EROSION PROCESS

Factors affecting river erosion

- **Water discharge: Volume of water passing through a given point in a given period of time.**
- **Velocity**
- **Channel gradient: slope of the stream.**
- **Sediment load**
- **Cross sectional areas: smooth and irregular cross sections.**

River erosion typically occurs in the following ways:

1. Surface Erosion/ Overland flow
2. Channel Erosion/ Stream flow:

Surface Erosion

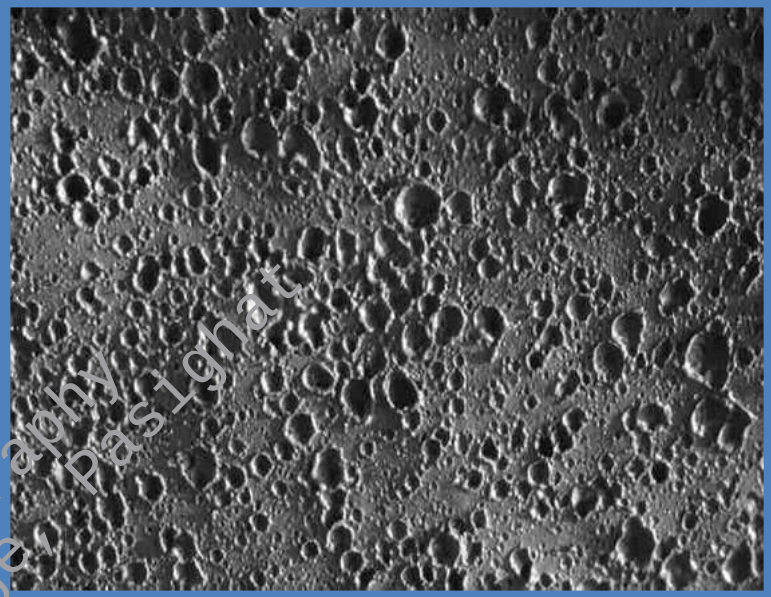
Water moving on the surface without being confined to a channel.

a) **Splash erosion**
b) **Sheet erosion**

Surface erosion contd...

Splash erosion

- soil particles are loosened by rain-drop impact.
- First step in the erosion process.
- Especially effective in arid and semi-arid regions where rainfall is sporadic and torrential and the surface is loose and friable and there is no vegetation cover.



