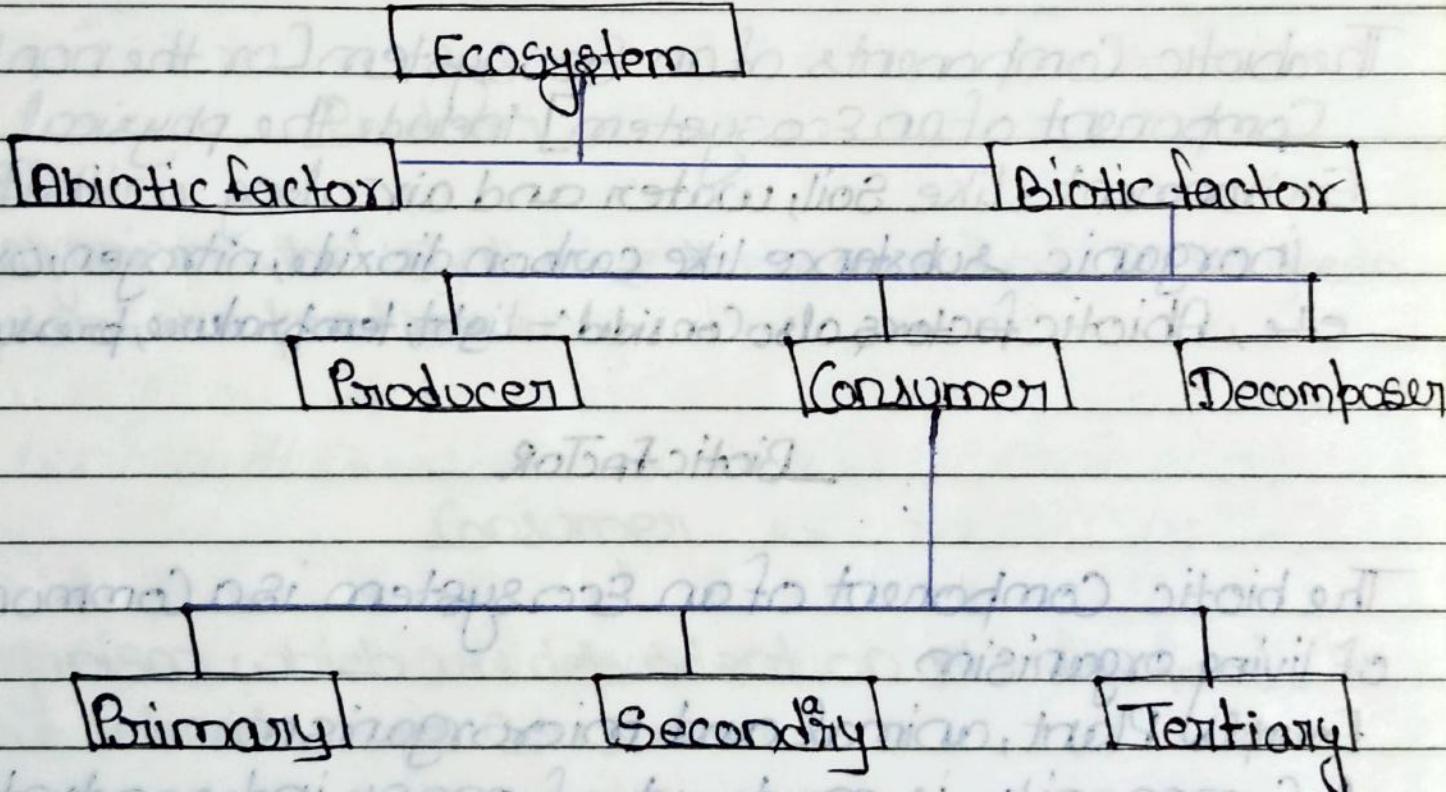
# Homeostasis OR Balanced Ecosystem

Balance Ecosystem - Biotic and Abiotic factor

Balance between the biotic and abiotic factors.

→ Note, the Role of Decomposers are same in the all Ecosystem.

