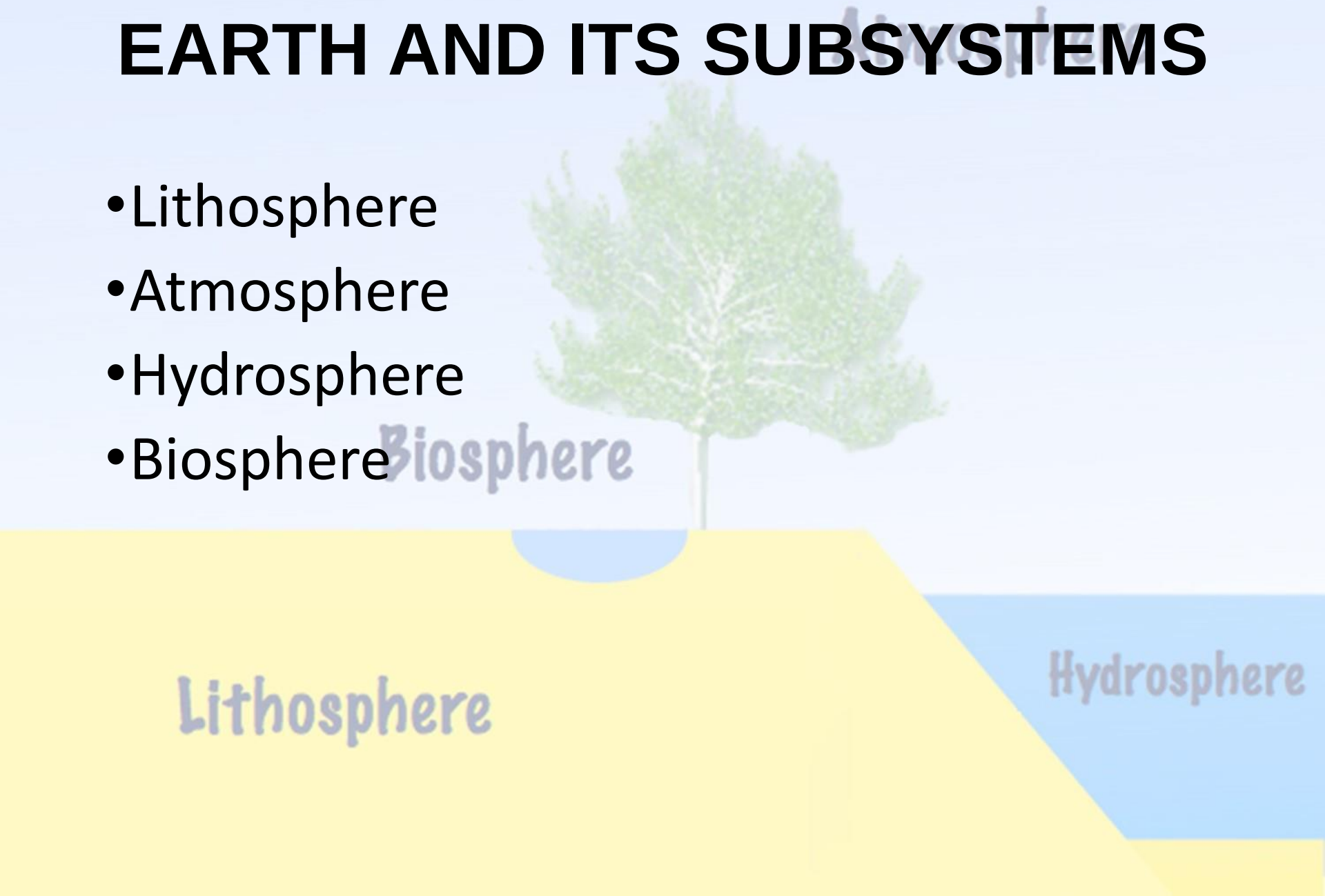
MODULE 1

- Systems of earth
- Lithosphere- composition, rocks, soils
- Atmosphere-layers, ozone layer, greenhouse effect, weather, cyclones, atmospheric circulations, Indian Monsoon
- Hydrosphere- Oceans, inland water bodies
- Biosphere
- Definition and meaning of key terms in Disaster Risk Reduction and Management

- Disaster
- Risk
- Risk assessment
- Risk mapping
- Risk capacity
- Hazard
- Risk resilience
- Disaster risk reduction
- Disaster risk management
- Early warning systems
- Exposure
- Disaster preparedness
- Disaster prevention
- Disaster mitigation
- Disaster response
- Vulnerability
- Damage assessment
- Crisis counselling
- Needs assessment

EARTH AND ITS SUBSYSTEMS

- Lithosphere
- Atmosphere
- Hydrosphere
- Biosphere



ATMOSPHERE

An atmosphere is a layer of gases that envelope a planet and held in place by the action of gravity by the planetary body

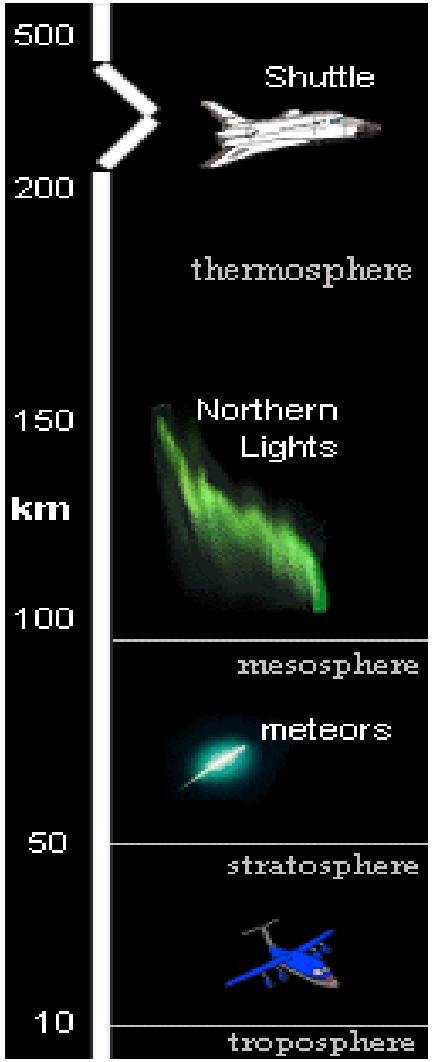
Chemical composition of atmosphere

• The atmosphere consists of a mixture of gases composed primarily of nitrogen, oxygen, carbon dioxide, water vapour and some other gases

- ❖ Nitrogen - 78.084 %
- ❖ Oxygen - 20.946 %
- ❖ Argon - 0.934%
- ❖ Carbon dioxide - 0.033%
- ❖ Others (Ne, Kr, Xe, Ra) - 0.003%

•The mesosphere exosphere, and thermosphere are zones of diffuse atmospheric components in the far reaches of the atmosphere.

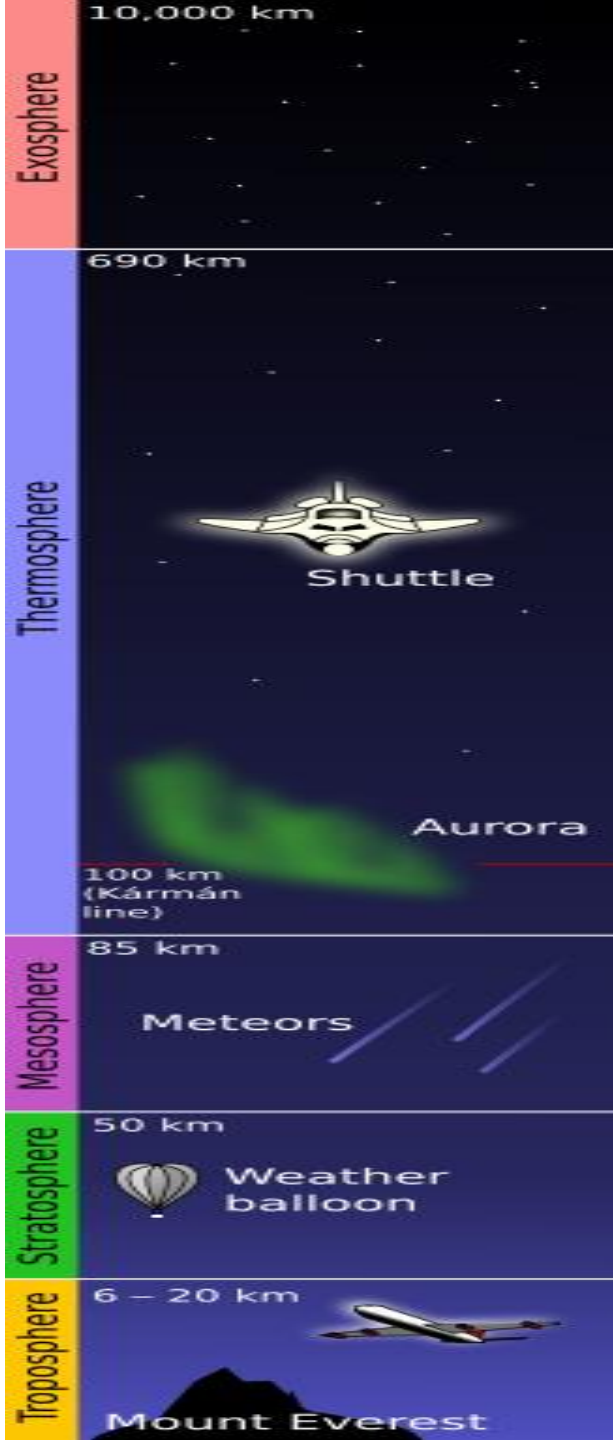
•The troposphere (0-10 km) constitutes the climate system that maintains the conditions suitable for life on the planet's surface.



