Assessment of Erosion Value and Sediment Delivery Ratio in the Unsealed and Forest Roads

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(Received: Oct. 9-2012 ; Accepted : Sep. 28-2013)

Abstract

In this research, sediment production and delivery amount by Darabkola forest roads was estimated using the SEDMODL model. To evaluate the model results, the sedimentation rate in the above roads was directly measured using rainfall simulator. Also, the paired t-test, BIAS, RE and RMSE were used to assess the results. The analysis showed that the rate of sediment production from study roads' surface using the SEDMODL model and direct measurement under the rainfall simulation were 420.97 and 341.19 tons per year, respectively, and rate of sediment delivered to the stream with sediment delivery ratios of 42% and 51%, respectively, was about 177.58 and 174.02 tons per year. Also, results of the statistical methods of BIAS, RE and RMSE for the aforesaid model were 0.04, 17.59 and 0.71, respectively, and at 95% confidence level, no significant difference was obtained between the observed and estimated data. Therefore, the aforesaid model has the appropriate accuracy and efficiency to estimate the sedimentation rate of the Darabkola forest roads. It was also found that from among the input parameters of model, longitudinal slope of road, precipitation and sediment delivery factors were the most influential factors in the sediment production and transport, respectively.

Keywords: Rainfall simulator, Forest roads, Sedimentation, Darabkola, SEDMODL.

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[DOR: 20.1001.1.24763594.1393.18.70.26.5]

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