Landslide Risk Assessment in Part Of Ukhimath, Rudraprayag District, Uttarakhand, India

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Slope failures are among the most frequent disasters experienced in the Himalayan terrains. Following China, India is one of the most affected countries in Asia, particularly in the monsoon period in India sub-continent theirs occurrences are high. The southern hills of Kumaun in the proximity of the main boundary thrust are very prone to recurrent landslides. Hence, with a little monsoonal or any anthropogenic trigger, these slopes are subjected to experiencing frequent slips every year. A quantitative procedure for mapping landslide risk has developed from considerations of hazard, vulnerability and weight of exposed element using Geographic Information System (GIS). In the present study, statistical relationships between past landslides and terrain parameters such as geology, slope angle, slope aspect, lineament distance, road distance, drainage distance, altitudinal zones and land cover has been use. The temporal database provided the number of landslides occurrence in the study area along with an extensive fieldwork. The methods adopted for the study is analytical hierarchical process (AHP) which is subjective and objective based model. The final Landslide Risk Maps were derived through the spatial integration of all causative factors and classified as different susceptibility classes viz. very low, low, moderate, high, and very high. The prediction accuracy of final Landslide Risk map was validated using past landslide (validation) locations using Area Under Curve (AUC) method. In additions to that, landslides are grouped into several types based on the filed observations following the major landslide classification scheme.

Keywords: Landslide hazard zonation, Analytical Hierarchical Process, GIS, Area Under Curve