The **stratosphere**(10 to 50 km), contains ozone that protects life on the planet by filtering harmful ultraviolet radiation from the Sun.

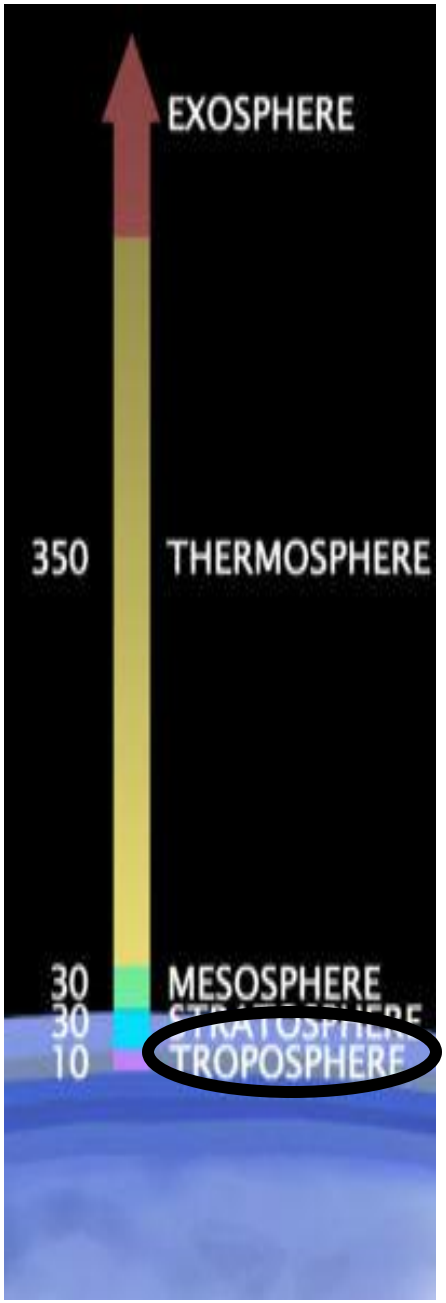
Atmosphere

- Exosphere
- Thermosphere
- Mesosphere
- Stratosphere
- Troposphere



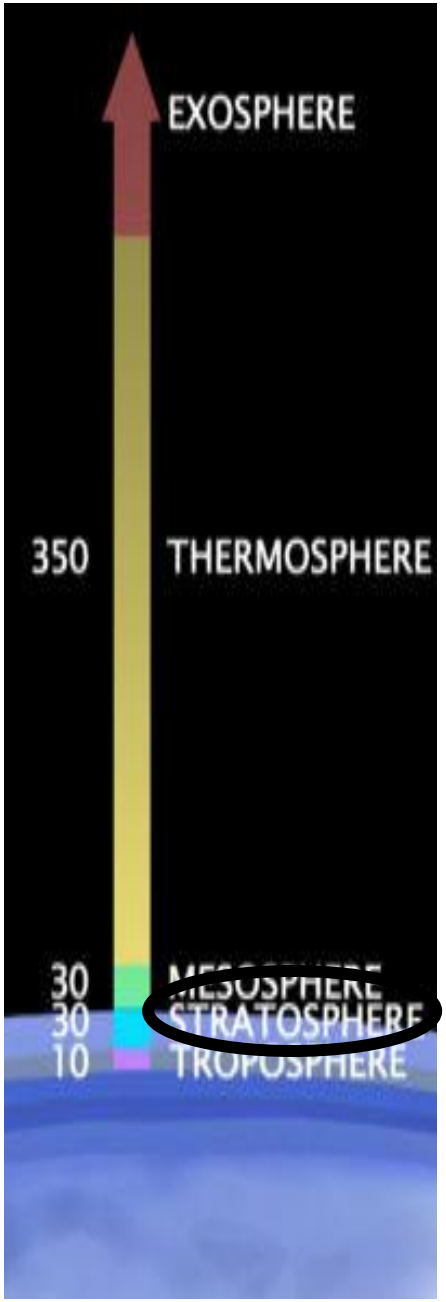
Troposphere

- Lowest portion of earth's atmosphere
- 75% of the entire atmosphere mass
  - Water Vapor
  - Aerosols
- 0 km – 10 km Depth ~ 11 km
- Warmer nearest earth Colder the further we go
- Important character is occurrence of strong turbulence and thorough mixing of gases in this layer.
- Responsible for most of the weather forming or meteorological processes on the earth.



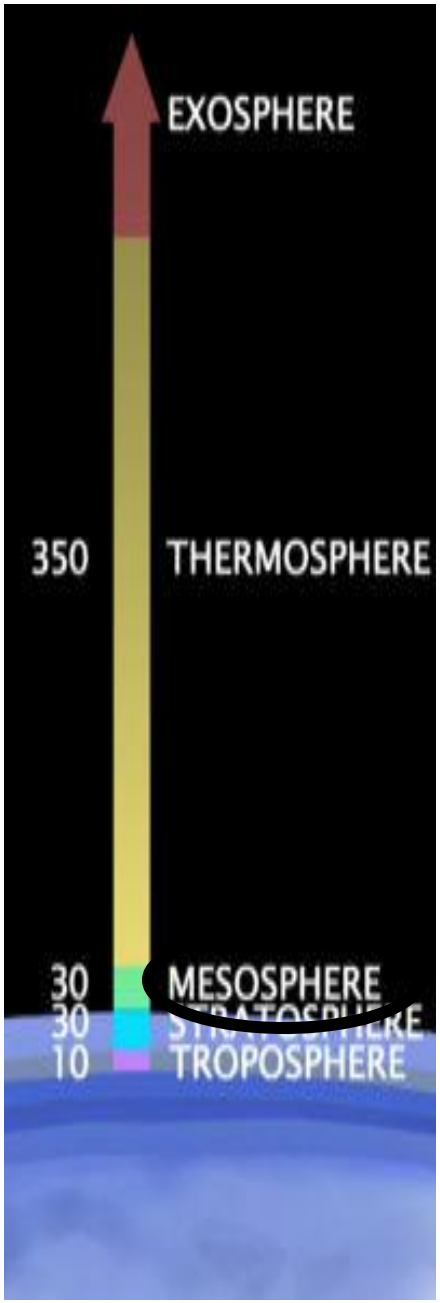
STRATOSPHERE

- Second layer of earth's atmosphere
- 10 km – 50 km Depth ~ 40 km
- Colder nearer the earth surface Warmer the further into the atmosphere
- Energy is transferred via heat absorption by the ozone layer.
- Heating caused by conduction from above and convection from below.
- The stratosphere could be called the Earth's 'sun-glasses'.
- This is where most of the ultraviolet solar radiation, which is harmful for man and all living organisms, is filtered out.
- This is mainly achieved by ozone, a molecule consisting of three oxygen atoms.
- About 90% of the total quantity of ozone is to be found in the stratosphere.



MESOSPHERE

- Middle layer of earth's atmosphere
- 50 km – 80 km Depth ~ 40 km
- It is characterized with a steep fall in temperature that may go to as low levels as -100°C at the upper limit of mesosphere



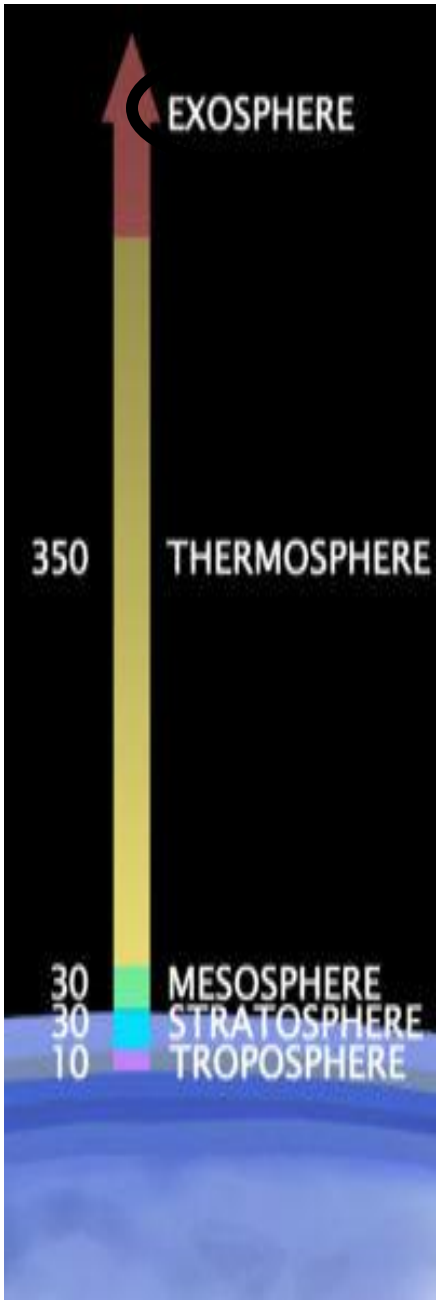
THERMOSPHERE

- Fourth layer of earth's atmosphere
- 80 km – 500 km Depth ~ 420 km
- The **Ionosphere** is a special zone recognised within the atmosphere.
- Atmospheric gases at these heights absorb a great part of solar radiation coming to the earth.
- In this process, these gases break up into ions or electrically charged particles.
- As a result, this part of atmosphere is made up entirely of ions and hence designated as Ionosphere.
- Scientists have taken due advantage of the existence of the ionosphere.
- It has proved a boon for the long distance radio communication by virtue of its property of reflecting radio waves.

