



**Centurion**  
**UNIVERSITY**

*Shaping Lives...*  
*Empowering Communities...*

# Eroded Soil Types and problems

Dr. Arunabha Pal



**Centurion**  
**UNIVERSITY**

*Shaping Lives...  
Empowering Communities...*

# What is soil erosion??

- ▶ Soil erosion is the washing or blowing away (by water or wind) of the top layer of the soil.
- ▶ Erosion whether it is by water , wind or tillage, involve three distinct action- **soil detachment, movement & deposition.**





**Centurion**  
**UNIVERSITY**

*Shaping Lives...  
Empowering Communities...*

# Types of soil erosion...

- ▶ 1. Geological Erosion
- ▶ 2. Accelerated Erosion
  - ▶ A) Wind erosion
  - ▶ B) Water Erosion
    - ▶ a) rain drop Erosion
    - ▶ b) rill erosion
    - ▶ c) gully erosion
    - ▶ d) bank erosion
    - ▶ e) Sheet erosion
    - ▶ f) landslide erosion
  - ▶ C) land slide erosion
  - ▶





**Centurion**  
**UNIVERSITY**

*Shaping Lives...  
Empowering Communities...*

# Geologic Erosion

It is a normal process, representing erosion of land in natural environment. It is caused by effect of

- Rainfall
- Run-off
- Wind
- Topography
- Atmospheric temperature



**Centurion**  
**UNIVERSITY**

*Shaping Lives...  
Empowering Communities...*

# Accelerated Erosion

Accelerated erosion is due to man made activities, which have brought about changes in natural cover and soil condition. The activities includes

- Land Preparation for raising crops,
- Land use patterns for building houses, infrastructures, industries, hill cutting, deforestation, lack of soil conservation and watershed management.



**Centurion**  
**UNIVERSITY**

*Shaping Lives...  
Empowering Communities...*

# Water Erosion

- ▶ The impact of rain drops causes splash erosion
- ▶ Run-off water causes scouring, scraping and transport of soil particles, leading to sheet, rill and gully erosion.
- ▶ Flood water causes erosion of River Banks
- ▶ Water waves cause erosion of bank and sides of reservoir, lakes and oceans.
- ▶ Subsurface seepage water causes soil boiling, erosion and removal by piping.
- ▶ Glacial erosion causes heavy landslide





**Centurion**  
**UNIVERSITY**

*Shaping Lives...  
Empowering Communities...*





**Centurion**  
**UNIVERSITY**

*Shaping Lives...  
Empowering Communities...*

# Wind Erosion

It is primary responsible for creation and maintenance of desert areas

- ❑ Finer soil particles from top soil along with organic matter and nutrients are easily detachable and removed by wind velocity.







**Centurion**  
**UNIVERSITY**

*Shaping Lives...  
Empowering Communities...*

# Erosion due to surface run-off





**Centurion**  
**UNIVERSITY**

*Shaping Lives...  
Empowering Communities...*

# Bank Erosion







**Centurion**  
**UNIVERSITY**

*Shaping Lives...  
Empowering Communities...*

# Sheet Erosion

- ▶ Sheet erosion is the movement of soil from rain drops splash and runoff water.
- ▶ It typically occurs evenly over a uniform slope and goes unnoticed until most of the productive topsoil has been lost.



**Centurion**  
**UNIVERSITY**

*Shaping Lives...  
Empowering Communities...*

# Sheet Erosion







**Centurion**  
**UNIVERSITY**

*Shaping Lives...  
Empowering Communities...*

# Rill Erosion

- ▶ In general the sheet flow is carried out by very small definable channels called interrill.
- ▶ When the process of soil erosion and deposition through interrill is prolonged, the interrills are widened, leading to formation of small channels called rills.





**Centurion**  
**UNIVERSITY**

*Shaping Lives...  
Empowering Communities...*







**Centurion**  
**UNIVERSITY**

*Shaping Lives...  
Empowering Communities...*

# Gully Erosion

- ▶ Rills are smaller in size and depth, they can be destroyed by tillage operation.
- ▶ If their occurrence is prolonged, rills become larger in size and can not be destroyed by tillage operation, and they become Gullies.



**Centurion**  
**UNIVERSITY**

*Shaping Lives...  
Empowering Communities...*







**Centurion**  
**UNIVERSITY**

*Shaping Lives...  
Empowering Communities...*

# Tillage Erosion





**Centurion**  
**UNIVERSITY**

*Shaping Lives...  
Empowering Communities...*

# Land slide Erosion







**Centurion**  
**UNIVERSITY**

*Shaping Lives...  
Empowering Communities...*

# Problems of Erosion

- ▶ Loss in agricultural production
- ▶ Loss of nutrients
- ▶ Reduction of infiltration rates
- ▶ Increased cost in tillage operation
- ▶ Flood may occur in Rivers
- ▶ Decreases in useful life of reservoir
- ▶ Survival of wild life
- ▶ Land degradation
- ▶ Cost of removal of sedimentation
- ▶ Desertification.