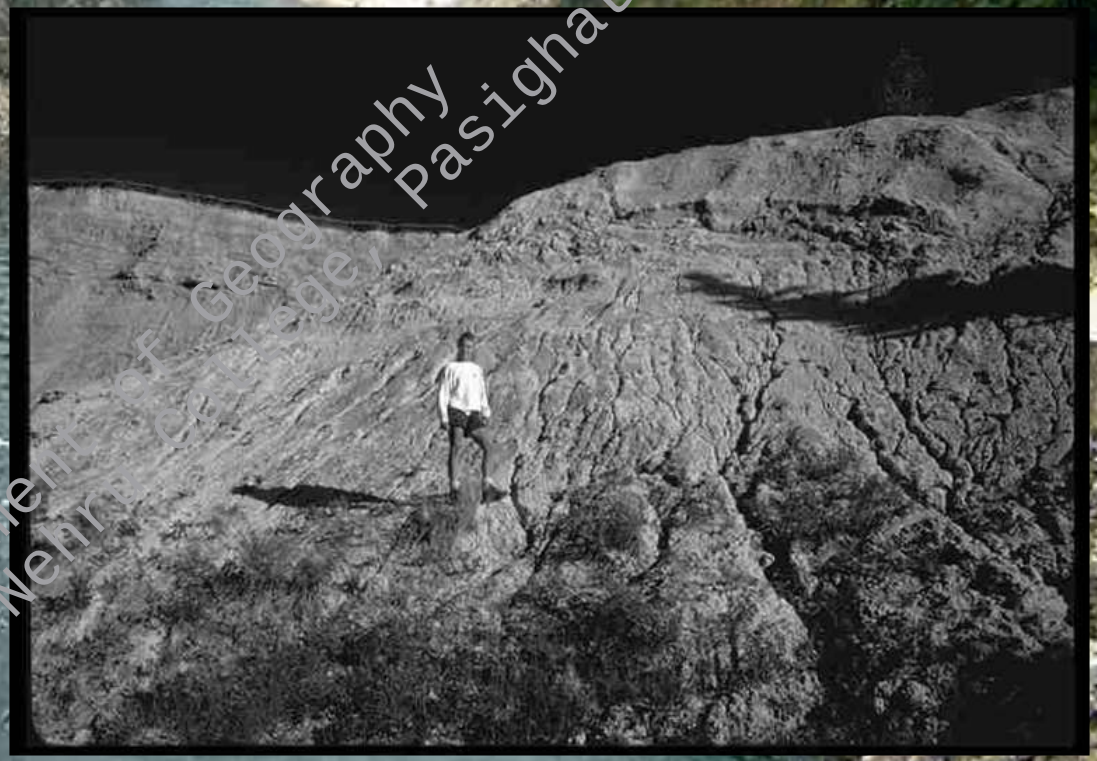
Sheet erosion

- entrainment of loose particles covering a considerable area in overland flow.

Channel Erosion/ Stream flow

Water is confined to long trough-like depressions called channel.

- *Rill erosion*
- *Gully erosion*
- *Streams*



Rills:

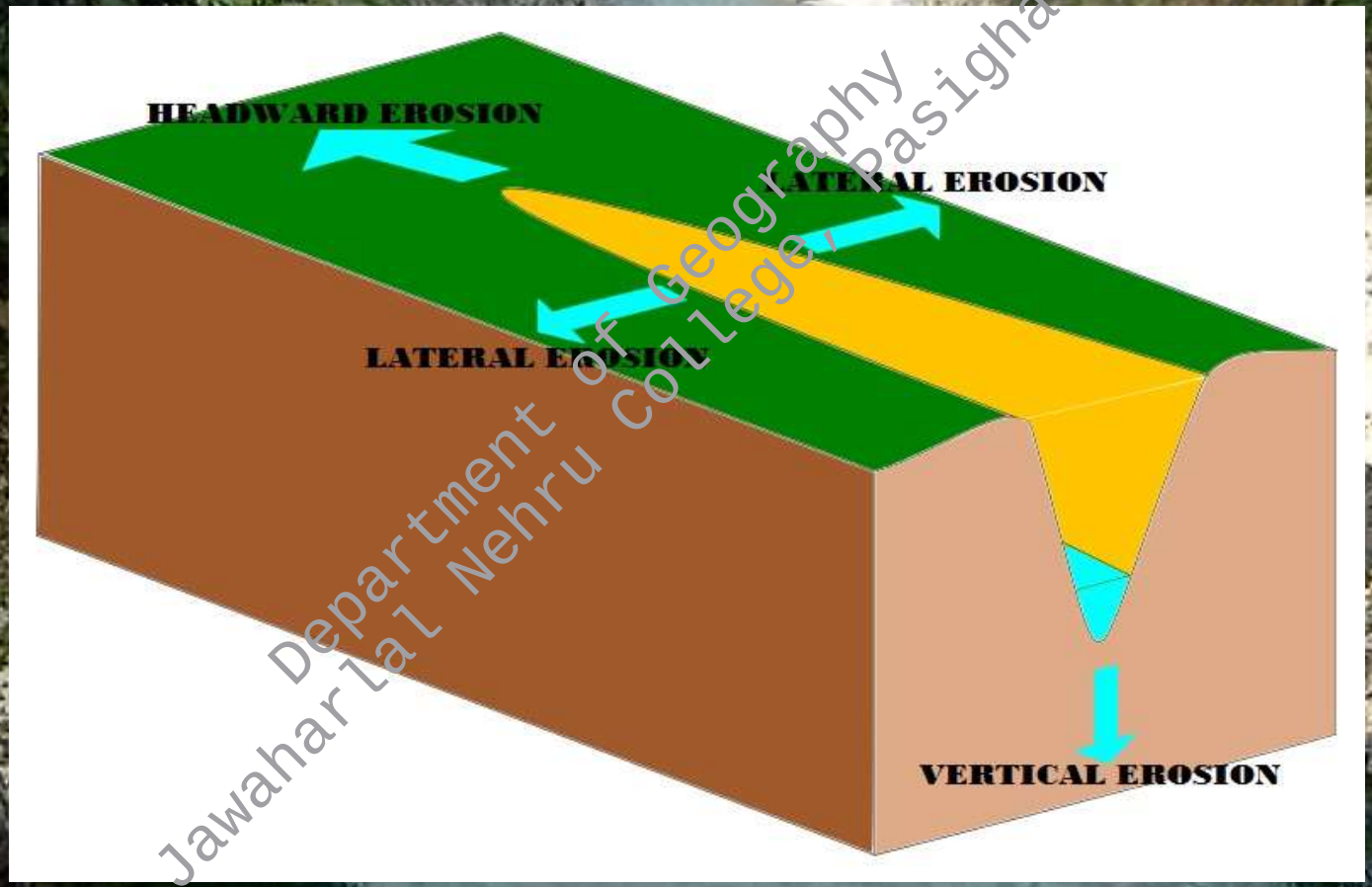
Tiny superficial and ill-defined channels.

