

INTRODUCTION

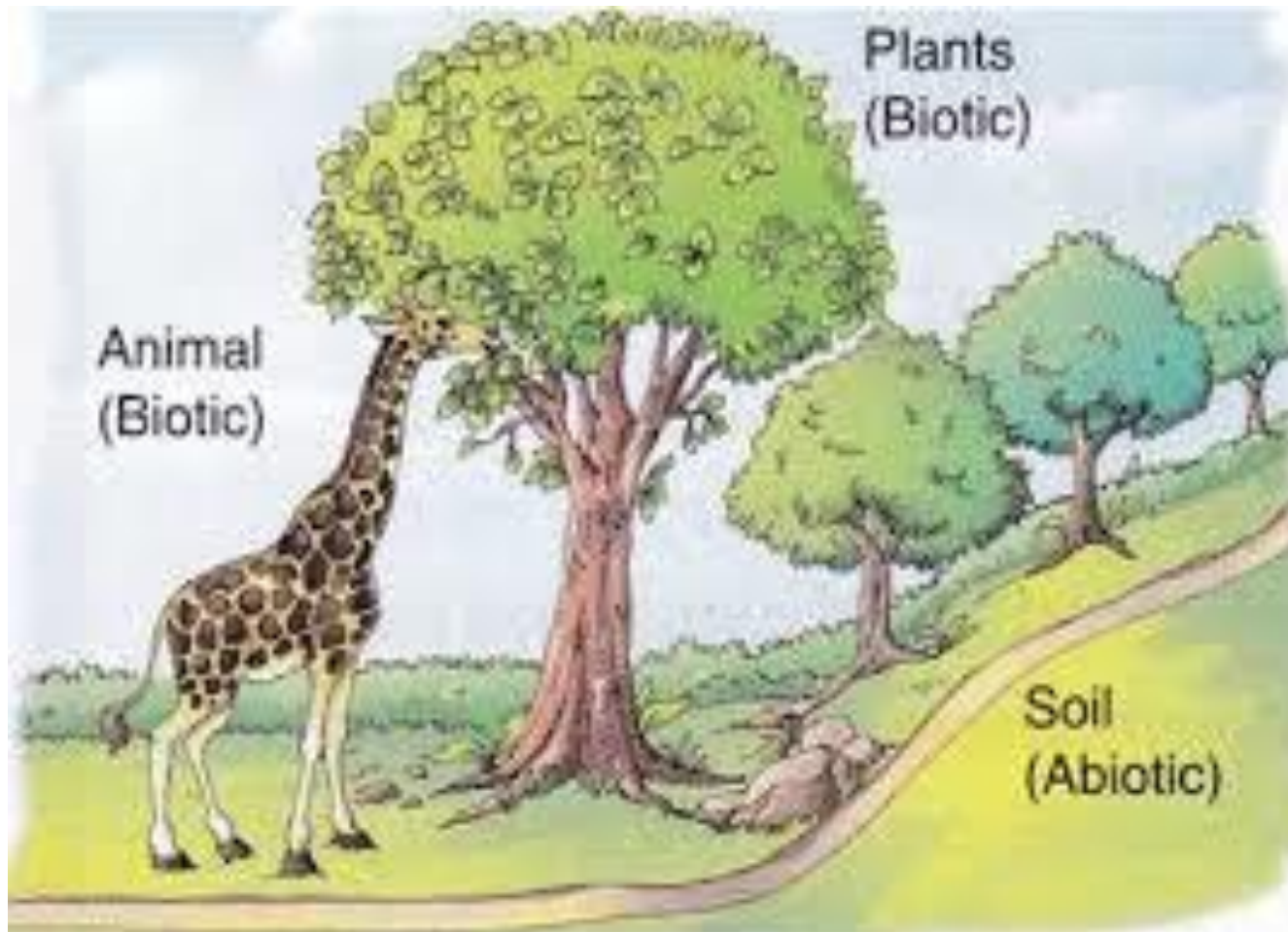


We must all work together in order to save the environment and the world that we live in from further change.

