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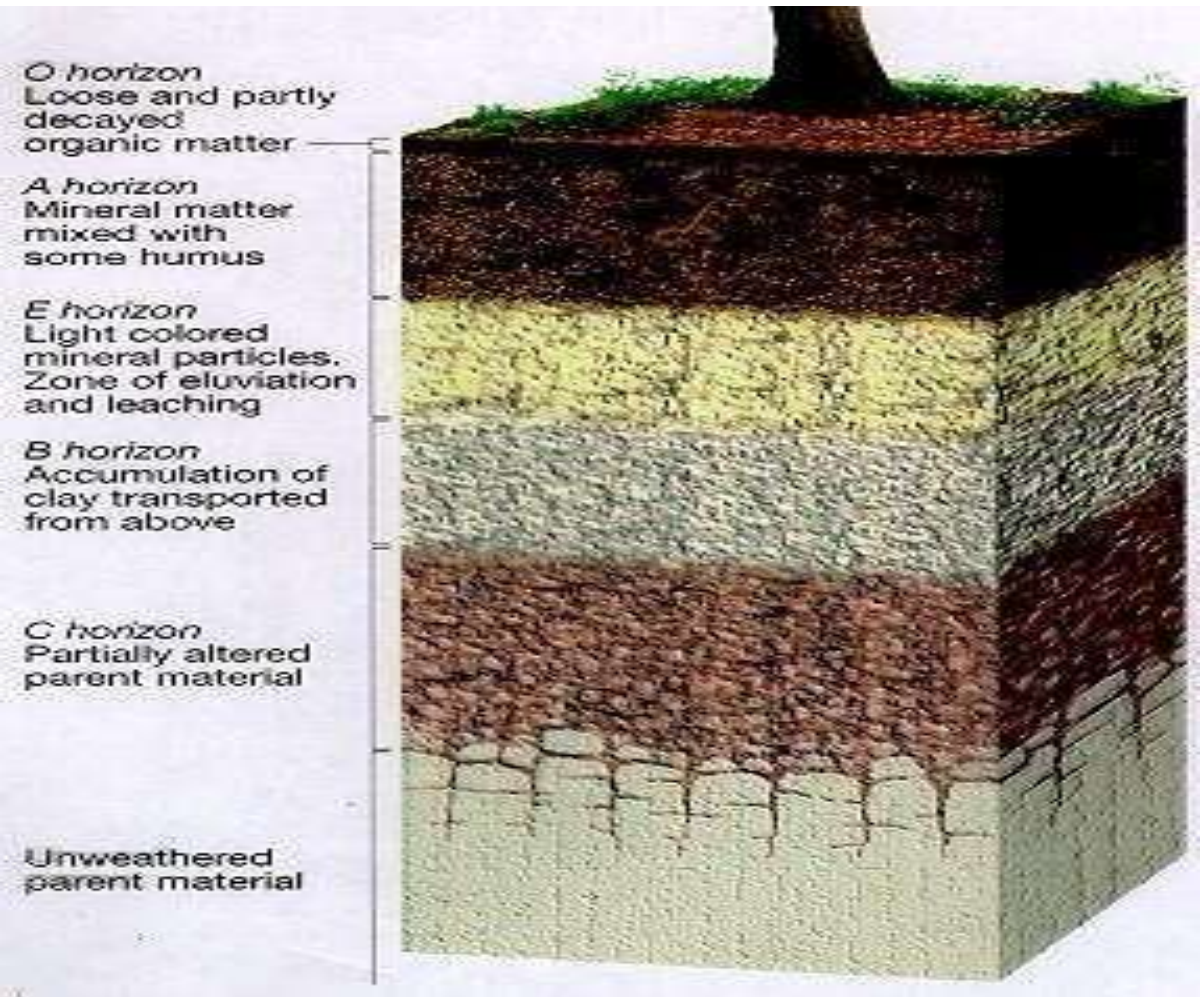
SOIL EROSION SOIL CONSERVATION CONTROL ON FLOODS

SOIL PROFILE

SOIL PROFILE

Soil profile is the sequence and nature of the horizons super imposed one above the other & exposed in a pit section dug through the soil mantle .



The O horizon

The A horizon

The B horizon

The C horizon

The R horizon

The O horizon

- These are **organic horizons** mainly composed of fresh or partly decomposed organic matter .
- This horizon is divided into two sub layers.

O-L (Aoo) region

It is the uppermost layer which consists of freshly-fallen dead leaves , flowers & fruits , dead remains of animals etc .