Types of fluvial erosion

Lateral erosion

Vertical erosion

Headward erosion

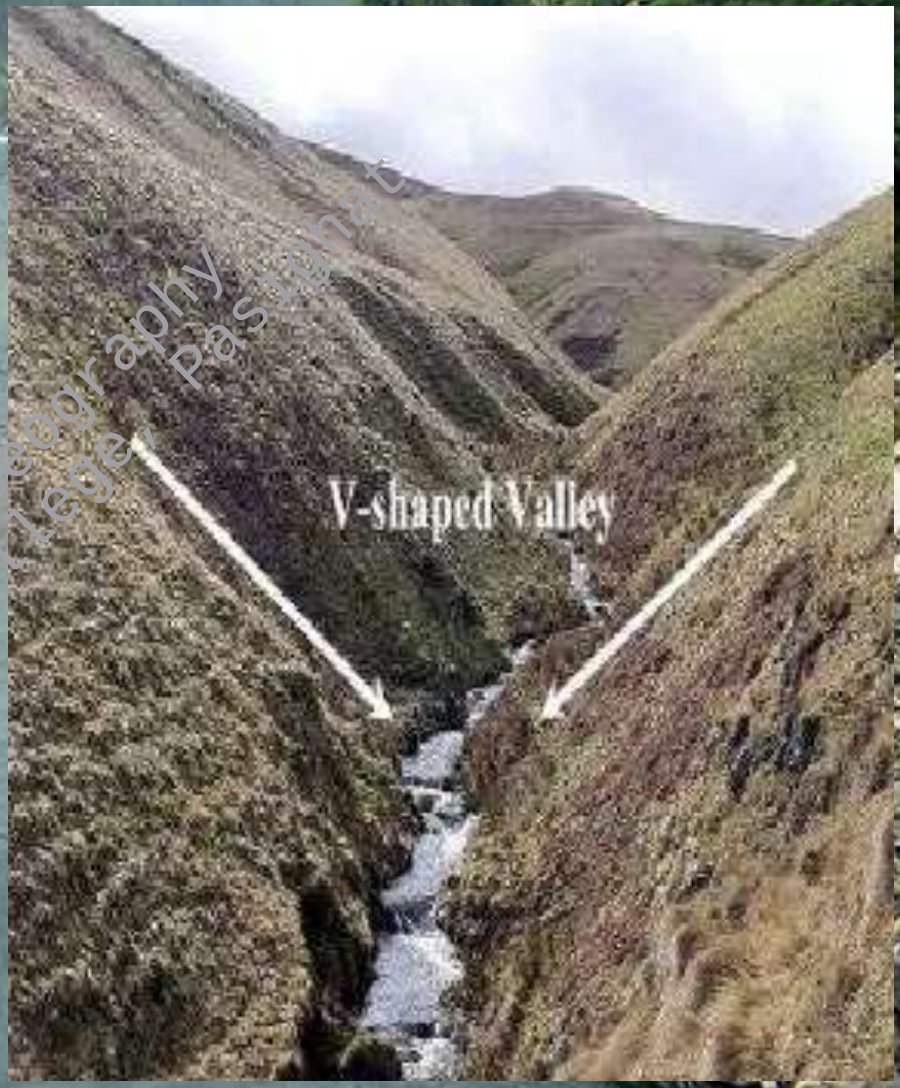


Vertical erosion

This is when the river cuts down vertically into the ground.

Or

Deepening of a river channel to create narrow v-shaped valley.



Lateral erosion

- This is when the river erodes out laterally, across the valley, creating a flat valley bottom.
- Occurs normally in the lower course

