## Assessment of Runoff Potential of a Small Watershed in Southern Palestine

## Samah Al-Jabari, Majed Abu Sharkh and Ziad Al-Mimi

Palestine Polytechnic University, E-mail:samahj@ppu.edu Palestine Polytechnic University, E-mail:msharkh@ppu.edu Birzeit University, E-mail:zmimi@birzeit.edu

## ABSTRACT

According to the Palestinian Ministry of Agriculture, the Governorates of the West Bank have been suffering severe drought for the past three years which affected, among other things, the agriculture sector (not enough water for the plants). In summary, water is usually in short supply and the study of surface runoff from small watershed here might help in reducing the effects of such short supply, and this is the interest of this research work.

For any hydrological studies on an ungaged watershed, a methodology has to be selected for the determination of runoff at its outlet. Many methods are used to estimate the runoff from a watershed. The curve number method is a versatile and widely used procedure for runoff estimation. This method includes several important properties of the watershed namely, soils permeability, land use and antecedent soil water conditions which are taken into consideration. In the present study, SCS method is used with GIS to estimate the runoff from Wadi Su'd watershed as a case study for agricultural watershed.

The Wadi is located in Hebron area of the West Bank, southern Palestine. The watershed having a geographical area of 1.87 square kilometer and the average annual rainfall is around 500 mm. The rainfall and land use data were used along with the experimental data of soil classification and infiltration rate for the assessment of runoff potential for the study area.

The results of the present study show that the average annual runoff depth for the study area (Wadi Su'd watershed) is 36.3 mm, and the average volume of runoff from the same watershed is 67840.2 cubic meter per year. The amount of runoff represents 7.3% of the total annual rainfall. The approach of this study could be applied in other Palestinian watersheds for planning of various conservations measures.

Keywords: Rainfall, Runoff, Watershed, SCS Curve Number, GIS.

## **INTRODUCTION** 1

It is well known that Palestine suffers from severe water shortage problem due to natural and political reasons, and there is a necessity of searching for substantial water resources. There is consensus in most studies conducted that water harvesting is the most appropriate option for future in addition to other options. This is due to the fact that it is a considerably cheap option and there is a necessity to benefit from the water flowing into the sea during the winter season. It is also very important to state that the water harvesting projects correlate with the economic and social situation for the nations of the area.

Land degradation by soil erosion, runoff, and sedimentation, are the serious problems facing the arid and semi-arid regions in the West Bank. As a result of these problems soil tend to degraded, causing low soil fertility, in addition of the over exploitation of natural resources for agricultural production. Soil and water conservation management by different water harvesting techniques, is an