



Assessment and recognition of sediment transport effective discharge (a case study: Tangrah hydrometric station, Iran)

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Gorgan River is one of the largest rivers in the North of Iran with a drainage area bigger than 10000 km². Gorgan River watershed is situated between 54° 10' to 56° 26' longitude (E) and 36° 35' to 38° 15' latitude (N). In order to determine the effective discharge of sediment transport in Gorgan River, some data from the Tangrah hydrometric station have been used (mean daily discharge as well as the measured sediment concentration, in the period from 1978-1979 to 2002-2003). For the calculation of the effective discharge, the abundance histogram of mean daily discharges has been developed. So, the 25 years mean daily discharge for the Tangrah station has been assessed and the abundance of the discharge occurrence has been assigned, according to 20 classes. Then, the frequency distribution and the probability of occurrence were calculated. By applying a relation between the value of measured flow discharge and sediment discharge, sediment rating curve was developed. Thus, for any class of flow discharge, the sediment discharge was estimated. By multiplying the daily sediment discharge with the probability of its occurrence, the so called curve of product of sediment magnitude and frequency was obtained. The value of effective discharge was obtained by finding the highest point on this curve. It is equal to the maximum river sediment transport. Further assessments showed that the effective discharge of sediment transport in Tangrah hydrometric station has a low return period. For this reason the bed and embankments of the river are eroded and the bed is going to be deeper.

Keywords: effective discharge; sediment transport; frequency discharge; Golestan.