Title: Watershed Management In The Northern Badia Region (Sirhan Basin/Jordan) As An Example For Desertic Regions.

Submitted by: AL al-Bayt University

Proposed by: Prof. Dr. Nadhir AI-Ansari
Prof. Dr. Elias Salameh
Dr. Hakam AI-Alami

Beneficiaries: Government of Jordan, Syria, and Saudi Arabia

Duration of project: Two years

Background

The challenge in water management in Jordan is confronted by the scarcity of water resources combined with many complication such climatic changes, water resources shortage, depletion of ground and water levels and the deterioration of its quality : (Rimawi & Al-Ansari, 1997, Clarke, 1991). The goals of such a management may be defined at different levels: national level, regional level, community level, and at the level of the individual consumer. Such goals may contain:

- Improving living standards.
- Increasing Gross National Product.
- Improving life quality.
- Redistribution of income.
- Conservation of national resources.
- Conservation and upgrading of environmental quality.

These aims have to be approached to achieve improvements to the region especially if applied on a large scale.

Beneficiaries

Jordan, Saudi Arabia and Syrian countries and governments are the major beneficiaries of the proposed project since the selected study area has a strategic location and any witnessed development in water resources will directly affect the local and regional environment. Hence the Middle East region can also benefit from applying similar techniques since the region has a common and almost similar environmental conditions and variations.

The Project

AL al-Bayt University AABU and the Strategic Environment and Water Resources Research Unit SEWRRU have proposed this project to achieve a better management of the surface water resources of the proposed study area using modern and advanced modeling techniques. The importance of the application of such techniques comes from the fact that understanding water-land-related aspects is the first step of any watershed managing schemes. Unfortunately the available data concerning the area is not adequate and has to be statistically evaluated, but the presence of satellite images and the availability of land-water aspects softwares can be of a great help.

The orographic conditions and meteorological characteristics of the area have to be also thoroughly grasped in order to comprehend the dominant condition with respect to the different year conditions. This can be achieved by processing the daily meteorological data with advanced methodologies and softwares.

Scope of the project

The main scopes of the project can be summarized in the following points:

1. To approach the precipitation-runoff relationship in order to estimate the amount and the flow rate of the floods to be managed.

2. To manage and control short and quick floods resulting from rainy events. This can be only achieved with the aid of a conceptual computer model based on the major features of the area.

3. Elaborating on the geological setting and the field-measured hydrological parameters to enhance the developed conceptual model.

4. To propose a suitable and efficient managing technique based on the areas local environmental with minimal environmental impacts.

5. To elaborate on precipitation, flood- and retained water quality and their expected influence on the local and regional water resources and environment.

It should be mentioned here that the application of such watershed management schemes within the Middle East region can be done with moderate modifications according to the change in the local environment.

Project objectives

The main objective of this proposed project is to utilize from the unused runoff or floodwater at the wintertime by retention or recharge techniques. The retained amounts of water are rendered to develop or at least maintain the water resources of the area. The implemented watershed management plan must maintain and improve the water resources of the area by either structural interference or by introducing water-diversion techniques to control the velocity and habit of flooding.

Another aims of the projects can be listed as follows:

1. To introduce a conceptual model based on the topographic and geomorphological conditions of the area.

2. To enhance the conceptual model to a terrain model with the introduction of the hydrogeological hydrological parameters of the study area.

3. To develop a 3-dimensional model to approach the water-land related features and aspects.

4. To propose a suitable management technique based on the obtained and analyzed parameters.

5. To analyze soil samples according to a configured mesh and at different depth (Surface,10, 50 cm).

6. To perform geochemical modeling in order to evaluate and estimate the water quality of the present resources and the retained water.

Achieved activities

Most of the proposed out puts for the planned activities of the project have been achieved. The obtained geochemical model has been utilized for the primary evaluation of the quality of water-resources at the study area. This has emphasized the fact that floodwater is rendered to enhance the groundwater recourses. This result has been checked through the analysis of the collected rainfall and groundwater samples.

On the other hand, the achieved conceptual model has been validated and showed its reliability for the topographic and geomorphological characteristics of the area. This has been made by additional field work.

Most of the maps; such as chemistry isohytal maps and soil cover; are in the process of final edition.

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