

The landslides hazard assessment using Remote Sensing and GIS techniques.

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Four broad groups of factors largely influence the stability of natural slopes: 1) regional and local geology; 2) geomorphology; 3) hydrogeology and climate; and 4) vegetation and land cover. Apart from the geological factors which have paramount influence, the other factors from this group having primary influence on the stability of natural slopes in Albania are mountainous and hilly relief of about 76% of its territory, significant horizontal and vertical de-fragmentation of rock masses, overland water flow patterns, river and sea erosion, climate, tectonic processes and seismicity, and vegetation. Albania is characterized by massive land instabilities triggered by natural (mechanical action of surface and underground waters, precipitation, seismic action, physical and chemical conveyance, etc.), natural-anthropogenic and solely anthropogenic factors. Engineering interventions on slopes, construction of dams and large water retention reservoirs, and construction of roads, tunnels and other related infrastructure facilities are factors of typical anthropogenic origin. Land instabilities in Albania primarily occur following massive torrential rains or snowfalls. Various modes of landsliding (rockfalls, topples, or torrent deposits) are often recorded along disturbed slopes of national and regional transportation routes, water irrigation and other surface channels, and places of other engineering works. A complete landslide hazard assessment requires an analysis of all these factors leading to instability in the region. The feature extraction of some of these factors can be done from the interpretation of satellite images. With the increase in efficient digital computing facilities, the digital remote sensing data and their analysis have gained enormous importance. Then the spatial and temporal thematic informations derived from remote sensing and ground based information need to be integrated for data analysis. This can be very well achieved using GIS which has the capabilities to handle voluminous spatial data. The GIS has found to be an excellent tool in the spatial analysis of the terrain parameters of landslide hazard assessment. The bivariate statistical analysis used for the purpose is subjective in decision rule for the determination of parameters or parameter combinations.