

The objective of this study is to investigate the applicability of the existing, steady State bed load formulac for predicting sediment transport rates in unsteady flows. Kabir (1993) has performed a detailed experimental study on bed load transport in unsteady flows, in Katholic University of Leuven, Belgium, and part of his experimental results has been used in this study. In his experiments, unsteady flow was established by passing hydrographs over an erodible bed.

To quantify the sediment transport in unsteady flow the hydrographs were divided into a number of small time intervals and the existing bed load formulae were applied to each time interval assuming that the flow characteristics during each time step to be steady. The steady state bed load formulae of Meyer-Peter & Muller, Ackers & White, Engelund and Hansen and Ven Rijn were selected for this study. The sediment discharges computed by the proposed method were compared with the measured sediment discharges.

It can be noted that the Engelund and Hansen formula always overestimates the sediment transport rate in unsteady flows where as, Ven Rijn underestimates the results. The sediment transport rate predicated by Ackers & White and Meyer-Peter formulae are nearly the same throughout the hydrograph and these values are very close to the observed sediment transport rates. Formula proposed by Kabir for unsteady flows appeared to be slightly overestimates the sediments transport rates, particularly at the peak flows. Finally it can be concluded that the proposed method of computing sediment discharge in unsteady flows can be applicable only with the Ackers & White and Meyer-Peter & Muller formulae.