ENVIRONMENT

Class VIII

Chapter-7
Weather, Climate and Adaptations of Animals to Climate

- Rainfall is measured by an instrument called the rain gauge. It is basically a measuring cylinder with a funnel on top to collect rainwater. The day to-day condition of the atmosphere at a place with respect to the temperature, humidity, rainfall, wind speed, etc., is called the weather at that place.
- temperature, humidity, and other factors are called the elements of the weather
- The average weather pattern taken over a longtime, say 25 years, is called the climate of the place
- The western region of India, for example Rajasthan, will show that the temperature is high during most part of the year.
- But during winter, which lasts only for a few months, the temperature is quite low.
- This region receives very little rainfall.
- This is the typical desert climate. It is hot and dry.
- The northeastern India receives rain for a major part of the year.
- Therefore, we can say that the climate of the north-east is wet.

(i) The polar regions

- The Polar Regions present an extreme climate.
- These regions are covered with snow and it is very cold for most part of the year.
- For six months the sun does not set at the poles while for the other six months the sun does not rise.
- In winters, the temperature can be as low as –37°C.
- Animals living there have adapted to these severe conditions.
- Polar bears, the penguin many types of fishes, muskoxen, reindeers, foxes, seals, whales, and birds have been seen in this region.
- Siberian crane that comes from Siberiato places like Bharatpur in Rajasthan and Sultanpur in Haryana

(ii) The tropical rainforests

- The tropical region has generally a hot climate because of its location around the equator.
- Even in the coldest month the temperature is generally higher than about 15°C.
- During hot summers, the temperature may cross 40°C.
- Days and nights are almost equal in length throughout the year.
- These regions get plenty of rainfall.
- An important feature of this region is the tropical rain forests.
- Tropical rainforests are found in Western Ghats and Assam in India, Southeast Asia, Central America and Central Africa.
- Because of continuous warmth and rain, this region supports wide variety of plants and animals.
- The major types of animals living in the rainforests are monkeys, apes, gorillas, lions, tigers, elephants,

leopards, lizards, snakes, birds and insects.

- The lion-tailed macaque (also called Beard ape) lives in the rainforests of Western Ghats
- Many tropical animals have sensitive hearing, sharp eyesight, thick skin and a skin color which helps them to camouflage by blending with the surroundings.
    - This is to protect them from predators.

Class-IX

Chapter-14
Natural Resources

Resources on the Earth

- the land, the water and the air, outer crust of the Earth is called the lithosphere,
- Water covers 75% of the Earth's surface comprise the hydrosphere,
- Air-covers the earth is called the atmosphere, life-supporting zone of the Earth where the atmosphere, the hydrosphere and the lithosphere interact and make life possible, is known as the biosphere.
- The air, the water and the soil form the non-living or abiotic component of the biosphere, carbon dioxide constitutes up to 95-97% of the atmosphere on Venus and Mars.
- the percentage of carbon dioxide in our atmosphere is a mere fraction of a percent because carbon dioxide is 'fixed' in two ways: (i) Green plants convert carbon dioxide into glucose in the presence of Sunlight and (ii) many marine animals use carbonates dissolved in sea-water to make their shells.
- Air is a bad conductor of heat.
- When air is heated by radiation from the heated land or water, it rises.
- Since land gets heated faster than water, the air over land would also be heated faster than the air over water bodies.
- air rises, a region of low pressure is created and air over the sea moves into this area of low pressure,
- During the day, the direction of the wind would be from the sea to the land
- Rainfall patterns are decided by the prevailing wind patterns.

Air Pollution

- The fossil fuels like coal and petroleum contain small amounts of nitrogen and sulphur
- Presence of high levels of all these pollutants causes visibility to be lowered, especially in cold weather when water also condenses out of air. This is known as smog and is a visible indication of air pollution

Water:

- A Wonder Liquid Fresh water is found frozen in the ice-caps at the two poles and on snow covered mountains.
- All cellular processes take place in a water medium

Water Pollution

- Water dissolves the fertilizers and pesticides that we use on our farms.
- The type of soil is decided by the average size of particles found in it and the quality of the soil is decided by the amount of humus and the microscopic organisms
- Found in it the topmost layer of the soil that contains humus and living organisms in addition to the soil particles is called the topsoil.
- The quality of the topsoil is an important factor that decides biodiversity in that area
- The large-scale deforestation that is happening all over the world not only destroys biodiversity, it also leads to soil erosion.

Biogeochemical Cycles

The Water-Cycle

- The whole process in which water evaporates and falls on the land as rain and later flows back into the sea via rivers is known as the water-cycle,
- As water flows through or over rocks containing soluble minerals, some of them get dissolved in the water.
- Thus rivers carry many nutrients from the land to the sea, and these are used by the marine organisms

The Nitrogen-Cycle

- Nitrogen gas makes up 78% of our atmosphere and nitrogen is also a part of many molecules essential to life like proteins, nucleic acids (DNA and RNA) and some vitamins.
- Found in other biologically important compounds such as alkaloids and urea toothe nitrogen-fixing bacteria are found in the roots of legumes (generally the plants which give us pulses) in special structures called root nodules.
- Other than these bacteria, the only other manner in which the nitrogen molecule is converted to nitrates and nitrites is by a physical process.
- During lightning, the high temperatures and pressures created in the air convert nitrogen into oxides of nitrogen.
- These oxides dissolve in water to give nitric and nitrous acids and fall on land along with rain.
- Plants generally take up nitrates and nitrites and convert them into amino acids which are used to make proteins
- Once the animal or the plant dies, other bacteria in the soil convert the various compounds of nitrogen back into nitrates and
- A different type of bacteria converts the nitrates and nitrites into elemental nitrogen