EXOSPHERE

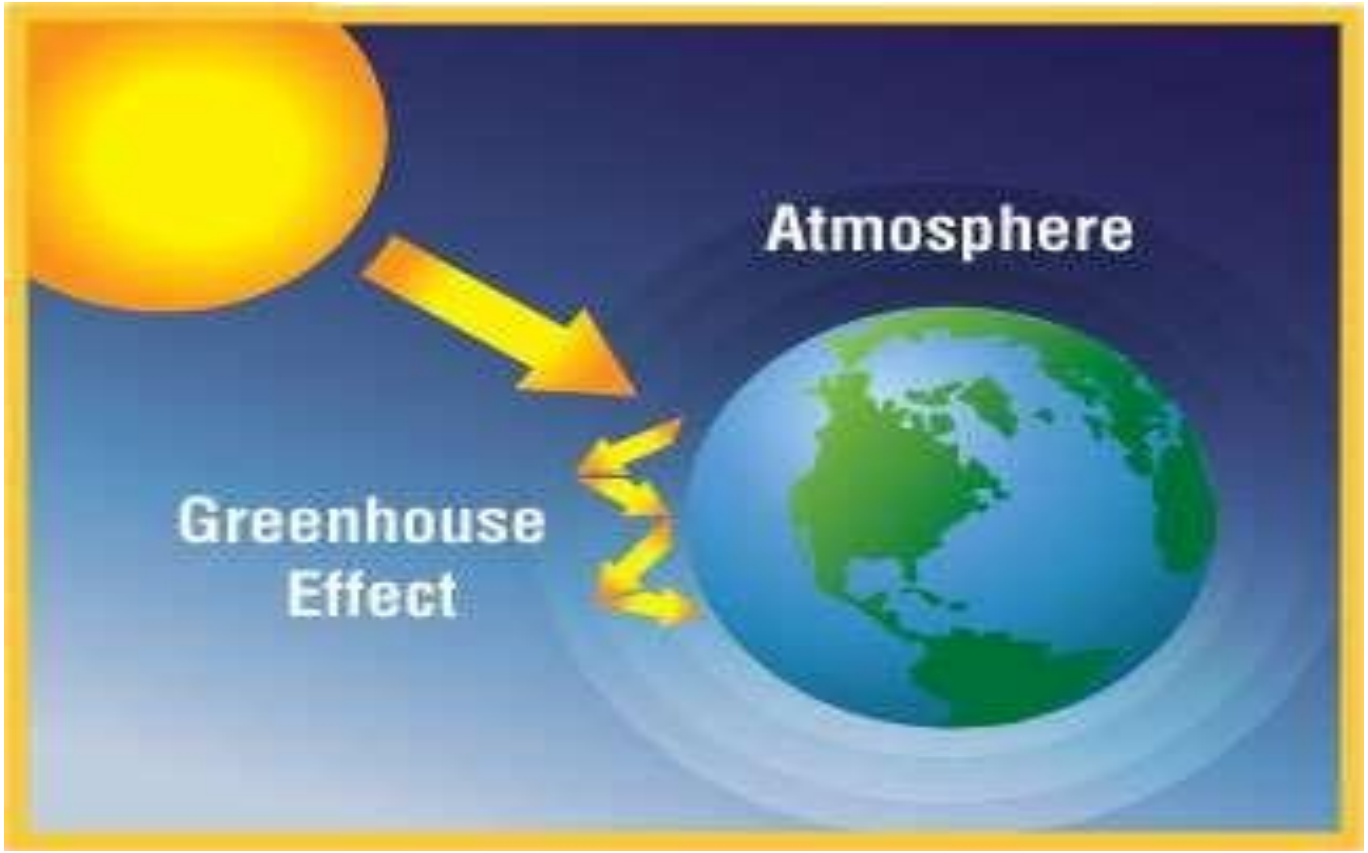
- Outer layer of the atmosphere
- Region of atmosphere beyond 700km
- Low density and higher temperature region
- Only layer of atmosphere where gases can escape

- Main gases found here:
  - Hydrogen
  - Helium
  - Carbon Dioxide



GREENHOUSE EFFECT

- The **GREENHOUSE EFFECT** is a natural process that warms the Earth's surface.



- The energy of the Sun is emitted as heat radiations.
- Some of the radiations such as near infrared rays are penetrated & some heat radiations with longer wavelength are absorbed & retained by earth's surface.
- Some of this absorbed heat is the reradiated by the heated earth.
- The temperature of the earth's surface is determined by the energy balance between the heat energy reaching the earth's surface and heat energy that is radiated back into the space.
- Fossil fuel based industrialisation & man's degenerative life-style based on over exploitation of resources like coal, oil & gases results in unprecedented rise in the concentration of green house gases like carbon dioxide, methane, CFCs, ozone & water vapour.

- These green house gases in the lower levels of the atmosphere will act like the glass of a green house.
- Like glass, they are transparent to the near infrared rays of short wavelength but are opaque to the heat radiated by the heated earth of longer wavelength and trap them.
- By not letting the solar rays to escape into the outer space, greenhouse gases add to the heat that is already present on the earth’s surface.
- This results in an increase in temperature and commonly known as greenhouse effect. And on a large scale, this effect is known as Global warming.

They pose the following threats

1. Rise in the global temperature will result in melting of ice masses in the Artic and Antarctica regions, resulting in rising of the sea level.
2. With the consequence there would be submergence of many low lying coastal areas.
3. Flooding of the coastal areas will cause massive soil erosion and siltation, contamination of water and water borne diseases.
4. In temperate regions, the summers will be longer and hotter where as the winters will be shorter and warmer.

5. The already dry sub-tropical regions may become drier and the tropical regions may become wetter.
6. Desertification, drought and famine would lead to migration of population and new urbanisation.
7. Due to increased concentration of carbon dioxide the growth and yield of plants will increase resulting in rapid depletion of nutrients from the soil.
8. Disruption of the ecosystem by increase in rainfall (9-10%) altered crop patterns and adverse effect on flora and fauna.

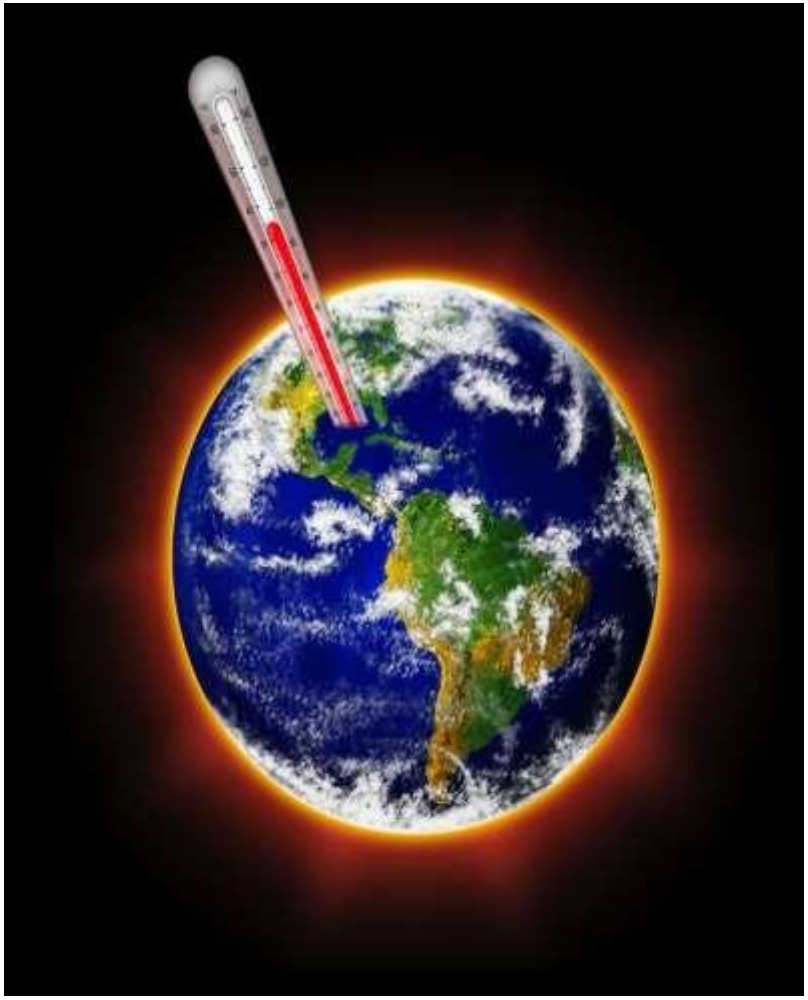
- Some other major effects are, the extra water vapour which is present in the atmosphere falls again as rain which leads to floods in various regions of the world.
- When the weather turns warmer, evaporation process from both land and sea rises.
- This leads to drought in the regions where increased evaporation process is not compensated by increased precipitation.
- In some areas of the world, this will result in crop failure and famine particularly in areas where the temperatures are already high.

