

PRIORITIZATION OF WATERSHEDS IN *KELANI* RIVER BASIN FOR SOIL AND WATER CONSERVATION

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Assessment of erosion status and prioritization of watersheds for soil and water conservation (SWC) is a prerequisite in river basin management. Geomorphic behavior of watersheds influences the soil erosion characteristics in the basin and thus use to prioritize the watersheds for SWC. There are evidence of higher rates of soil erosion occurring in *Kelani* river basin. Thus soil conservation in this basin is crucial at present. This study was carried out to identify the priority within the *Kelani* river basin for SWC planning using GIS (ArcGIS ver.10.1). *Kelani* river basin was first delineated on the Digital Elevation Model (DEM) of 15 x 15 m resolution. It was further sub divided into 20 watersheds (KB1 to KB20) using spatial analysis techniques in GIS. Morphometric parameters such as areal, linear and relief were calculated for twenty watersheds and ranked them considering the susceptibility to erosion. Final priorities were assessed based on the compound value (Cp). Hypsometric Integrals (HI) were also calculated for the twenty watersheds and watersheds were categorized into young, mature and old. Watersheds prioritization based on morphometric analysis was validated using the observed sediment data of six sites by correlation analysis. The results based on Cp value revealed that watersheds KB4, KB9, KB18 and KB20 need more attention for SWC. On the bases of HI, watershed KB3, KB6, KB15, KB16, KB18 and KB20 reached to mature class which require more attention for SWC. Sub watersheds, KB18 and KB20 fallen under very high priority were further sub divided (KB18¹ to KB18⁶ and KB20¹ to KB20⁸ respectively) to investigate most prioritized areas for SWC. The results showed that KB18⁵, KB18⁶, and KB20¹, KB20² and KB20³ are the most susceptible areas for soil erosion in KB18 and KB20 watersheds, respectively. Significant higher correlation (-0.529 at $p < 0.01$) between Cp and observed sediment flow validated the morphometric base priority for SWC in *Kelani* river basin. The results of the study can be utilized in watersheds prioritization for SWC in *Kelani* river basin in Sri Lanka.

Keywords: GIS, Morphometric analysis, Soil and water Conservation, Soil erosion, Watershed