1 RESOURCES AND DEVELOPMENT

1.1 INTRODUCTION :

"Resources are generally considered as gifts of nature". Resources are actually a function of human activities. They transform material available in our environment into resources and use them.
Plants, animals, land, water and minerals are termed as natural resources.
By utilizing natural resources, humans created their own world of living. They created building, roads, railways, town, machines, industries etc.

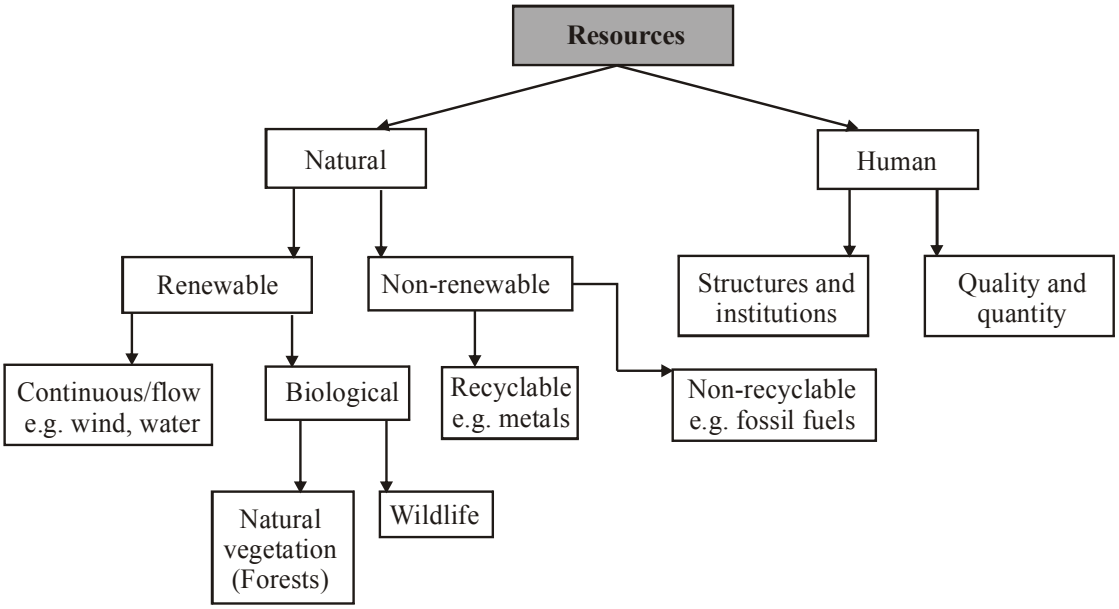
Knowledge Based Questions :

1. Which among the following are non renewable resources?
   (A) Fisheries (B) Water (C) Minerals (D) Forests
2. Soil erosion tends to be high in
   (A) bad-lands (B) plateau
   (C) equatorial forests (D) steep slopes with vegetation
3. Soils are generally classified on the basis of
   (A) texture and colour (B) nature of development
   (C) use (D) age
4. Which of the following is not a natural resource?
   (A) Land (B) Soils (C) Canals (D) Rivers
5. A natural resource different from the other three among the following in the ability to regenerate itself is
   (A) forests (B) wildlife (C) minerals (D) wind
6. Economic development of a nation depends on the
   (A) richness of natural resources (B) development of resources
   (C) management of resources (D) all of the above
7. Resource planning is aimed at
   (A) making inventory of resources
   (B) exploration of resources
   (C) assessing the future requirement of resources
   (D) proper utilization of resources
8. Weathering of rocks involves
   (A) physical and chemical forces (B) chemical and biological forces
   (C) biological and physical forces (D) physical, chemical and biological forces

9. The most fertile soils among the major types of Indian soils are
(A) black soils (B) red soils (C) alluvial soils (D) laterite soils

10. Conservation of resources is necessary for
(A) their continued availability in future (B) checking and degradation
(C) preventing soil erosion (D) maximisation

