Ch - 10

Denudation

Denudation is the process of breaking and removing the rocks from the surface of the earth.
It results in lowering the level of land, rounding exposed rock surface and levelling the peaks.

Processes Involved in Denudation -

i) Weathering - It refers to the disintegration of rocks by atmospheric agents at or near the surface of the earth.

ii) Erosion - It refers to the displacement of rocks by agents like wind, water or ice.

iii) Mass Movement or Mass Wasting - It refers to the large-scale movement of loose materials (rock-waste) down the slope on account of gravity. The steeper the slope, the more rapid is the movement.

iv) Transportation - It refers to the movement of material loosened by erosion and transported to the other place by the action of wind or water.

v) Deposition - It refers to the laying down of material that has been weathered,

eroded and transported by natural processes such as water, wind and ice.

Agents of denudation erode, transport and deposit sediments at the earth's surface to produce erosional and depositional landforms.

Work of a river -
Rivers are the greatest agents of erosion, transportation and deposition.

Factors affecting work of a river -

i) Velocity of water - Erosion and transportation are both maximum when velocity is high. Deposition, on the other hand takes place when velocity of water is low.

ii) Volume of water - The larger the volume of water, the greater is the power of erosion and transportation.

iii) Load - Load is the material transported by a river.
The load of a river, does all the work of erosion and deposition.

Course of a river -
The path along which the river flows is known as the course of a river.

i) Source - The place of origin of a river is called its source.

ii) Mouth - Where a river enters the sea or disappears before joining the sea is called its mouth.

iii) Tributaries - The streams or small rivers which join the main river are called its tributaries.

iv) Distributaries - Where a river divides into channels or smaller rivers, they are called its distributaries.

From the source to its mouth, a river is divided into three main sections - Upper course, Middle course and Lower course. These three sections are also called the Profile of a River.

Upper course -
At this stage, the river flows swiftly, for the gradients are steep. In the upper course the dominant activity of a river is erosion.

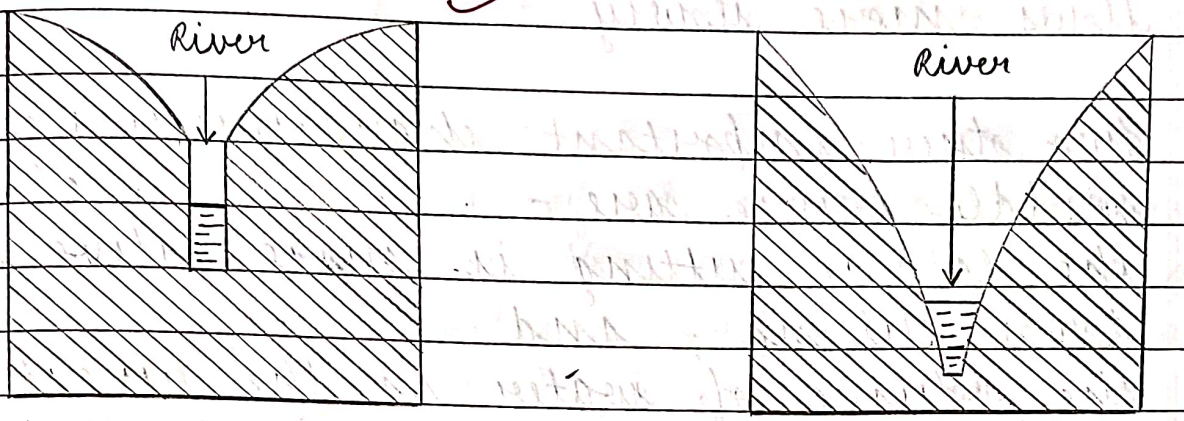
Landforms of the upper course -

i) V-shaped valleys -

i) A V-shaped valley is a narrow valley formed from a stream eroding downward,

through a process, called down cutting.

ii) In regions of hard rocks it develops almost vertically in an I- shape.



