



Impact of landslides on environment

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DESCRIPTION

A landslide is also known as a landslip. It is the downward movement of a rock, rubble, soil, or mass of soil. Landslides occur when gravity or other types of shear stress in the slope exceeds the shear strength of the material that forms the slope. Shear stress can build up in the slope by several processes. These include, for example, steepening of the embankment base due to natural erosion or excavation, and load on the embankment, for example due to water inflow, groundwater rise or accumulation of debris on the embankment surface. Short-term loads such as earthquakes and storms can also contribute to landslide activation. Landslides can also be caused by the process of weakening the shear strength of slope materials. Shear strength depends on two main factors. Coarse particles such as sand grains have high frictional strength but low cohesive force, but clay is made of fine particles, so the opposite is true.

Another factor that affects the shear strength of embankment materials is the spatial arrangement of their constituent particles, called sedimentary structures. Some materials with loosely open sedimentary structures weaken when mechanically disturbed or flooded with water. An increase in water content, resulting from either natural causes or human activity, typically weakens sandy materials through the reduction of inter particle friction and weakens clays through the dissolution of inter particles, the hydration of clay minerals, and the elimination of inter particle tension.

Causes

Landslides occur when the slope undergoes some processes that change its condition from stable to unstable. This is essentially due to a decrease in

the shear strength of the slope material, an increase in the shear stress borne by the material, or a combination of the two. A change in the stability of a slope can be caused by a number of factors, acting together or alone. Natural causes of landslides include:

- Saturation by rain water infiltration, snow melting, or glaciers melting.
- Rising of groundwater or increase of pore water pressure (e.g. due to aquifer recharge in rainy seasons, or by rain water infiltration).
- Increase of hydrostatic pressure in cracks and fractures.
- Loss or absence of vertical vegetative structure, soil nutrients, and soil structure (e.g. after a wildfire – a fire in forests lasting for 3–4 days).
- Erosion of the top of a slope by rivers or sea waves.
- Physical and chemical weathering.
- Floor shaking due to earthquakes, which could destabilize the slope directly
- Volcanic eruptions, landslides are irritated with the aid of using human activities including Deforestation, Blasting, mining, cultivation and construction.

Mitigation of landslides

Landslides pose a recurrent danger to human existence and livelihood in maximum elements of the world, in particular in a few areas which have skilled speedy populace and financial growth. Hazards are mitigated in particular through precautionary means—for instance, with the aid of using limiting or maybe casting off populations

from regions with a records of landslides, with the aid of using limiting sure forms of land use wherein slope balance is in question, and with the aid of using putting in early caution structures primarily based totally at the tracking of floor situations including pressure in rocks and soils, slope displacement, and groundwater levels.

ENVIRONMENTAL IMPACT

Landslides can overwhelm, and even pollute streams and water bodies with excess sediment. In extreme cases they can dam streams and rivers, impacting both water quality and fish habitat. Landslides can wipe out large tracts of

forest, destroy wildlife habitat, and remove productive soils from slopes.

They damage/destroy ecosystems, harm agriculture, damage built infrastructure, lead to economic losses, deaths, social disruption and can lead to other hazards. Landslides impact the Earth's natural environment, including effects on the morphology of the Earth's sub aerial and submarine surfaces, forests and grasslands, habitats of native flora and fauna. Morphologic effects are part of a general tendency of surface degradation by mass wasting and erosion.