O_2 (Ao) region

This is just below the O_1 region in which decomposition has began . Thus organic matter is found under different stages of decomposition & micro organisms like bacterium , fungi , actinomycetes are formed

The A horizon

- These are the **mineral horizons** . These are rich in organic matter & soluble salts , clay ,aluminum etc.

A! region

- This is dark & rich in organic matter . The amorphous , finely divided organic matter become mixed with mineral matter which is known as Humus which is dark brown or black colored

A_2 region

- This is light in color which the mineral particle of large size as sand are more with little amount of organic matter . This is also known as eluvial zone

THE B HORIZON

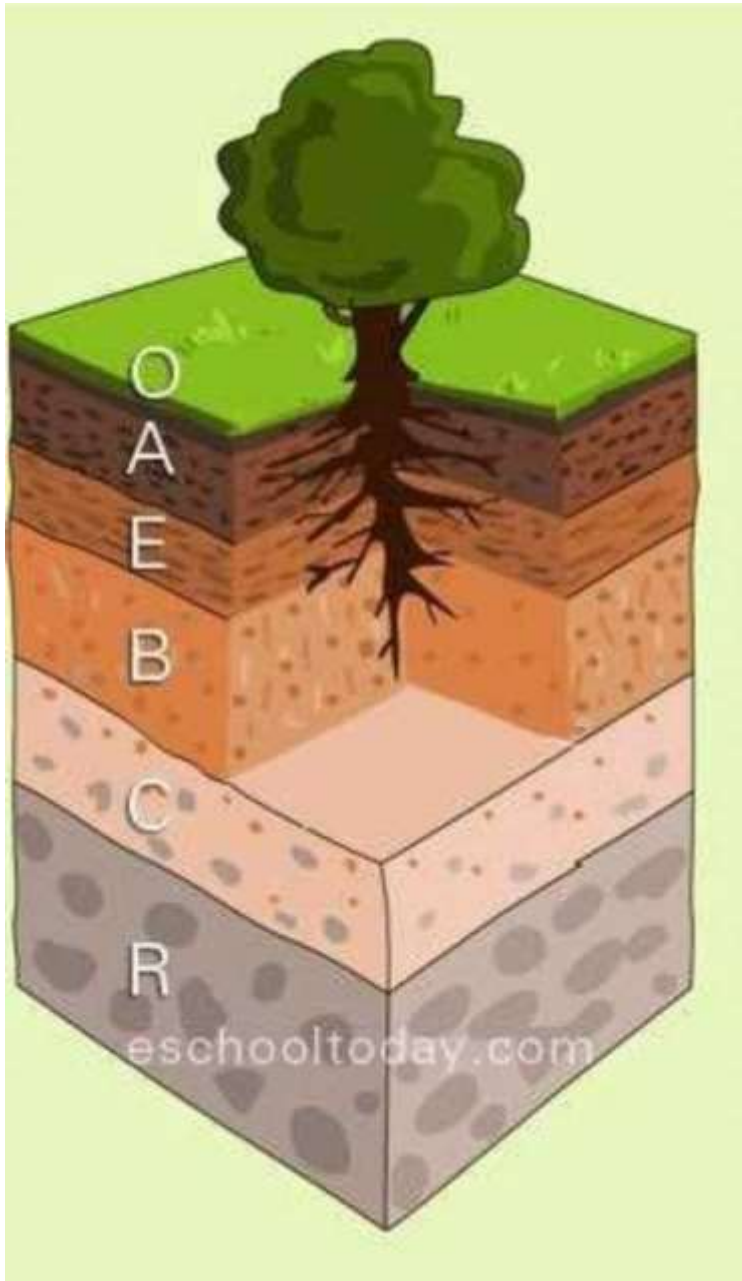
- The B horizon is dark colored due to the presence of silica rich clay organic compounds , hydrated oxides of aluminum & iron etc.

THE C HORIZON

- These are the **mineral horizon** below the B horizon but excluding true bed rock and without any characteristics of A & B horizons . It consists of incompletely weathered large mass of rocks.

