

Abstract:

Hirmand river is the most important source of surface water supply in Sistan plain and its discharge is controled from the outside of the geographical boundaries (upstream of the river) of the country. Therefore, the possibility of upstream river management is excluded. According to the destructive floods in the history of Sistan plain, the study and evaluation of existing hydraulic structures operation in the river on reduction of river discharge and back water is necessary. In this study HEC RAS model have been used to simulate Sistan River, this model is very capabale for hydraulic calculations. After the calibration and hydraulic validation, the simulations were performed in four scenarios. The results of this study showed that the existence of Zehak dam does not reduce the capacity of the river. Comparing surface profiles in different operations of Zehak dam showed that the profiles are similar for 50 to 100 percent openings of the gates and no back water occurrence. The results also showed that back water due to operation of the gates of Zehak dam affects the river capacity such that dam discharge is reduced by 40 percent due to back water when the gates opening is 10 percent. When the gates are fully closed and when the discharge reaches 400 cubic meters per second, the effect of back water could be observed in Jarikeh.

Keywords: Back water, River discharge, Zehak dam, HEC RAS, Sistan plain.



University of Zabol
Graduate school
Faculty of Water and Soil
Department of Water Engineering

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Supervisors:

Dr. F. Hasanpour

Advisors:

M. R. Nakhaei Moghaddam

By:

A. Dehghan

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