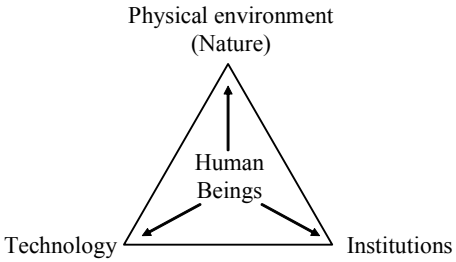
FLOW LEARNING



IMPORTANT TERMS

- **Individual Resources :** The resources owned privately by individuals.
- **National Resources :** The resources that belong to the nation.
- **International Resources :** The resources that do not belong to any individual country.
- **Resources Planning :** The widely accepted strategy for cautious use of resources is known as resource planning.
- **Gross Cropped Area :** Area sown more than once in an agricultural year plus net sown area is known as gross cropped area.
- **Soil Erosion :** The removal of top fertile soil cover due to various reasons like wind, glacier and water is called soil erosion.
- **Gullies :** The running water cuts through the clayey soils and makes deep channels known as gullies.
- **Bad Land or Ravines :** Due to the formation of gullies the land becomes unfit for cultivation and is known as bad land or ravines.
- **Sheet Erosion :** When the top soil is washed away due to heavy flow of water down the slopes it is known as sheet erosion.
- **Wind Erosion :** When the top fertile soil blows off due to wind it is known as wind erosion.
- **Shelter Belts :** Planting lines of trees to create shelter breaks up the force of the wind. Rows of such trees are called shelter belts.

1.2 CONCEPT OF RESOURCES :



(i) Everything available in our environment which can be used to satisfy our needs, provided, it is technologically accessible, economically feasible and culturally acceptable can be termed as 'Resource'.

(ii) The process of transformation of things available in our environment involves an inter-dependent relationship between nature, technology and institution.

(iii) Human beings interact with nature through technology and create institutions to accelerate their economic development.

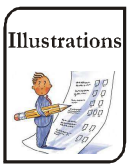


Illustration 1 : ***What is a resource?***

Solution : Everything available in environment which is technologically accessible, economically feasible and culturally acceptable.

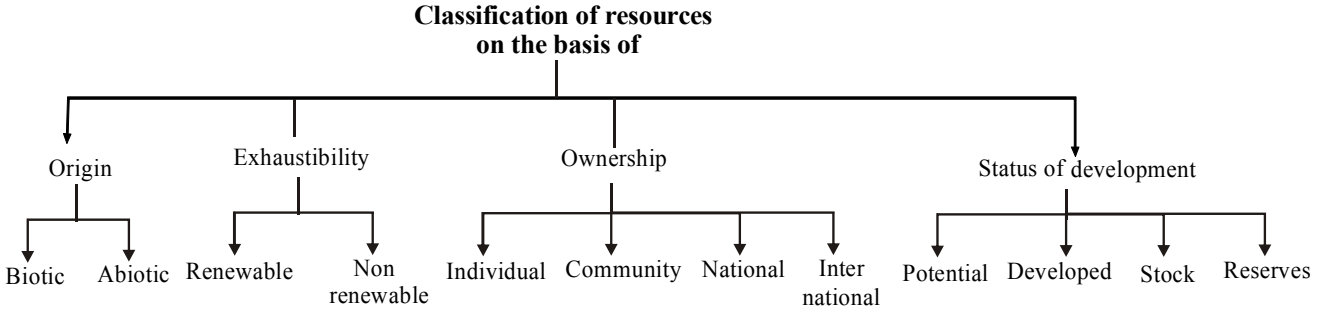
Illustration 2 : ***How do human beings interact with to speed up their economic development?***

Solution : Human beings interact with nature through technology.

Try yourself :

1. What do you understand by the term interdependence in this context?
2. Are resources free gifts of nature?

1.3 CLASSIFICATION OF RESOURCES :



On the basis of Origin :

Biotic Resources: These are obtained from biosphere and have life such as human beings, flora and fauna, fisheries, livestock etc.

Abiotic Resources: All those things which are composed of non-living things are called abiotic resources. For example, rocks and metals.

On the basis of Exhaustibility :

Renewable Resources: The resources which can be renewed or reproduced by physical, chemical or mechanical processes are known as renewable or replenishable resources. For example, solar and wind energy, water, forests and wildlife, etc.