THE R HORIZON

This is the parent unweathered bedrock upon which there is a collected water


O
A
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SOIL EROSION

What is soil erosion

Types of soil erosion

Agents of soil erosion

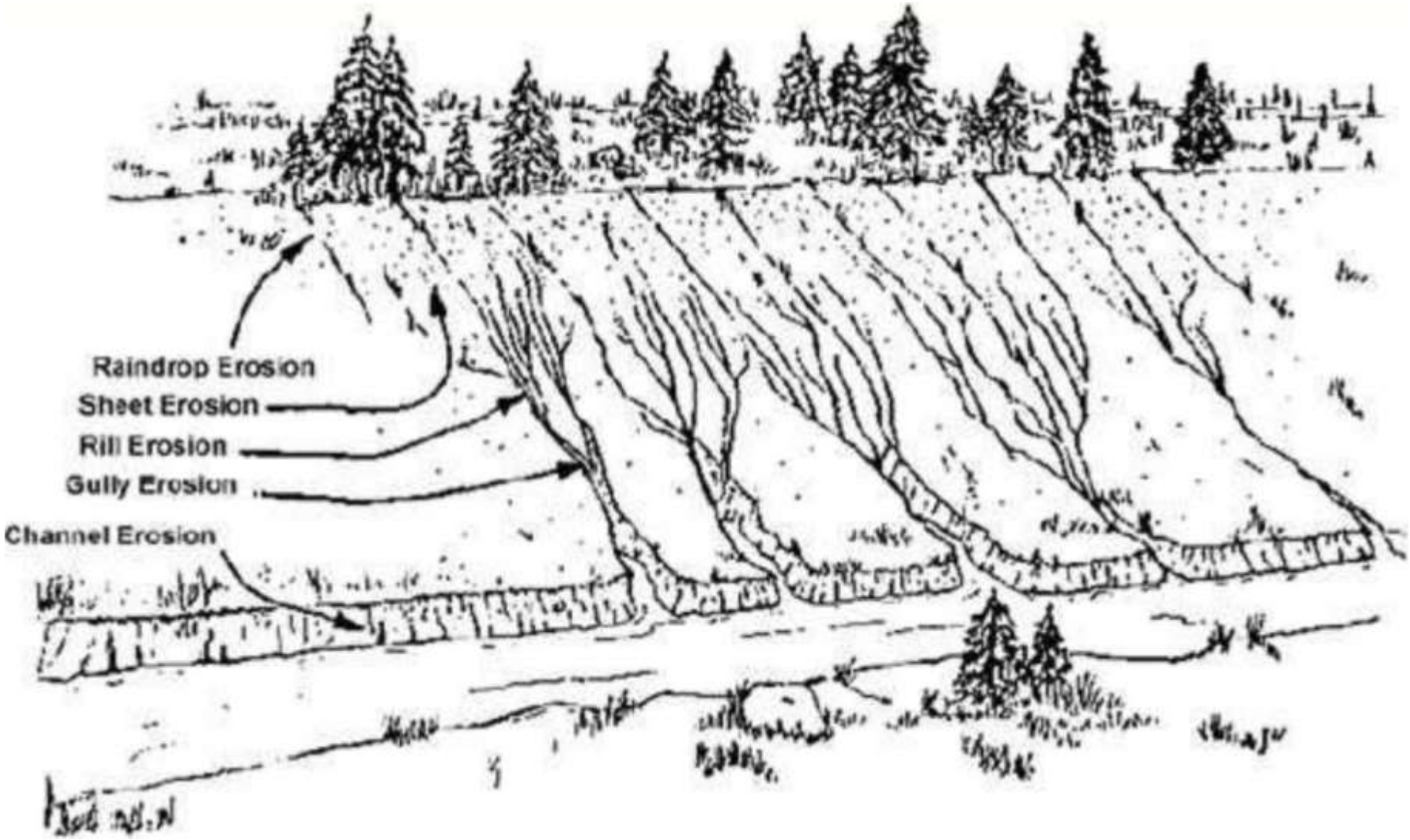
Factors influencing soil erosion

Effects of soil erosion

SOIL EROSION

What is soil erosion ?

- **Soil erosion is a natural process & remove soil from one location to another. It becomes a problem when human activity causes it to occur much faster than under natural conditions .**