Eco-system chart



# Abiotic & biotic Factor

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## Abiotic factor

Abiotic factor are not change

Example:- Atmosphere, chemical Elements, Sunlight, temperature, wind and water.

Abiotic component Consist of kinds:- quantity and distribution of physicochemical factor.

OR

The abiotic Components of an Ecosystem [or the non living Component of an Ecosystem] include the physical Environment like Soil, water and air along with the inorganic substance like carbon dioxide, nitrogen, oxygen etc, Abiotic factors also Consider:- light, temperature, pressure etc.

## Biotic factor

The biotic Component of an Ecosystem is a Community of living organism

Example Plant, animal and microorganism

A Community is made-up of many independent populations.

## Biotic Factor

The biotic Component of an Ecosystem [or the living Component of Ecosystem] is a Community of organism [Plant and animal]

It Consist of 3 type of organisms :

- ① Producer organism [Autotrophs]
- ② Consumer organism [Heterotrophs]
- ③ Decomposer organism [saprotrophs]

### Producer

organism which synthesize their own food. All the green plant are producers.

### Consumer

organism which are dependent on other for food. All the animals are consumer.

### Decomposer

organism which consume the dead remains of the organism Certain bacteria and fungi are decomposer

→ Definition AS FACTER TERM  
Producer

→ Biotic factors which makes their food is called  
Producers

Consumers

→ Biotic factors which takes other food is called  
Consumers

Decomposers

Biotic Factor which breakdown their food is  
Called Decomposer.

## Ecosystem

- i) Structure of an Ecosystem.
- ii) Function of an Ecosystem

- (a) Energy flow of an ecosystem
- (b) food chain or ~~or~~ food web
- (c) Nutrients cycling or Biogeochemical cycle or chemical cycle
- (d) Energy flow

→ Food chain:— Transfer of Energy level from one trophic level to the another

OR

A Sequence of organism through which food chain its contained Energy passes with each member.

