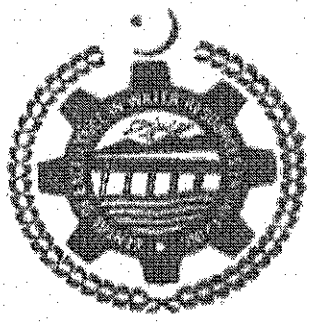
THESIS

HYDROLOGIC OPTIMAL DESIGN OF STORAGE POND FOR WATER HARVESTING IN ARID ZONE



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ABSTRACT

The biggest threat to the survival of life in a desert is the unavailability of the water. The aim of this study is to ensure the availability of water for human, livestock and wildlife in Cholistan Desert. HEC-HMS model was used to estimate the availability of water. After estimating the parameters of HEC-HMS model its performance was evaluated by simulating different known rainfall-runoff values. The simulated and observed value matches very well. Therefore volume of water available was generated from known rainfall storm event data. Demand of water was estimated from the population and cattle heads of the area by using drinking water requirements.

Design Reservoir Window (DRW) was used to estimate the volume of water required to meet the demand. DRW is based on the Ripple Mass Curve method and Sequent Peak Analysis. Ripple Mass Curve method being the conservative of the two above mentioned techniques. So the combination of HEC-HMS and DRW was used to obtain the optimal storage of water required for drinking purposes and for small scale irrigation in the locality.

Evaporation and seepage are the major losses in the extreme hot weather of Cholistan Desert. Evaporation could be minimized by decreasing the ratio of surface area of the storage pond and the depth of the storage pond. Seepage could also be minimized by using buried membrane.