Types of Soil Erosion

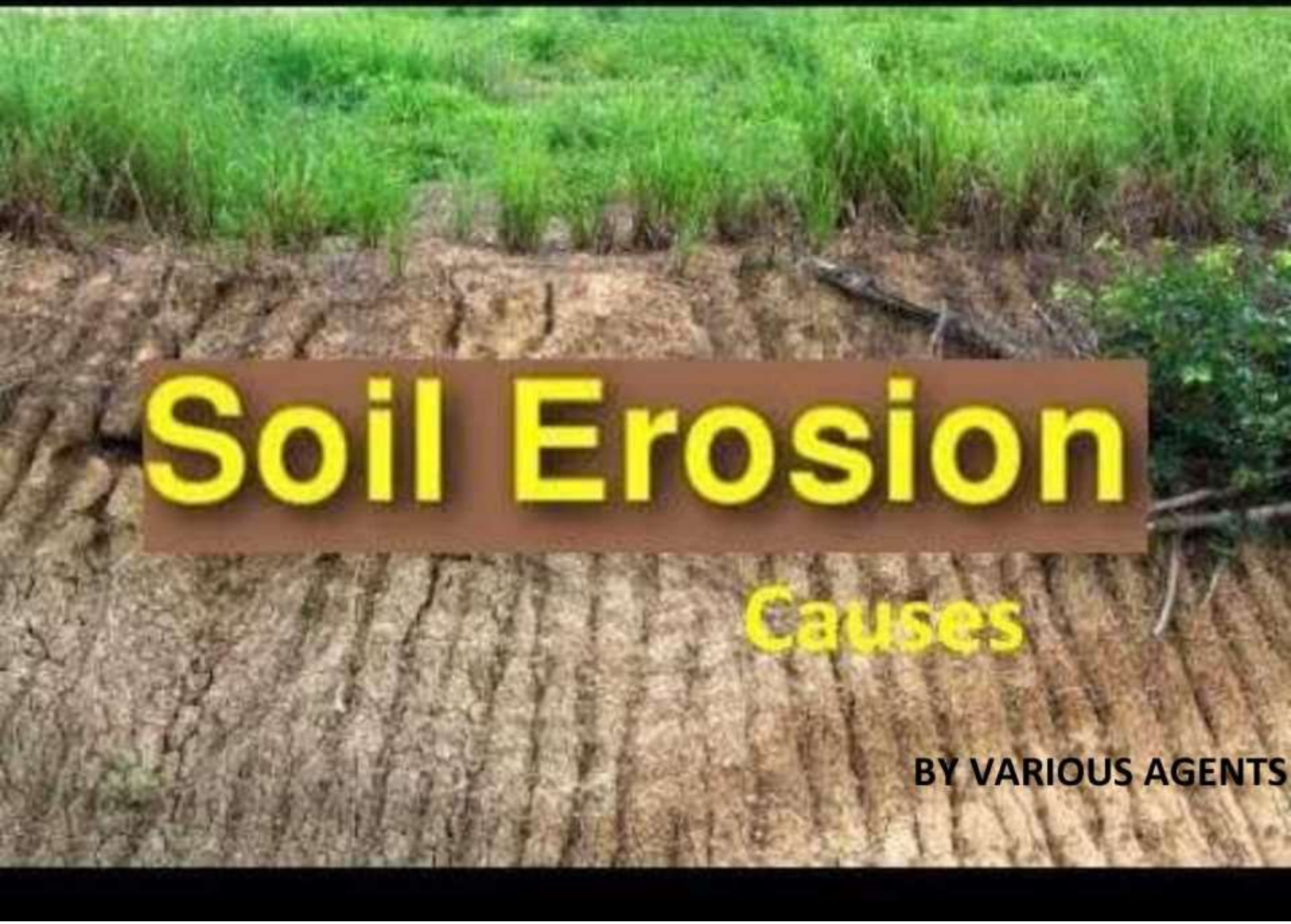
TYPES OF SOIL EROSION

- **Normal or geologic erosion**

  It occurs under normal natural conditions by itself without the interference of man .
  It is a very slow process.

- **Accelerated soil erosion**

  This is the most serious types of loss generally caused by an interference of any agencies like man & animals. It is a rapid process


Soil Erosion
Causes
BY VARIOUS AGENTS

AGENTS OF SOIL EROSION

Based on the various agents that bring about soil erosion , there are following types of soil erosion in nature .

WATER EROSION

WIND EROSION

EROSION DUE TO OVER HUNTING, OVER GRAZING & DEFORESTATION

WATER EROSION

- It is caused by the action of rain water , which removes the soil by falling as rain drops as well as by its surface slope action
- Types soil erosion caused by water

> **Splash erosion**

> **Sheet erosion**

> **Rill erosion**

> **Gully erosion**

> **Stream bank erosion**

Runoff from a heavy ram carries topsoil from unprotected, highly erodible soils in northwest Iowa

Soil erosion caused by rain

WATER EROSION

SPLASH EROSION

- This type of soil erosion occurs when the falling drops splash on the soil .