The Carbon-Cycle

- It occurs in the elemental form as diamonds and graphite
- It is found as carbon dioxide in the atmosphere, as carbonate and hydrogen carbonate salts in various minerals,
- While all life-forms are based on carbon-containing molecules like proteins, carbohydrates, fats, nucleic acids and vitamins.
- The endoskeletons and exoskeletons of various animals are also formed from carbonate salts. Carbon is incorporated into life-forms through the basic process of photosynthesis which is performed in the presence of Sunlight by all life-forms that contain chlorophyll.
- This process converts carbon dioxide from the atmosphere or dissolved in water into glucose molecules

The Oxygen-Cycle

- In the crust, it is found as the oxides of most metals and silicon, and also as carbonate, sulphate, nitrate and other minerals.
- It is also an essential component of most biological molecules like carbohydrates, proteins, nucleic acids and fats (or lipids) Oxygen from the atmosphere is used up in three processes, namely combustion, respiration and in the formation of oxides of nitrogen.

Oxygen is returned to the atmosphere in only one major process, that is, photosynthesis. The process of nitrogen-fixing by bacteria does not take place in the presence of oxygen.

Ozone Layer

- ozone is poisonous,
- It absorbs harmful radiations from the Sun
- Various man-made compounds like CFCs (carbon compounds having both fluorine and chlorine which are very stable and not degraded by any biological process) were found to persist in the atmosphere.

Class-X

Chapter-15

Our Environment Eco-system

what are its components?

- All the interacting organisms in an area together with the non-living constituents of the environment form an ecosystem.
- An ecosystem consists of biotic components comprising living organisms and abiotic components comprising physical factors like temperature, rainfall, wind, soil and minerals.

Food Chains and Webs

- series or organisms taking part at various biotic levels form a food chain
- Each step or level of the food chain forms a trophic level.
- The autotrophs or the producers are at the first trophic level. They fix up the solar energy and make it available for heterotrophs or the consumers.
- The herbivores or the primary consumers come at the second, small carnivores or the secondary consumers at the third and larger carnivores or the tertiary consumers form the fourth trophic level

Ozone Layer and How it is Getting Depleted

- Ozone (O3) is a molecule formed by three atoms of oxygen.
- While O2, which we normally refer to as oxygen, is essential for all aerobic forms of life.
- Ozone is a deadly poison.
- At the higher levels of the atmosphere, ozone performs an essential function.
- It shields the surface of the earth from ultraviolet (UV) radiation from the Sun.
- This radiation is highly damaging to organisms, for example, it is known to cause skin cancer in human beings.
- Ozone at the higher levels of the atmosphere is a product of UV radiation acting on oxygen (O2) molecule.
- The higher energy UV radiations split apart some molecular oxygen (O2) into free oxygen (O) atoms.
- These atoms then combine with the molecular oxygen to form ozone as shown—The amount of ozone in the atmosphere began to drop sharply in the 1980s.
- This decrease has been linked to synthetic chemicals like chlorofluorocarbons (CFCs) which are used as refrigerants and in fire extinguishers.
- In 1987, the United Nations Environment Programme (UNEP) succeeded in forging an agreement to freeze CFC production at 1986 levels.

Class-x

Chapter-16
Management of natural Resources

- Ganga Action Plan. This multi-crore project came about in 1985 because the quality of the water in the Ganga was very poor
- Coliform is a group of bacteria, found in human intestines, whose presence in water indicates contamination by disease-causing microorganisms
- Three R's to save the environment: Reduce, Recycle and Reuse.

Forests And Wild Life

- Forests are 'biodiversity hot spots'

Sustainable Management

- The Chipko Andolan ('Hug the Trees Movement') was the result of a grassroot level effort to end the alienation of people from their forests. The movement originated from an incident in a remote village called Reni in Garhwal, high-up in the Himalayas during the early 1970s.
- Himachal Pradesh had evolved a local system of canal irrigation called kulhs

Water Harvesting

- Watershed management emphasizes scientific soil and water conservation in order to increase the biomass production.
- The aim is to develop primary resources of land and water, to produce secondary resources of plants and animals for use in a manner which will not cause ecological imbalance.
- Watershed management not only increases the production and income of the watershed community, but also mitigates droughts and floods and increases the life of the downstream dam and reservoirs.
- Water harvesting is an age-old concept in India. Khadins, tanks and nadisin Rajasthan, bandharasand talsin Maharashtra, bundhis in Madhya Pradesh and Uttar Pradesh, aharsand pynesin Bihar, kulhsin Himachal Pradesh, ponds in the Kandi belt of Jammu region, and eris(tanks) in Tamil Nadu, surangamsin Kerala, and kattasin Karnataka are some of the ancient water harvesting, including water conveyance, structures still in use today

Coal And Petroleum

- Coal and petroleum were formed from the degradation of bio-mass millions of years ago and hence these are resources that will be exhausted in the future contain hydrogen, nitrogen and sulphur.
- When combustion takes place in insufficient air (oxygen), then carbon monoxide is formed instead of carbon dioxide.
- Of these products, the oxides of sulphur and nitrogen and carbon monoxide are poisonous at high concentrations and carbon dioxide is a green-house gas they are huge reservoirs of carbon and if all of this carbon is converted to carbon dioxide, then the amount of carbon dioxide in the atmosphere is going to increase leading to intense global warming.