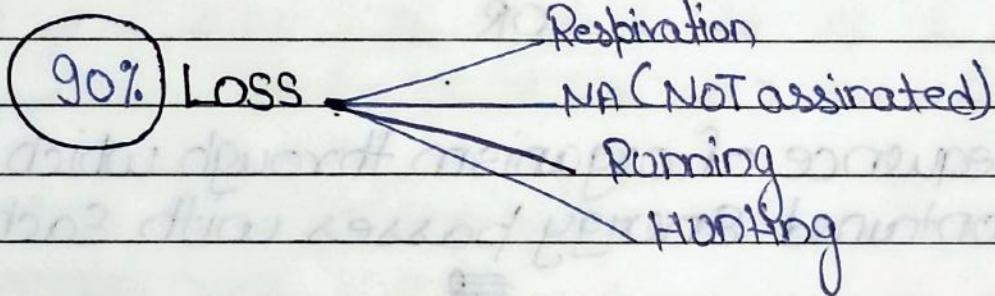
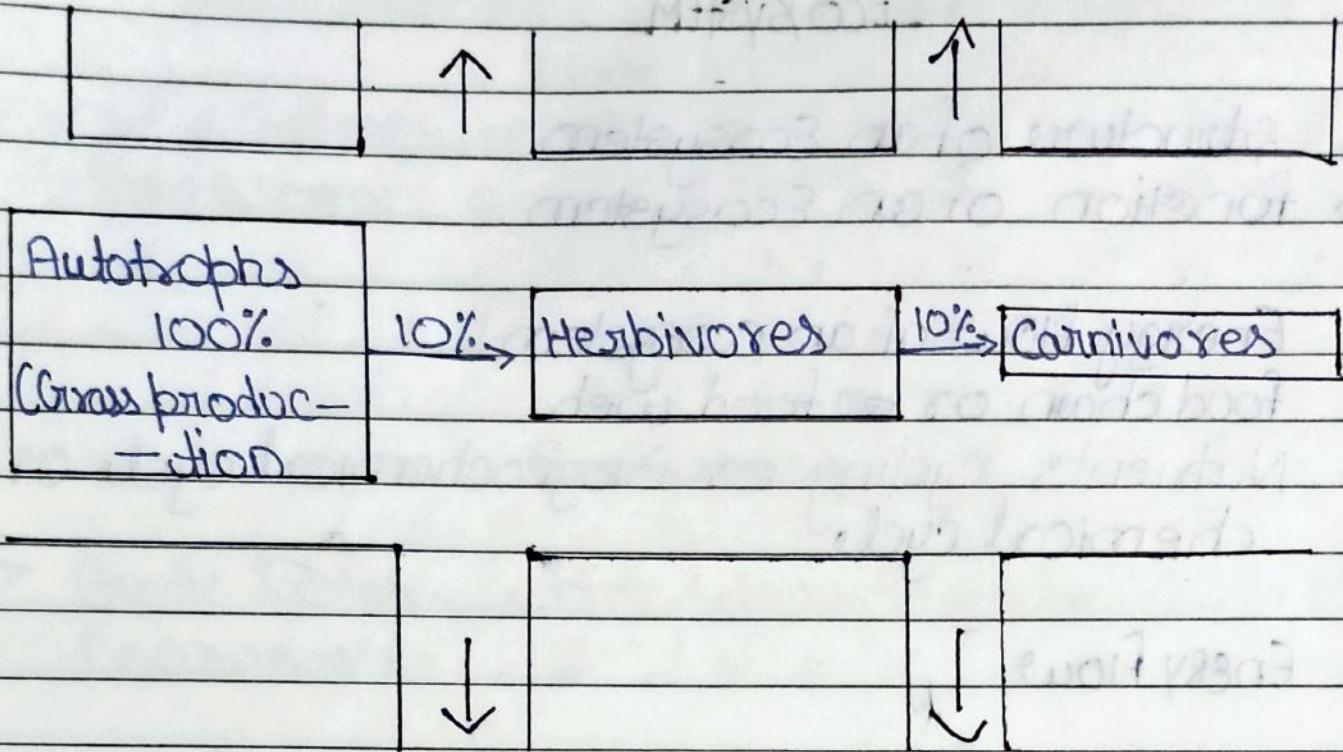
→ Food WEB:— The operation of many food chain simultaneously.

OR

Network of interrelated and interconnected food chain.

### ENERGY flow

It is also known as Non-cyclic flow. It is uni-directional flow and 10% Energy flow.



In. Question Arrives Here . . .

Question-1 How Energy flow is unidirectional

Question-2 Energy flow of an Ecosystem?

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## Biogeochemical cycle and chemical Cycle

The cyclic movement of the chemical from earth to the plants and again to the next trophic level [Primary, Secondary, tertiary, Quaternary] and again is returning to the environment with the help of Decomposers.

### Nitrogen Cycle =

Nitrogen is needed for the formation of proteins, amino-acids and nucleic acids.

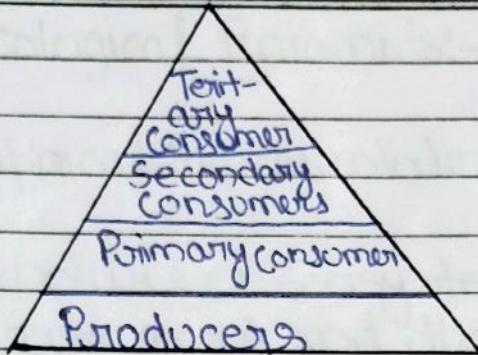
"The cyclic process of nitrogen being fixed, used by plants and animal and later returned to the atmosphere is referred to as the nitrogen cycle.

**Carbon Cycle**:- The Carbon cycle is the biogeochemical cycle by which Carbon is exchanged among the biosphere, Pedosphere, geosphere and atmosphere of the Earth. The Carbon Cycle was initially discovered by Joseph Priestley and Antoine Lavoisier.