Headward erosion

- Lengthening of the river in the upstream direction.
- River cut its source.

MECHANISM OF STREAM EROSION

1. ***Hydraulic Action***:
   Erosion by the force of moving water.

2. ***Abrasion or Corrasion:***
   The river's load (rock fragments) wears away the bed and the sides.

continues...

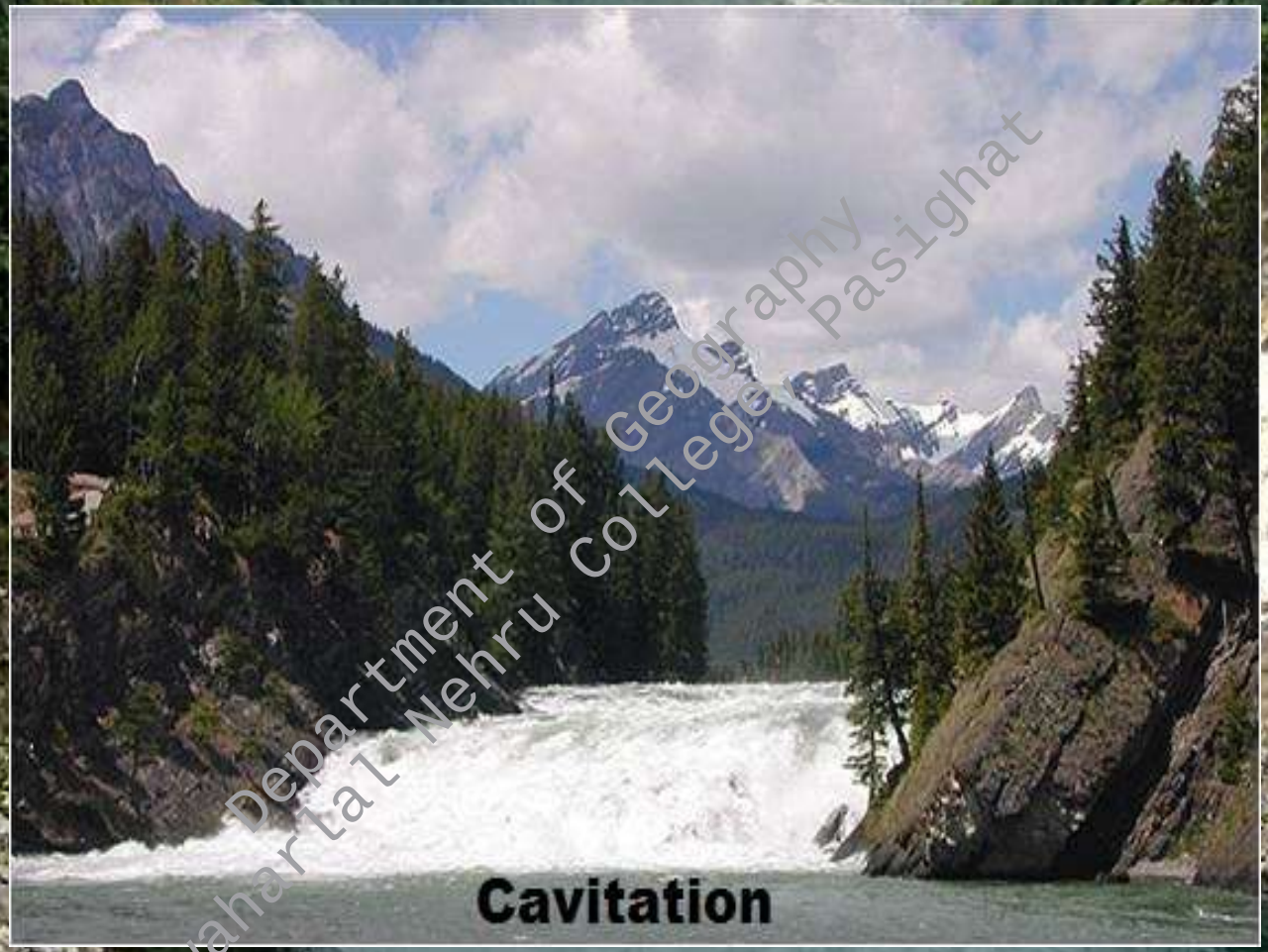
3. Attrition: Mechanical wear and tear of the erosional tools in themselves.

