RESEARCH ARTICLE

COMPARATIVE STUDY OF ESTIMATION OF SOIL ERODIBILITY FACTOR FOR THE LOWER TRANSACT OF RANIKHOLA WATERSHED OF EAST SIKKIM

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Abstract: Soil erosion is a two phase process consisting of the detachment of individual particles from soil mass and their transport by erosive agents such as running water and wind. When sufficient energy is no longer available to transport the particles, a third phase (deposition) occurs. The amount of erosion from raindrops has been linked to the rainfall characteristics such as the rainfall intensity, drop diameter, impact velocity and rainfall kinetic energy. The size, distribution and shape of rain drops influence the energy, amount and erosivity of rainstorm. On the other hand, the soil properties, particles size distribution and organic matter content determine whether soil can be detached and transported. Soils with faster infiltration rates, higher levels of organic matter and improved structure have a greater resistance to erosion. Hence soil erodibility is another important parameter in the estimation of soil erosion. In the present study the main objective was to determine the soil erodibility indices of Ranikhola watershed area so that the values of the soil erodibility index can be established for future works. Runoff Plot method and Soil Physical Properties Analysis method was used for determination of 'K' factor in transact of Ranikhola watershed (Sikkim). The range of 'K' factor in study area varied from 0.0086 to 0.034 with an average value of 0.025 (t ha h/ha mm MJ) by Runoff Plot method. Using Soil Physical Properties Analysis method, the 'K' values were found in between 0.051 to 0.073 with an average value of 0·064 (t ha h/ha mm MJ). From the study it was concluded that the study areas falls under low erodibility (K) class. Among the both methods, the runoff plot methods were under estimated than the other method. Soil textural analyses revealed all the important soil components affecting directly soil inherent properties to resist erosion or to become susceptible to erosion, hence the 'K' values as obtained from Soil Physical Properties Analysis method was considered appropriate for the lower transact of Ranikhola watershed.

Keywords: Soil Erodibility, USLE, Runoff plot, Sikkim

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