SHEET EROSION

- The soil removed in small but uniform amounts fromall over and therefore , does not leave a mark behind.

WATER EROSION

- **Rill erosion**

  The run off water moves rapidly & cuts small stream like structure

- **Gully erosion**

  Several rills converge towards the steep slopes & join to form board channels of water called gullies .

- **Stream bank erosion**

  The rivers during floods splash their water against the banks & cuts through them

WIND EROSION

- Soil erosion by wind is common in dry regions where soil is chiefly sandy & vegetation is very poor or even absent
- Wind erosion also triggered by the destruction of natural vegetation cover of land
- Erosion due to winds is very common & includes

Saltation

Suspension

Surface creeping

Weathering and erosion caused by wind

WIND EROSION

- **Suspension**

  The wind lift finer particles high up.

- **Surface creeping**

  The coarser & heavier particles roll along the surface

- **Saltation**

  In arid regions , where rainbow is low , drainage is poor & high temperature prevail , water evaporates quickly leaving behind the salts

EFFECTS OF SOIL EROSION

- Loss of soil
- Harmful effects of soil erosion on organic matter and soil structure
- Decline of soil capacity
- Deposition of sand and gravel on agriculture land
- Flooding of streams

EFFECTS OF SOIL EROSION

- **Loss of soil**

The top-soil is lost by erosion which is the most fertile section , having evolved over centuries of soil forming processes. Due to the formation of gullies & ravines , valuable agriculture lands are lost .

EFFECTS OF SOIL EROSION

- **Harmful effects of soil erosion on organic matter & soil structure**

  Erosion of upper layer of soil decreases the content of organic matter & as soil nutrients . As a result the soil structure gets impoverished .

EFFECTS OF SOIL EROSION

- **Decline in soil capacity**

When soil is removed bodily from field , both potential and available plant food along with mineral material is carried away . As erosion progresses , the compact soil of low infiltration capacity is approached . The ability of land to supply moisture for plant growth is reduced and the beneficial activity of microorganisms lessened . Due to these bad effects , the yield are lowered .

EFFECTS OF SOIL EROSION

- **Deposition of sand & gravel on agriculture lands**

The wind-borne sand encroaches the arable lands and makes them unfertile . Crops are damaged due to sand storms .

EFFECTS OF SOIL EROSION

Flooding of streams

Soil erosion in catchment areas of streams due to deforestation & other destructive activities leads to silting of streams & reservoirs . This reduces the capacity of these water bodies to carry large volume of waters , as they occur during the rainy season . This way streams are more prone to flooding .

SOIL CONSERVATION

Soil conservation means protection , improvement & sustained renewal of the soil at any place .

SOIL CONSERVATION

PRINCIPLES OF SOIL CONSERVATION

- Protection of soil from impact of rain drops
- To prevent water from concentrating & moving down the slope
- To slow down the water movement when it flows around the slope
- To encourage more water to enter the soil
- To increase the size of soil particle
- Reduction in wind velocity near the ground by growing vegetation cover , ridging the land .

SOIL CONSERVATION

- ***METHODS OF SOIL CONSERVATION***

BIOLOGICAL METHODS (Agronomic practices , Dry farming , Agrostological methods)

MECHANICAL METHODS (Countour bunding , contour terracing , water harvesting etc.)

OTHER METHODS

(Gully control , stream bank protection , afforestation)

AGRONOMIC PRACTICES

Natural protection is provided to the soil by growing vegetation in a manner that reduces soil loss .

- **Contour farming**

It involves preparation of the field with alternative furrows and ridges

Terrace cropping

- The soil is cut and laid to make steps . On the margins between two steps the slope is vertical

STRIP CROPPING

This practices consists of growing erosion-permitting crops (jowar, bajra , maize) in alternate strips with erosion checking close growing crops (grasses , pulses)

CROP ROTATION

This refers to growing of two or more different crops in sequence in a field for maintaining the soil fertility .

MECHANICAL METHODS

- **Basin listing**

It involves the construction of small basin along the contours to retain water which also reduces its velocity

- **Contour terracing**

This involves digging a channel along the slope to intercept and divert the run off water

OTHER METHODS

- **Gully control**

  To check the widening of gullies by constructing bunds , dams , drains or diversions through which excess run off water is channeled

- **Stream bank protection**

  For preventing the cutting and caving of river banks , drains and constructed and concrete or pitching is done


Thank
You