I- Shaped Valley V- Shaped Valley

River Valleys

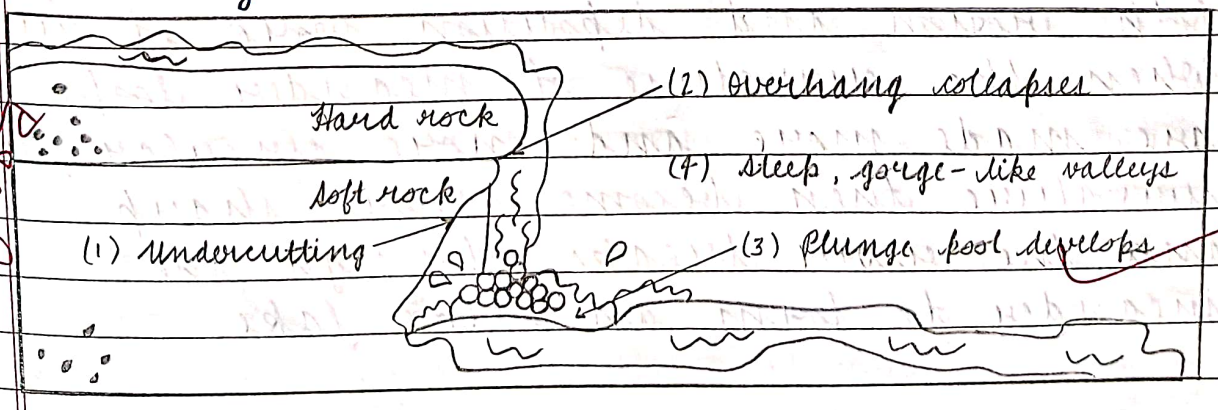
ii) Waterfall -

i) A waterfall is defined as a vertical fall of water of enormous volume from a great height.

ii) The smaller differences (in the rate of erosion) leads to formation of step- like features known as rapids.

iii) The water that falls down creates a hollow basin called plunge pool.

iv) The world's highest and best known falls are Angel Falls (986 m) in Venezuela.



Middle course -

The second stage of a river is known as the maturity stage. At this stage, the gradient is reduced, and the river flows more slowly.

Two other important characteristics of the middle course are -

i) the lateral cutting is more active than down cutting; and
ii) the volume of water in the river increases due to many tributaries joining it.

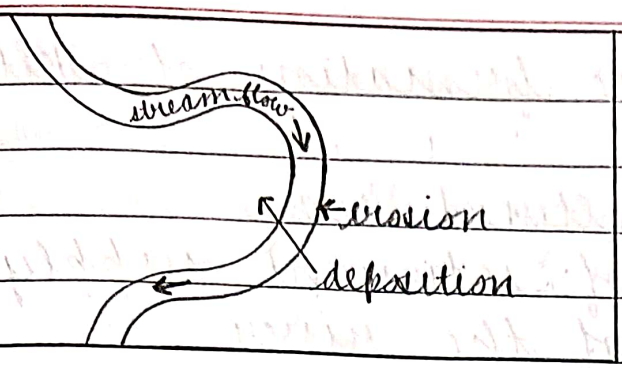
The river gets widened as a result of great volume of water and the impact of the load.

Landforms of the ~~Upper~~ Middle course -

Meander -

Ganga

i) A pronounced curve or loop in the middle course of a river channel is called meander.
ii) S-shaped meanders are the result of both erosion and deposition work of rivers.
iii) When the curvature of meander loops are made more and more circular, the curvature then becomes more sharp and the river breaks through the meander to form an oxbow lake.



