UNIT - 3

NATURAL RESOURCES

After studying this unit you :

- recall the meaning of natural resources.
- recognize the types of natural resources.
- classify natural resources into renewable and non-renewable resources.
- explain the importance of soil, forest and fossil fuels.
- realize the need of conservation of natural resources.

The Earth is the only planet that supports life. All organisms depend upon nature for their survival. Nature provides many things such as land, air, water and soil for the organisms to live. These things which are provided by nature are called **Natural resources.**

Think of such useful things found in nature.

Activity 3.1 : *Make a list of the natural and man made resources that you find in your surroundings.*

Natural resources are generally classified into renewable and non-renewable resources.

1) **Renewable resources :** Resources that are continuously available for use and do not get exhausted are called renewable resources.

Example : solar energy, air, wind, water, soil and forests.

2) Non-renewable resources : Resources that are limited and get exhausted after continuous use are called non-renewable resources.

Example : fossil fuels and minerals.

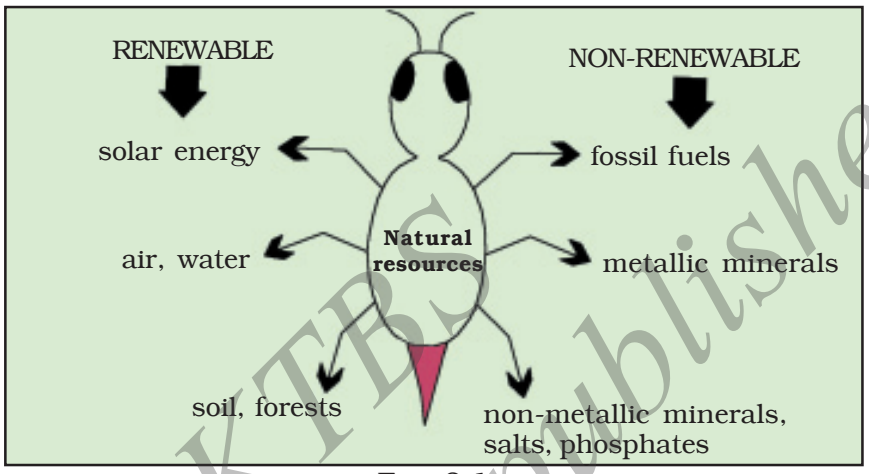

Fig. 3.1
Natural resources

Activity 3.2 : *Classify the following into renewable and non-renewable resources.*

coal, iron, oxygen, copper, gold, petrol, forests, wildlife, biogas.

1. Renewable resources :

You have already learnt the importance of air and water as renewable resources in the previous units.

Let us know some other renewable resources.

(i) Soil :

The rocky and earthy layer of earth's crust is called **lithosphere**. The thin top layer of lithosphere containing minerals and organic compounds is called **soil**.

Composition of the soil :

Soil is mainly made up of eight most common elements namely oxygen, silicon, aluminium, iron, calcium, sodium, potassium and magnesium. They compose nearly 99% of the earth's crust.

Element	percentage
Oxygen	46.60
Silicon	27.72
Aluminium	8.13
Iron	5.00
Calcium	3.63
Sodium	2.83
Potassium	2.70
Magnesium	2.09

Formation of Soil :

You know that the land around us keeps changing. This change is caused by water, wind and living beings. Soil is formed by the disintegration of rocks. This process is called **weathering** of rocks.

Top soil is necessary for the growth of plants. Top soil is the reservoir of minerals, water and other useful substances. It takes about 500 to 1500 years for the formation of about 3 cm of soil. But a single flood or a dust storm can remove the top soil which is not covered by vegetation. Don't you think that this top soil is getting lost due to human activities? Then how to preserve the top soil?

Activity 3.3 : *Take two identical flat trays with a slit on one of its four sides as shown in the figure.*

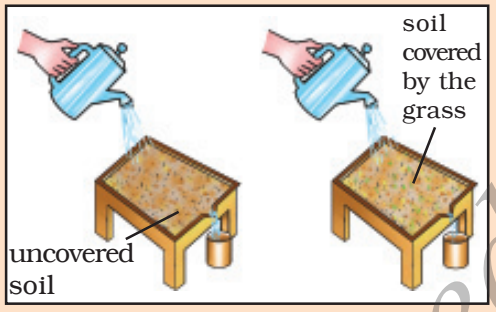

Fig. 3.2
Preservation of soil

Keep them slightly slanted on a support. Keep a plastic bowl below the pointed slit of both the trays to collect water and soil that flows out of the trays. Fill both trays with soil. Cover the soil in one of the trays with grass. Follow the steps given below.

