

Application of GIS in Optimization of water conveyance channel route **(Case study Artificial Recharge Project of CHIKHAB River, Ilam, IRAN)**

S.A. Hosseini

*Senior Research Engineer, Dept. of River Engineering, Soil Conservation and Watershed Management Research Institute, P. O. Box 13445-1136, Tehran, Iran
sahosseini@yahoo.com , hosseini_sa@scwmri.ac.ir*

M. Habibi

Associate professor of River Engineering, Soil Conservation and Watershed Management Research Institute

N. Javaheri

Ph.D. in Hydraulic Structures, Water Science College, Chamran university of Ahwaz

Abstract

In this paper the method of optimization of the channel route and bed slope of a water conveyance channel by means of Geographic Information System (GIS) is described. The work is a part of the Flood Spreading and Groundwater Management Project of Chikhab River; a river located in the area of Dehloran, South-West of IRAN.

First based on the topographic maps (scale 1/10000), the Digital Evaluation Model (DEM) of the channel route was developed. Then, considering the limitation of the height of the water intake, the bed longitudinal slope and the location of the required hydraulic structures, different variants of the channel route were identified and studied. On this basis, 12 variants of the channel route and project line at 4 different slopes (a total of 48 variants) were investigated.

The best channel route was determined by minimizing the volume of the earth-work (cut and fill) and by considering the variety and total number of the required hydraulic structures within the channel route. Finally a 19 kilometers earth channel was proposed as the best variant. This paper indicates the capabilities of GIS in optimization of the design parameters in this type of hydraulic engineering projects.

Keywords: Water conveyance, Optimum route, Artificial recharge, Chikhab River, GIS.

1- Introduction

Aquifer management with optimum exploitation of catchment water sources, leads to decrease the destroying effects of floodwater, increase land and aquifer moisture sources and soil and water resources sustainable development.

Floodwater Spreading and Infiltration Project (FSAIP) is an efficient and environmentally friendly method to achieve this goal. In a FSAIP, after diverting floodwater from a river and directing the water to a safe and suitable land, water flows from spread channels, spreads