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## Integrated Approach of Universal Soil Loss Equation (USLE) and Geographical Information System (GIS) for Soil Loss Risk Assessment in Upper South Koel Basin, Jharkhand

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### ABSTRACT

Soil erosion is a growing problem especially in areas of agricultural activity where soil erosion not only leads to decreased agricultural productivity but also reduces water availability. Universal Soil Loss Equation (USLE) is the most popular empirically based model used globally for erosion prediction and control. Remote sensing and GIS techniques have become valuable tools specially when assessing erosion at larger scales due to the amount of data needed and the greater area coverage. The present study area is a part of Chotanagpur plateau with undulating topography, with a very high risk of soil erosion. In the present study an attempt has been made to assess the annual soil loss in Upper South Koel basin using Universal Soil Loss Equation (USLE) in GIS framework. Such information can be of immense help in identifying priority areas for implementation of erosion control measures. The soil erosion rate was determined as a function of land topography, soil texture, land use/land cover, rainfall erosivity, and crop management and practice in the watershed using the Universal Soil Loss Equation (for Indian conditions), remote sensing imagery, and GIS techniques. The rainfall erosivity R-factor of USLE was found as 546 MJ mm/ha/hr/yr and the soil erodibility K-factor varied from 0.23 - 0.37. Slopes in the catchment varied between 0% and 42% having LS factor values ranging from 0 - 21. The C factor was computed from NDVI (Normalized Difference Vegetative Index) values derived from Landsat-TM data. The P value was computed from existing cropping patterns in the catchment. The annual soil loss estimated in the watershed using USLE is 12.2 ton/ha/yr.

### KEYWORDS

Universal Soil Loss Equation (USLE); Remote Sensing &amp; GIS; Soil Loss

### Cite this paper

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