Lesson - 9

Soils of Bharat

Soil plays a major role in the economic life of a country. It is still more important in a country like Bharat which has agricultural base and where more than 70 per cent of its population depends upon agriculture as the means of their livelihood. Soil is that layer of land surface which is ***made up of the disintegrated materials of rocks and decomposed matter of vegetation and fossils***. Soil has the capacity to grow various types of trees and plants. Soil formation and characteristics depend upon the rocks, climate and the vegetation of a region.

Depending upon the process of formation, soil is of two types - ***Local and Transported***. Due to the effect of weathering process the rock debris stay in its own areas or their movement is insignificant, then of rock disintegration leads to the formation of the soils known as ***local soils***. Most of the Deccan plateau is covered by the soils of this type. Such soils bear the characteristics of their parental rocks. Consequently, the soils formed by the disintegration of the local crystalline metamorphosed rocks are stony, rough structured, red coloured and infertile. Disintegration of lava rocks leads to the formation of black soil which is very fertile.

Rivers, glaciers, winds etc. are the major agents of denudation which not only disintegrate the rocks to convert them into soils but also transport them to long distances. Hence, these soils are deposited by the agents of denudation in the areas far away from their source region. These are known as ***transported soils***. The soils of the great plains and the coastal plains of Bharat are of this category. These soils are very fertile.

Due to the vast expansion of our country, topographical, climatic and vegetational variations, it is natural that a variety of soils are found in Bharat. The economic significance of soils lie in their utility of supporting crops. Ploughing, irrigation, choice of the appropriate crops, methods of cultivation etc are important aspects of raising crops. These aspects mostly depend upon the type of soil. On the basis of formation and their characteristics, Bhartiya soils are classified into the following categories (Fig. 9.1)

1. Alluvial Soil

Great plains of Bharat and the coastal plains are made by thick deposits of alluvium. It has been deposited by various rivers. This type of soil covers about 8 lakh square kilometers area in Bharat. According to geographical conditions the soil can be sub-divided into three categories -

(a) Older Alluvium - It is found in the areas where flood water of rivers cannot reach. Such areas are known as ***Bangar*** in Bharat. Bangar areas are very fertile and are subjected to the intensive cultivation growing two crops in a year. These soils require irrigation.