- The extra water vapour content in the atmosphere will fall again as extra rain hence causing flood.
- Towns & villages which are dependent on the melting water from snowy mountains may suffer drought & scarcity of water supply.
- Global warming can severely affect the health of living beings.
- Excess heat can cause stress which may lead to blood pressure and heart diseases.

- Crop failures and famines, which are a direct consequence of heating up of earth, can cause a decline in human body resistance to viruses and infections.
- Global warming may also transfer various diseases to other regions as people will shift from regions of higher temperatures to regions of comparatively lower temperatures.
- Warmer oceans and other surface waters may lead to severe cholera outbreaks and harmful infections in some types of sea food

GLOBAL WARMING

- Due to the increasing use of fossil fuels, burning of forest lands to increase agricultural production, decaying of agricultural products and other human activities, the concentration of greenhouse gases in the atmosphere has been increasing, resulting in an ‘enhanced greenhouse effect’ which is often referred to as global warming.

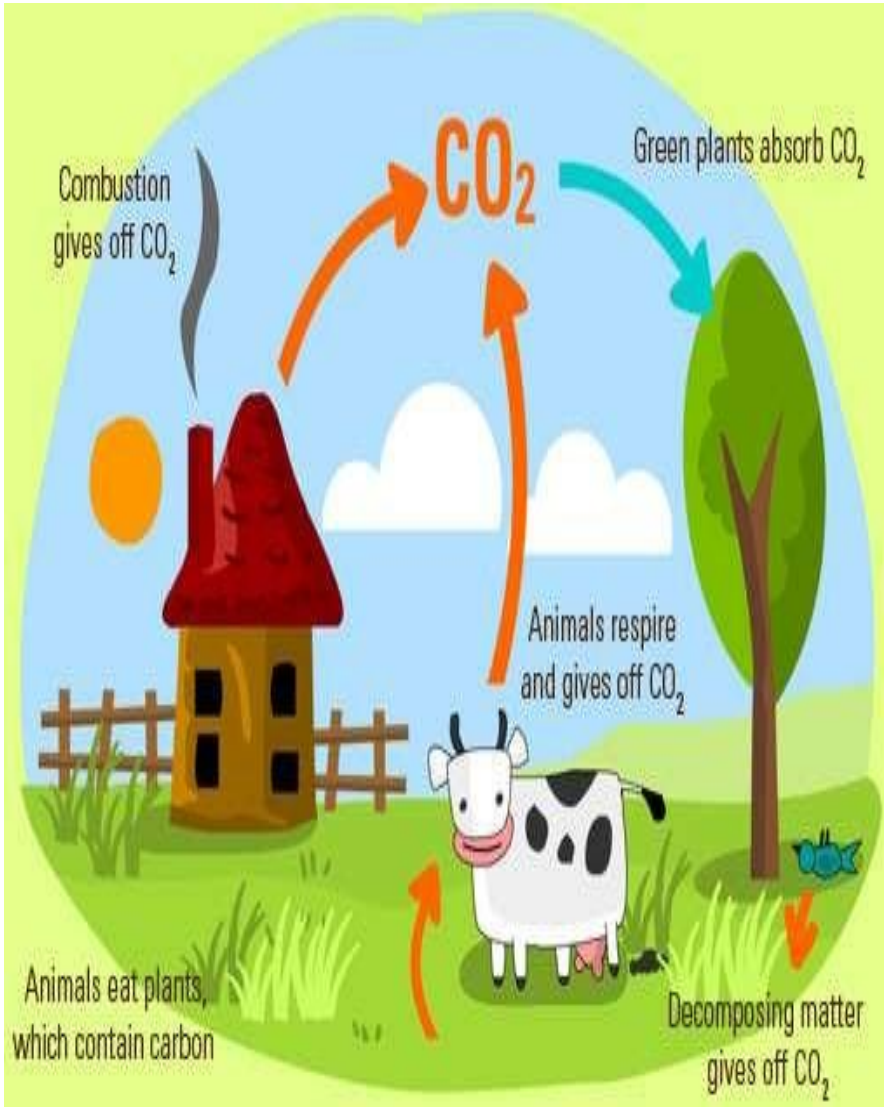


CAUSES OF GLOBAL WARMING

- The major cause of global warming is the greenhouse gases.
- They include carbon dioxide, methane, nitrous oxides and in some cases chlorine and bromine containing compounds.
- The build-up of these gases in the atmosphere changes the radiative equilibrium in the atmosphere.
- Their overall effect is to warm the Earth's surface and the lower atmosphere because greenhouse gases absorb some of the outgoing radiation of Earth and re-radiate it back towards the surface.
- The second major cause of global warming is the depletion of ozone layer.

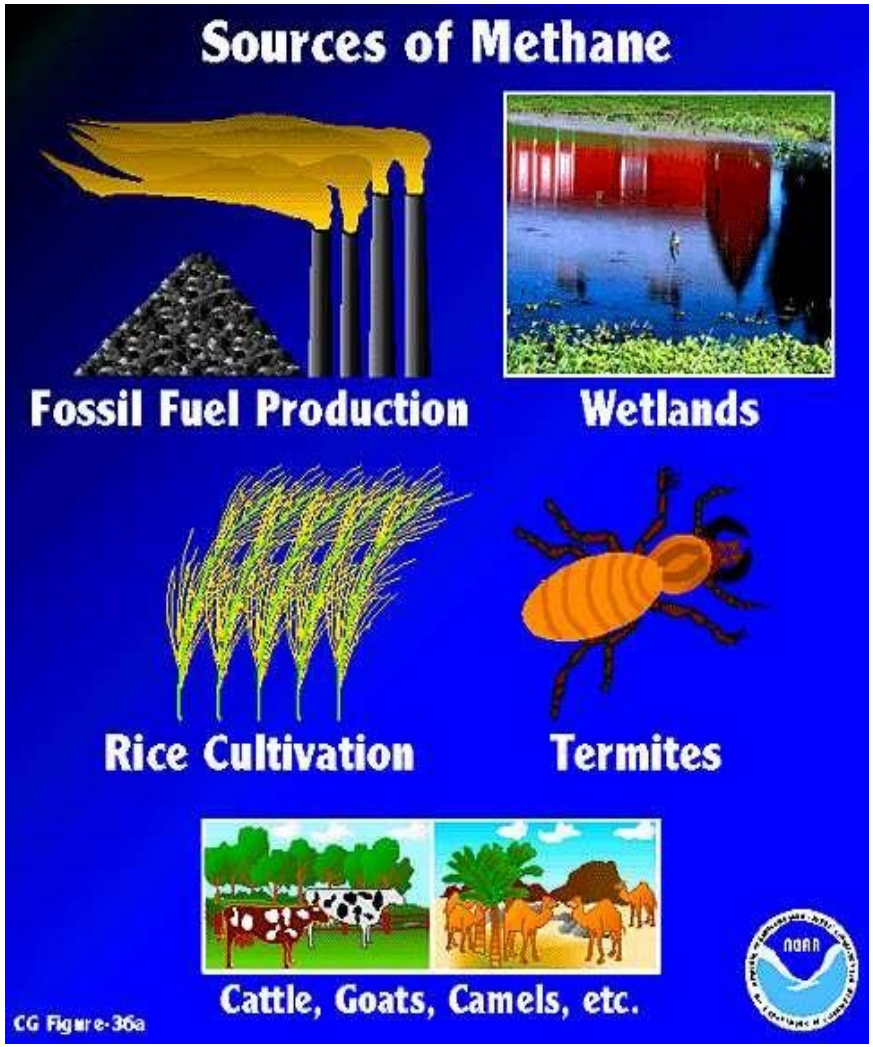
- This happens mainly due to the presence of chlorine- containing source gases.
- When ultraviolet light is present, these gases dissociate releasing chlorine atoms which then catalyses ozone destruction.
- Aerosols present in the atmosphere are also causing global warming by changing the climate in two different ways.
- Firstly, they scatter and absorb solar and infrared radiation and secondly, they may alter the microphysical and chemical properties of clouds and perhaps affect their lifetime and extent.

