

Abstract

Water resources assessment in Al Auja study area (Surface and Sub-Surface catchments) was the main issue studied in this research, in terms of rainfall-runoff relation, base flow and recession for the major springs and assessment of the sustainable yield of the Lower Aquifer of Ein Samia well field.

The selection of this study area is based on its significance with respect to population, and because of the critical water supply situation in this central area, more over because it is totally located within the eastern groundwater basin, which is considered the most important for the Palestinians water supply in the central and southern areas.

The studies of Rainfall Runoff analysis in the West Bank suffers from lack of assessment of actual Runoff, and Infiltration from the Rainfall events. Such studies depend on measurements of Wadis flow. Because no comprehensive meteorological system in the study area to measure rainfall events on short periods, but only daily rainfall records were measured, the Soil Conservation Surface method used to measure actual Rainfall Runoff relations and to find the Runoff coefficient, infiltration occurrence in Al Auja surface and Sub-Surface catchments, and to estimate the annual amount of flood occurs in wadi Al Auja. For the comprehensive assessment of water resource in the study area, the Ground water resources were evaluated to assess the impact of the current development on the Aquifer System, after that an analytical modeling approach was used to estimate the optimized ground water abstraction from the Lower Aquifer in Ein Samia well field.

The main objectives of the study are (1) to conduct a comprehensive assessment for Wadi Al-Auja catchment's area which include: an assessment of the surface water resources: rainfall and surface runoff by using Soil Conservation Surface method (SCS), and (2) Assessment of the groundwater resources within Al Auja sub basin: ground water recharge, discharge

occurrence and flow. (3) Assessment of the ground water production from Lower Aquifer in Ein Samia well field, which is located in the study area by using a two dimensional analytical modeling tool (TWODAN).

The study found that the average storm runoff coefficient is 6.7%, and the average annual runoff coefficient is 3.5% of the average annual Rainfall, where the total flood in the Sub-Surface and Surface catchments was 10.27 and 2.70 MCM/yr respectively. The infiltration in the study area was estimated around 30 MCM//yr, which is equal to 11-15% of annual rainfall.

For base flow measurements, which consider one part of the surface water source in the area, recession analysis approach for the major springs are adapted to estimate the potential storage and remaining base flow for each spring, and the result was 42 MCM/yr and 25.7 MCM/yr respectively.

The optimal abstraction was 7800 M³/ day which equal to 2.84 MCM/yr, that mean a reduction in abstraction from 8900 M³/day to 7800M³/day (3.24 to 2.84 MCM/yr).

Finally; an adequate water resources assessment is a corner stone for sustainable management of these important groundwater and surface water resources. Such assessments are required for decision makers and planners to develop the water sector in fordable and sustainable manner.