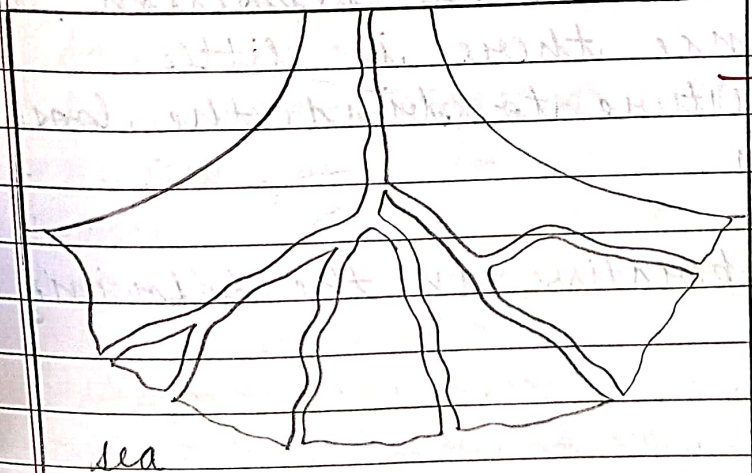
Lower Course -

The third stage is of a river is known as the old stage. The river flows sluggishly The load-transporting capacity is drastically reduced

Landforms of the lower course -

Delta -

i) The deposition over a large area results in a triangular-shaped formation called delta. It resembles the Greek letter Δ (Delta).
ii) The river divides itself into many distributaries & mini-distributaries.
iii) This is due to deposition of sediments over a large area near the mouth of rivers



DELTA

Conditions for the formation of deltas -

i) nearly calm sheltered sea.
ii) large amount of sediment supply.
iii) reasonable size of the river.

Ex, the Ganga - Brahmaputra delta is growing towards the sea. It is also one of the largest in the world.

A funnel shaped opening at the tidal mouth of the river is called Estuary.

Work of wind -
The horizontal movement of air over the earth's surface is known as wind. Wind picks up loose debris like sand and pebbles and transports as well as deposits them in another location

Action of Winds -
The wind is the most effective agent of erosion, transportation and deposition, in arid regions. Since there is little vegetation or moisture to bind the loose surface materials.

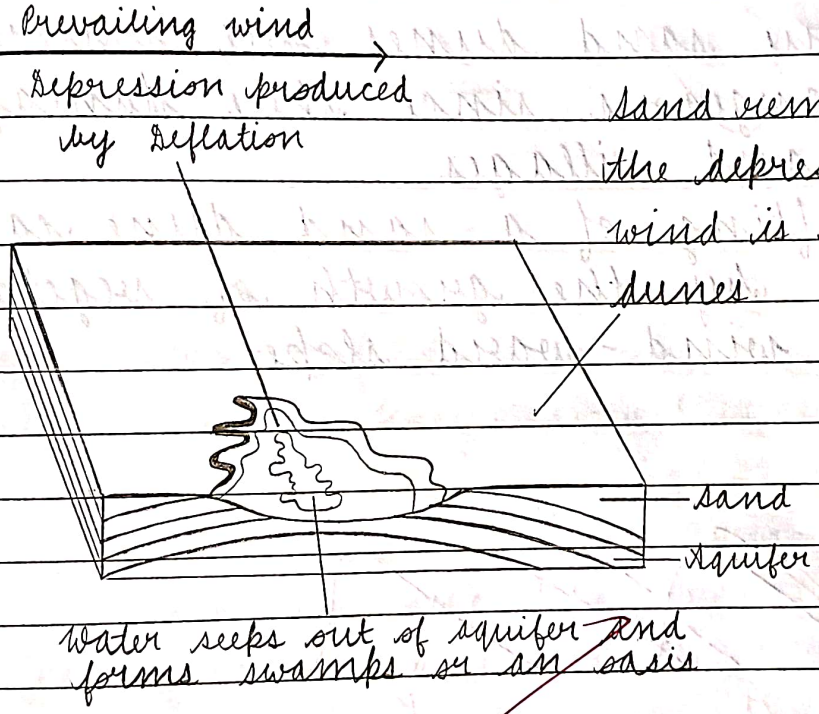
Wind erosion is operative in the following ways:

i) Deflation Hollows -
1. Deflation involves the lifting as well as

the blowing away of loose materials from the ground.