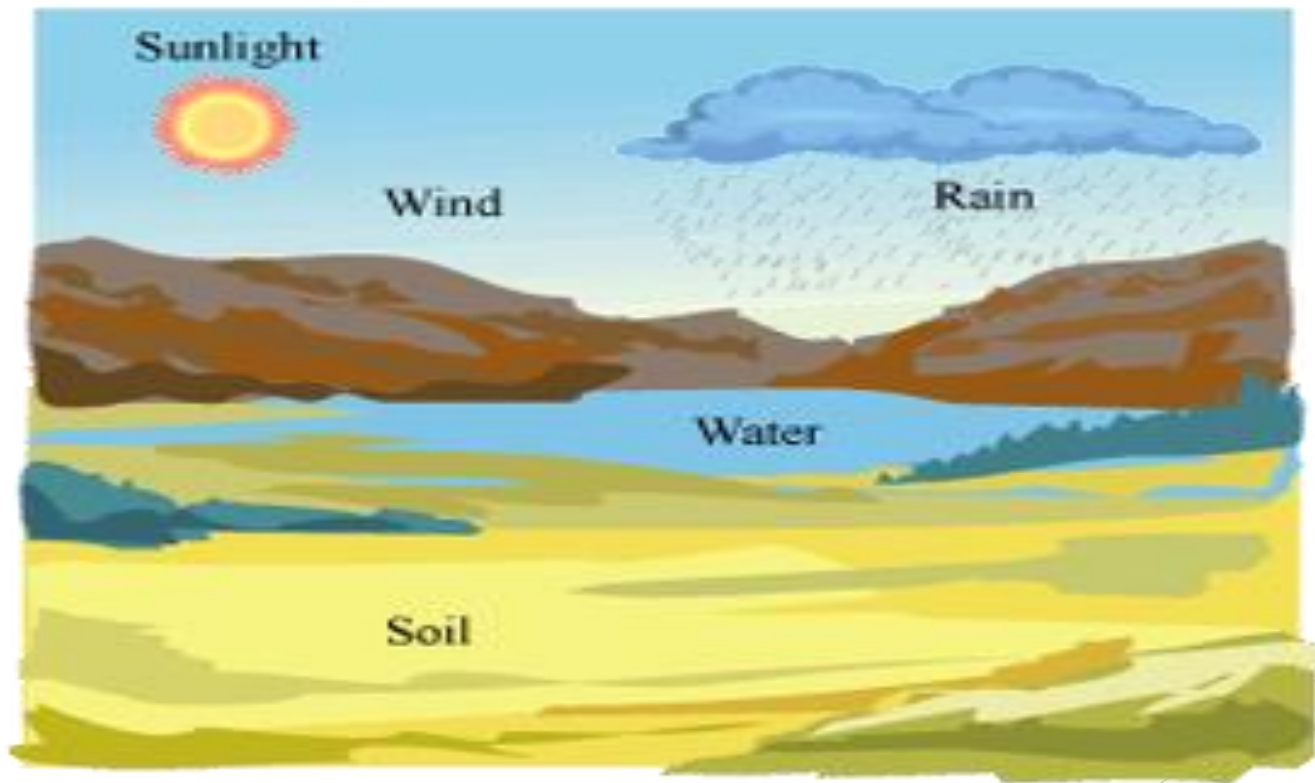
ENVIRONMENT

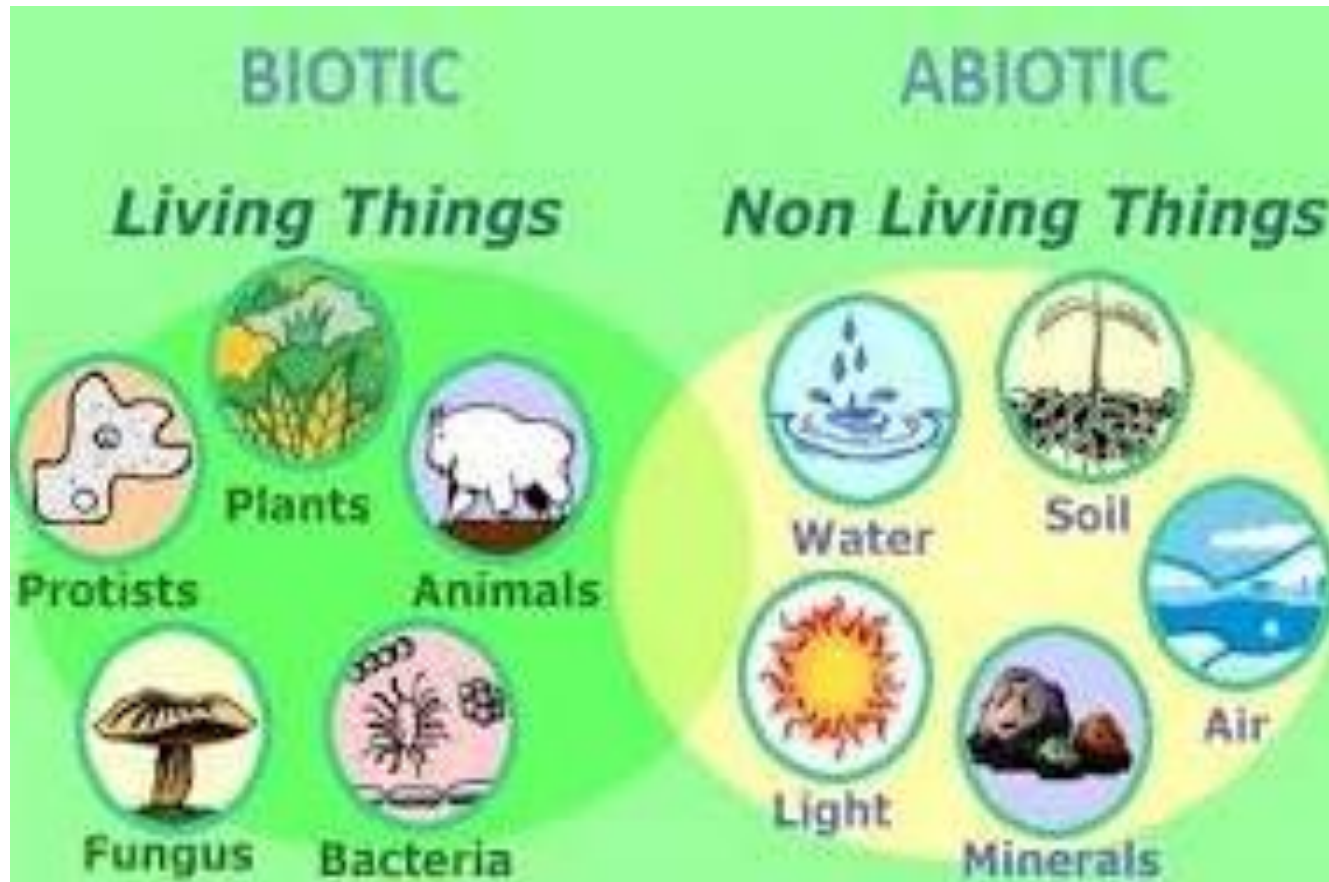
- ▶ The word 'environment' -----means Environner or encircle or surround.
- ▶ All the biological and non-biological things surrounding and organism are thus included.
- ▶ Definition: *Environment is sum total of water, air and land, interrelationship among themselves and also with human beings, other living organisms and property.*
- ▶ *Divided in to two parts:*
 - 1-Biotic*
 - 2-Abiotic*

Biotic environment: These are the living component of the eco system



Abiotic environment: These are the non living component of the eco system (composed of external physical factors like temperature, humidity, water soil, minerals gases). It provides both habitation and raw materials for the synthesis of organic food.





Biotic and Abiotic component are in dynamic state.

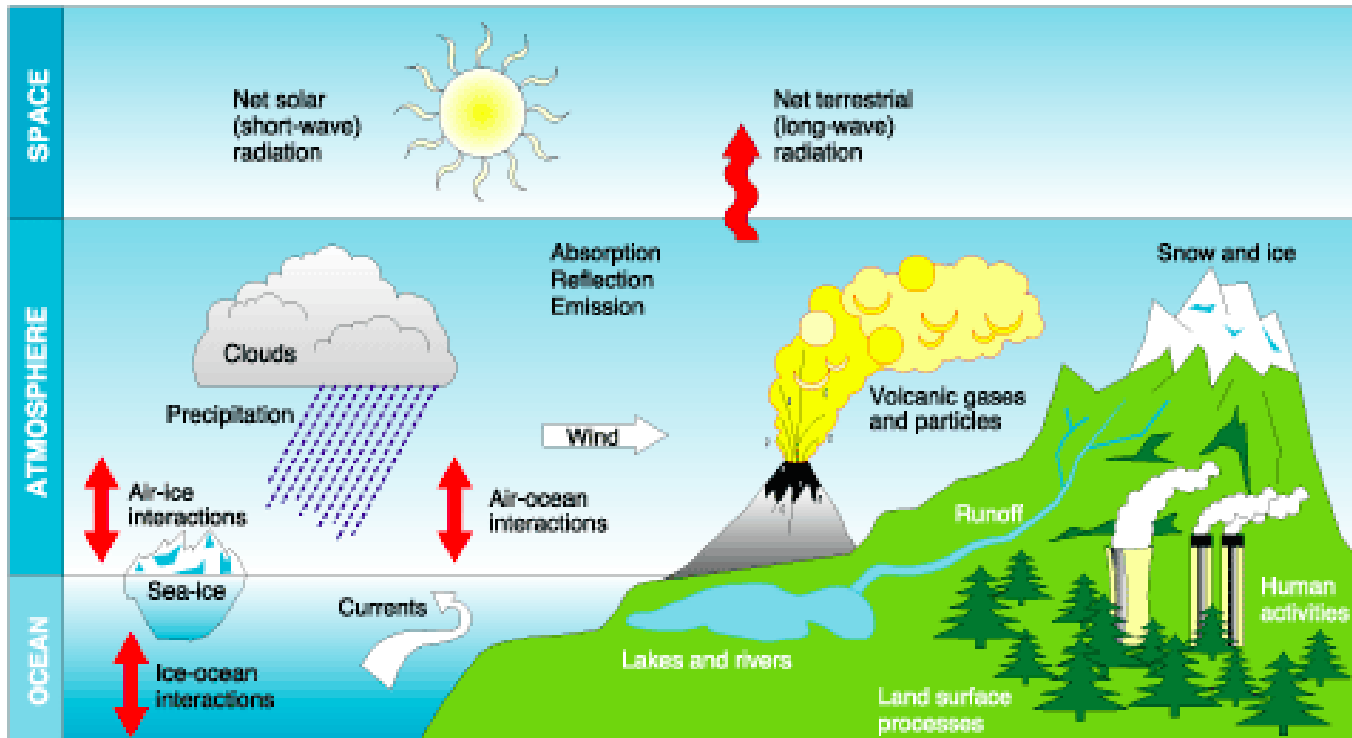
They constantly affect each other and can't be isolated from each other

Environmental or ecological factor:

- ▶ *Any constituents of the environment which directly or indirectly affects the growth and development of an organism is called ecological factor.*
- ▶ Examples:
 1. Climatic factors
 2. Topographic factors
 3. Biotic factors
 4. Fire factors
 5. Edaphic (related to soil) factors.

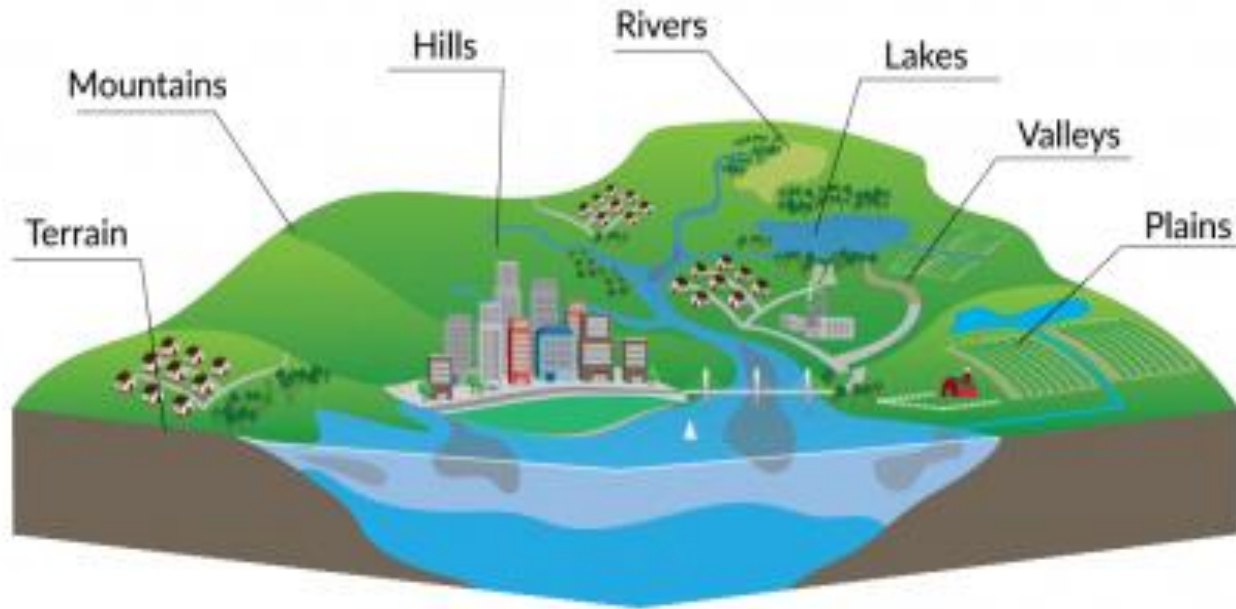
Climatic factors

Physical conditions that determine the **climate** in a given area, e.g. latitude, altitude, ocean streams, etc.



