

# HAZARDS OF EROSION AND SEDIMENTATION DUE TO CLOUD BURST IN SMALL CATCHMENTS - A CASE STUDY FROM KUMAUN HIMALAYA, INDIA

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The highly rugged Himalayan terrain often faces extreme hydro-meteorological conditions leading to flash floods and consequent devastation. The temporal and the spatial variations in extreme rainfall constitute the chief determinant factors of the floods. A cloudburst comes with the speed of thunder and lasts from a few minutes to a few hours, leaving behind a trail of devastation. Particularly, if the area involved is a small catchment characterised by steep hill slopes and river bed gradients, the impact is more ravaging.

The most important adverse effect of cloud burst is the triggering of large-scale mass movement, which introduces enormous amounts of sediment to the drainage system (Carson et al. 1988). The consequences of large scale erosion due to cloudburst in small catchments is two fold .

- i) The excessive sediment load may cause aggradation of the river bed further downstream, thereby increasing the water level in general and flood hazards in particular (Pal and Bagchi 1978).
- ii) The sudden and large-scale erosion and resultant debris, including big boulders, may temporarily dam the river. The subsequent breaching may cause a devastating surge of water leading to excessive mass movements along its course.

In this connection, a case study related to a cloud burst in the Karmi area of the Kumaon Himalayas, India and the resultant flash floods leading to the washing away of many houses and loss of human lives and livestock, in addition to bank erosion along the Karmi stream, is presented.