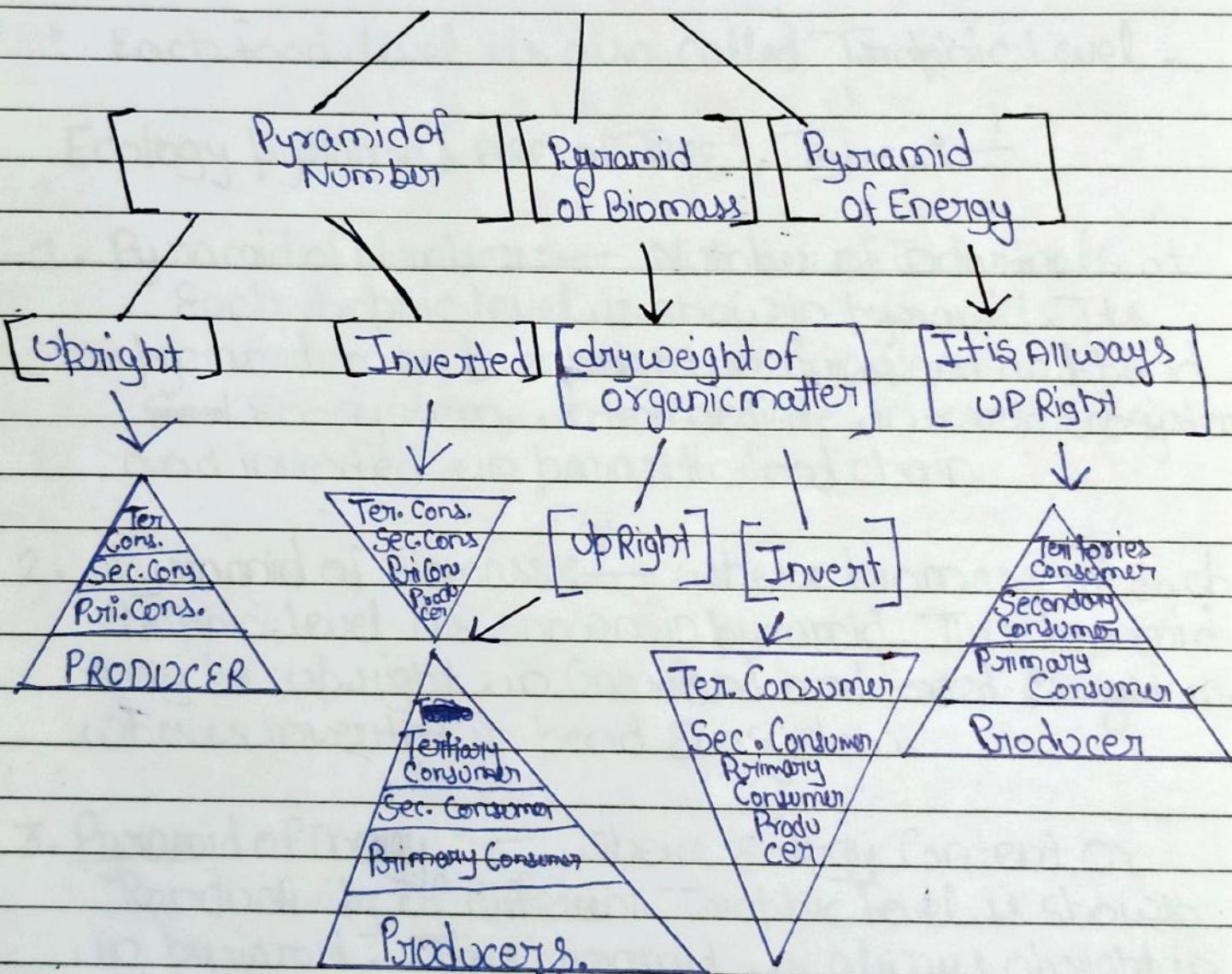
⇒ Nutrients Cycle (Bi-directional flow and cycle) :-

OR

⇒ MATERIAL Cycle | Nutrient cycle | Biochemical cycles.

Energy flow

-

Pyramid Forming

## Ecological Pyramids:-

It is a graphical Representation.