Non-Renewable Resources: These occur over a very long geological time. Minerals and fossil fuels are examples of such resources.

Some of the resources like metals are recyclable and some like fossil fuels cannot be recycled and get exhausted with their use.

On the Basis of Ownership :

Individual Resources: These are also owned privately by individuals. Many farmers own land which is allotted to them by government against the payment of revenue.
In **villages** there are people with land ownership but there are many who are landless.
Urban people own plots, houses and other property. Plantation, pasture lands, ponds, water in wells etc.
Community Owned Resources: There are resources which are accessible to all the members of the community.
Village commons (grazing grounds, burial grounds, village ponds, etc.) public parks, picnic spots, playgrounds in urban areas etc.
National Resources: Technically, all the resources belong to the nation. The country has legal powers to acquire even private property for public good. Eg. roads, canals, railways being constructed on fields owned by some individuals. All the minerals, water resources, forests, wildlife, land within the political boundaries and oceanic area upto 12 nautical miles (19.2 km) from the coast termed as territorial water and resources therein belong to the nation.
International Resources: There are international institutions which regulate some resources. The oceanic resources **beyond 200 km of the Exclusive Economic Zone** belong to open ocean and no individual country can utilise these without the concurrence of international institutions.

On the Basis of the Status of Development :

Potential Resources: Resources which are found in a region, but have not been utilised. The western parts of India particularly Rajasthan and Gujarat have enormous potential for the development of wind and solar energy, but so far these have not been developed properly.
Developed Resources: Resources which are surveyed and their quality and quantity have been determined for utilisation. The development of resources depends on technology and level of their feasibility.
Stock:
(i) Materials in the environment which have the potential to satisfy human needs but human beings do not have the appropriate technology to access these, are included among stock.
(ii) e.g. Water is a compound of two inflammable gases: hydrogen and oxygen. Hence, it can be considered as stock.

Reserves: are the subset of the stock, which can be put into use with the help of existing technical 'know-how' but their use has not been started. These can be used for meeting future requirements.
River water can be used for generating hydroelectric power but presently, it is being utilised only to a limited extent.

1.4 SUSTAINABLE DEVELOPMENT :

Sustainable economic development means development should take place without damaging the environment, and development in the present should not compromise with the needs of the future generations.

Rio de Janeiro Earth Summit, 1992 :

In June 1992, more than 100 heads of states met in Rio de Janeiro in Brazil, for the first International Earth Summit.
The Summit was convened for addressing urgent problems of environmental protection and socio economic development at the global level.
The Rio Convention endorsed the global Forest Principles and adopted Agenda 21 for achieving Sustainable Development in the 21st century.

Agenda 21 :

It is declaration signed by world leaders in 1992 at the United National Conference on Environment and Development (UNCED).

It is an agenda to combat environmental damage, poverty, disease through global co-operation on common interests, mutual needs and shared responsibilities.

One major objective of the Agenda 21 is that every local government should draw its own local Agenda 21.

There are regions which are rich in certain types of resources but are deficient in some other resources.

There are some regions which can be considered self sufficient in terms of the availability of resources and there are some regions which have acute shortage of some vital resources.

For example,

(i) The states of Jharkhand, Chhattisgarh and Madhya Pradesh are rich in minerals and coal deposits.

(ii) Arunachal Pradesh has abundance of water resources but lacks in infrastructural development.

(iii) The state of Rajasthan is very well endowed with solar and wind energy but lacks in water resources.

(iv) The cold desert of Ladakh is relatively isolated from the rest of the country. It has very rich cultural heritage but it is deficient in water, infrastructure and some vital minerals.

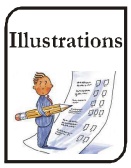


Illustration 3 : ***When & where was the first international summit held?***
Solution : Rio De Jeneiro in Brazil in 1992.

Illustration 4 : ***What declaration was signed by the leaders?***
Solution : Declaration on Global climatic change and Biological diversity.

Illustration 5 : ***What is Agenda 21?***
Solution : Declaration signed by world leaders in 1992 at UNCED.

