



Landslide and Flash Floods

Why in News

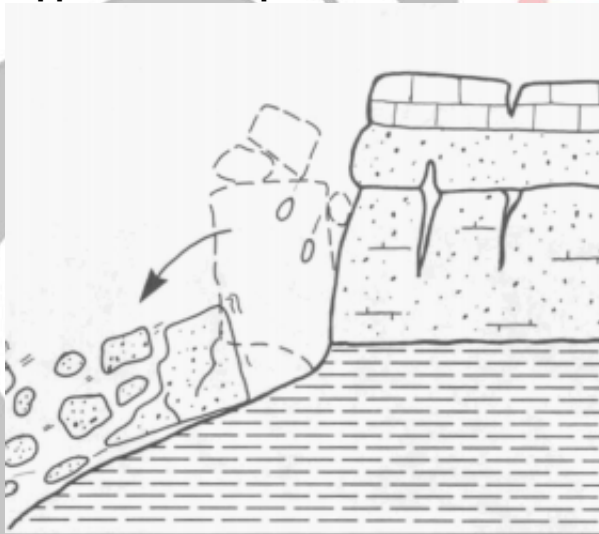
Recently, heavy rains caused **flash floods** and **landslides** in many parts of Himachal Pradesh.

Key Points

▪ Landslide:

◦ About:

- A landslide is defined as the **movement of a mass of rock, debris, or earth down a slope.**
- They are **a type of mass wasting**, which denotes any downward 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.** //



◦ Causes:

- Slope movement occurs **when forces acting downward** (mainly due to gravity) exceed the strength of the earth materials that **compose the slope.**
- Landslides are caused due to three major factors: **geology, morphology, and human activity.**
 - **Geology** refers to characteristics of the material. The earth or rock might be weak or fractured, or different layers may have **different strengths and stiffness.**
 - **Morphology refers to the structure** of the land. For example, slopes that lose their vegetation to fire or drought are more vulnerable to landslides.

- Vegetation holds soil in place, and without the root systems of trees, bushes, and other plants, the land is more likely to slide away.
- **Human activity** which includes agriculture and construction increases the risk of a landslide.

- **Landslide-Prone Areas:**

- The entire Himalayan tract, hills/mountains in sub-Himalayan terrains of North-east India, Western Ghats, the Nilgiris in Tamil Nadu Konkan areas are landslide-prone.

- **Mitigation:**

- **Restriction on the construction and other developmental activities** such as roads and dams in the areas prone to landslides.
- **Limiting agriculture to valleys** and areas with moderate slopes.
- **Control on the development of large settlements** in the high vulnerability zones.
- **Promoting large-scale afforestation programmes** and construction of bunds to reduce the flow of water.
- **Terrace farming** should be encouraged in the northeastern hill states where Jhumming (Slash and Burn/Shifting Cultivation) is still prevalent.

- **Step Taken:**

- The [Geological Survey of India \(GSI\)](#) has done a **national landslide susceptibility mapping** for 85% of the entire 4,20,000 square km landslide-prone area in the country. The **areas have been divided into different zones according to the propensity of the disaster.**
 - Improvement in early warning systems, monitoring and susceptibility zoning can reduce the damage caused by landslides.

- **Flash Floods:**

- **About:**

- These are **sudden surges in water** levels generally during or following an intense spell of rain.
- These are **highly localised events of short duration** with a very high peak and usually **have less than six hours** between the occurrence of the rainfall and peak flood.
- The **flood situation worsens** in the presence of **choked drainage lines** or encroachments obstructing the natural flow of water.

- **Causes:**

- It may be caused by **heavy rain associated with a severe thunderstorm**, hurricane, tropical storm, or meltwater from ice or snow flowing over ice sheets or snowfields.
- Flash Floods can also occur **due to Dam or Levee Breaks, and/or Mudslides (Debris Flow).**
- In areas on or near [volcanoes](#), flash floods have also occurred after eruptions, when glaciers have been melted by the intense heat.
- The intensity of the rainfall, the location and distribution of the rainfall, the land use and topography, vegetation types and growth/density, soil type, and soil water-content all determine just how quickly the Flash Flooding may occur, and influence where it may occur.

- **Mitigation:**

- Instead of valleys, people should live in areas on slopes with firm ground for safety reasons.
- In areas where ground fissures have developed, appropriate steps should be taken to check the infiltration of rainwater and surface water.
- Banning "indiscriminate" and "unscientific" construction works.

[Source: TH](#)

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