

## ABSTRACT

" A Development Of Water Harvesting System at Safawi Area  
in Northern Jordan Badia "

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The Jordanian Badia Cover the majority of the area of Kingdom, it is an arid areas having little urbanization. The little urbanization in the Badia is due to the shortage of water resources. For the development of these areas, the water resources must be available, the surface water is one of the important resources in the arid and semi arid regions.

In this study, the rainfall data for the years (1965-1990) are collected in safawi area for four stations which are: Um Quttain station and H-5 Evaporation station within the SAFAWI AREA, Azraq station and H-5 station out of the area. By Thiesson method, the area divided into four polygons for the station, the average areal rainfall is calculated yearly, the frequency curve for annual rainfall is developed.

Using Soil Conservation Service (SCS) Curve Number (CN) method, the storm runoff depths for every station are calculated and the yearly runoff depths for the area are obtained. The runoff coefficient for every year is calculated, the average runoff coefficient found is (2.9%).

In this study, the maximum daily storms for every year are obtained for the stations: Um Quttain station and H-5 station. The daily rainfall frequency curves are developed for the two stations. Seven Wadis in the area are selected which are:

JILAD, AL MHADDAH, ALI, EL LAHFI, SALMA, AL SAFAWI, and AL HASHAD. Using the SCS Dimensionless Unit Hydrograph method, the unit hydrograph for each wadi is developed for the calculated duration, the duration of the unit hydrograph is changed to 1-hr using S-curve technique.

The daily rainfall depths for return periods: 5, 10, 25, 50 and 100 yr are checked from the frequency curves for the stations Um Quttain and H-5. these depths are used in calculating the runoff in the selected wadis. By the Curve Number method, the 1-hr increment runoff depths are calculated. Using the 1-hr unit hydrograph, a series of 1-hr hydrographs are calculated, the summation of them results in the daily hydrograph.

At the end of this study, the frequency peak discharge for every wadi are summarized. Using the runoff coefficient obtained in this study and the annual rainfall depths that checked from the yearly frequency curve developed in this study too, the runoff volumes drains from the wadi catchment are calculated for different return period.