Try yourself :

3. Why was the International Earth summit convened in June 1992?
4. What was the major objective of Agenda 21?

1.5 RESOURCE PLANNING AND STAGES OF RESOURCES PLANNING :

Resource Planning :

Planning is the widely accepted strategy for judicious use of resources. It has importance in a country like India, which has enormous diversity in the availability of resources.

Stages of Resources Planning :

Resource planning is a complex process which involves

(i) Identification and inventory of resources across the regions of the country. This involves surveying, mapping and qualitative and quantitative estimation and measurement of the resources.

(ii) Evolving a planning structure endowed with appropriate technology, skill and institutional set up for implementing resource development plans.

(iii) Matching the resource development plans with overall national development plans.

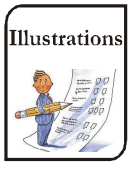


Illustration 6 : ***What are Chhatisgarh & M.P. rich in?***
Solution : Minerals & coal deposits

Illustration 7 : ***What does Rajasthan lacks in?***
Solution : Water resources

Illustration 8 : ***What is Ladakh rich in?***
Solution : Cultural heritage

Try yourself :

5. Which sources are available in Rajasthan?
6. Mention the resources in which Arunachal is rich and resources in which it is poor?
7. Why is resource planning called a complex procedure?
8. Why does Arunachal lack in infrastructural development.

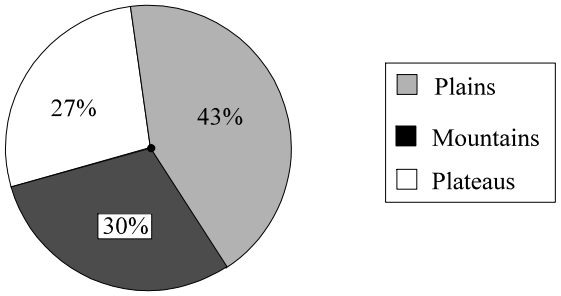
1.6 CONSERVATION OF RESOURCES AND LAND RESOURCES :

Conservation Of Resources :

Resources are vital for any developmental activity. But irrational consumption and over-utilisation of resources may lead to socio-economic and environmental problems. To overcome these problems, resource conservation at various levels is important.

Example: Gandhiji was very apt in voicing his concern about resource conservation in these words: "There is enough for everybody's need and not for any body's greed."

Land Resources :



India : Land under important Relief Features

About 43 per cent of the land area is **plain**, which provides facilities for agriculture and industry.

Mountains account for 30 per cent of the total surface area of the country and ensure perennial flow of some rivers, provide facilities for tourism and ecological aspects.

About 27 per cent of the area of the country is the **plateau region**. It possesses rich reserves of minerals, fossil fuels and forests.

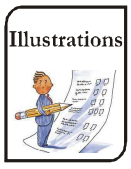


Illustration 9 : Who voiced his concern about conservation of resources?

Solution : Gandhiji

Illustration 10 : What is the percentage of plains in India?

Solution : 43%

Illustration 11 : What is the % of plateau region?

Solution : 27%

Try yourself :

9. Why is conservation of resources important?
10. What is the importance of plains?
11. What is the importance of mountains?
12. What is the importance of plateau region?

1.7 LAND USE PATTERN IN INDIA :

Land Use Pattern In India :

The use of land is determined both by physical factors such as topography, climate, soil types as well as human factors such as population density, technological capability and culture and traditions etc.

Points

(i) The land under permanent pasture has decreased.

(ii) Most of the other than the current fallow lands are either of poor quality or the cost of cultivation of such land is very high.

(iii) Hence, these lands are cultivated once or twice in about two to three years and if these are included in the net sown area then the percentage of NSA in India comes to about 54 per cent of the total reporting area.

(iv) The pattern of net sown area varies greatly from one state to another. It is over 80 per cent of the total area in Punjab and Haryana and less than 10 per cent in Arunachal Pradesh, Mizoram, Manipur and Andaman Nicobar Islands.

(v) Forest area in the country is far lower than the desired 33 per cent of geographical area, as it was outlined in the National Forest Policy (1952). It was considered essential for maintenance of the ecological balance.

(vi) A part of the land is termed as waste land and land put to other non-agricultural uses.

(vii) Waste land includes rocky, arid and desert areas and land put to other non-agricultural uses includes settlements, roads, railways, industry etc.

