

# LANDSLIDE

## **What is landslide?**

A **landslide** is defined as the movement of a mass of rock, debris, or earth down a slope. Landslides are a type of "mass wasting," which denotes any down-slope movement of soil and rock under the direct influence of gravity. The term "landslide" encompasses five modes of slope movement: falls, topples, slides, spreads, and flows. These are further subdivided by the type of geologic material (bedrock, debris, or earth). Debris flows (commonly referred to as mudflows or mudslides) and rock falls are examples of common landslide types.

## **Based on the rate of movement and water content landslides are classified into 3 types:**

1. Large scale rapid of rock waste. Water is needed as lubricating agent for such type of mass movement. Landslide is the typical example of this type.
2. Slow flowage of rock waste and weathered debris. Partial saturation of rock debris is required for such mass movement and hence moderate quantity of water is needed as lubricating and stimulating agent. Rock creep, soil creep, solifluction etc. are the typical examples of this type.
3. Rapid flowage of weathered debris. Sufficient quantity of water is needed as lubricant. Earth flow, mud flow etc. are representative of this type of landslides

## **Causes of landslides**

- **Heavy rain:** Heavy rain is the main cause of landslides.
- **Deforestation:** Deforestation is another major cause of landslides. Tree, brushes and grasses keep the soil particles compact. Mountain slope loses their protective cover by felling of trees. The rain water flows on such slopes with unimpeded speed.
- **Earthquakes and volcanic explosions:** Earthquake is a common feature in the Himalaya. Tremors destabilize the mountains and the rocks tumble downwards. Volcanic explosions also trigger landslides in the mountainous areas.
- **Building of roads:** Roads are built in mountainous areas for development. During the process of the construction of road, a large amount of rocks and debris has to be removed. This process dislodges the rock structure and changes the angle of slopes. Consequently landslides are triggered.
- **Shifting agriculture:** In the North Eastern part of India, the number and frequency of landslides has increased due to the practice of shifting agriculture.

- **Construction of houses and other buildings:** For giving shelter to the ever-increasing population and promotion of tourism more and more house and hotels are being built. In building processes large amount of debris created. This causes the landslides.

### **Impact of landslide**

- **Degrading of environment:** Landslides are degrading the environment of mountains. Natural beauty is diminishing slowly and slowly.
- Sources of water are drying up.
- Flooding in rivers is increasing.
- Roads are blocked.
- Life and property are lost

### **Measures to control landslides and to mitigate their impact**

- Afforestation: Trees and bushes help in binding the soil particles.
- New technology in road construction: Roads should be constructed in such a way, that lesser amount of debris are generated.
- Ban on quarrying of stones and mining of minerals.
- Instead of exploitation of forests, they should be used scientifically.
- Permanent crops like orchards of fruits should replace the seasonal or annual crops.
- By controlling the surface flow of water, seepage of water should be minimized.
- Retaining walls can be built on mountain slopes to stop land from slipping.
- Hazard mapping should be done to locate areas commonly prone to landslides. Building and construction activities may be banned in such areas.