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The Effects of Check Dams on Runoff Storage in Gav-Darreh Watershed, Kurdistan, Iran

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Abstract

Preservation of water resources is the main purpose of watershed management operations. To evaluate watershed response to mechanical operations in order to increase water storage, this research was conducted in Gav-Darreh watershed, Kordestan, Iran. The watershed area is 6.27 km^2 which has been subjected to mechanical operations to prevent water and soil losses. The dimensions of constructed check dams and related reservoirs and their spatial distribution were recorded. The data were used to derive the volume of retained water and sediments. The hydrology was modeled using the Hydrologic Engineering Center-Hydrologic Modeling System (HEC-HMS) model, and watershed changes were quantified with site survey. Actual storms

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were used to calibrate and validate HEC-HMS rainfall-runoff model. The calibrated HEC-HMS model was used to simulate before and after mechanical operation stream flows and to forecast the impact of check dams effects on runoff storage. The model was used both for entire watershed and an individual sub-watershed with most mechanical operations. In case of entire watershed, the results shows that the practices had insignificant impacts on the runoff storage, and conversely the contribution of the basin management at individual sub-watershed was significant.

Keywords: Watershed Operations, Runoff Storage, Check Dams, HEC-HMS, Gav-Darreh Watershed.