(viii) Continuous use of land over a long period of time without taking appropriate measures to conserve and manage it, has resulted in land degradation.

(ix) It has serious repercussions on society and the environment.

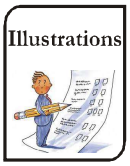


Illustration 12 : Mention the physical factors which determine the use of land.
Solution : Climate, type of soils and topography

Illustration 13 : How much forest area was desired in the National forest policy?
Solution : 33%

Illustration 14 : What are the non-agricultural uses of land?
Solution : It includes roads, railways, industries, settlements etc.

Try yourself :

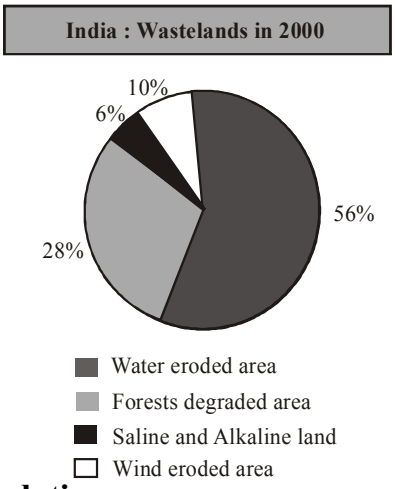
13. Try to do a comparison between the two pie charts given for land use and find out why the net sown area and the land under forests have changed from 1960-61 to 2002-03 very marginally.
14. Why is net sown area 80% in Punjab and 10% in Mizoram, Manipur and Arunachal Pradesh?
15. Explain wasteland.
16. Explain land degradation.

1.8 LAND DEGRADATION AND CONSERVATION MEASURES :

Land Degradation :

Ninety-five per cent of our basic needs for food, shelter and clothing are obtained from land.
At present, there are about 130 million hectares of degraded land in India. Approximately, 28 per cent of it belongs to the category of forest degraded area, 56 per cent of it is water eroded area and the rest is affected by saline and alkaline deposites.

Wastelands :



Causes of Land Degradation :

(i) Some human activities such as deforestation, over grazing, mining and quarrying have contributed significantly in land degradation.

(ii) **Mining sites are abandoned** after excavation work is complete leaving deep scars and traces of over-burdening. In states like **Jharkhand, Chhattisgarh, Madhya Pradesh and Orissa deforestation** due to mining have caused severe land degradation.

(iii) In states like **Gujarat, Rajasthan, Madhya Pradesh and Maharashtra overgrazing** is one of the main reasons for land degradation.

(iv) In the states of **Punjab, Haryana, western Uttar Pradesh, over irrigation** is responsible for land degradation due to water logging leading to increase in salinity and alkalinity in the soil.

(v) The **mineral processing** like grinding of limestone for cement industry and calcite and soapstone for ceramic industry generate huge quantity of dust in the atmosphere. It retards the process of infiltration of water into the soil after it settles down on the land.

(vi) In recent years, **industrial effluents** as waste have become a major source of land and water pollution in many parts of the country.

Conservation measures :

(i) Afforestation and proper management of grazing can help to some extent.

(ii) Planting of shelter belts of plants, control on over grazing, stabilisation of sand dunes by growing thorny bushes.

(iii) Proper management of waste lands, control of mining activities, proper discharge and disposal of industrial effluents and wastes after treatment can reduce land and water degradation in industrial and suburban areas.

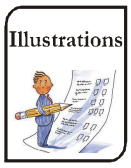


Illustration 15 : Name two states which suffer from deforestation due to minning.
Solution : Jharkhand and Orissa

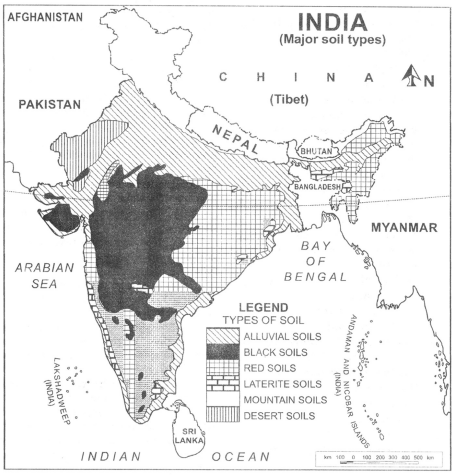
Illustration 16 : Name two states where overgrazing is the major cause of land degradation.
Solution : Gujarat & Rajasthan

Illustration 17 : What is the major cause of land degradation is Punjab?
Solution : Over irrigation

Try yourself :

17. Mention two causes of land degradation.
18. Suggest two methods to solve the problem of land degradation.
19. What is the percentage of water eroded area as given in figure? Mention one reason for it.

