

**SPATIAL MULTI-CRITERIA EVALUATION MODEL FOR LANDSLIDE
HAZARD ZONATION USING GEOGRAPHIC INFORMATION SYSTEM - A
STUDY FROM KANDY DISTRICT**

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Landslides are the most common disasters in mountainous regions in Sri Lanka. Landslide hazard zonation (LHZ) mapping is a powerful tool together with the Geographic Information System (GIS) in identifying landslide-prone areas. Kandy District is one of the landslide-vulnerable areas in the Central Highlands of Sri Lanka. This study was carried out to identify the causative factors for landslides in the Central Highlands of Sri Lanka and develop the landslide hazard zonation map following the Spatial Multi-Criteria Evaluation (SMCE) model. The literature survey identified eight major landslide causative factors: slope, aspect, soil, geology, land use, rainfall intensity, distance from the road, and distance from the stream. The spatial geo-databases for each causative factor were developed and analysed using Arc GIS 10.5 software. The contribution of each causative factor to the slope failures was evaluated using the Analytic Hierarchy Process (AHP) and modelled with the SMCE model in a GIS environment. The developed SMCE model is at an acceptable level as the acquired consistency ratio (CR) value is 0.07 (≤ 0.1). Forty-seven per cent (910.25 km²) of Kandy District's land area belongs to the moderate landslide susceptibility zone. Secondly, the low susceptible zone showed the greatest land extent, 39% (744.48 km²) of the study area. High and very high landslide-susceptible zones showed 12% (242.55 km²) and 0.1% (1.83 km²) for the study area. The developed SMCE model showed a 75% accuracy with previous landslide information. The developed landslide hazard zonation map can be used to identify the future landslide susceptible regions in the Kandy District. Accordingly, policymakers and developers can use this LHZ map effectively in future development activities.

Keywords: Geographic information system, Kandy, Landslide hazard zonation, Spatial multi-criteria evaluation model