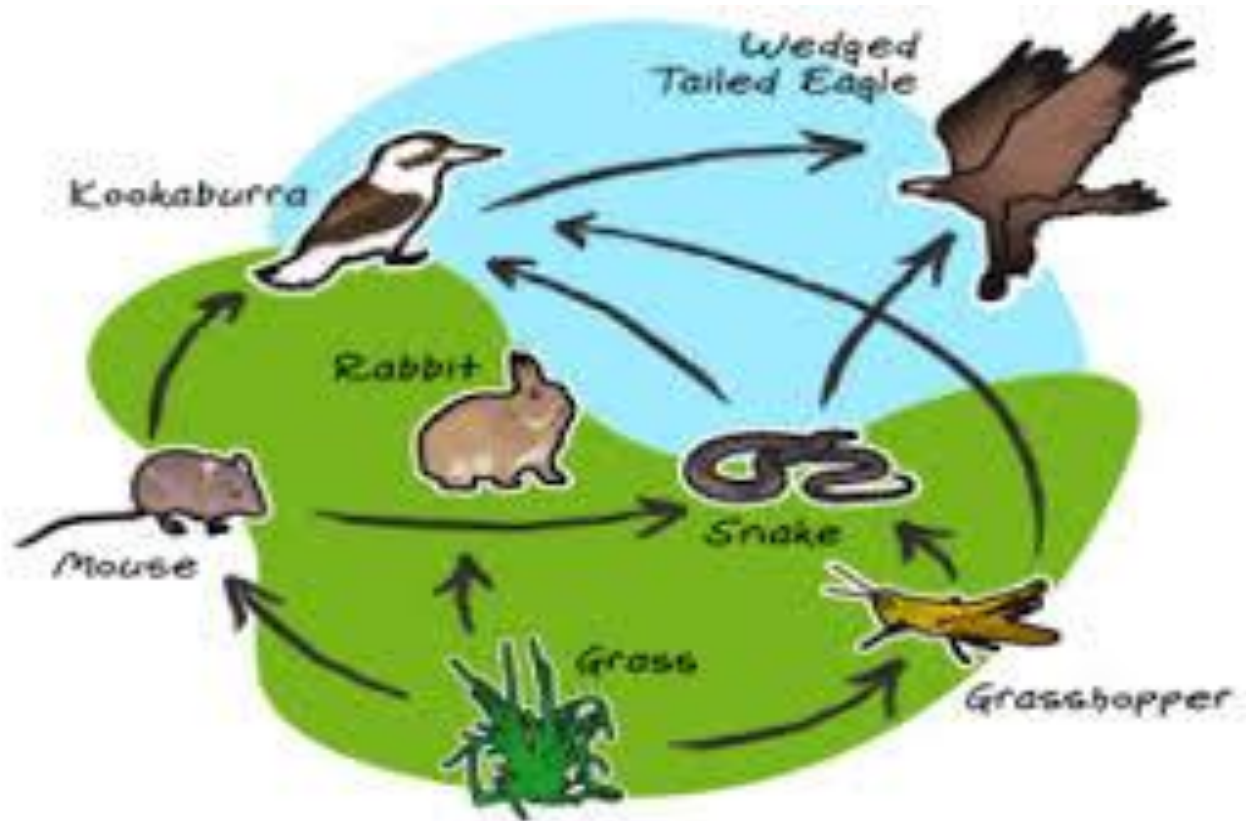
Topographic factors

Topographic factors such as elevation, slope angle, slope aspect, general curvature, plan curvature, and profile curvature are considered as the main causes of landslides.



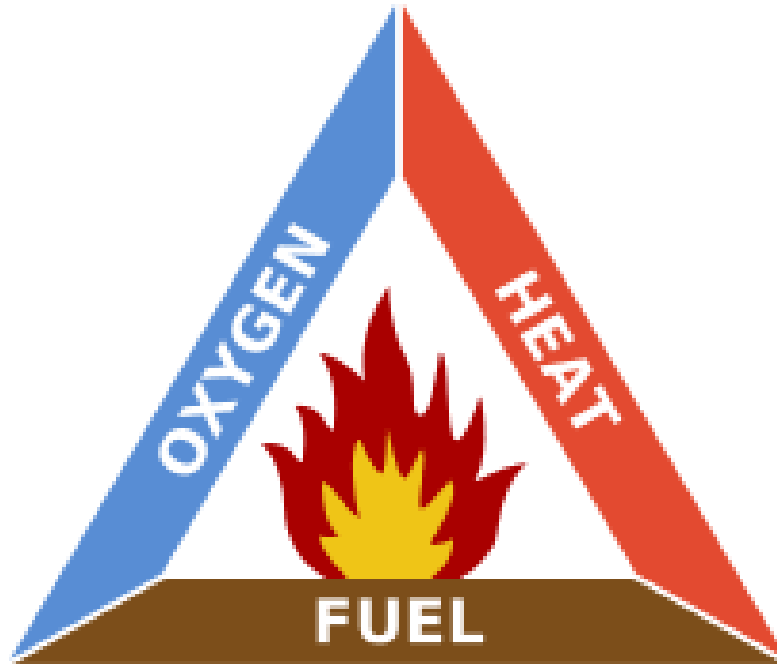
Biotic factor:

A **biotic factor** is any living thing that has an effect on an ecosystem. Biotic means “pertaining to life.” A factor is something that influences another thing. ... Abiotic factors are nonliving entities that affect ecosystems (for example, rain, sunlight, and rocks).



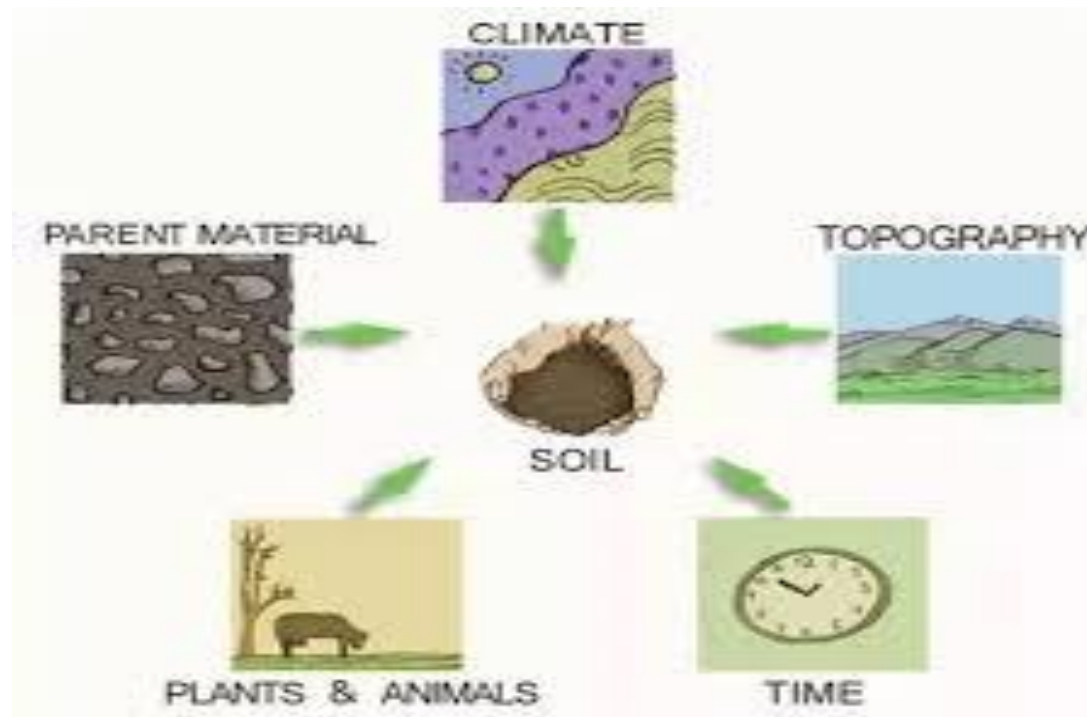
Fire factor:

The triangle illustrates the three elements a **fire** needs to ignite: heat, fuel, and an oxidizing agent (usually oxygen). A **fire** naturally occurs when the elements are present and combined in the right mixture.



Edaphic (related to soil) factor:

- The factor which relates to structure and composition of soil are called as edaphic factor.
- There are certain **edaphic**, **climatic** and biological **factors** that limit the biological nitrogen fixation. **Edaphic factors** include excessive **soil** moisture, drought, **soil** acidity, P deficiency, excess mineral N and deficiency of Ca.

