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Identification of Landslide Susceptible Zones of Nuwara Eliya District Using Geospatial Technologies

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Abstract

Landslides constitute a significant natural hazard in Sri Lanka, particularly prevalent in the Nuwara Eliya District where 1,560 individuals were affected and caused severe property damages in 2018. Identifying high susceptible zones in landslide-prone areas is crucial for effective disaster mitigation and management. This study employs a geospatial methodology based on freely accessible satellite and open data, with ArcGIS software utilized for advanced spatial analysis and cartographic representation. Determinant parameters for landslide susceptibility, identified through literature and applied in this study, includes slope, elevation, topographic wetness index, vegetation cover, and annual average rainfall. Weighted overlay analysis of these rasters indicated that 1,707.94 km² of the area in Nuwara Eliya District is high and moderate susceptible to landslides with the Nuwara Eliya Divisional Secretariat Division (DSD) exhibiting highest susceptibility, covering 81.48 km². Other highest susceptible zones include Ambagamuwa, Kothmale, Hanguranketha DSDs. The findings of this geospatial approach provide a basis for decision-making in developing structural mitigation strategies in high susceptible zones. The proposed approach offers a cost-effective, open-source solution that supports the development of proactive, non-structural mitigation measures in disaster management, aimed at preventing potential impacts from landslide hazards.

Keywords: *Landslide, Susceptibility, Geospatial analysis, Weighted overlay*