

# **Landslide hazard assessment in Mansehra District using remote sensing and GIS**

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Mansehra district is prone to landslide because of climate conditions, geological and geomorphologic characteristics of the region. In October 2005, Kashmir earthquake triggered several thousand landslides in the Himalaya region of Northern Pakistan and India. In future, there are still great threats of further happening of such landslide events in this region. Therefore, it is very important to prepare detailed landslide susceptibility maps of the region helpful for any pre-emptive measures. In this study, the relationships between the landslides and various instability factors contributing to the occurrence of landslides were investigated using Remote Sensing and Geographical Information System (GIS) based approaches. For the preparation of landslide inventory maps slope, aspect, elevation, landuse/landcover, distance to stream, distance to road, distance to fault line, lithology, and soil types were used as raster layers in ArcGIS, and ranked using a numerical scale corresponding to the physical conditions of the area.

In order to investigate the role of each instability factor in controlling the spatial distribution of landslides, Weighted Linear Combination Method was used. An index based approach is adopted both to put the various classes of all the parameters in order of their significance to the process of land sliding and weight the impact of on parameter against another. Using primary and secondary level weights, a contentious scale of numerical indices is obtained with which the study area is divided into different classes/zones of land sliding susceptibility from extremely low susceptible to very high susceptible classes. The results showed a strong relationship between the landslides occurrence and various instability factors.