1.9 SOIL AS A RESOURCE AND CLASSIFICATION OF SOILS :



Soil as a Resource :

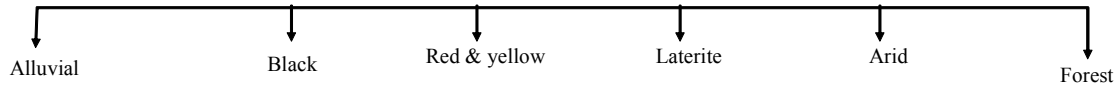
(i) Soil is the most important renewable natural resource. It is the medium of plant growth and supports different types of living organisms on the earth.

(ii) It takes millions of years to form soil upto a few cm in depth. Relief, parent rock or bed rock, climate, vegetation and other forms of life and time are important factors in the formation of soil.

(iii) Various forces of nature such as change in temperature, actions of running water, wind and glaciers, activities of decomposers etc. contribute to the formation of soil.

(iv) Chemical and organic changes which take place in the soil are equally important. Soil also consists of organic (humus) and inorganic materials.

Classification of Soils :



On the basis of the factors responsible for soil formation, colour, thickness, texture, age, chemical and physical properties, the soils of India can be classified in different types.

Alluvial Soils :

(i) This is the most widely spread and important soil. In fact, the entire northern plains are made of alluvial soil.

(ii) These have been deposited by three important Himalayan river systems-the Indus, the Ganga and the Brahmaputra.

(iii) Also found in the eastern coastal plains particularly in the deltas of the Mahanadi, the Godavari, the Krishna and the Kaveri rivers.

(iv) The alluvial soil consists of various proportions of sand, silt and clay.

(v) On the basis of their age soils can be classified as old alluvial (**Bangar**) and new alluvial (**Khadar**). The **banger** soil has higher concentration of kanker nodules than the **Khadar**. It has more fine particles and is more fertile than the **bangar**.

(vi) Alluvial soils as a whole are very fertile. Mostly these soils contain adequate proportion of potash. phosphoric acid and lime which are ideal for the growth of sugarcane, paddy, wheat and other cereal and pulse crops.

(vii) Due to its high fertility, regions of alluvial soils are intensively cultivated and densely populated.

Black Soil :

(i) These soils are black in colour and are also known as regur soils. Black soil is ideal for growing cotton and is also known as black cotton soil.

(ii) This type of soil is typical of the Deccan trap (Basalt) region spread over northwest Deccan plateau and is made up of lava flows.

(iii) They cover the plateaus of Maharashtra, Saurashtra, Malwa, Madhya Pradesh and Chhattisgarh and extend in the south east direction along the Godavari and the Krishna valleys.

(iv) Are made up of extremely fine i.e. clayey material. They are well-known for their capacity to hold moisture. In addition, they are rich in soil nutrients, such as calcium carbonate, magnesium, potash in phosphoric contents.

(v) They develop deep cracks during hot weather, which helps in the proper aeration of the soil. These soils are sticky when wet and difficult to work on unless tilled immediately after the first shower or during the pre-monsoon period.

Red and Yellow Soils :

(i) Red soil develops on crystalline igneous rocks in areas of low rainfall in the eastern and southern parts of the Deccan plateau.

(ii) Yellow and red soils are also found in parts of Orissa, Chhattisgarh, southern parts of the middle Ganga plain and along the piedmont zone of the Western Ghats.

(iii) These soils develop a reddish colour due to diffusion of iron in crystalline and metamorphic rocks. It looks yellow when it occurs in a hydrated form.

Laterite Soil :

(i) Laterite has been derived from the Latin word 'later' which means brick.