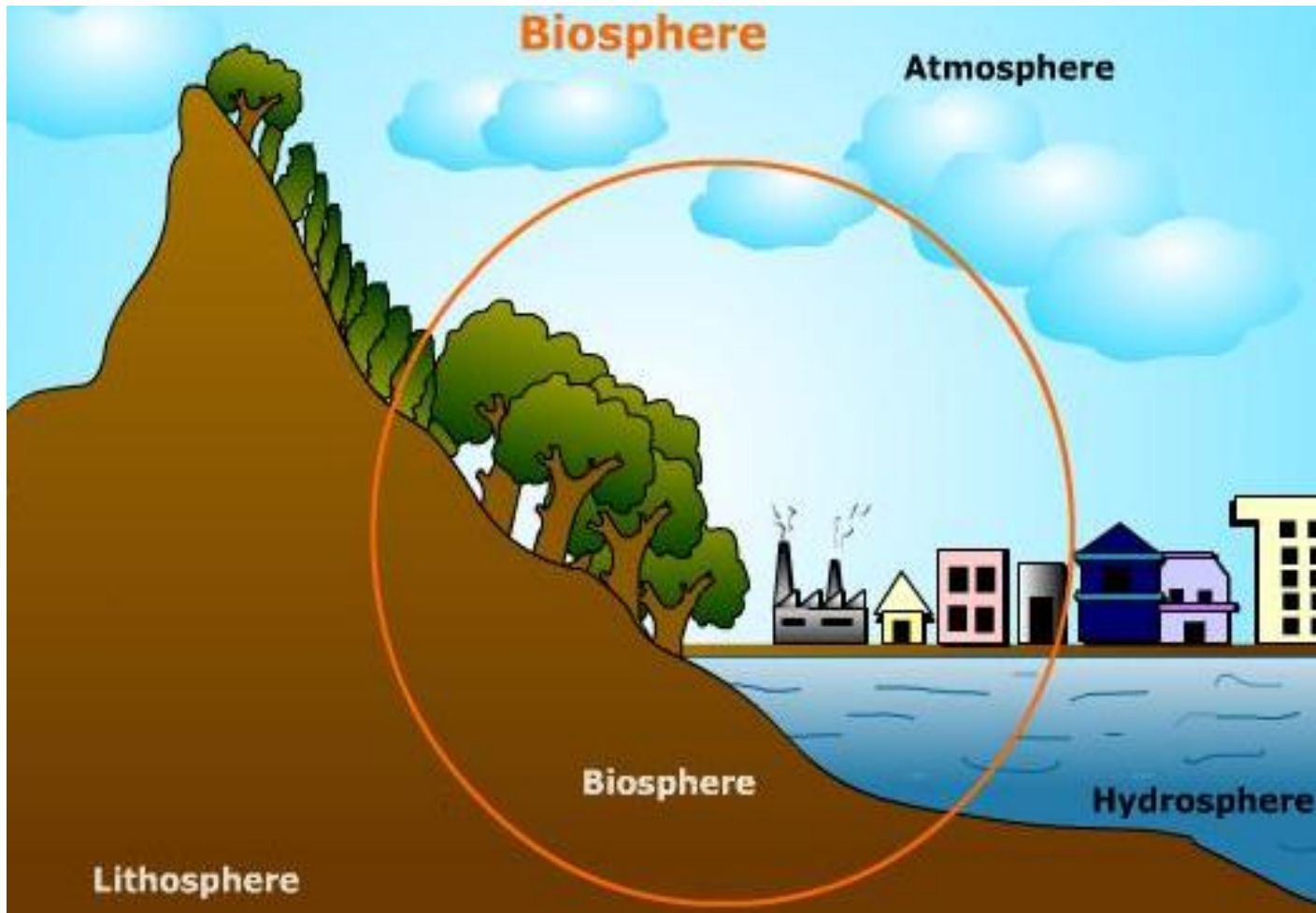


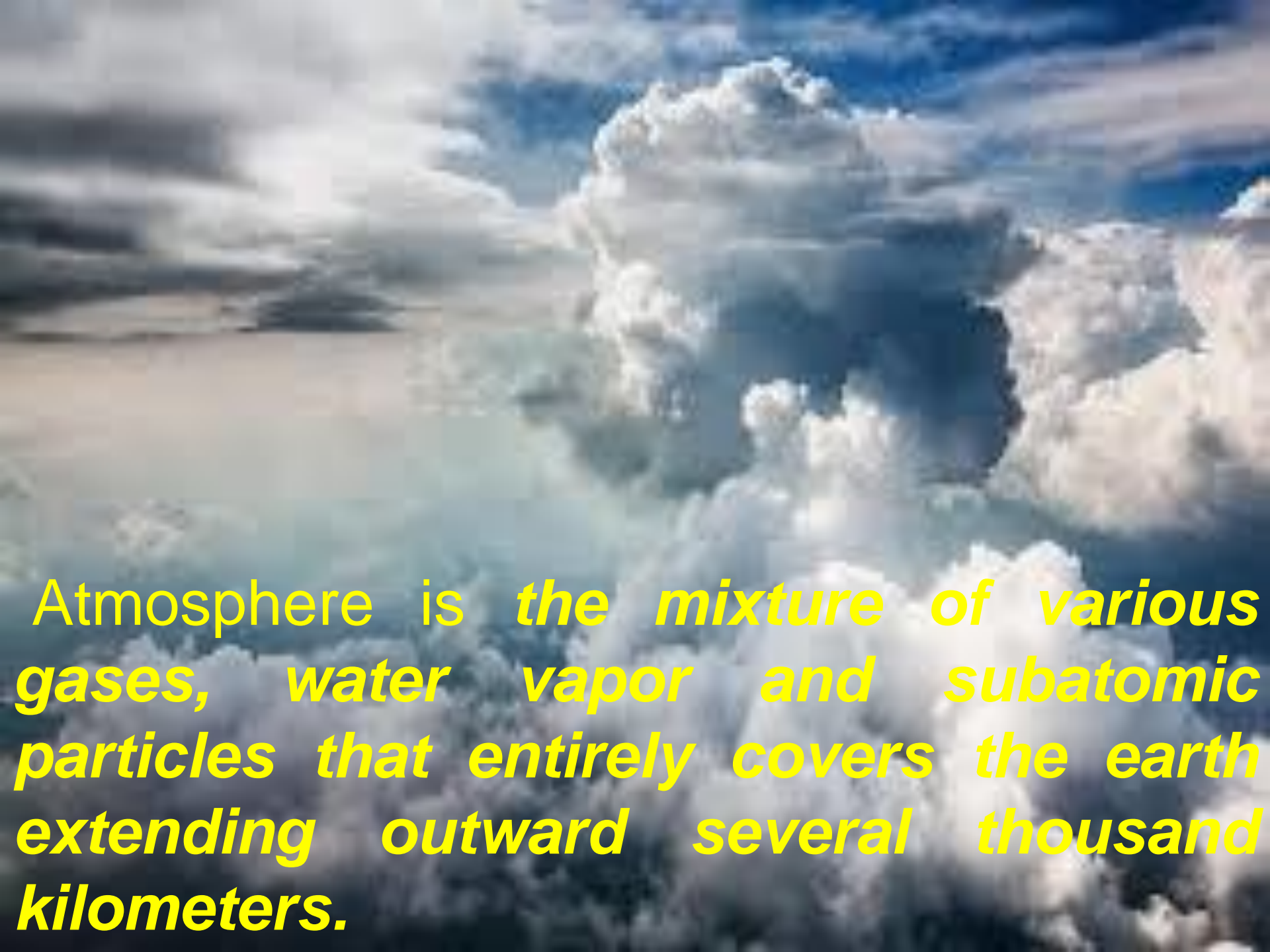
COMPONENTS OF ENVIRONMENT:

► Environment can be divided into four components:

1. Atmosphere
2. Hydrosphere
3. Lithosphere
4. Biosphere

COMPONENTS OF ENVIRONMENT:



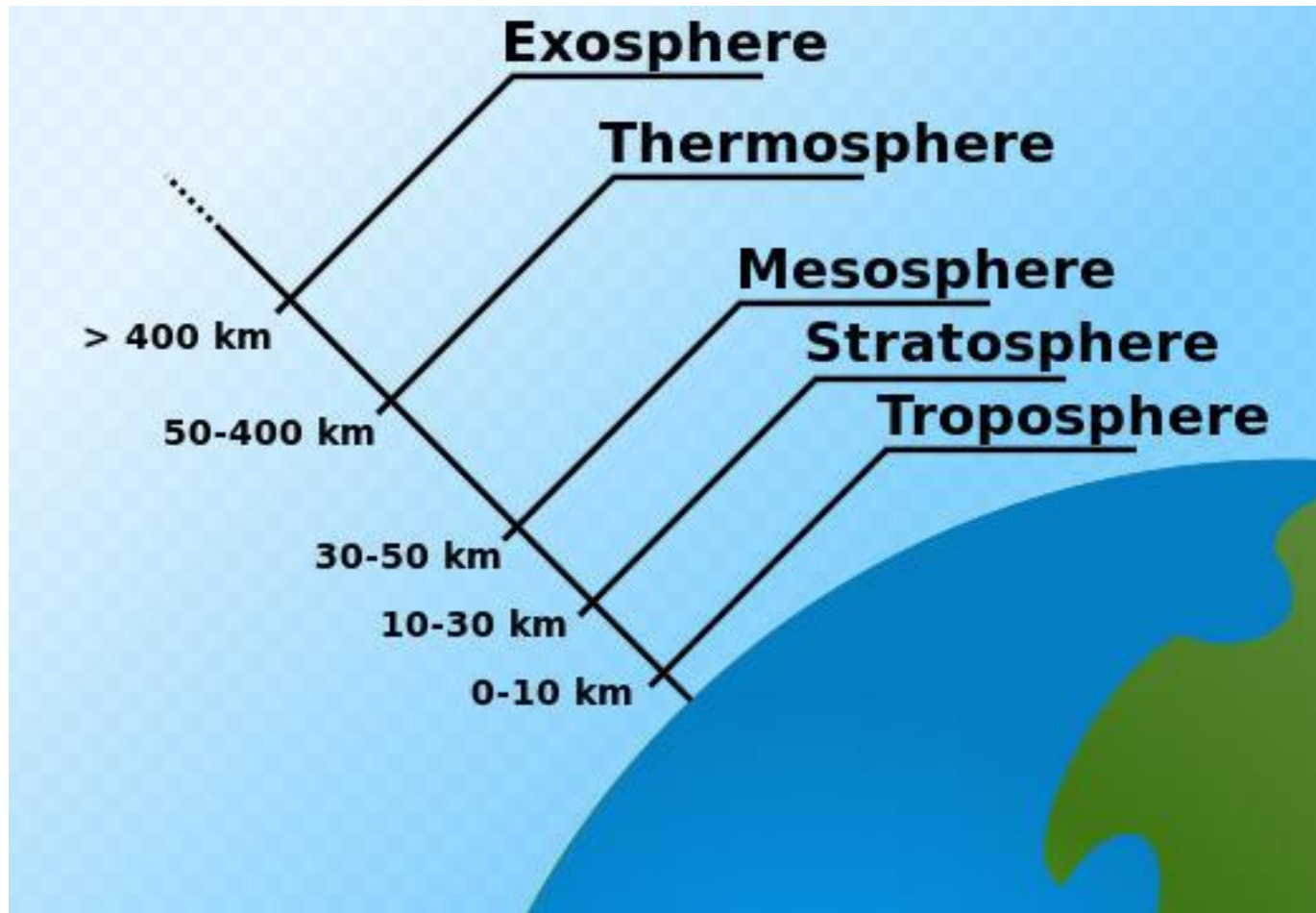


Atmosphere is *the mixture of various gases, water vapor and subatomic particles that entirely covers the earth extending outward several thousand kilometers.*

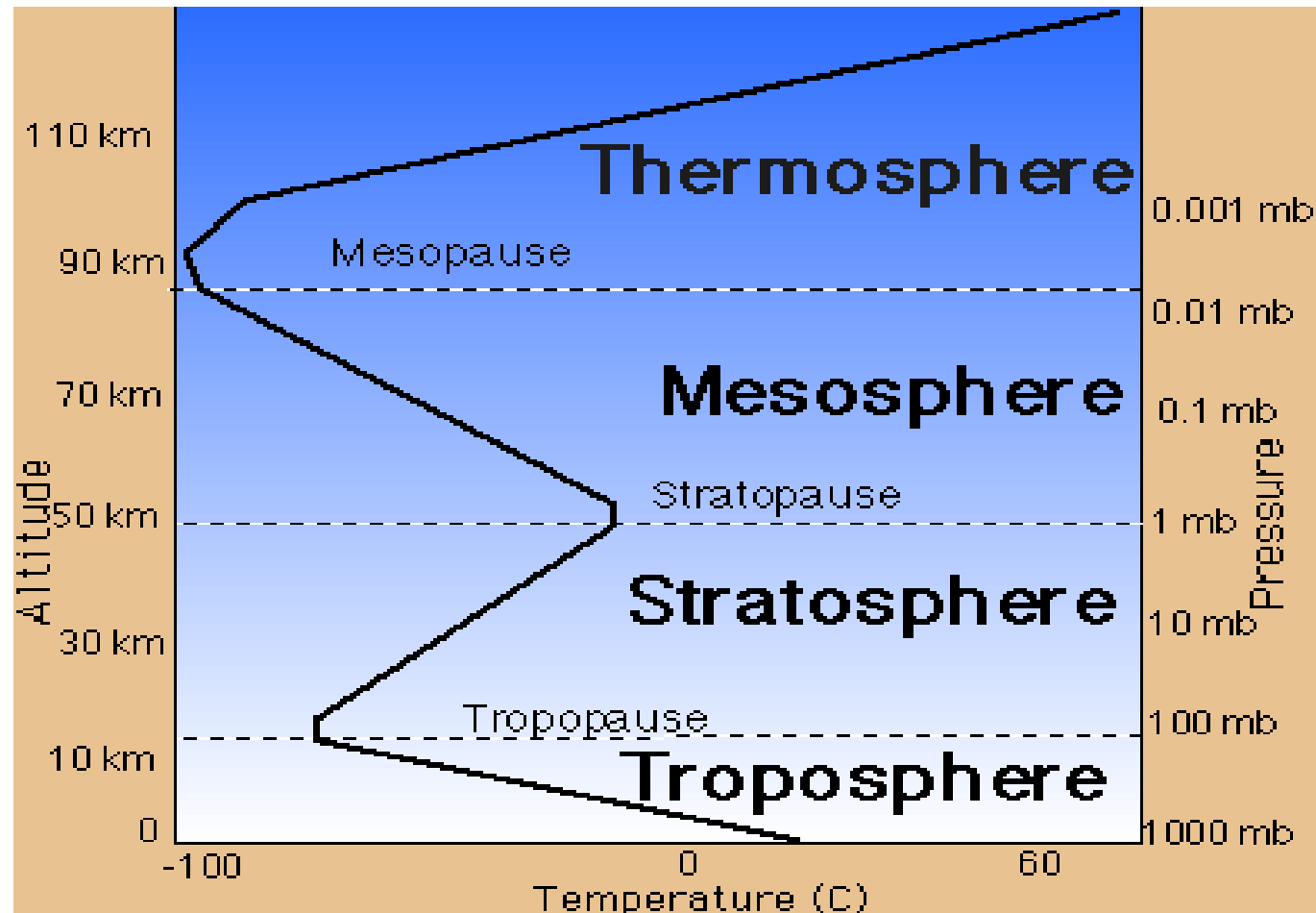
Atmosphere:

- ▶ The major gases in a pollution free dry air are Nitrogen(78%), Oxygen (21%) Argon(1%) and carbon dioxide.
- ▶ The minor gases include Neon, Helium, Methane, Hydrogen, Carbon monoxide, ozone etc.
- ▶ The concentration of *Carbon dioxide is increasing by about 1.5ppm yearly* as a result of deforestation and increased air pollution.

STRUCTURE OF ATMOSPHERE



TEMPERATURE PROFILE CURVE OF ATMOSPHERE



1. Troposphere:

- ▶ Troposphere is the lower portion of the atmosphere which extends up to 8 km at the poles and 16 km at equator.
- ▶ The temperature in the region decrease at the rate of 5 to 7 °C/km.
- ▶ Short term properties of the troposphere (temperature, wind, pressure, humidity, cloud, etc.) at a given place and time are called **weather**.

2. Stratosphere:

- ▶ It is above troposphere and extends up to 50-55km. Up to about 20 km temperature remains constant then increases with increase in height. Ozone layer is in this layer.

3. Mesosphere:

- ▶ It is the layer above stratosphere and extends up to 80 km. Here temperature decreases slowly with altitude but then sharply to about -75°C

4. Thermosphere:

- ▶ Temperature increases rapidly with increases in height. The heating of this layer is due to absorption of the solar energy. Within the thermosphere there is a layer of charged particles known as ionosphere.

5. Exosphere:

- ▶ Very little is known about this layer. It exists above the ionosphere and extends up to 2000km above the earth. This layer is almost airless and empty. It probably contains hydrogen gas in ionized state. It has very high temperature ($>1200^{\circ}\text{C}$).

HYDROSPHERE



HYDROSPHERE

- ▶ The hydrosphere is in fact the water environment.
- ▶ About 70% of the earth is covered by water. **Water is available in seas, oceans, lake, river, glaciers etc.**
- ▶ It is estimated that the hydrosphere contains about 1360 million cubic km of water out of which **97% is in the oceans and sea, 2% in glaciers and ice caps while remaining 1% of fresh water is available for human consumption.**
- ▶ Water is the main constituent in all the living organism and acts as an important resource for human life.