- Trophic structure of ecosystem is a type of Producer-Consumer arrangement and the graphical representation of trophic structures of ecosystem constitute Ecological pyramids.
- Each food level is also called Trophic Level.

Ecology pyramids ARE OF THREE Type. :-

1. Pyramid of Number :— Number of individuals at each trophic level is shown in pyramid. Its pyramid may be upright in Grassland and pond ~~Ecosystem~~, intermediate in forest Ecosystem and inverted in parasitic food chain.
2. Pyramid of Biomass :— where biomass of each trophic level is shown in pyramid. This pyramid may be upright in Grassland and forest Ecosystem, whereas inverted in pond Ecosystem.
3. Pyramid of Energy :— where Energy Content or Productivity of different Trophic Level is shown in pyramid. This pyramid is always upright in all Ecosystem.

⇒ Ecological Succession:— It is a phenomenon or process by which an Ecological Community undergoes more or less orderly and predictable changes following disturbance or initial Colonisation of new habitat

- orderly changes in the structure of Community
- Contain stages like Pioneer, serial stages, climax
- Desert Ecosystem, forest Ecosystem

1. Introduction of the Species — pioneer

2. Struggling Cawees — Combination

3. Strong Species Dominance

4. final STAGE

### Type of Succession

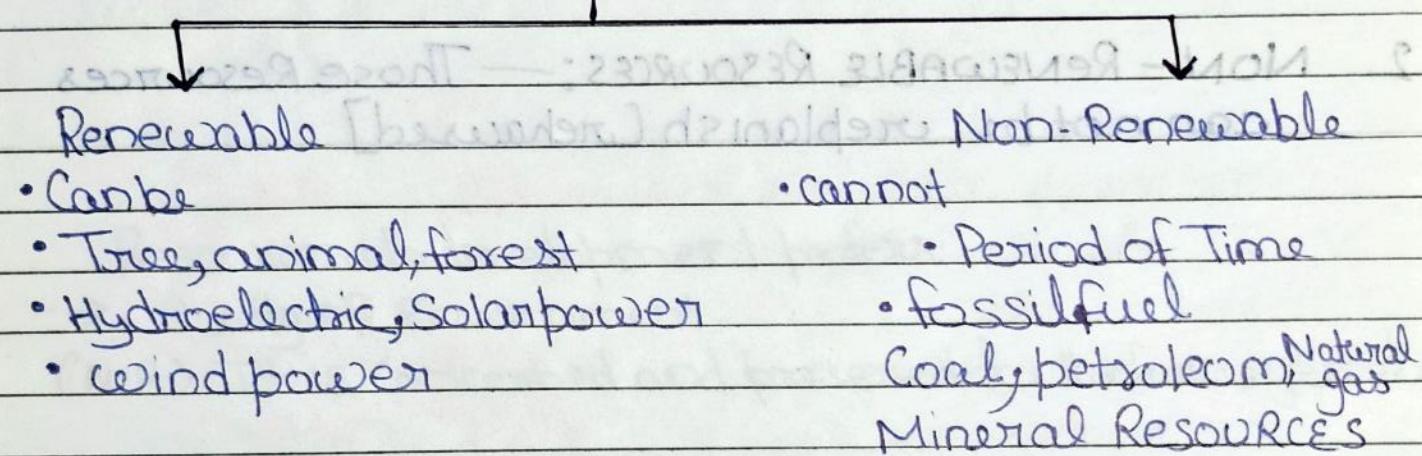
There are mainly two types of Ecological Succession

1 Primary Succession:— In this type, an Ecological Community is in the areas where no living organisms ever existed, eg. Sandy land, rocks of stone, etc.

2. Secondary Succession:— In this an ecological community is developed in the regions where ecological community was earlier present, but whose existence has been destroyed, e.g., to destroy a forest through fire, but again reappearance and development of a new forest Community

⇒ Energy Resources:—

### NATURAL RESOURCES



### B WATER RESOURCES

B MINERAL RESOURCES — USES, Types, Mining Effect on Environment

C forest — USES / Direct, Indirect  
— Deforestation — Cause, Default

⇒ NATURAL Resource :— Naturally occurring material used by HUMAN.