(b) Newer Alluvium - This type of soil is

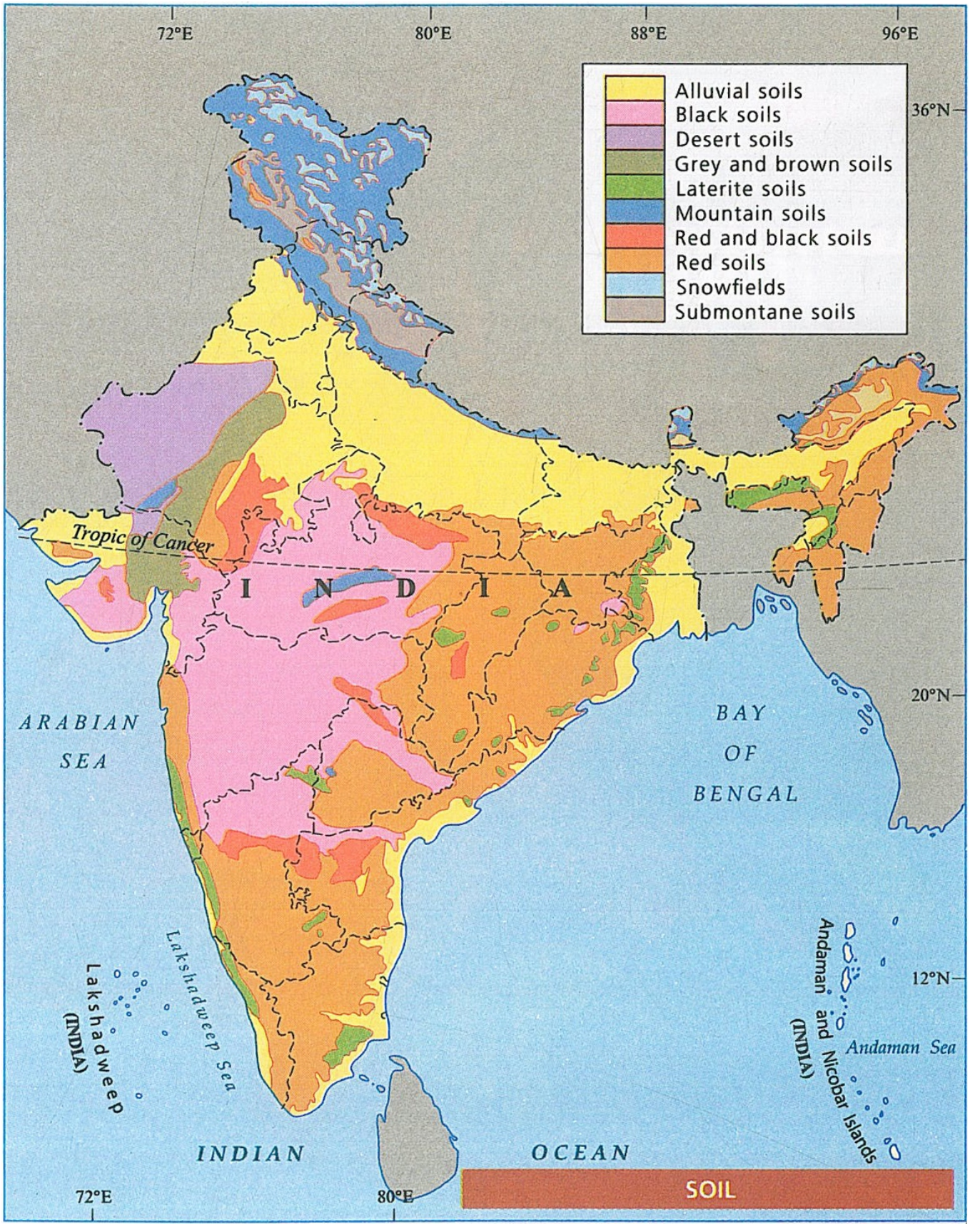

Fig. 9.1 : Soils of India

found to the extent upto which the flood water of rivers can reach. It is designated as **newer** because a new or a fresh layer of soil is deposited in such areas every year by flooding. Such areas are known as ***Khadar*** in Bharat. The soils of khadar have a larger clay content. It does not require irrigation.

(c) Newest Alluvium - It is found in Ganga-Brahmaputra Delta. It is highly rich in calcium, magnesium, potash, phosphorus and humus due to which it is a very fertile soil for cultivation. This type of soil is also found in some of the coastal plains of Bharat.

Characteristics of Alluvial Soils

1. Such soils are found in level plains which have tremendous facilities for the construction of canals, digging wells and performing various agricultural activities.

2. These soils can retain moisture for a longer time.

3. These are fine textured friable soils in which it is easy to grow crops. Plants can also procure their food easily from such soils.

4. Such soils are rich in humus content because vegetative materials fall into river water and ultimately degenerate and decomposed to form humus.

5. Such soils are naturally rejuvenated every year by flooding. Therefore, these soils don't require manures or fertilizers.

6. These are transported soils which are very fertile.

2. Black or Lava Soil

Black soil is found in lava regions of Bharat covering Maharashtra, western Madhya Pradesh, western Andhra Pradesh, northern Karnataka, Gujarat and south-eastern Rajasthan. This soil covers an area of about 5 lakh square kilometers in Bharat. It possesses a unique quality of moisture retention. It appears similar to the black soil of Prairie region of north America and to the Chernozem of Russia but black soil of Bharat is structurally different from them. In those regions, the soil is black because of its richness in humus and fossil content. But the black soil of Bharat owes its colour to the disintegrated lava deposits. It is rich in iron and aluminium contents. It also contains potash and calcium. It is very fertile soil and is highly suitable for growing cotton. That is why this soil is also popularly known as ***Black Cotton Soil***. Black soil of Bharat is also named ***Regur soil***. It needs little irrigation and the requirement for fertilizers is also limited. It becomes hard when it is dry and its surface is marked by several cracks. It is almost 7 metres thick in the valleys of Narmada, Tapti, Godawari and Krishna rivers. Besides cotton, groundnut and sugarcane cultivation has also been introduced in the black soil regions. Introduction of irrigation facilities in the region has led to an unexpected rise in agricultural production.

3. Red Soil

It is a rough textured soil and is highly porous. It lacks moisture retaining capacity. Therefore, it requires irrigational facilities. It is not a fertile soil. Use of fertilizers and manures compensate lower fertility of this soil. Its colour is brown and red because it is rich in iron content. It lacks nitrogen, phosphorous and humus content. Calcium content is also less. It is found in a thin layer. Its thickness is higher only in river valleys. This type of soil is found in Chhatisgarh, Chhota Nagpur, Orissa, eastern Andhra Pradesh, Tamil Nadu and Karnataka.

4. Laterite Soil

Its colour is red like that of a brick. It consists of granules of large size. It is usually formed by disintegration of old rocks rich in iron and aluminium content. It lacks calcium, phosphorus, nitrogen, potash and fossils. This soil is found in hot and humid regions. Rain water washes away silica, chemical salts and fertile ions of soil. It becomes hard like a rock when it is dry. This type of soil is found in the Western Ghat region, in eastern ghat region from Rajmahal hills to Assam, extending in a continuous narrow belt through west Bengal. This soil is suitable for growing tea. It supports thin cover of hard wood trees which provide building wood.