LITHOSPHERE

- ▶ The outer soil crust of the earth is lithosphere.
- ▶ The living organisms, plants and vegetation are supported by the lithosphere.
- ▶ It also contains resources like minerals, organic as well inorganic matter and to some extent air and water.
- ▶ Lithosphere plays an important role as it not only produces food for human beings and animals, but also decomposition of organic wastes is carried out by a host of microorganisms in the soils.

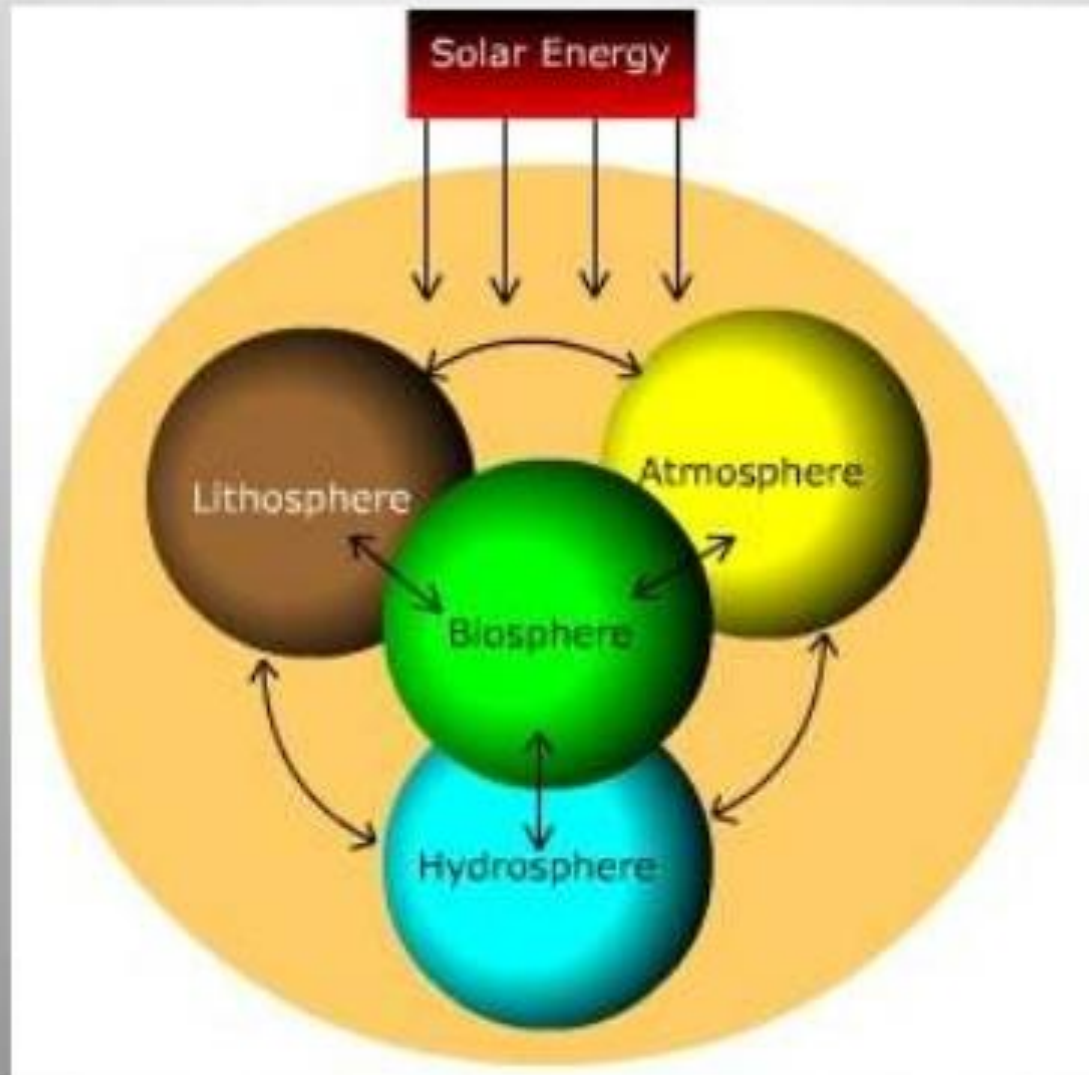


BIOSPHERE

BIOSPHERE

- ▶ Biosphere is the thin outer crust of the earth which includes all the living organisms and their environment.
- ▶ It extends from the **lowest sea bed level to about 24 km of the atmosphere.**
- ▶ Thus biosphere consists of lithosphere, atmosphere and hydrosphere. The living organisms interact with one another in biosphere and sustain their life.
- ▶ The waste products in gaseous, liquid and solid waste forms are discharged in to biosphere. **Though the sustaining and assimilative capacity of the biosphere is tremendous but it is not infinite.**
- ▶ The system is in operation for millions of years but now it is showing **stress primarily due to impact of human** upon environment.

Interaction between different components of environment



Effects of Technology to Environment



IMPACT OF HUMAN ON ENVIRONMENT : or IMPACT OF TECHNOLOGICAL DEVELOPMENT ON ENVIRONMENT

- ▶ The biosphere has received and assimilated the waste generated by plants and animals for centuries.
- ▶ The sustaining and assimilative capacity of biosphere is tremendous, but it is not infinite.
- ▶ For centuries biosphere has done the **self purification** as the quantity of waste or pollutants generated were within its assimilative capacity but now it is showing signs of stresses as quantity of pollutant have increased tremendously due to man's activity.

Cont....

- ▶ **Man is the only living organism capable of modifying its surrounding environment** according to the need.
- ▶ Initially man started hunting animals and cutting trees for his basic needs, gradually he started cultivating food grains.
- ▶ To increase his comfort he started disturbing the every component of environment.
- ▶ Large scale deforestation, increasing in quantity of carbon dioxide due to burning of forest, grass, crop waste are the example of early cause of pollution.
- ▶ This is up to the assimilative capacity of environment hence it's effect were not pronouncent.

But

TECHNOLOGY???

What is **TECHNOLOGY?**



“Technology can be defined as the products, tools and processes used to accomplish tasks in daily life. According to Use of Technology, technology is the application of science to solve a problem. Technology involves the application of engineering and applied sciences to solve the practical problems of human lives.”



The Effects are Categorized into:

- Natural Environment Impacts
- Human Health Impacts



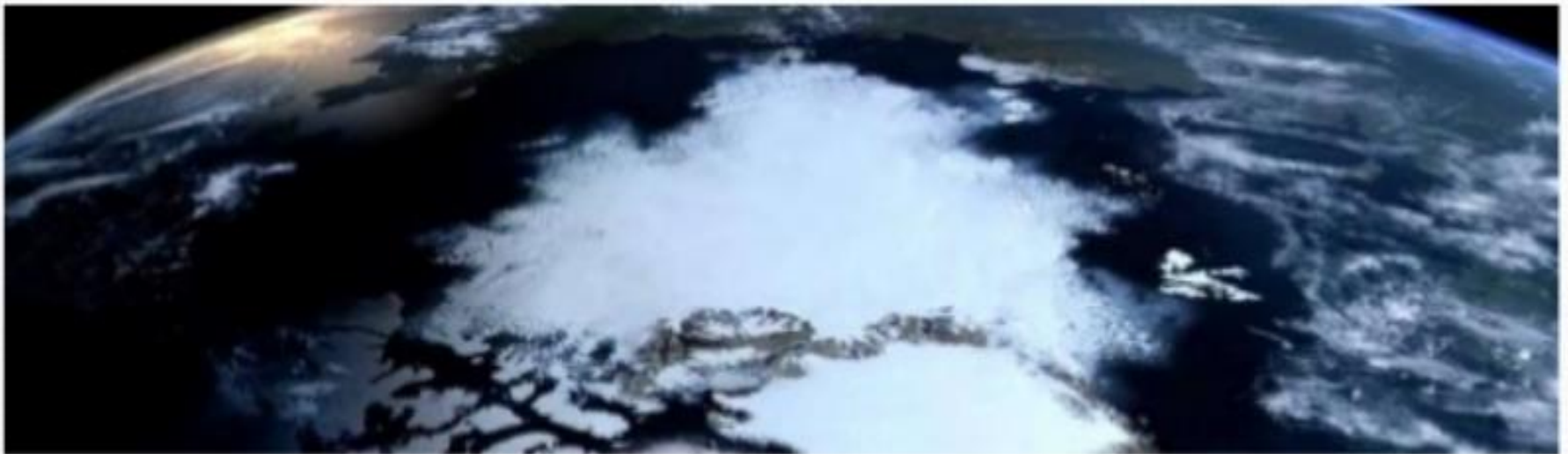
Human Health Impacts

Technology can have a large impact on users' mental and physical health. Being overly connected can cause psychological issues such as distraction, narcissism, expectation of instant gratification, and even depression.