1 Renewable Resources :— Those Resources which can be reproduced (reduced)

OR

2 NON-RENEWABLE RESOURCES :— Those Resources cannot be replenished [reduced]

## $\Rightarrow$ Sustainable development :-

The development which meets the \_\_\_\_\_ of present generation without disturbing (Compromission) it from future.

Resources to development prefers

$\rightarrow$  Quality of Environment.

(N.R.) It is concerned and preserved for the future generation

Carrying Capacity - Rate of reservation  $\rightarrow$  Not to exceed the demand  
 $50 \rightarrow$  Not to exceed.

# Environmental Impact Assessment [EIA]

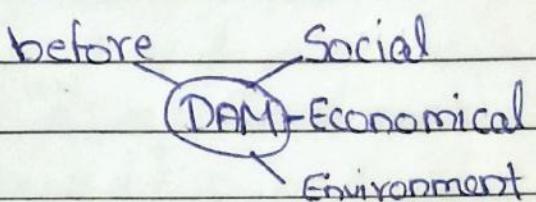
Concept:- Identify environmental, social, economical impact of a project (before)

→ As a tool

## EIA MANDATORY UNDER EPA

### STAGES Involved in EIA

- Screening - Selection of site
- Scoping - which area applicable



- Assessment and Translation
- Report EPA - Suggestion
- Review EIS → Mining
- Decision Making - prefers/Not → Transport
- Monitoring - → Industries
- (EA) Environment Auditing → River Pollution

### 29 Categories of development -

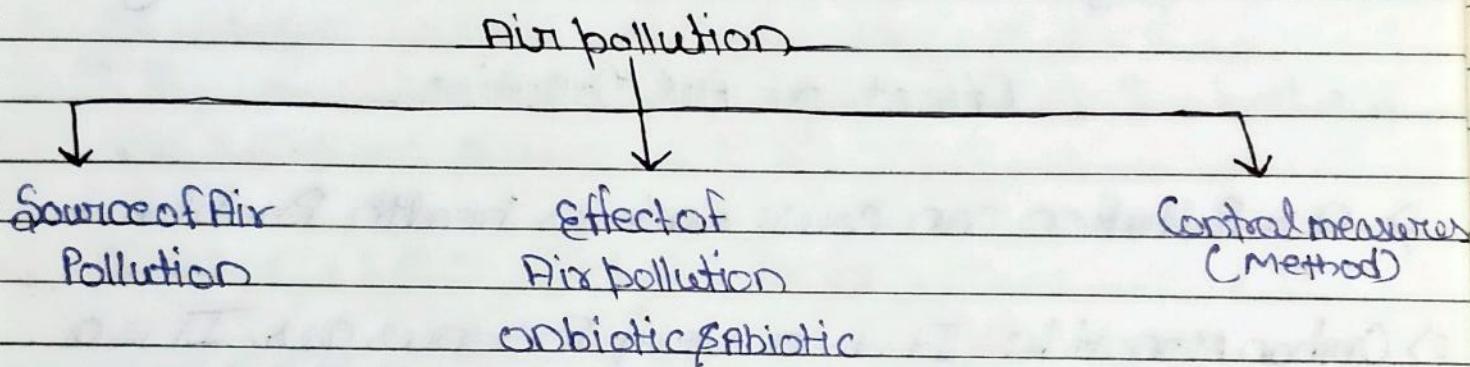
use of the resources in such a way most conserved for Sustainable Development :-

- Exploration
- Population

AIR POLLUTION

ENVIRONMENTAL POLLUTION:- The introduction of undesirable substance in air, water and soil. in such a ~~concent~~ Concentration that it will have the bad or harmful effects on biotic and abiotic things or factor

⇒ Air pollution:- The introduction of undesirable substance in air in such a Concentration that it will have the bad or harmful effects on biotic and abiotic things or factor.