4. Solution or Corrosion: chemicals in the river water wearing away the bed and the banks.

5. Cavitation: The implosion of bubbles or cavities during rapid, turbulent stream flow usually occurs downstream of an obstruction.

6. Evorsion: erosion by eddies in the rock bed of a stream, forming pot holes.

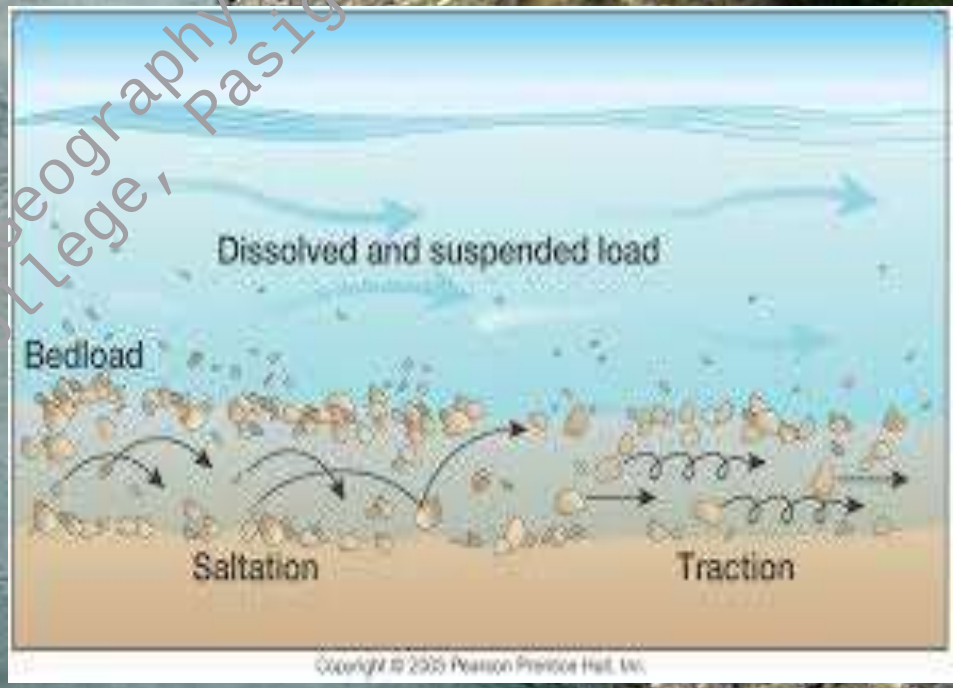
Continues...



