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Mathematical Model for Flow and Sediment Yield Estimation on Tel River Basin, India

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Abstract : Soil erosion is a slow and continuous process and one of the prominent problems across the world leading to many serious problems like loss of soil fertility, loss of soil structure, poor internal drainage, sedimentation deposits etc. In this paper remote sensing and GIS based methods have been applied for the determination of soil erosion and sediment yield. Tel River basin which is the second largest tributary of the river Mahanadi laying between latitude 19° 15' 32.4"N and, 20° 45' 0"N and longitude 82° 3' 36"E and 84° 18' 18"E chosen for the present study. The catchment was discretized into approximately homogeneous sub-areas (grid cells) to overcome the catchment heterogeneity. The gross soil erosion in each cell was computed using Universal Soil Loss Equation (USLE). Various parameters for USLE was determined as a function of land topography, soil texture, land use/land cover, rainfall, erosivity and crop management and practice in the watershed. The concept of transport limited accumulation was formulated and the transport capacity maps were generated. The gross soil erosion was routed to the catchment outlet. This study can help in recognizing critical erosion prone areas of the study basin so that suitable control measures can be implemented.

Keywords : Universal Soil Loss Equation (USLE), GIS, land use, sediment yield,
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