2. It results in the lowering of the land surface to create depressions called deflation hollows.

3. The Qattara Depression of the Sahara Desert which lies almost 450 feet below sea level is a good example of deflation.



Deflation Hollow

ii) Sand dunes -

1. Dunes are called hills of sand.
2. Dunes are found in deserts, ~~rooted with~~ where the sand is being continuously moved, reshaped and redeposited.

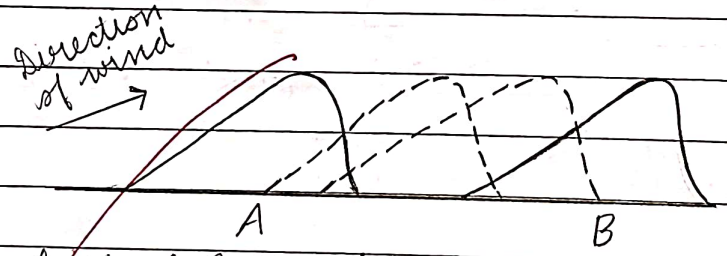
Shape and size -

Their shape and size depend upon factors such as :

i) The direction and force of wind.
ii) The nature and amount of sand brought by the wind.
iii) The nature of vegetation, relief, water features on the land.

Shifting or Migration -

i) Sand dunes move in the direction of the wind.
ii) Migratory sand dunes are uncertain and dangerous since they damage towns and villages.
iii) The shifting of a sand dune can be checked by the growth of vegetation on the wind-ward slope.



A - Original Position of Dune B - Later Position

Shifting of Sand Dune

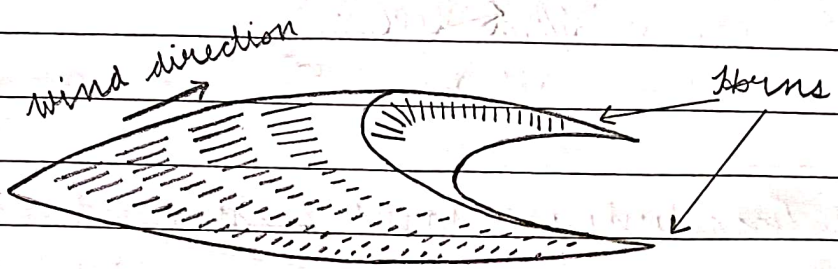
Two types of dunes are seen in the tropical deserts -

a) Barchan -

i) These are crescent shaped dunes.
ii) They are initially formed by an accumulation of sand at an obstacle, such as a heap of rocks.

iii) Their horns thin out and become lower in the direction of the wind.

iv) The windward side is convex and gentley-sloping while the leeward side (being sheltered) is concave and steep.



Barchan

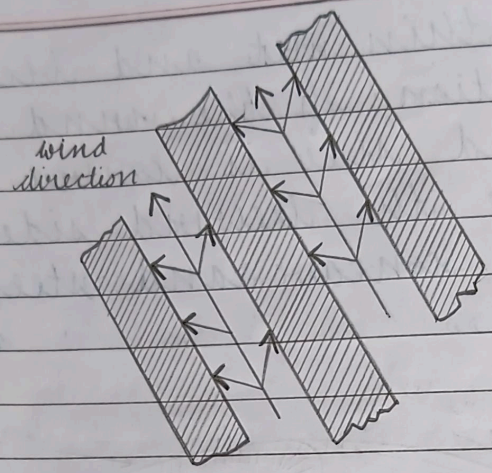
The migration of the barchans is a threat to desert life. They sometimes encroach on an oasis, burying palm trees or houses. Long-rooted trees and sand-holding grasses are planted to halt the advance of the dunes.

b) Longitudinal Dunes or Seifs -

i) These are long and narrow sand-ridges which grow parallel to the direction of the prevailing wind.

ii) Seifs means 'sword' in Arabic.

iii) An important feature of such a dune is that in its crest line there are ride and fall patterns.



longitudinal sand Dunes

Good