Transportational work of streams

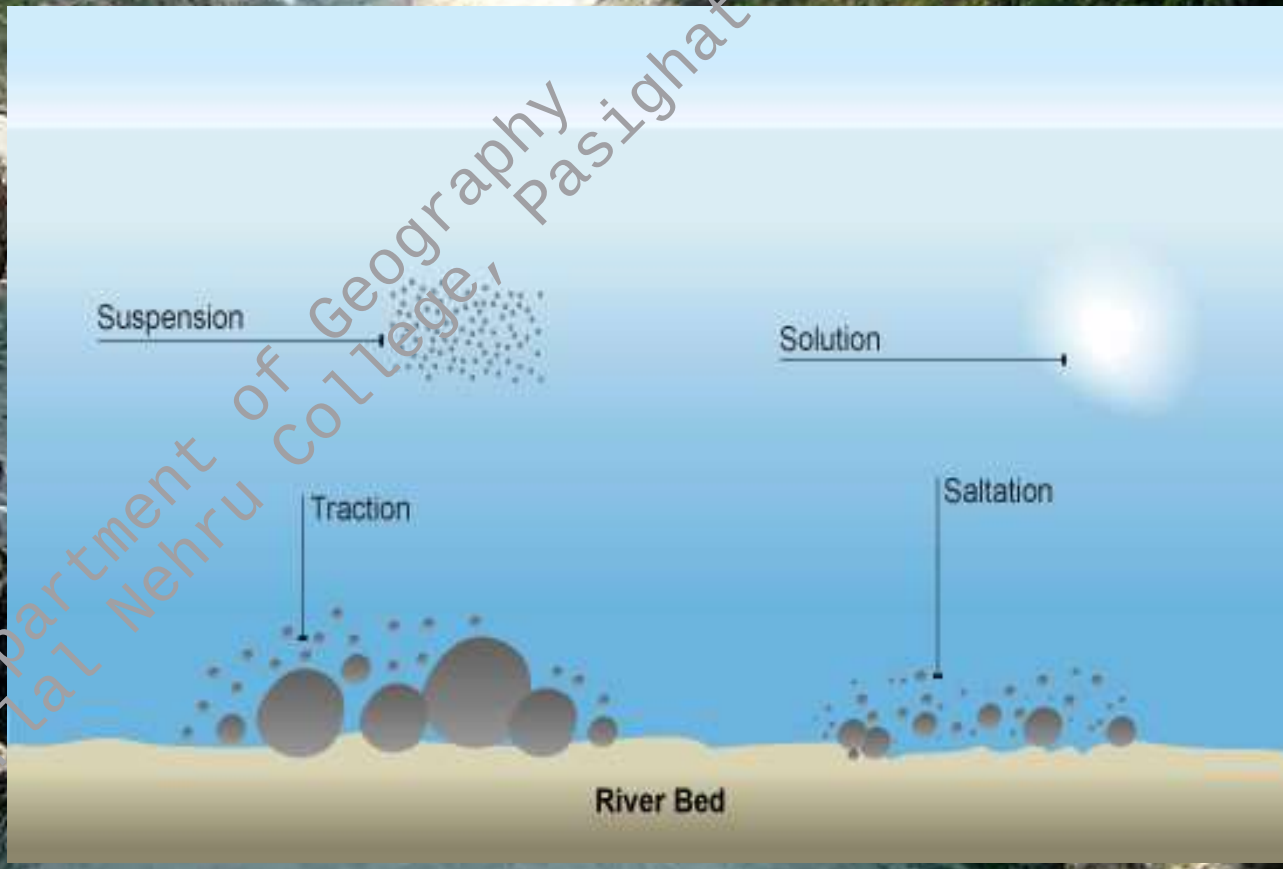
Sediment load carried by river:

1. **Suspended Load:** Fine particles which are suspended in water. E.g. Sand and silt.
2. **Bed Load:** Large fragments, coarse sand and pebbles which are carried along the bed.