(ii) The laterite soil develops in areas with high temperature and heavy rainfall. This is the result of intense leaching due to heavy rain.

(iii) Humus content of the soil is low because most of the micro organisms, particularly the decomposers, like bacteria, get destroyed due to high temperature.

(iv) Laterite soils are suitable for cultivation with adequate doses of manures and fertilizers. These soils are mainly found in Karnataka, Kerala, Tamil Nadu, Madhya Pradesh, and the hilly areas of Orissa and Assam.

Arid Soils :

(i) Arid soils range from red to brown in colour. They are generally sandy in texture and saline in nature.

(ii) In some areas the salt content is very high and common salt is obtained by evaporating the water. Due to the dry climate, high temperature, evaporation is faster and the soil lacks humus and moisture.

(iii) The lower horizons of the soil are occupied by Kankar because of the increasing calcium content downwards.

(iv) The Kankar layer formations in the bottom horizons restrict the infiltration of water. After proper irrigation these soils become cultivable as has been in the case of western Rajasthan.

Forest Soils :

(i) These soils are found in the hilly and mountainous areas where sufficient rain forests are available.

(ii) The soils texture varies according to the mountain environment where they are formed. They are loamy and silty in valley sides and coarse grained in the upper slopes.

(iii) In the snow covered areas of Himalayas, these soils experience denudation and are acidic with low humus content. The soils found in the lower parts of the valleys particularly on the river terraces and alluvial fans are fertile.

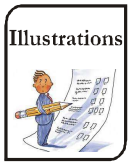


Illustration 18 : What does soil consist of?

Solution : Organic & inorganic materials

Illustration 19 : Mention the differences between khadar & Bangar

Solution :

	Khadar	Bangar
1	New alluvium	Older alluviam
2	More fertile	less fertile than khadar

Illustration 20 : What is Black soil also known as?

Solution : Regur soil & Black cotton soil

Try yourself :

20. Mention two characteristics of laterite soils
21. Why do the soils acquire red or yellow colour?
22. How do arid soils become cultivable?

1.10 SOIL EROSION AND SOIL CONSERVATION :

Soil erosion :

The denudation of the soil cover and subsequent washing down is described as **soil erosion**.

Causes of Soil erosion :

(i) Sometimes, this balance is disturbed due to **human activities** like deforestation, over-grazing, construction and mining etc.

(ii) **Natural forces** like wind, glacier and water lead to soil erosion.

(iii) The running water cuts through the clayey soils and makes deep channels as **gullies**. The land becomes unfit for cultivation and is known as **bad land**. In the Chambal basin such lands are called **ravines**.

(iv) Sometimes water flows as a sheet over large areas down a slope. In such cases the top soil is washed away. This is known as **sheet erosion**.

(v) Wind blows loose soil off flat or sloping land known as **wind erosion**. Soil erosion is also caused due to defective methods of farming. Ploughing in a wrong way i.e. up and down the slope form channels for the quick flow of water leading to soil erosion.

Methods to Conserve Soil :

(i) Ploughing along the contour lines can decelerate the flow of water down the slopes. This is called **contour ploughing**.

(ii) Steps can be cut out on the slopes making terraces. Terrace cultivation restricts erosion. Western and central Himalayas have well developed terrace farming.

(iii) Large fields can be divided into strips. Strips of grass are left to grow between the crops. This breaks up the force of the wind.

(iv) Planting lines of trees to create shelter also works in a similar way. Rows of such trees are called **shelter belts**. These shelter belts have contributed significantly to the stabilisation of sand dunes and in stabilising the desert in western India.

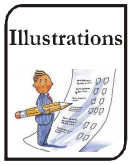


Illustration 21 : What is soil erosion?
Solution : Denudation of soil cover and subsequent washing down of soil.

Illustration 22 : Name the two types of erosion caused by running water?
Solution : Gully and Sheet erosion.

Illustration 23 : State two methods of soil conservation.
Solution : Contour ploughing and strip cropping.

Try yourself :

23. Explain badlands and ravines.
24. Mention human activities and natural forces which are responsible for soil erosion.
25. In the outline map of India locate & label laterite soils and alluvial soils.