→ Source of Air Pollution:-

- 1) Sulphur Dioxide:- Burning of fossil fuels, Automobile exhaust, refining of Petroleum and its products, Volcanic eruption.
- 2) Oxides of Nitrogen:- Burning of fossil fuels, automobile exhaust.
- 3) Excess of Carbon dioxide:- Burning of fossil fuels.
- 4) Carbon monoxide:- Automobile Exhaust, incomplete Combustion of fossil fuels.

- 5) Acid fumes:- Fertilizers and chemical industries
- 6) Smoke:- Incomplete Combustion of fossil fuels.
- 7) Dust:- Stone crushing, wood work, volcanic eruptions.
- 8) Lead Compounds:- Automobile Exhaust on burning Leaded Petrol.
- 9) ~~Chloro~~-chloro-fluoro carbon (CFCs):- used in ~~refrigerator~~ refrigerator, air conditioners and spray cans.

### Effect of Air Pollution.

- 1) Air Pollution can cause various health Problems.
- 2) Carbon Monoxide:- It is a very Poisonous gas. It is a Colourless and ~~or~~ odourless when inhaled in excess, it combines with the haemoglobin. This prevents it from carrying oxygen. As a result, the blood become oxygen ~~defisi~~ deficient which causes unconsciousness or even death.
- 3) Oxides of Sulphur:- (Sulphur dioxide and sulphur trioxide) Cause various respiratory problems and even ~~Damage~~ damage ~~Lungs~~ LUNGS.
- 4) Oxides of Nitrogen:- It cause lungs Congestion.

- B) Fumes:- It Coming out of chemical industries cause irritation in eyes, nose and throat.
- C) Particles of Lead oxides present in the automobile exhaust can cause mental disorder and brain damage.
- D) Particles of dust in air can cause bronchitis.

## 2. Air pollution can cause acid Rain:-

Burning of fossil fuel like Coal, Petrol or diesel produces Carbon dioxide, Carbon monoxide, oxides of Sulphur, oxides of Nitrogen and unburnt hydrocarbons.

"The rain water containing large amount of dissolved acid is called ACID RAIN"

## DAMAGING EFFECT OF ACID RAIN

- (a) Acid rain increases the acidity of soil and thus effect plant and animal life it leads to the loss of soil fertility.
- (b) Acid Rain makes the water of lakes and rivers acidic leading to destruction of aquatic plant and animal.
- (c) Acid rain destroy monuments and buildings.
- (d) Acid rain promotes Corrosion of metallic object like railway bridges and gates.

### 3) Air pollution causes Depletion of ozone layer:-

Ozone gas forms a layer in the ~~stratosphere~~ stratosphere of the atmosphere. This ozone layer prevents harmful ultraviolet radiation coming from the sun to enter our Earth.

"Chlorofluorocarbons (CFCs), which are used in refrigerators, air conditioners and aerosol sprays, when released in air, damage the ozone layer of the atmosphere."

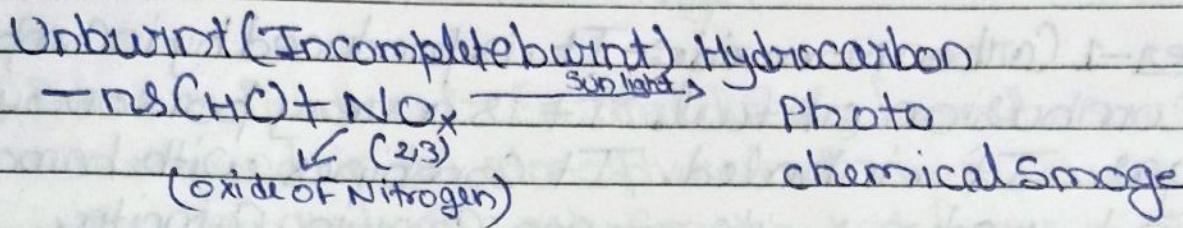
#### DAMAGING effect of ozone layer depletion:-

- Harmful ultraviolet radiation reaching the Earth cause various diseases in human being such as Cataract, Skin Cancer, damage of eyesight etc.
- Harmful ultraviolet radiations can bring about changes in the genestructure leading to ~~mutation~~ mutation.
- Harmful UV radiation cause damage to early development stages of fish, crabs and other animal.

