Application of Geographical Information System to Assess Landslide Vulnerability and Risk: Based on Kiriketioya and Belihuloya Watershed

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Sri Lanka is a continental island situated near the Indian sub-continent. It claims 65000km^2 land surface. The country is highly vulnerable to natural hazards like floods, cyclone, landslide, and tsunami. The selected study area is situated in the Rathnapura district, Imbulpe Divisional Secretariat Division. It covers eleven Grama Niladari Divisions of the Imbulpe DSD which cover 72km^2 of land area. The study area covers the parts of second and third peneplain of the country because it has high geographical variation.

In the study "Weighted overlay method" in Arc GIS was used to analyze landslide risk and vulnerability of the area. To calculate landslide vulnerability, slope, elevation and drainage distribution and vegetation density of the area were used as parameters. Satellite images were used to generate maps of slope, elevation and drainage distribution. NDVI calculation was used to identify vegetation density of the area. All layers were overlaid by using the weighted overlay method. The generated landslide vulnerability map was overlaid with the settlement distribution map and the road distribution map of the area to generate the landslide risk map. The study found out that, 47.54% of the land area is located under the low vulnerable zone. The 14.2% of the land area is in the highly vulnerable zone. The 12% of the land area belongs to the landslide risk-free zone and from the total land area 23% of land belongs to the high-risk zone of landslides. An implication of proper land use policies, replace mountain tops with native tree species, the establishment of disaster mitigation societies and conducting awareness program could be suggested as possible mitigation activates to reduce landslide risk of the area.

Key words: *GIS, Imbulpe, Landslide, Risk, Vulnerability*