Impacts on the Natural Environment

This category focuses on the effects a technology may have on organisms, their habitats, the life supporting capacity of natural ecosystems, and on biodiversity. Of particular concern is the loss of endangered and rare plant and animal species, and destruction of endangered and limited habitats.



- ▶ The Industrial revolution, the use of fossil fuel for generation of power, for running vehicles increase the pollution of all type.
- ▶ **Quantity of carbon dioxide** emitted increased tremendously which has started showing effect in the form of **Global warming**.
- ▶ **Rivers** are becoming increasingly polluted due to discharge of **industrial waste and sewage**.
- ▶ Major environmental issues arising due to human activities are **global warming, acid rain, ozone depletion and population explosion**.

	POPULATION	LAND USE	TRANSPORTATION	SERVICES
ATMOSPHERE	INCRESED RELEASE OF CO2,DECREASED O2 PRODUCTION, AS PLANT COLONIES ARE DESTROYED BY SPREADING URBAN AREAS	INCREASED AVERAGE TEMPERATURES FOR MOST URBANIZED AREAS	AIR POLLUTION FROM COMBUSTION OF FUELS CREATIONS OF PHOTOCHEMICAL SMOG	PARTICULATE MATTER AND NOXICIOUS FUMES FROM INCINERATORS LANSFILLS AND SEWAGE TREATMENT PLANTS
HYDROSPHERE	GREATER DEMAND ON WATER RESOURCES	MORE INTENSE USE OF HYDROLOGIC RESOURCES CAUSING INCREASED POLLUTION	RAIN AND SURFACE WATERS POLLUTED WITH LEAD. DRAINAGE PATTERNS ALTERED BY INFRASTRUCTURE	LEACHING OF POLLUTANTS FROM LANDFILLS. DISCHARGES FROM SEWAGE OUTFALLS POLLUTION FROM BOATS
LITHOSPHERE	INCREASED TRANSFORMATION OF UNINHABITATED AGRICULTURAL OR UNUTILIZED LAND TO URBAN USES	COMPLETE CHANGES DUE TO CONSTRUCTION LANDSCAPING etc....	DISTRUPTION OR DISFIGUREMENT OF LANDSCAPE etc..	SANITARY LANDFILL OF URBAN WASTES AND INSTALLATION/REPAIRS OF SERVICES DISTURB LANDSCAPE

- ▶ **Emission of CO₂ and other gases** in atmosphere from fossil fuel burning and other human activities may raise the temperature.
- ▶ **Chlorofluorocarbons and halons** released in to lower atmosphere are drifting into the upper atmosphere and reacting with and gradually depleting ozone faster than it is being formed.
- ▶ An estimated **36,500 species of plants & animals** becomes extinct each year.
- ▶ **8.1 million sq.km** of once productive land have now become dessert in the **last 50 years**.
- ▶ **50 % of tropical forests** are cleared.
- ▶ Reduction in biodiversity
- ▶ **5 million people die** from preventable water borne diseases.

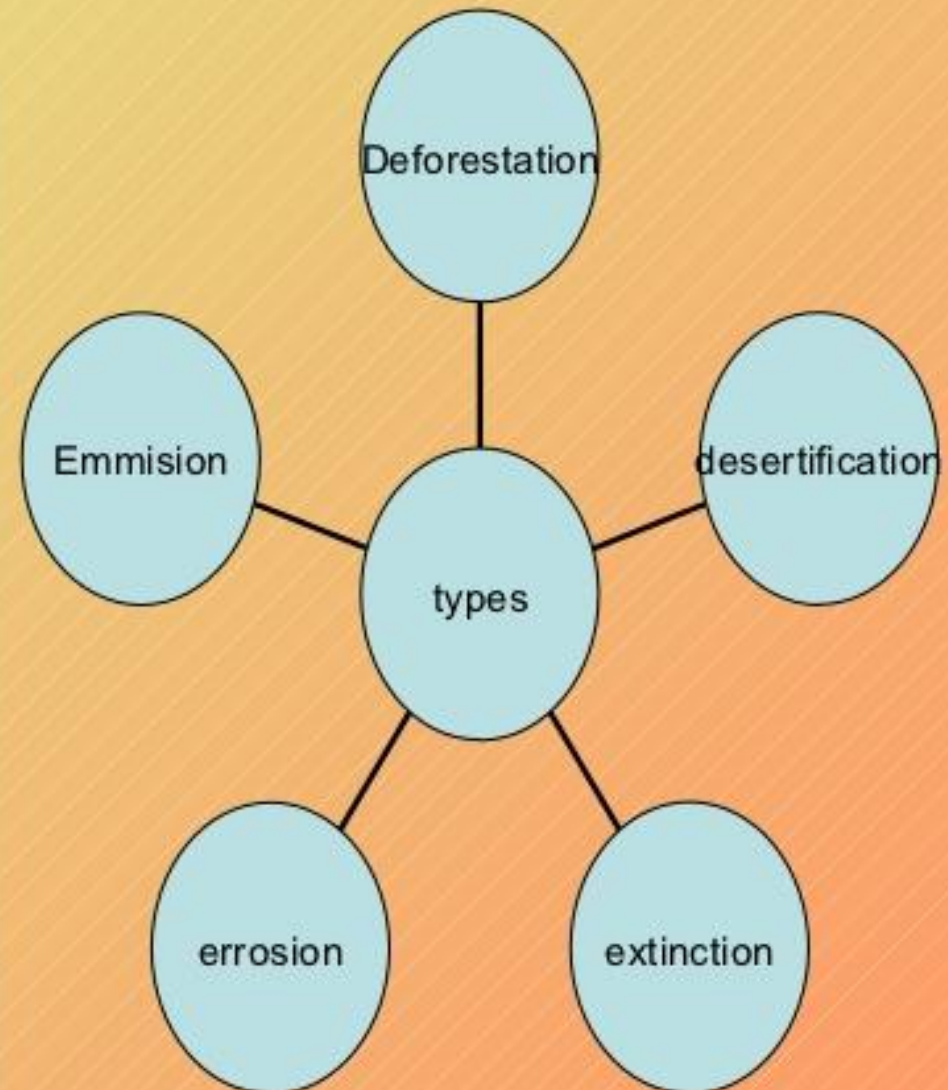
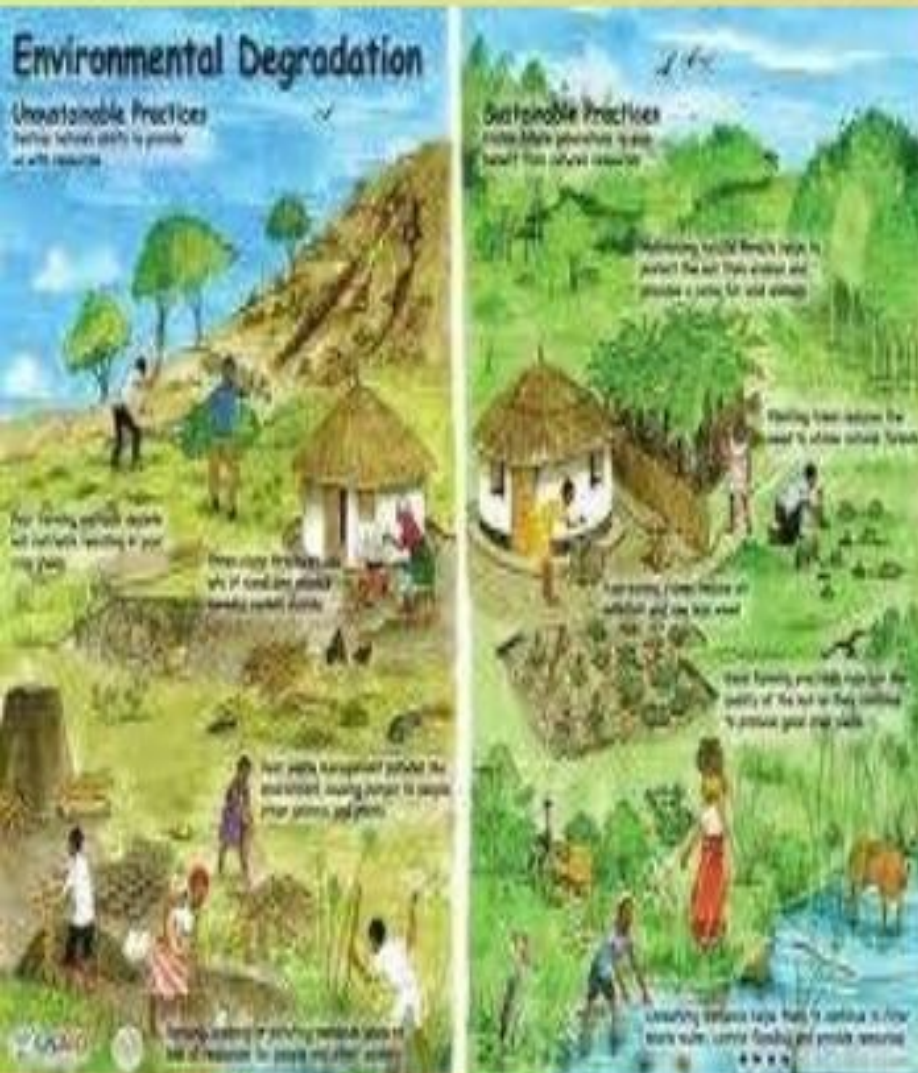
ENVIRONMENTAL DEGRADATION