Step1 : *Pour an equal quantity of water to both the trays from the same height. Study the quantity of soil and water that flows out of the two trays. Are they same ?*

Step 2 : *Replace the plastic bowls and keep two new bowls. Pour equal quantity of water on both the trays at a height three or four times higher than the previous height.*

- *Study the quantity of soil and water that flows out from the trays.*
- *Is the quantity of soil and water same in both the trays ?*
- *Is the quantity of soil that flows out more or less or equal to the quantity washed out earlier ? What is your conclusion?*

Conservation of soil :

- Field should be covered with vegetation.
- The soil should not be used for non-agricultural purposes.
- Construction of bunds in the edges of the field.
- Contour tilling should be adopted in slope areas.

Know this :

fig 3.3

Contour tilling

Contour tilling means ploughing along the contour lines (outlines) of the land to trap water runoff and to prevent soil erosion.

(ii) Forests :

Forests are natural resources distributed in different parts of the world. They provide habitat for various plants and animals. Forests provide useful materials such as fuel, food, wood, wax, gum and raw meterials. Such forest wealth has to be protected.

Fig. 3.4
Forest

Word help :

habitat - the area where an organism normally lives.

Conservation of forests :

It is a process of **preserving the forest wealth**. This can be done by following methods.

- Restriction on unnecessary felling of trees
- Tree planting
- Forest disasters such as forest fire and flood should be controlled.

2. Non renewable resources :

We are obtaining energy by using various types of fuels. Fuel is the material that is burnt to obtain energy.

Activity 3.4 : *Name some of the fuels that are used to run the vehicles.*

- **Fossil fuels :** Fossil fuels are formed by the remains of extinct plants and animals which were burried under the earth's crust over millions of years.

Example : Natural gas, petroleum and coal.

Know this :

Hydrogen is the only gaseous fuel that does not contain carbon. It is highly efficient and used in rockets and industries. It is projected as future fuel.

1. Natural Gas :

Natural gas is found with petroleum in oil wells. Methane is the chief constituent of natural gas. Natural gas when compressed is called **Compressed Natural Gas (CNG)**. This compressed natural gas is used as an alternative to petrol and diesel in automobiles. Pollution caused by CNG is less than petrol and diesel.

Fig. 3.5

Know this :

Methane is the first member of hydrocarbons. It is made up of one carbon atom and four hydrogen atoms.

2. Petroleum :

Petroleum is a liquid mineral found underneath the soil. Petroleum is formed by the action of bacteria, heat and pressure on dead organisms burried underneath rocks.

Know this :

Petroleum is also called by other names like rock oil, crude oil, black gold.

Petroleum is a mixture of several liquid hydrocarbons. Oil is extracted from oil traps. It is called crude oil and it has to be refined.

Know this :

Hydrocarbons are the compounds of hydrogen and carbon atoms.

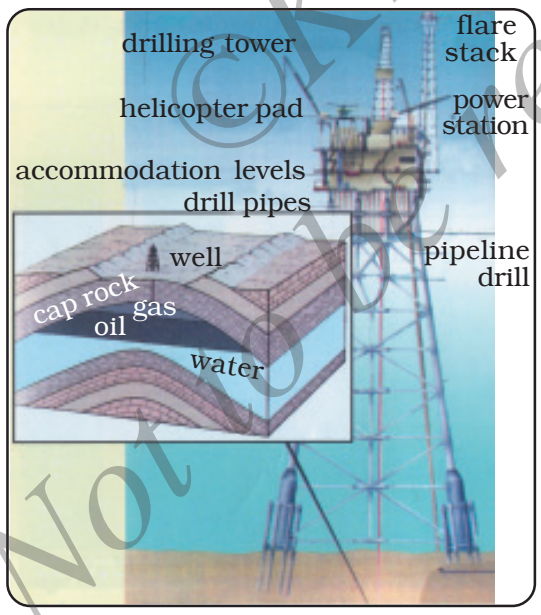

Fig. 3.6
Oil production platform

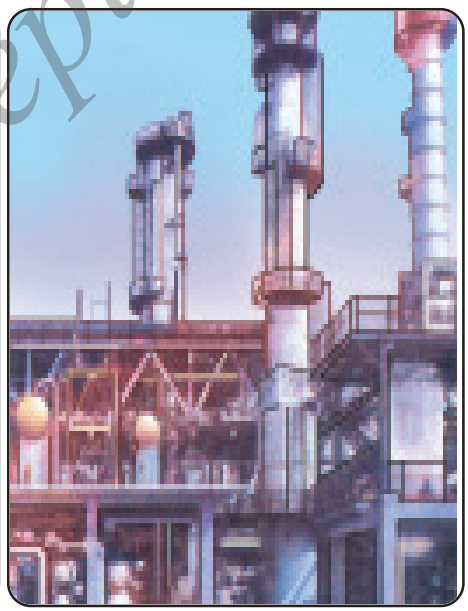

Fig. 3.7
Petroleum refinary

Many products such as petrol, diesel, kerosene, paraffin wax, candles, water proof curtains, wood

polish, ointments, paints, lipsticks, vaseline jelly etc., are obtained from petroleum.

