Soil Erosion Risk Assessment using Remote Sensing & GIS in a Himalayan Watershed

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Abstract

Soil erosion is a global environmental crisis in the world today that threatens natural environment and agriculture. Accelerated soil erosion has adverse economic and environmental impacts (Lal, 1998).Livelihood of people in the Himalayan region is mainly dependent on farming system and especially on subsistence agriculture. The soil erosion risk assessment can be helpful for land evaluation in the region where soil erosion is the main threat for sustained agriculture. It's quantification under various land use /land cover helps to prioritize the watershed for soil conservation planning, in order to encourage effective natural resource conservation and sustainable development. This study was aimed at use of remote sensing and GIS for soil erosion risk assessment at Hanvel watershed near Chamba in Tehri Garhwal district of Uttarakhand and in its conservation planning. The semi empirical RUSLE model is used for prediction of soil erosion risk.

Remote sensing data provides us inputs required for preparing various maps used in computation of soil erosion using RUSLE. IRS P6 LISS IV image has been used along with SOI toposheet and field collected information for land use/land cover classification. ASTER DEM with 30m resolution has been used for preparation of topographic factor (slope). Physiographic soil map was prepared using the interpretation of land use/land cover, topographic information and field collected soil information. Rainfall data for the area was used for the preparing the rainfall factor. The C factor and P factors for various land use/land cover types were estimated using the data collected during field survey. The various RUSLE factor maps were integrated in a GIS platform to predict the soil erosion risk in this watershed using empirical RUSLE model. More than 31% of the study area falls in the very high soil erosion risk class, which is a matter of serious concern. The soil erosion map thus generated, can be used as tool for planning and implementation of various management and conservation practices

Keywords: Soil erosion, RUSLE model, Remote Sensing, GIS.