Model Development for Quantifying and Predicting Rainfall Induced Erosion in Tropics Region using Dimensional Equation approach

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Abstract

Erosion and sedimentation has a serious problem over the year especially in semi arid where soil is loose and in addition torrential rainfall. The need to develop a specissessment of rainfall induced soil erosion and sediment yield model is necessary.. Data was collected between 2018&2019 which was used to develop a dimensionless model for predicting Rainfall-induced erosion using the dimensional analyses approach. Factors used include; Soil infiltration rate, Soil erodibility factor, Hydraulic shear stress, Soil grain diameter, Depth of tilt Mean diameter of raindrop, Rainfall intensity, Rainfall duration, Gully size, and Density of soil Runoff velocity.The model produced reasonable predictions relative to field measurements with coefficient of determination $R^2$of 0.768, the variables in the model are easily measurable; this makes it better and easily adoptable. It is recommended to use locally developed model using specific local data.

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