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Evaluation and Improvement of Bed Load Formula Using Tapi River Data, India

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ABSTRACT
The effect of non uniformity of bed material on the sediment transport has been studied by various investi-gators in the past. In the present paper the bed load transport rate has been estimated for non uniform bed material considering the various variables like discharge, hydraulic mean depth, flow velocity, bed slope, average diameter of particle etc. by collecting field data of Tapi River. The majority of the bed load formulae represent a functional relationship between bed load discharge and shear stress. This study focuses on evalu-ating the bed load using Einstein's formulae. The bed load of pre monsoon season is estimated using various field parameters. The mathematical model has been developed using effective shear stress and bed load dis-charge. The statistical analysis, multiple regression and curve fitting (by nonlinear square fitter) is carried out using allometric function of Micro cal Origin 7.5. The proposed model has been tested using five years field data of Tapi River other than that used for the development of model. The value of rmse is close to zero in-dicates a perfect fit between measured and predicted values. The inequality coefficient is close to 0.50 sug-gest moderate relationship between estimated and computed bed load.

KEYWORDS
Sediment Transportation, Bed Load Equation, Einstein, Ripple Factor, Mathematical Model

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