CARBON DIOXIDE



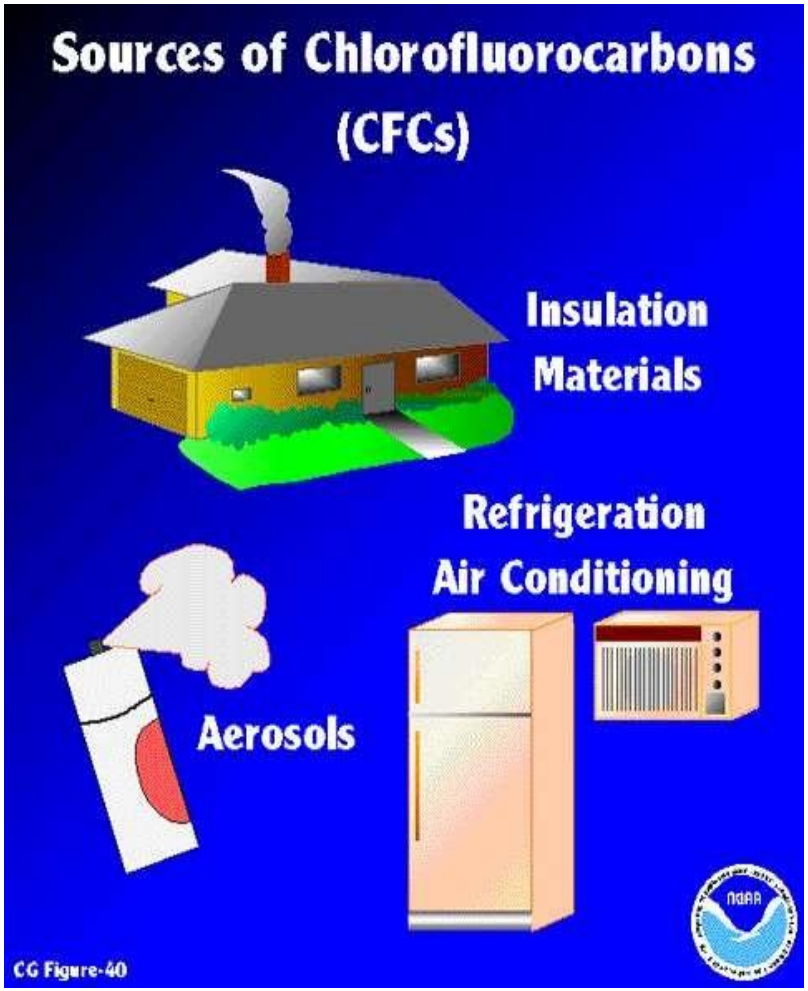
- **CARBON DIOXIDE** (CO_2) is naturally produced when people and animals breathe.
- Plants take in and use CO_2 to produce their own food.
- It is also returned to the air as a product of combustion and decomposition.

METHANE



- **METHANE** (CH_4) is emitted by natural sources such as wetlands, as well as human activities such as leakage from natural gas systems and the raising of livestock.

CLOROFLUOROCARBONS

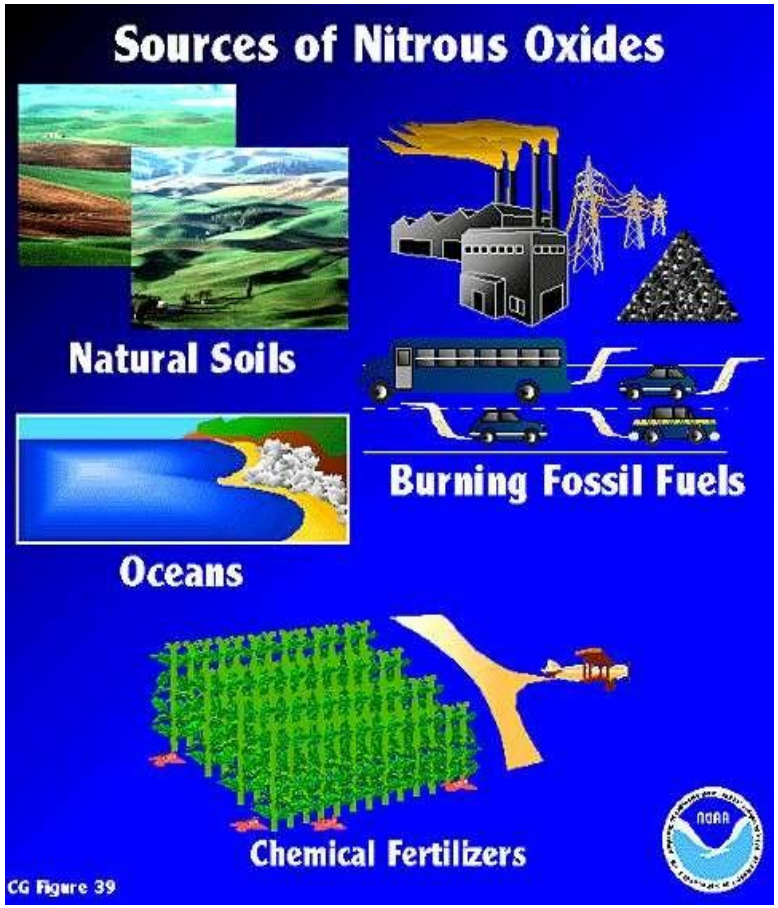


- CFC's are anthropogenic compounds that have been released into the atmosphere since 1930s in various applications such as in air-conditioning, refrigeration, blowing agents in foams, insulations and packing materials, propellants in aerosol cans and as solvents.

WATER VAPOR

- **WATER VAPOR** is the gaseous phase of water. It is one state of water within the hydrosphere.
- Water vapor can be produced from the evaporation or boiling of liquid water or from sublimation of ice.

NITROUS OXIDE



- **NITROUS OXIDES** is naturally present in the atmosphere as part of the nitrogen cycle and has a variety of natural sources.
- However, human activities such as agriculture, fossil fuel combustion, waste water management and industrial processes are increasing the amount of nitrous oxide in the atmosphere

BIOSPHERE

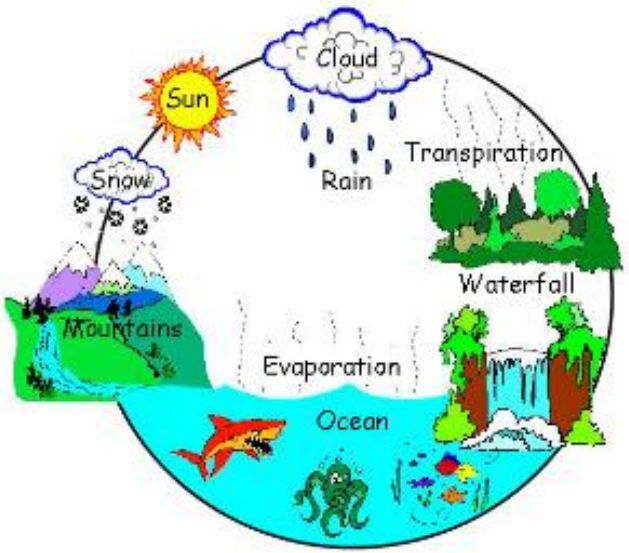
The ***biosphere*** **is the "life zone"** of the Earth, and includes all living organisms (including humans), and all organic matter that has not yet decomposed.

THE BIOSPHERE

- The biosphere is structured into a hierarchy known as the food chain (all life is dependant on the first tier – mainly the primary producers that are capable of photosynthesis).
- Energy and mass is transferred from one level of the food chain to the next.

HYDROSPHERE

The ***hydrosphere*** contains all the water found on our planet.



- Water found on the surface of our planet includes the ocean as well as water from lakes and rivers, streams, and creeks.
- Water found under the surface of our planet includes water trapped in the soil and groundwater.
- Water found in our atmosphere includes water vapor.
- Frozen water on our planet includes ice caps and glaciers.
- Only about 3% of the water on Earth is “fresh” water, and about 70% of the fresh water is frozen in the form of glacial ice.