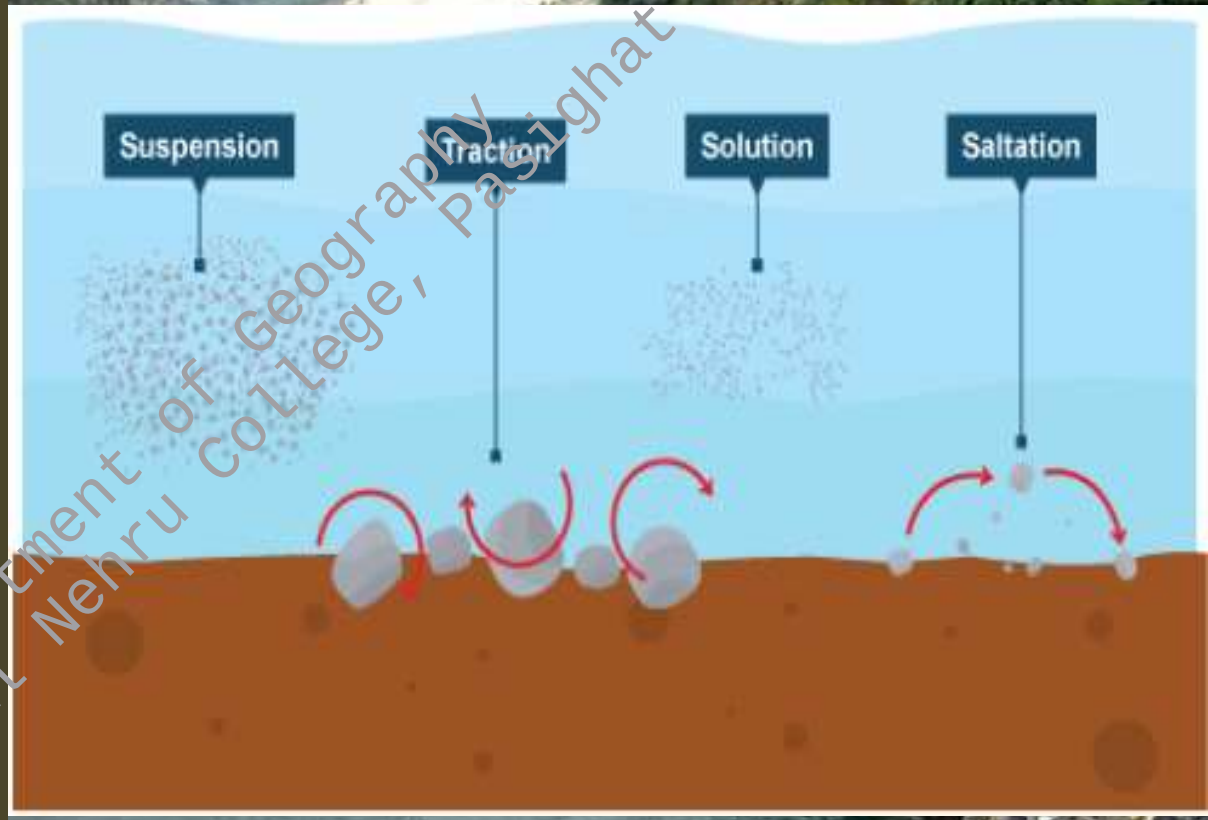
River transport their load in different ways:

- Solution
- Suspension
- Saltation
- Traction



Continues...

1. **Solution**: The soluble materials are dissolved in water and become invisible.
2. **Suspension**: Sediments which remain suspended in water are easily carried away by the streams.