Fig. 3.8
Uses of petroleum

3. Coal :

Formation of coal : Millions of years ago the earth's surface was covered by dense forests. The trees of these forests were buried in the soil. The trees which did not decay completely got buried under the layers of the rocks. The high temperature and pressure in the layers changed them to coal.

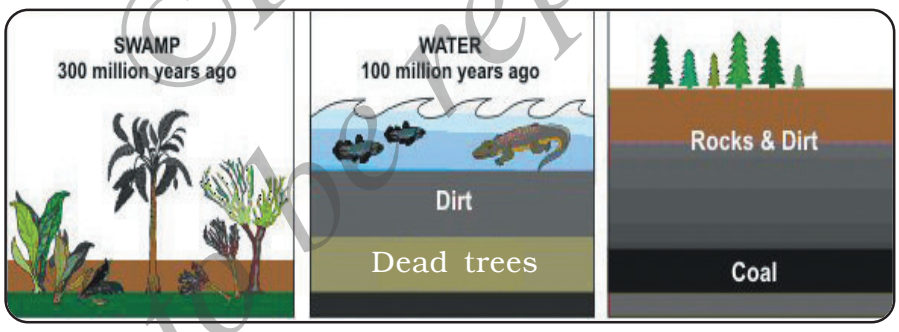

Fig. 3.9
Formation of coal.

Fig. 3.10
Coal mines

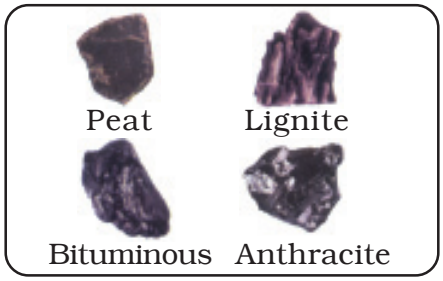

Fig. 3.11
Types of coal

Uses of coal :

1) Coal is used as fuel in thermal power plant for the production of electricity.

2) Coal products are used in the making of plastics, drugs, cosmetics, fertilizers, medicines, nylon etc.

Fig. 3.12
Uses of coal

Conservation of Fuels :

You know that non-renewable resources such as fuels are the nature's gift to us. Hence they must be used judiciously. If used continuosly they get exhausted completely.

Activity 3.5 : *With the help of your teacher, make a list of some of the alternative sources of energy.*

Remember :

- Air, water, soil and fuels provided by nature are called natural resources.
- Natural resources are generally classified into renewable and non-renewable resources.
- Renewable resources like air, water and soil are continuously available for use and do not get exhausted.
- Non-renewable resources like fuels are limited and get exhausted after continuous use.
- Soil is the thin top layer of lithosphere containing minerals and organic compounds.
- Soil is formed by the disintegration of rocks.
- Forests provide useful materials such as fuel, food, wood, wax, gum and raw materials.
- Fuel is the material that is burnt to obtain energy.
- Natural gas, petroleum and coal are non-renewable resources. They must be used judiciously.

Tips :

- Never cut down trees.
- Grow more and more trees in your locality.
- Walk or use bicycles for short distances.

- Use public transport system for long distances.
- Waste materials should be recycled wherever possible.
- Alternative sources of energy like solar energy, wind energy, geothermal energy should be used wherever possible.
- Create awareness among your parents and public through dramas, talk and debate etc., at school, home and at public places about the importance of preserving the environment.
- Celebrate World Environment Day on 5th June of every year.
- Avoid polluting air, water and soil.

Exercises :

I. Choose the most appropriate answer and put a tick (✓) mark against it :

1. Kerosene and diesel are obtained from

   a) coal b) petrol

   c) petroleum d) natural gas

2. Which of the following cause least pollution

   a) petrol b) Compressed natural gas

   c) diesel d) coal

II. Fill in the blanks with suitable words :

1. The rocky and earthy layer of earth's crust is called _____
2. Natural gas is found with _____ in oil wells.
3. The oil extracted from oil traps is called _____
4. In thermal power stations _____ is used as fuel to produce electricity.

III. Answer the following questions :

1. What are natural resources ?
2. Name the types of natural resources.
3. How is soil formed?
4. Explain the uses of soil and forests.
5. Why do we consider coal and petroleum as fossil fuels?

Suggested Activity :

What are the steps that you can take to conserve soil, forest and fossil fuels ? Prepare a chart and discuss with your friends and teacher.