#### PARTICLES OF AIR POLLUTION

- These are not ~~gaseous~~ gaseous substances
- They are suspended droplets, Solid particles are mixtures of \_\_\_\_\_.

$\Rightarrow$  Reaction :-



**Question:- Write down Control measure of pollution of Pollutants? (5 to 8 Marks)**

~~Advise~~ On Days when High particle level are Expected, Take these Extra Steps to Reduce Pollution

- ① Reduce the number of trips you take in your car.
  - ② Reduce or eliminate fireplace and wood stove use.
  - ③ Avoid burning leaves, trash and other materials.
  - ④ Avoid using gas-powered lawn and garden equipment
  - ⑤ Look for the ENERGY STAR Label when buying home or office equipment
  - ⑥ Be sure your tires are properly inflated.
  - ⑦ Keep cars, boat, and other engines properly tuned.
  - ⑧ Consider using gas logs instead of wood

Notes: People and Tulsi plant is 100% release oxygen in 24 hours.

→ Pollution under Control (PUC) are used u

Question → Define two Air pollutants?

Answer - 1 Carbon Monoxide :- It is produced by incomplete combustion of fuel. It is a very poisonous gas. If inhaled, it combines with haemoglobin and reduces its oxygen carrying capacity. This leads to laziness, reduced vision and cause death.

- 2. Oxides of Sulphur :- These are Sulphur dioxide and sulphur trioxide. These are produced by burning of coal and petroleum. Both these gases damage the building and clothing as well as plants animals. High concentration of  $\text{SO}_2$  causes chlorosis.

→ CONTROL MAJOR [METHODS] OR REMEDIAL MAJOR :-

- i) We can use tall chimneys in factories to reduce air pollution to ground level.
- ii) USE of Catalytic Converters. It helps to reduce the pollution level.
- iii) Not burning and open burning
- iv) Plantation of tree
- v) USE CNG
- vi) USE OF ELECTRIC Vehicle
- vii) Pollution Control equipment
- viii) Air pollution Act Control the air pollution.

## THERE ARE TWO TYPES OF AIR POLLUTION

Based on the origin

1, Primary Pollution :- Emitted directly from the sources and are found in the atmosphere in the form in which they were emitted, like ash, smoke, dust, fumes, mists, sprays, radioactive compounds etc.

2, Secondary Pollution:- These are formed in atmosphere by chemical interaction between primary pollutants and atmospheric constituents, like, OZONE, Peroxacylnitrate (PAN), aldehytes, ketones, etc

(OR)

The third thing which are created by our moisture.

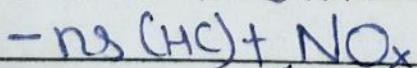
### BASED ON STAGE OF MATTER:-

1. Gaseous Air pollution:- These pollutants exist in a gaseous state at normal temperature and pressure  
They are Carbon dioxide, Nitrogen dioxide, Sulphur dioxide etc.

2, Particulate Air Pollutants:- These are not gaseous substance They are suspended droplets, solid particles or mixture of

→ REACTION,

Unburnt (Incomplete burning)



oxide of nitrogen

Photo

# INTERNET

- 1 - Inter - Interconnection
- 2 - Net - Network

(Internet) - Interconnection of network

\* Internet \*

yashveen singh

① [Internet is equal to interconnection of network]

[Web etc]

[Internet is a networks which consist of inter-connected networks]

\* Application of Internet \*

- ① Research
- ② hospitals
- ③ up transition
- ④ E-Commerce
- ⑤ Communication
- ⑥ web browsing

\* Network \*

[A network is a collection of computers that are connected to each other with the help of cables or satellites to share information around the world.]

(TELEGRAM) ~~WIRELESS TELEGRAPHY~~ ~~TELEGRAPHIC MESSAGES~~

~~TELEGRAMS ARE PREPARED IN THE FORM OF TELEGRAMS~~

~~TELEGRAMS ARE PREPARED IN THE FORM OF TELEGRAMS~~