

# 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 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 sun over 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 fuel like coal and petroleum contain small amounts of nitrogen and sulphur
- Presence of high level of all these pollutants cause 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 fertilisers 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 known as the water-cycle,
- As water flows through or over rock 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 too the 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 in all 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.

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