Subcomponents of hydrosphere are connected via the hydrologic cycle

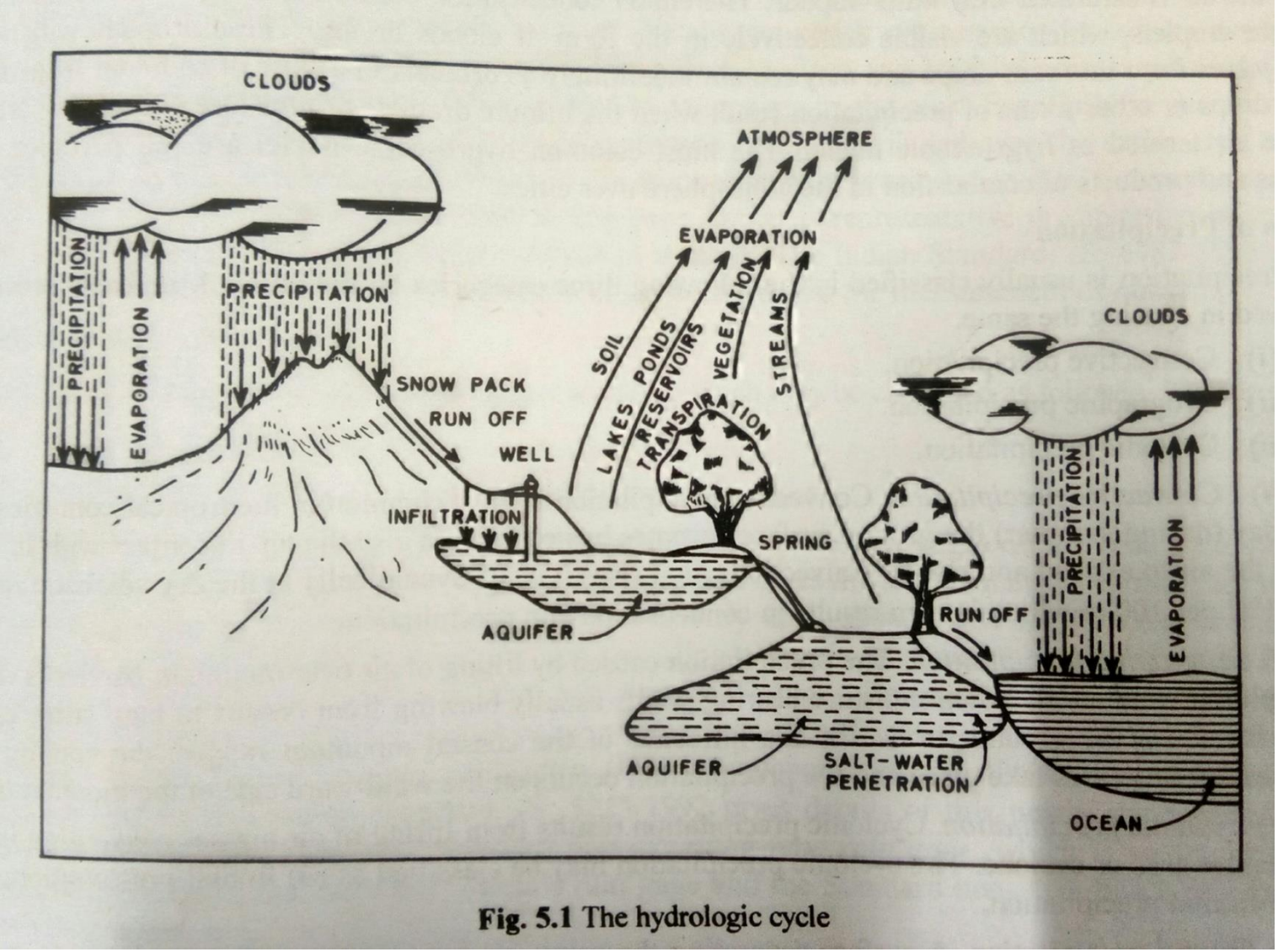
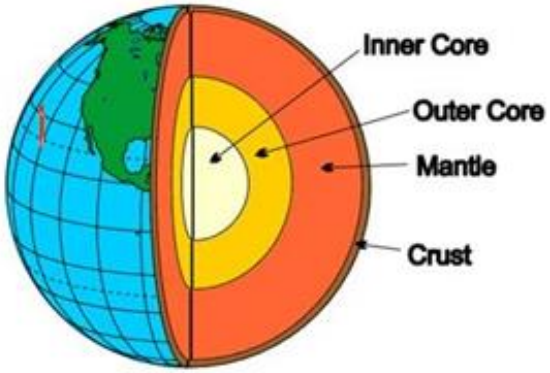
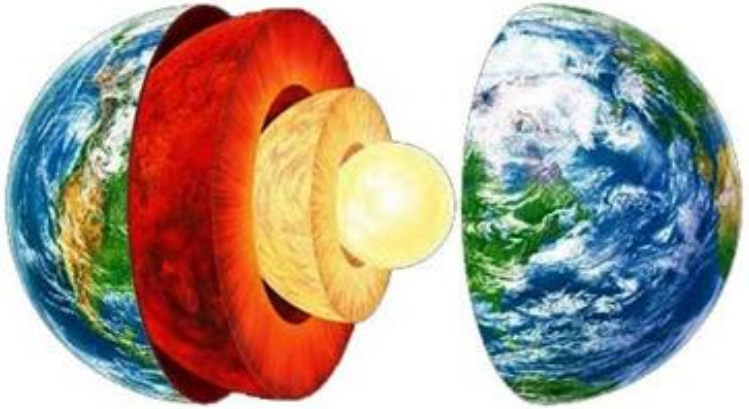


Fig. 5.1 The hydrologic cycle

LITHOSPHERE

- The Earth's internal structure is subdivided into crust, mantle and core and was formed very early during its development.
- Compared to the Earth radius, the crust is extremely thin, only 4 to7 km under the oceans and about 100 km under the continents.
- At the mid-ocean ridges, which can be described as a series of active magma chambers





THE CRUST

- The Crust - Uppermost shell of earth
  - ❑Physical Properties:
    - ✓Outermost layer
    - ✓Thinnest layer (5-70km thick)
    - ✓Where we live
    - ✓Touches the atmosphere
  - ❑Composition:
    - ✓Consists of loose rocks & soil

THE MANTLE

- **Second concentric shell of the Earth**
- Lies beneath the crust, makes upto 84% of earth's volume
- Extends up to a depth 2900 km
- **Nature of mantle is incompletely understood**
- Sub-divided into : Upper (Depth 100 – 900 km) & Lower mantle (Depth 900 – 2900 km)
- Consists of molten rock and magma
- Rich in iron and Magnesium but poor in Silica

THE CORE

- Innermost concentric shell of the Earth
- Sub-divided into : Outer Core & Inner Core
- Consists of Iron and Nickel

DISASTER

- Disaster is an event or series of events, which gives rise to casualties & damage or loss of properties, infrastructures, environment, essential services or means of livelihood on such a scale which is beyond the normal capacity of the affected community to cope with.
- Disaster is a result from the combination of hazard, vulnerability & insufficient capacity or measures to reduce the potential chances of risk.
- A disaster happens when a hazard impacts on the vulnerable population and causes damage, casualties and disruption.

For eg:

- Earthquake in an uninhabited desert cannot be considered a disaster, no matter how strong the intensities produced.
- An earthquake is disastrous only when it affects people, their properties & activities.
- Thus, disaster occurs only when hazards and vulnerability meet.

HAZARD

- Hazard may be defined as “a dangerous condition or event that threat or have the potential for causing injury to life or damage to property or the environment.
- **Natural hazards** are hazards which are caused because of natural phenomena (hazards with meteorological, geological or even biological origin).
- Examples of natural hazards are cyclones, tsunamis, earthquake and volcanic eruption which are exclusively of natural origin.
- Landslides, floods, drought, fires are socio-natural hazards since their causes are both natural and manmade.
- **Manmade hazards** are hazards which are due to human negligence. Manmade hazards are associated with industries or energy generation facilities and include explosions, leakage of toxic waste, pollution, dam failure, wars or civil strife etc.

1. GEOLOGICAL HAZARDS

- Earthquakes - Liquefaction (soils), Tsunamis.
- Volcanic Eruptions - Lava Flows, Ash Fall, Lahars.
- Landslides - Rock Falls or Slides, Debris Flows, Mud Flows.
- Floods - Inundation, Erosion.
- Sand Blasting (Windblown)

2. METEREOLOGICAL HAZARDS

- Tropical cyclones such as hurricanes, typhoons, & cyclones
- Monsoons
- Tornadoes
- Waterspouts
- Ice storms
- Severe winter storms
- Hailstorms
- Frost

3. BIOLOGICAL HAZARDS

- Malaria, Dengue fever.
- Meningitis, influenza.
- Pest infestations.
- Zoonoses - HIV, H5N1 virus (Bird flu), H1N1 (Swine Flu), the plague, Anthrax, Cholera, Leptospirosis.
- Medical wastes - Used needles, medication that has expired etc.

VULNERABILITY

Vulnerability is defined as the extent to which a community, structure, service, or geographic area is likely to be damaged or disrupted by the impact of a particular hazard, on account of their nature, construction and proximity to hazardous terrain or a disaster prone area.

There are many aspects of vulnerability, arising from various physical, social, economic, and environmental factors. Examples may include:

- poor design and construction of buildings,
- inadequate protection of assets,
- lack of public information and awareness,
- limited official recognition of risks and preparedness measures, and
- disregard for wise environmental management.

TYPES OF VULNERABILITY

1. Physical Vulnerability:

- It includes notions of who and what may be damaged or destroyed by natural hazard such as earthquakes or floods.
- It is based on the physical condition of people and elements at risk, such as buildings, infrastructure etc; and their proximity, location and nature of the hazard.
- It also relates to the technical capability of building and structures to resist the forces acting upon them during a hazard event. It may be determined by aspects such as population density levels, remoteness of a settlement, the site, design and materials used for infrastructure and for housing.
- *Example*: Wooden homes are less likely to collapse in an earthquake, but are more vulnerable to fire.

2. Social Vulnerability:

- Social Vulnerability refers to the inability of people, organizations and societies to withstand adverse impacts to hazards due to characteristics inherent in social interactions, institutions and systems of cultural values.
- It is linked to the level of well being of individuals, communities and society.
- It includes aspects related to levels of literacy and education, the existence of peace and security, access to basic human rights, systems of good governance, social equity, positive traditional values, customs and ideological beliefs.
- Example: When flooding occurs some citizens, such as children, elderly and differently-able, may be unable to protect themselves or evacuate if necessary

3. Economic Vulnerability:

- The level of vulnerability is highly dependent upon the economic status of individuals, communities and nations.
- The poor are usually more vulnerable to disasters because they lack the resources to build sturdy structures and put other engineering measures in place to protect themselves from being negatively impacted by disasters.
- Example: Poorer families may live in squatter settlements because they cannot afford to live in safer (more expensive) areas.

4. Environmental Vulnerability:

- Natural resource depletion and resource degradation are key aspects of environmental vulnerability.
- Example: Wetlands and Swamps are sensitive to increasing salinity from sea water, and pollution from stormwater runoff containing agricultural chemicals, eroded soils, etc.