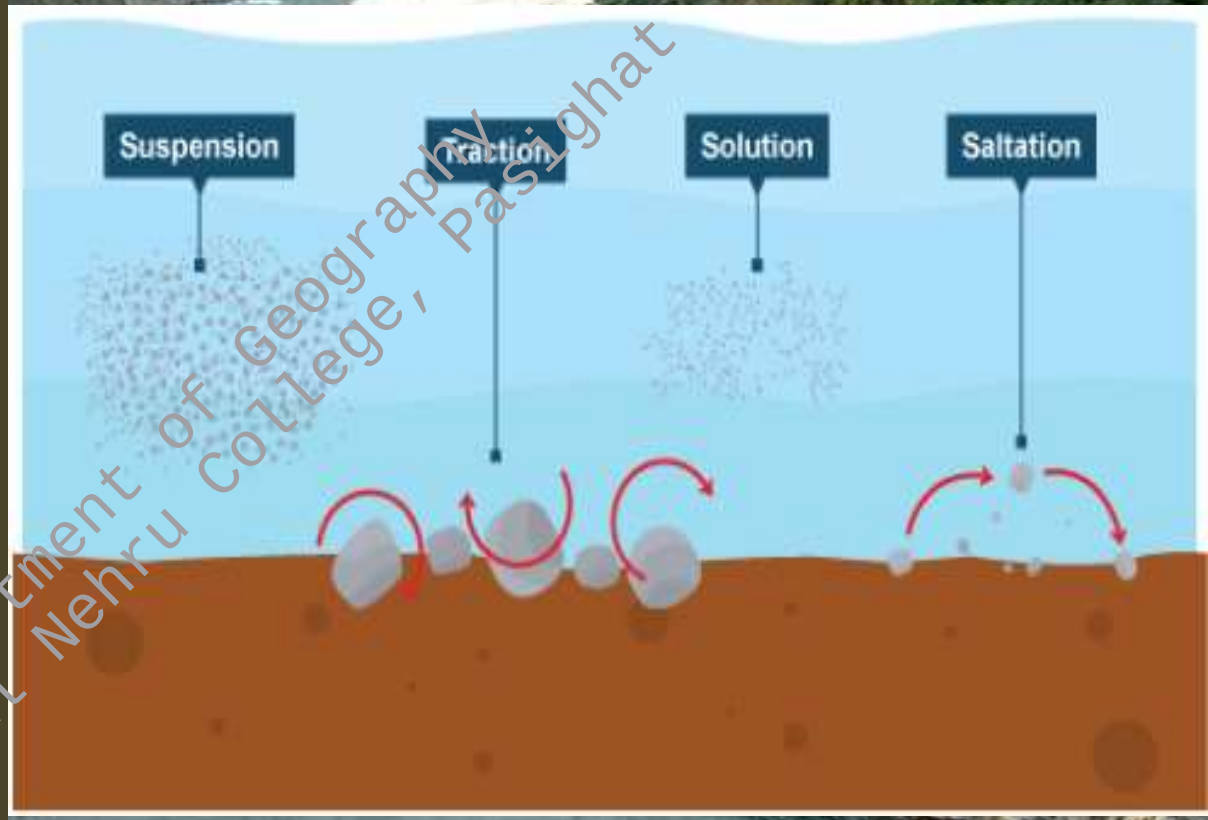
Continue...

3. Saltation:

Transportation of loads with water currents wherein coarse load moves downward by leaping and jumping.

4. Traction:

Transportation of boulders of bigger size which moves as bed load by rolling or sliding.



Depositional work of streams

The deposition of load carried by the streams is affected by a variety of factors:

- decrease in channel gradient,
- spreading of stream water over larger area,
- obstructions in channel flow,
- decrease in the volume and discharge of water,
- decrease in the velocity of streams,
- increase in load.


THANK YOU
Department of Geography
Jawaharlal Nehru College, Pasighat
Marina Langkam