

IMPORTANCE OF INTEGRATING DEBRIS FLOW ANALYSIS IN LANDSLIDE SUSCEPTIBILITY ANALYSIS

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Landslide is a frequent hazard which occurs in mountainous regions like Koslanda Sri Lanka. Although debris flow is one of the most dangerous hazards due to their unpredictable pattern associated with unexpected impacts, rapid rate of movement and long rate run out, most landslide susceptibility assessments are not been considered. Due to the natural formation of the topography and climatic conditions, Sri Lanka is suffering more devastation from landslide disasters. However, there are limitations in the disaster management activities with the lack of up to date complementary data, and lack of specialized personnel. So a feasible and low cost method to mitigate these landslide hazards has to be introduced. Hence this study analysed the significance of applying debris flow in to landslide susceptibility analysis using DEM data as a low cost and quick method. Terrain failure was analysed by using four topographical factors as slope, aspect, planar curvature and profile curvature. Weights were assigned to the topographical factor maps by using information value method. The terrain failure susceptibility map was obtained by combining the weighted factor maps and validation was done by calculating relative failure density. The debris flow susceptibility map which is used to determine the debris flow prone areas was obtained by using TauDEM software. By integration of terrain failure susceptibility map and debris flow susceptibility map, the final landslide susceptibility map was obtained which gives the most realistic prediction on landslides. In final susceptibility map both high and medium susceptibility areas occupy a considerable area of 83%. This result will be disadvantageous for land development processes in Koslanda area. By using these susceptibility regions, it is possible to propose land planning rules to mitigate the landslide risk.

Keywords: *Terrain failure, Debris flow, GIS, Landslide*