Environmental Degradation means

- **Depletion of natural resources.**
- **Natural hazards and industrial disasters.**
- **Extinction of endangered species.**
- ***Environmental pollution.***
- **Declining of quality of life.**

Types of environmental degradation



Three principal impact pathways should be considered when assessing impacts in this category:

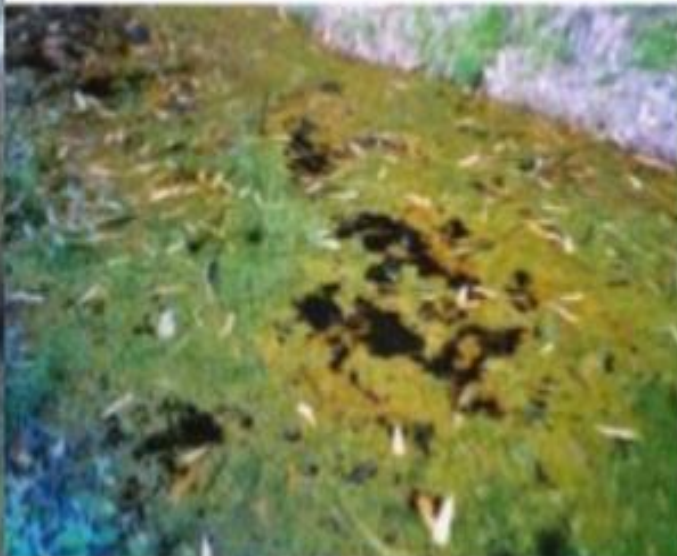
- Habitat loss or alteration through land clearance (e.g. as a consequence of raw material demand or development of a site).



- Physical disruption of habitat; for example, the construction of pipelines that inhibit the migration of animals.



- The chemical contamination of the environment through the release of wastes that have a direct toxic effect on flora and fauna (e.g. pesticides) or that alter the functionality of an ecosystem through such processes as eutrophication (e.g. the discharge of nutrients or other chemicals with high biological oxygen demand (BOD) and acidification).

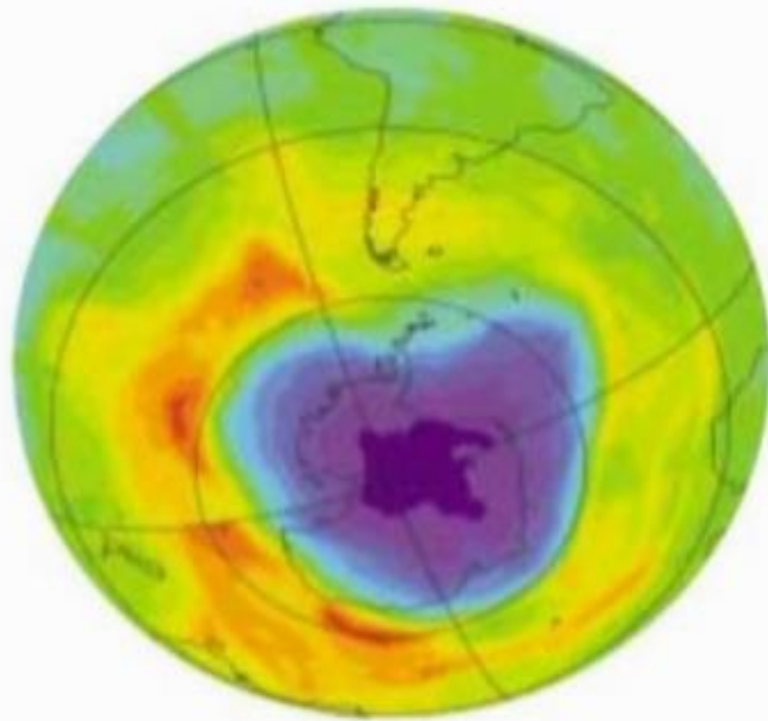


- Enhance global warming (i.e. greenhouse gases such as carbon dioxide, and nitrous oxides).



- Deplete the stratospheric ozone layer, for example chlorofluorocarbons.

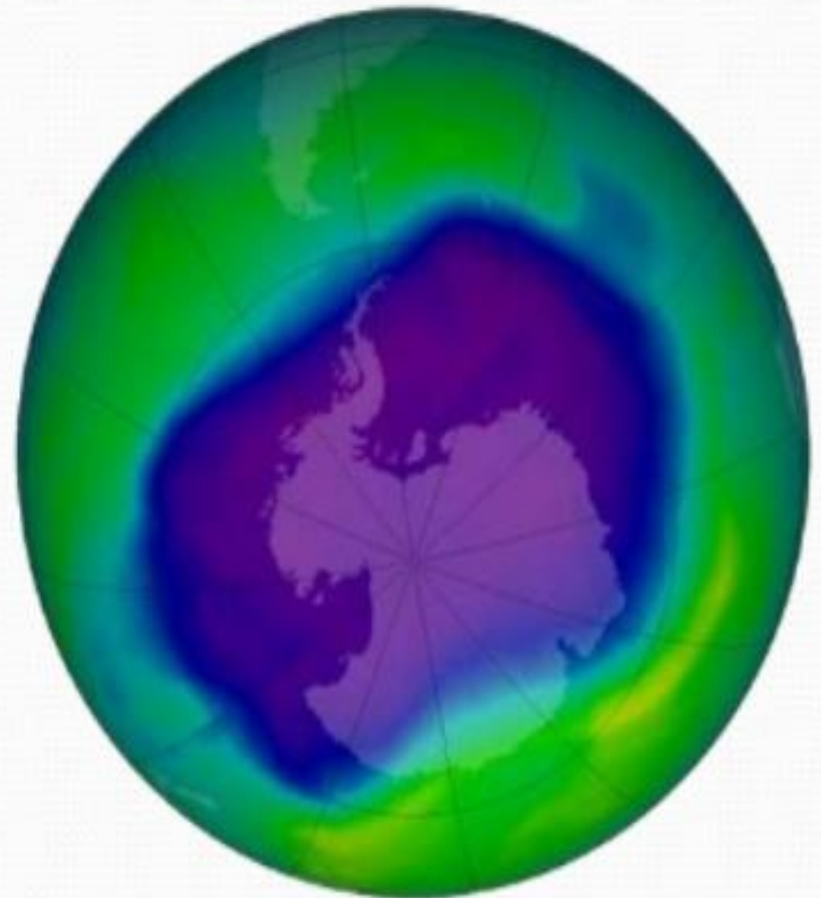
Antarctic Ozone Hole



4 October 2001



Total Ozone (Dobson units)





Nearly 80% of sewage in developing countries is discharged untreated and pollutes **rivers, lakes and coastal areas.**



In developing countries, 70% of industrial waste is dumped untreated into waters where it pollutes the **potable water supply**.



Every day, 2 million tons of **human waste** is disposed in water bodies.



The [global sea level](#) rose about 6.7 inches in the last century. The rate in the last decade, however, was nearly double that.



Between 2030 and 2050, climate change is expected to cause approximately 250,000 additional deaths a year, mainly because of **malnutrition**, **malaria**, **diarrhoea** and **heat stress**.

SUSTAINABLE DEVELOPMENT

- ▶ Sustainable development is the development that meets the need of the present without jeopardizing the needs of future generation”.
- ▶ *Sustainable development can be done by following steps:*
 - 1 Control of population
 - 2 Reduction in excessive usage of resources
 - 3 Recycling and reuse of materials
 - 4 Concentrating more on social and economical development
 - 5 Using cleaner fuel and technologies
 - 6 Mass transportation
 - 7 Effective environmental management tools (EIA), ISO...

THE GLOBAL GOALS

For Sustainable Development



SUSTAINABLE DEVELOPMENT

SFU's integrated approach includes the Centre for Sustainable Development and the Program in Sustainable Development. There are also many other sustainability-related courses at SFU.

The background features abstract, overlapping green geometric shapes, primarily triangles and polygons, in various shades of green, creating a modern and dynamic visual effect. The shapes are concentrated on the right side of the slide, with some extending towards the left.

Thank you