Abstract:

Amount of Helmand river flow as the most important source of surface water in Sistan plain is controlled by factors from outside of political boundaries. Therefore management of river flow and sediment is not possible at upstream of Helmand river. There are a lot of destructive flood in the history of Sistan plain so it is necessary to control of Sistan river bed. In this study Sistan River simulated using HEC-RAS model. HEC-RAS model is able to calculate annual sediment and hydraulic variables in mobile bed condition. Sampling of river was done to grading of bed and suspended load in Sistan River. Flow simulated in quasi-unsteady condition for flood of 1385-86. Different dredging scenarios were assessed to rising flood waters can flow after calibration of model and choosing the best sediment transport function. Results show that the best sediment transport function for Sistan River is Toffaleti function with Toffaleti fall velocity method. Maximum sedimentation occurs between Niatak spillway and Zahak dam. Also maximum erosion is occurred at Zahak dam downstream. In both cases of open and close gates amount of accumulated sediment in the reach between Niatak spillway and Zahak dam is 6750372 and 13486202 tons, respectively. Dredging the river by constant depth and width was determined as the best alternative for dredging of Sistan River. In this condition by dredging 7001848 cubic meters of sediment, potential of crossing the flood was duplicated.

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

The Thesis Submitted for the Degree of M.Sc (in the field of Irrigation hydraulic Structures)

Bed level modification using HEC-RAS model in Sistan river

Supervisors:
Dr. F. Hassanpour

By:
M. Motallebian

October 2013