

## **Abstract**

**Evaluation of efficiency and performance of watershed management practices, To find the weaknesses and strengths of used strategies and their effectiveness In order to achieve administrative and better management solutions is inevitable principle in watershed management That could well be examined in paired watershed. This study aimed to evaluate the effects of watershed management practices on the hydrological behavior of the watershed and flood hydrograph changes. Kakhk paired watershed was selected and investigated. This watershed is located about 30 kilometers south of the of Gonabad city. For this study, watershed basic information, including topographic, geology and land use maps, storms Statistics and watershed flood data from project start to 2014 and also Watershed management activities details such as the mechanical, biological and biomechanical practices was received from relevant organizations. Then, using ArcGIS functionality and Google Earth images, Maps of elevation, slope, land use, geology and location of the precipitation gauge and hydrometric stations was prepared. The actual condition of the treatment and control watershed was modeled using HEC-HMS that was calibrated according to the three storms. The statistical parameters such as coefficient of determination, relative error and Nash-Sutcliffe criteria of flood peak discharge and volume showed the high accuracy of model. The results show that watershed management practices has been able to penetrate at least 7.5 mm of rainfall without creating runoff. Also per a 40 mm Storm, flood volume and peak discharge in control and watershed is (11754.3 and 64.2) m<sup>3</sup> and (0.915 and 0.035) m<sup>3</sup>/s, respectively**

**Keywords: Watershed management, Flood hydrograph, HEC-HMS, Kakhk paired watersheds**



University of Zabol

Graduate school  
Faculty of Soil and Water  
Department of Range and Watershed  
Management

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**Supervisors:**  
M. Nohtani, PhD

**Advisers:**  
M. Dehghani, MSc

**By:**  
Fatemeh. Ghotbaldin

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