5. Sandy Soil

It extends over western Rajasthan, Saurashtra and Rann of Kutch. Alkaline content is higher in this type of soil while nitrogen and humus

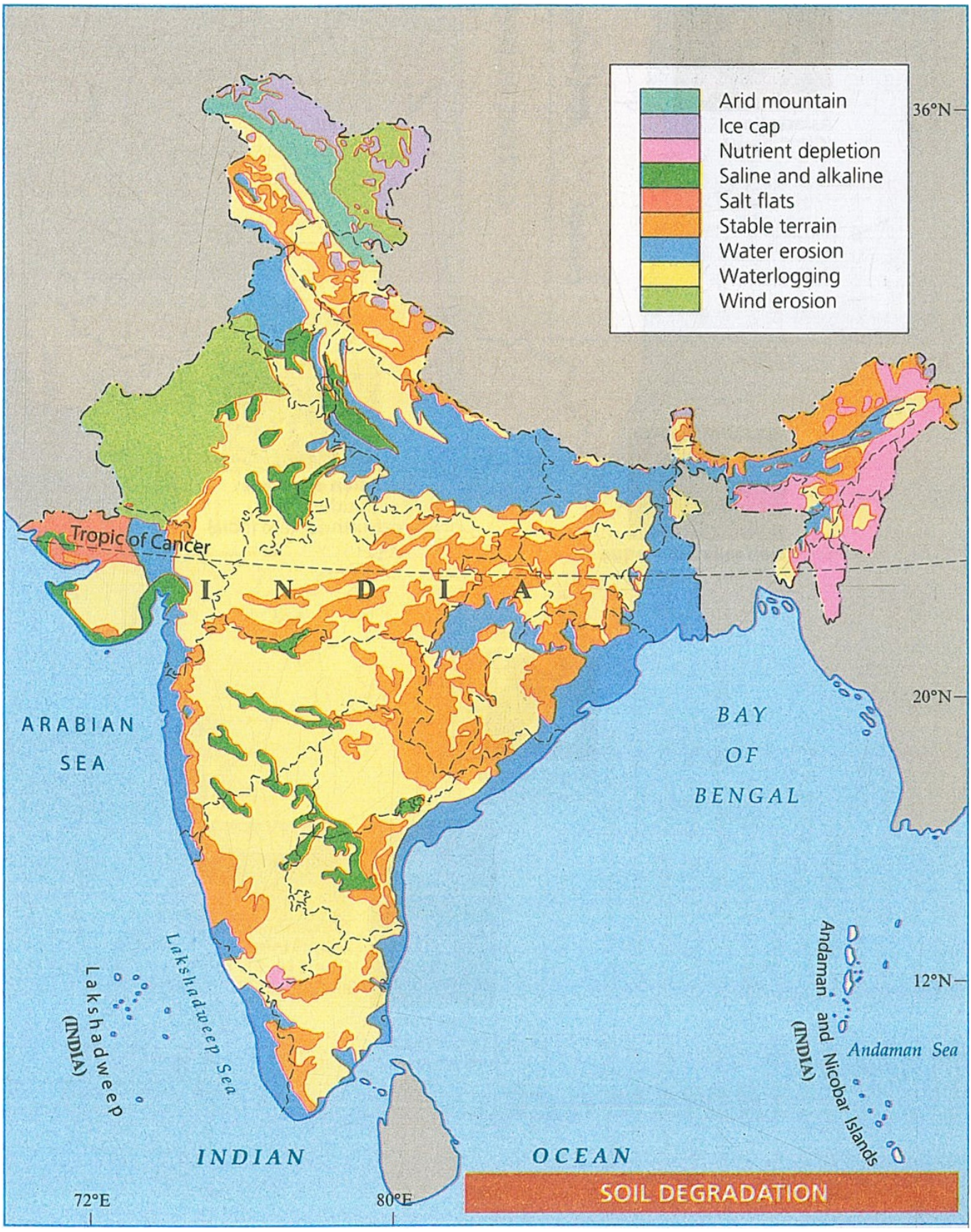

Fig. 9.2 : Soil Degradation in India

content is lower. It can easily be transported by winds because it is dry and porous soil. This soil proves to be very fertile when irrigation facilities are made available to it. Agricultural prosperity of Hanumangarh, Ganganagar and Bikaner districts prove this fact. Work on Indira Gandhi Canal is progressing very fast. It has reached ahead of Mohangarh near Jaisalmer. When completed, it is expected that the desert will become green and agriculturally prosperous.