CAPACITY

- Capacity can be defined as “resources, means and strengths which exist in households and communities and which enable them to cope with, withstand, prepare for, prevent, mitigate or quickly recover from a disaster”.

a) Physical Capacity

- People whose houses have been destroyed by the cyclone or crops have been destroyed by the flood can salvage things from their homes and from their farms.
- Some family members have skills, which enable them to find employment if they migrate, either temporarily or permanently.

b) Socio-economic Capacity

- Rich people have the capacity to recover soon because of their wealth.
- In fact, they are seldom hit by disasters because they live in safe areas and their houses are built with stronger materials.
- However, even when everything is destroyed they have the capacity to cope up with it.

- Hazards are always prevalent, but the hazard becomes a disaster only when there is greater vulnerability and less of capacity to cope with it.
- In other words the frequency or likelihood of a hazard and the vulnerability of the community increases the risk of being severely affected.

RISK

- Risk is a "measure of the expected losses due to a hazard event occurring in a given area over a specific time period.
- Risk is a function of the probability of particular hazardous event and the losses each would cause."

The level of risk depends upon:

- Nature of the hazard
- Vulnerability of the elements which are affected
- Economic value of those elements

- A community/locality is said to be at 'risk' when it is exposed to hazards and is likely to be adversely affected by its impact.
- Risk can be calculated using the following equation:

Risk = Probability of Hazard x Degree of Vulnerability.

There are different ways of dealing with risk, such as:

- **Risk Acceptance:** an informed decision to accept the possible consequences and likelihood of a particular risk.
- **Risk Avoidance:** an informed decision to avoid involvement in activities leading to risk realization.
- **Risk Reduction** refers to the application of appropriate techniques to reduce the likelihood of risk occurrence and its consequences.
- **Risk Transfer** involves shifting of the burden of risk to another party. One of the most common forms of risk transfer is Insurance.

Elements at risk during/after disaster

- People
- Livestock
- Rural housing stock
- Houses
- Crops, trees, telephone, electric poles
- Boats, looms, working implements
- Personal property
- Electricity, water and food supplies
- Infrastructure support

PREPAREDNESS

- This protective process embraces measures which enable governments, communities and individuals to respond rapidly to disaster situations to cope with them effectively.
- Preparedness includes the formulation of viable emergency plans, the development of warning systems, the maintenance of inventories and the training of personnel.
- It may also embrace search and rescue measures as well as evacuation plans for areas that may be at risk from a recurring disaster.

MITIGATION

- Mitigation embraces measures taken to reduce both the effect of the hazard and the vulnerable conditions to it in order to reduce the scale of a future disaster.
- Therefore mitigation activities can be focused on the hazard itself or the elements exposed to the threat.
- Examples of mitigation measures which are hazard specific include water management in drought prone areas, relocating people away from the hazard prone areas and by strengthening structures to reduce damage when a hazard occurs.
- In addition to these physical measures, mitigation should also aim at reducing the economic and social vulnerabilities of potential disasters.
- **Structural mitigation:** dams, windbreaks, terracing, hazard resistant buildings
- **Non-structural mitigation:** Education programs and policies, e.g. land-use, zoning, crop diversification, building codes, forecasting and warning

EXPOSURE

- The presence and number of people, property, livelihoods, systems or other elements in hazard areas (and so thereby subject to potential losses) is known as exposure.
- Exposure is one of the defining components of disaster risk.

- If a hazard occurs in an area of no exposure, then there is no risk.
- The extent to which exposed people or economic assets are actually at risk is generally determined by how vulnerable they are, as it is possible to be exposed but not vulnerable.

EXPOSURE

- To reduce disaster risk, it is important to reduce the level of vulnerability and to keep exposure as far away from hazards as possible by relocating populations and property.
- The reduction of vulnerability can be achieved through such measures as mitigation and preparedness.

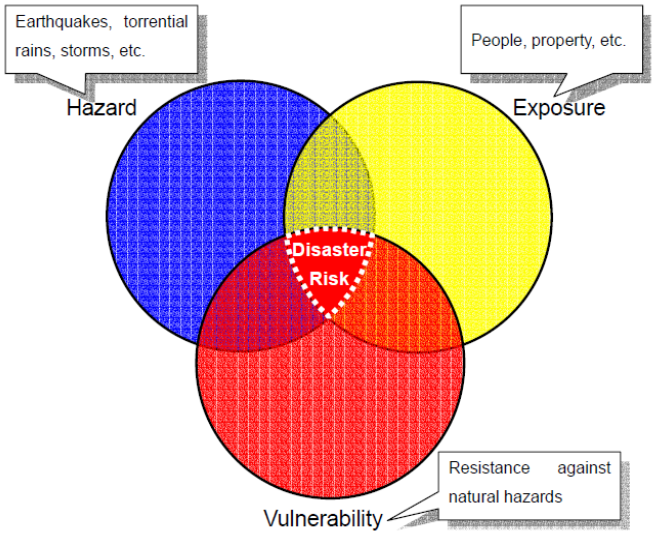


Fig a. Mechanism behind Natural Disasters

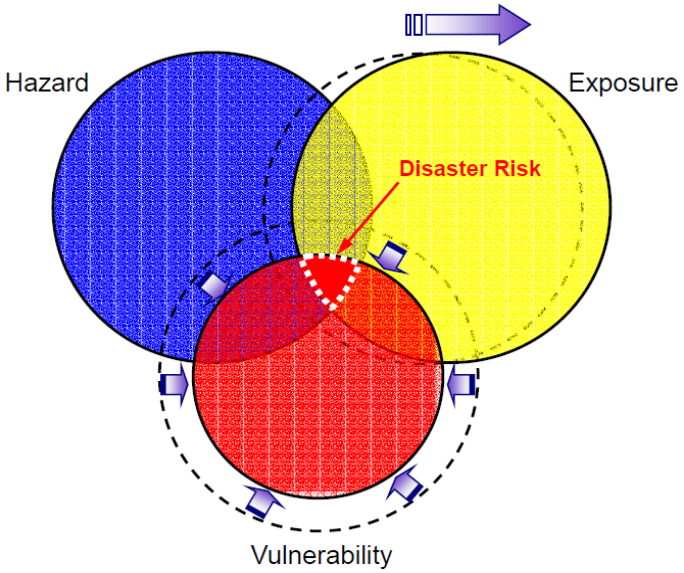


Fig. (b) Mechanism of Natural Disaster Reduction

EMERGENCY

- Emergency is a disruption of the functioning of society, causing human, material or environmental damages and losses which do not exceed the ability of the affected society to cope using only its own resources.

- Emergency is a situation in which normal operations cannot continue and immediate action is required so as to prevent a disaster

Example – forest fire, oil spills, road accidents, outbreak of epidemics etc.

EMERGENCY

When an emergency or a disaster affect a city or a region, efforts are conducted initially to care for the wounded, to restore lifelines and basic services, and subsequently to restore livelihoods and to reconstruct communities. Such efforts can be structured in three phases:

(i) Response phase: where activities such as search & rescue, rapid damage and needs assessments, and the provision of first aid are conducted; followed by the opening and management of temporary shelters for those left homeless as well as the provision of humanitarian assistance to those affected;

(ii) Rehabilitation phase: where basic services and lifelines are restored, even on a temporary basis, including the road network and other essential facilities including bridges, airports, ports and helicopter landing sites;

(iii) Recovery phase: where reconstruction efforts are carried out on the basis of a more precise assessment of damage and destruction of infrastructure. In addition, efforts are conducted to reconstruct infrastructure when needed and to restore the livelihoods of those affected

CRISIS

- It is any event that is going (or is expected) to lead to an unstable and dangerous situation affecting an individual, group, community, or whole society.
- Crisis is a smaller version which may degenerate in to a disaster if not properly managed.
- Crisis develops over time and disaster is sudden.

DISASTER RESILIENCE

- Disaster resilience is the ability of individuals, communities, organisations and states to adapt to and recover from hazards, shocks or stresses without compromising long-term prospects for development.
- Disaster resilience is determined by the degree to which individuals, communities and public and private organisations are capable of organising themselves to learn from past disasters and reduce their risks to future ones, at international, regional, national and local levels.
- Disaster resilience is ‘the ability of individuals, communities and states and their institutions to absorb and recover from shocks, whilst positively adapting and transforming their structures and means for living in the face of long-term changes and uncertainty.

DISASTER RESILIENCE

The core elements of disaster resilience are as follows

(1) **CONTEXT**: It deals with whose resilience is being built such as a social group, socio-economic or political system, environmental context or institution.

(2) **DISTURBANCE**: These disturbances take two forms Stresses and Shocks.

SHOCKS

- Shocks are sudden events that impact on the vulnerability of the system and its components.
- There are many different types of disaster-related shocks that can strike at different levels. These include disease outbreaks, weather-related and geophysical events including floods, high winds, landslides, droughts or earthquakes. There can also be conflict-related shocks such as outbreaks of fighting or violence, or shocks related to economic volatility.

STRESSES

- Stresses are long-term trends that undermine the potential of a given system or process and increase the vulnerability.
- These can include natural resource degradation, loss of agricultural production, urbanisation, demographic changes, climate change, political instability and economic decline.

