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Title : TRANSPORT OF BED LOAD SEDIMENT IN THE PRESENCE OF STABLE CLAST

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Surface bedform in the form of stable clast is deduced to be presence at micro-scale. Stable clast is believed to modify the flow field and provide sink and source for incoming sediment particles. The dynamics of flow pattern and bed load rate in the presence of stable clast are always puzzling due to wide range of particle size and presence of roughness elements. Thus, this issue can be treated using two methodological approaches namely local scale and reach scale solutions. Incorporating the flow fields and turbulence statistics at a very local scale leads to the prediction of occurrence of bed load transport using probability approach. The binary model of dimensionless velocities for ejection and local bed shear using TKEw' gave better prediction among other models. Almost 80% of the bed load mechanism (whether occur or not) can be predicted by this proposed model. Understanding transport occurrence at finer scale is vital for in-stream rehabilitation, river restoration and installation of sediment sampler on river beds. However, treating the dynamics of flow and bed load at reach scale is significantly differed from local scale approach. Transport of sediment in the presence of stable clast at reach scale is best equipped using continuous transport prediction or reach-averaged bed load model. Transport of bed load sediment using existing prediction model postulate the less suitability and a need for modification. Thus, a similarity approach is used to develop the bed load model which can predict the bed load transport at reach scale. This new equation is successfully predicting the transport of bed load sediment in the presence of stable clast. Almost 70% of the selected river data portrayed better prediction compared to existing model. This newly proposed model make the full use of particle densimetric Froude number as the main predictor variable.