6. Mountain Soil

It is found in Himalayan mountain region. It is a rough textured soil consisting of stones and pebbles and hence it is known as immature soil. This soil is found in a thin layer. This soil lacks humus and calcium. It is acidic soil. Where the layer of this soil is thicker, tea and potato cultivation is done. In the areas where the granular structure is fine, terraced farming is done to raise rice crop. Pastures are found on the slopes with less fertile soils.

Soil Problems & Conservation

Problems

Of a variety of soil problems, **soil erosion** is a major one. Agricultural land becomes infertile due to soil erosion. Soil erosion refers to an act of movement of soil to distant places. It is mainly done by running water and winds. It is a major problem in many parts of Bharat. According to an estimate, about ¼ of the area of our country is under the aggression of soil erosion. Rajasthan, Haryana, Uttaranchal, Uttar Pradesh, Madhya Pradesh, Chhattisgarh, Jharkhand and Bihar suffer from the serious problem of soil erosion. The problem is also acute in Yamuna, Chambal, Damodar and Mahanadi river valleys. In these regions soil erosion of both types - **sheet erosion** and **gully erosion** are common. Deep ravines have been created by the gully erosion of Yamuna and Chambal (Fig. 9.2).

There are many reasons of soil erosion in Bharat - (1) Bharat receives torrential monsoonal rains which erode soils fastly. (2) Heavy monsoonal rains cause flooding due to which soil layers become loose. (3) There have been deforestation on the mountain slopes so that the nude slopes bear the blunt of soil erosion by rain water and winds. (4) Animal grazing is practiced unsystematically or the pastures of hill slopes have been converted into farms. (5) Farms are left uncultivated during summers. Hence, summer winds drift away surface soil layer fastly and easily.

Conservation

Soil conservation is extremely necessary. Special measures are required to be taken to control the problem of soil erosion. These measures should be based on the principle that the velocity of running water should be reduced and soils should not become loose. Several steps can be taken to control soil erosion - (1) Afforestation, (2) bunding and barricading of the channels, (3) development of terraced farming on mountain slopes, (4) bunding of farms, (5) proper management of animal grazing, (6) contour ploughing on the slopes of the hills and (7) Damming of rivers. Many important projects have been undertaken in Bharat. Government has also opened research centres in Dehradun, Kota, Jodhpur, Bellari and Utakmand for controlling soil erosion. Trees have been planted to check the expansion of deserts. Pastures have been developed, Babool and Aak plantation has been done by spreading seeds through aeroplanes in order to check sand drift in Rajasthan. Forest festivals (Van Mahotsav) and multipurpose projects have been taken up in hand to solve this problem. But the most important effort in this direction can be the awareness and cooperation of the farmers.

Second major problem related to soil is the depletion of fertility. It means that crop production is decreasing due to depletion of fertility. It happens when we deprive soils of fertile elements by procuring higher yields and no effort is being made to recover soil fertility by natural or artificial methods. In order to face the problem of the depletion of soil fertility, animal dung compost and the chemical fertilizers should be used. Crop rotation and the use of green manures can also check the loss of soil fertility. Natural way of replenishing the soil fertility is to leave the land fallow for sometime.

Important Points

1. Soils are formed by the disintegration of rocks and the decomposition of vegetation and

fossils. It is an important resource for an agricultural country like Bharat.

2. Alluvial soil - It is a transported fertile soil, old, new and newer type.
3. Black soil - fertile, regur soil, suitable for growing cotton, groundnuts, sugarcane etc.
4. Red soil - Rough textured, greater need for irrigation, less fertile.
5. Laterite soil - leached and without humus, less fertile, suitable for growing tea and coffee.
6. Sandy soil - found in dry areas, become fertile when water is made available.
7. Mountain soil - Immature, rough textured, suitable for pastures and rice cultivation on terraced slopes.
8. Soil problems - Soil erosion, depletion of soil fertility, soil pollution; various factors responsible for it; measures to control soil problems are necessary in an agricultural country like Bharat.

Exercise

Multiple Choice Questions

1. Local soils in Bharat are -
   (A) Mountain (B) Sand
   (C) Transported (D) Black.
2. The best suitable soil for growing cotton in Bharat is -
   (A) Mountain (B) Black
   (C) Red (D) Laterite.
3. Black soil in Bharat is -
   (A) Transported (B) Marshy
   (C) Made from Lava (D) Leached.

Very Short Answer Type

4. What is the colour of laterite soil?
5. Where is old alluvium found in Bharat?
6. How does leaching occur?

Short Answer Type

7. What is meant by soil conservation?
8. Which type of soil is rejuvenated naturally?
9. What is meant by soil erosion?

Essay Type

10. Explain the soil formation process and describe various types of Bhartiya soils in detail.

Skill

11. Mark Red and sandy soil regions in an outline map of Bharat.
12. Mark black and mountain soil regions in an outline map of Bharat.

Answer Key

1. (A), 2. (B), 3. (C)