DISASTER RESILIENCE

The core elements of disaster resilience are as follows

(3) **CAPACITY TO RESPOND:** The ability of a system or process to deal with a shock or stress depends on sensitivity and adaptive capacity.

SENSITIVITY:

- Sensitivity is the degree to which a system will be affected by, or will respond to, a given shock or stress. This can vary considerably for different factors within a system.
- For example, women accounted for up to 80% of those who died during the 2004 Indian Ocean tsunami, and death rates among women were almost four times higher than those among men in the 1991 Bangladesh cyclone.
- Limited mobility, skills set and social status exacerbated sensitivity to the shock.

ADAPTIVE CAPACITY:

- Adaptive capacity means how well the system can adjust to a disturbance or moderate damage, take advantage of opportunities and cope with the consequences of a transformation.

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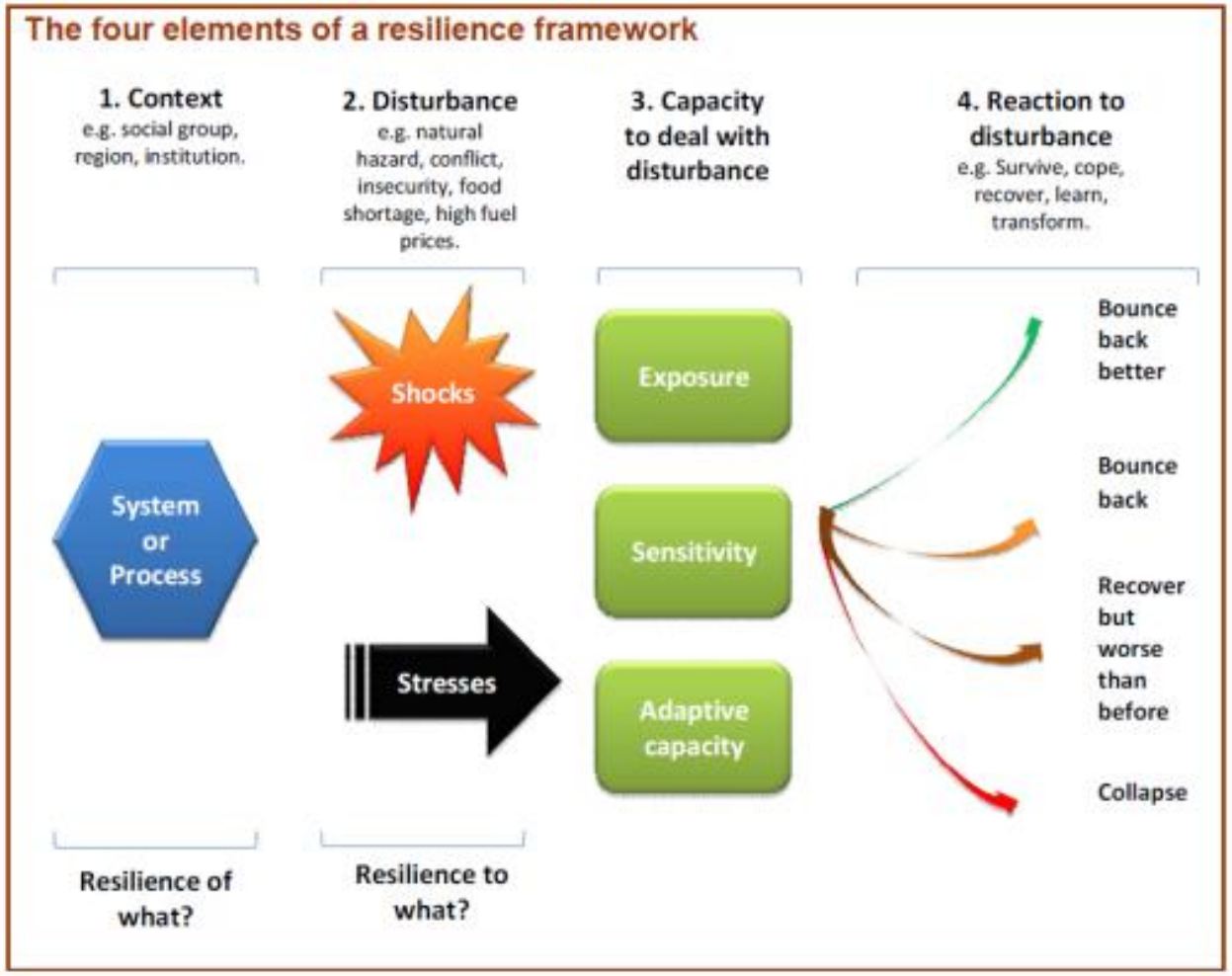
(4) **REACTION:**

A range of responses are possible, including: bounce back better, where capacities are enhanced, exposures are reduced, and the system is more able to deal with future shocks and stresses; bounce back, where pre-existing conditions prevail; or recover, but worse than before, meaning capacities are reduced.

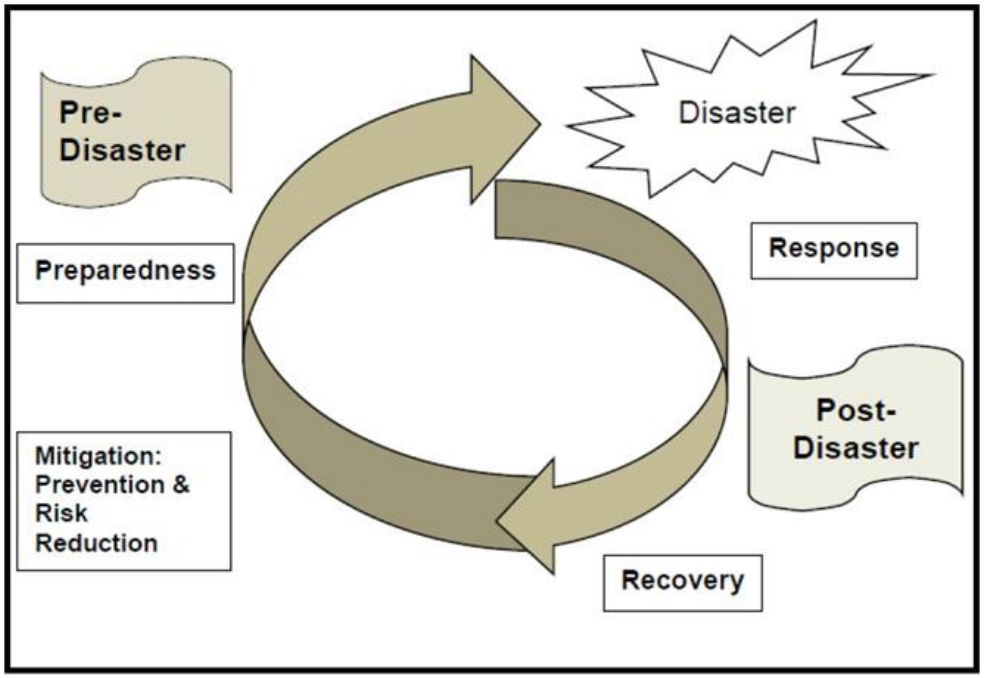
In the worst-case scenario, the system collapses, leading to a catastrophic reduction in capacity to cope with the future.


The four elements of a resilience framework
1. Context
e.g. social group, region, institution.
2. Disturbance
e.g. natural hazard, conflict, insecurity, food shortage, high fuel prices.
3. Capacity to deal with disturbance
4. Reaction to disturbance
e.g. Survive, cope, recover, learn, transform.
Shocks
Stresses
System or Process
Exposure
Sensitivity
Adaptive capacity
Bounce back better
Bounce back
Recover but worse than before
Collapse
Resilience of what?
Resilience to what?

DISASTER MANAGEMENT CYCLE

- Disaster Risk Management includes sum total of all activities, programs and measures which can be taken up before, during and after a disaster with the purpose to avoid a disaster, reduce its impact or recover from its losses.

DISASTER MANAGEMENT CYCLE



DISASTER MANAGEMENT CYCLE

1. BEFORE A DISASTER (PRE-DISASTER)

Activities taken to reduce human and property losses caused by a potential hazard.

Eg:-Carrying out awareness campaigns, strengthening the existing weak structures, preparation of the disaster management plans at household and community level etc.

Such risk reduction measures taken under this stage are termed as mitigation and preparedness activities

DISASTER MANAGEMENT CYCLE

2. DURING A DISASTER (DISASTER OCCURENCE)

Initiatives taken to ensure that the needs and provisions of victims are met and suffering is minimized. Activities taken in this stage are called emergency response activities.

3. AFTER A DISASTER (POST-DISASTER)

Initiatives taken in response to a disaster with a purpose to achieve early recovery and rehabilitation of affected communities, immediately after a disaster strikes. These are called as response and recovery activities.

What is Disaster Management?

Preparedness -- activities prior to a disaster.
Examples: preparedness plans; emergency exercises/training; warning systems.

Response -- activities during a disaster.
Examples: public warning systems; emergency operations; search and rescue.

Recovery -- activities following a disaster.
Examples: temporary housing; claims processing and grants; long-term medical care and counseling.

Mitigation - activities that reduce the effects of disasters.
Examples: building codes and zoning; vulnerability analyses; public education.