**Mapping of Multiple Hazards Using Remote Sensing and GIS in Gandaki Province, Nepal**

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***ABSTRACT***

Nepal is a country with diverse geography ranging from the majestic Himalayas to the fertile plains in the Terai and this varied topography makes it susceptible to different hazards. This study, analyzed the most destructive natural disasters, i.e.; landslides and floods and the results have been presented using Geographic Information System (GIS) based on hazard risk zonation applying Analytical Hierarchy Process (AHP) techniques in Gandaki Province, Nepal. Hazard risk mapping was performed based on 12 conditioning parameters under four groups mainly topographic factors (Elevation, Slope, Land Use Land Cover and Profile curvature), hydrological factors (Proximity to stream, Precipitation, Flow Accumulation, Drainage Density and Topographic Wetness Index), geological factors (Geology and Fault lines) and infrastructure factor (Proximity to road). These hazard risk maps were produced and were classified into five classes: very low, low, moderate, high, and very high risks. The validity and accuracy were tested by calculating the Areas Under the Curve (AUC) value of the receiver operating characteristic (ROC) curve. The AUC value of landslide and flood were found to be 0.792 and 0.855 respectively indicating good performance. The final risk maps can be used for disaster risk reduction, land use planning and early warning systems.

**Keywords:** Geographic Information System, Remote Sensing, Analytical Hierarchy Process ( AHP), Hazards, Risk Zone