

ASSESSMENT OF SOIL EROSION IN THE CLOSER CATCHMENT OF THE PROPOSED LOWER *MALWATHU OYA* RESERVOIR USING INVEST SDR MODEL

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Soil erosion poses a significant environmental and socio-economic threat, impacting agricultural productivity and water quality. To prioritize soil conservation areas for sustainable land management, quantitative and spatial assessment of soil erosion is essential. Erosion modelling proves to be cost-effective in assessing the spatial distribution of soil erosion severity. This study employs Integrated Valuation of Ecosystem Services and Trade-offs Sediment Delivery Ratio - (InVEST-SDR) model to analyse the spatial distribution of soil erosion in the closer catchment of the proposed lower *Malwathu Oya* reservoir. This study utilized a Digital Elevation Model (30 m x 30 m), 22 years of rainfall data, land use and land cover maps, soil map, and cropping factors as input. Results revealed an average annual soil loss range from 0 to 15.55 t ha⁻¹ yr⁻¹ in the catchment. Erosion severity was classified into four hazard classes: insignificant (<0.5 t ha⁻¹ yr⁻¹), weak (0.5–3 t ha⁻¹ yr⁻¹), considerable (3–12 t ha⁻¹ yr⁻¹) and severe (12 < t ha⁻¹ yr⁻¹). Notably, 87.6% of the sub-basin exhibited insignificant erosion, while 12% of the basin was categorized as a weak soil erosion hazard area. Only 0.12% area was identified as a considerable soil erosion hazard area, necessitating urgent erosion control measures. High-risk areas included *Galpottagama* and *Asirikgama Grama Seva* Divisions (GS) in *Nuwaragampalatha* central Divisional Secretariat (DS), *Puleliya* GS in *Medawachchiya* DS, and *Navodagama* and *Thuppitiyawa* GS areas in *Mahawilachchiya* DS. The study estimated the catchment's mean annual sediment export rate as 0.016 t ha⁻¹ yr⁻¹. These findings provide valuable insights for formulating and implementing soil conservation practices in the catchment of the proposed lower *Malwathu Oya* reservoir.

Keywords: Erosion hazard zones, Geographic information system, *Malwathu Oya* river basin