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Developing a Model using GIS to Identify Soil Erosion Potential Areas of Kukule Ganga Watershed, Sri Lanka

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The process of soil erosion in Sri Lanka commenced in the 19th century with the expansion of human settlements and cultivation of upland rain fed crops. It was aggravated by the changes in land use patterns during the British administration when upper catchments of major rivers located in the central highlands were stripped of natural vegetation to make way for plantation agriculture such as coffee and tea. Most of the reservoirs of Sri Lanka are below the catchments areas. Those are threatened by continuous sedimentation. Due to this problem, the water carrying capacity of the reservoirs has been reduced.

The study area is the Kukule ganga watershed that is one of the main tributaries of the Kalu river (*ganga*) in Sri Lanka. The watershed is situated in the Kalawana D.S. Division of the Ratnapura district. The total area of the Kukule watershed is 309.44 km^2 and it consists of three sub catchments. This research paper describes two main objectives. One is to develop a model to identify soil erosion potential areas of a catchment in a Grid environment and the other is prioritize catchment area according to the erosion potential areas for conservation practices. This study was carried out by using four main causative factors; soil characteristics, land use and land cover, rainfall intensity and slope characteristics. By using these factors a precise model in the Geographical Information Systems (GIS) environment was developed. The probable areas for each causative factor were identified according to the weighting average scheme and the critical areas were found out by applying Overlaying methodologies in GIS. Finally, the watershed was classified in to the five risk regions, such as Very High, High, Moderate, Low and Least risk areas. Then, the results were clarified / proved by the field survey carried out using Global Positioning Systems (GPS). The accuracy of the findings was 85% or above.