AN APPLICATION OF RUSLE MODEL TO PRIORITIZE EROSION CONTROL IN KELANI RIVER BASIN IN SRI LANKA

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Soil erosion is the process of removal and transport of soil materials by the activity of erosive agents such as water, wind, ice, snow, animals and human activities. It is one of the serious environmental and ecological issues in Sri Lanka which lead to decrease in biological diversity, ecosystem stability and agricultural land productivity. Hence, it is important to prioritize areas especially in river basins to implement conservation measures. In this study, soil erosion was evaluated and hazard map of the soil erosion was created for the *Kelani* river basin using Revised Universal Soil Loss Equation (RUSLE) model in Arc GIS (version 10.2). Digital Elevation Model (15 x15 m), historical twenty years rainfall data of 14 rain gauge stations, land use and soil map were used to derive RUSLE factors. Soil map for the basin was digitized using soils of the wet zone of Sri Lanka map and land use map was extracted from the Survey Departments map. Raster calculator in GIS was used to estimate the average annual soil erosion of the river basin. The average annual soil loss in Kelani river basin varied from 0 to 103.7 $tha^{-1}year^{-1}$ with mean annual soil loss of 10.9 $tha^{-1}year^{-1}$. The basin was categorized into five different erosion hazard classes; low, moderate, high, very high, and extremely high. About 70% of the area in the river basin comes under low to moderate erosion hazard class (< 12 $tha^{-1}year^{-1}$). The developed erosion hazard map indicates majority of extremely vulnerable soil erosion areas (> 60 $tha^{-1}year^{-1}$) are located around Kithulgala and Ampana areas in Kegalla district and Laxapana area in Nuwaraeliya district. It further help to identify the critical erosion prone areas to adopt appropriate soil prevention and control measures in the Kelani river basin.

Keywords: Kelani river basin, Revised Universal Soil Loss Equation, Soil erosion, Soil erosion hazard map.