

Abstract

Increasing use of groundwater, especially in semi-arid areas, has caused a sharp drop in the groundwater level. The wells of Mokhtaran plain are one of the main resources for Birjand supply water. Mokhtaran plain is located in the southern lowland of Birjand plain. The total catchment area of Mokhtaran is about 2486 square kilometers of which 1264 square kilometers of plains and mountains make up the rest. Water level in observation wells has come down and represents water table is declining. The trend continues to cause irreparable damage to the aquifer of Mokhtaran. Mathematical model of GWM is a three-dimensional model to simulate and optimize the management of groundwater in the saturated zone is the finite difference method. This model is capable to simulate the features such as rivers, harvest wells and evapotranspiration. In this study, using GroundwaterVistas-6 software, the simulated groundwater flow in the area for a period of 10 years were conditions and decline in groundwater levels were determined in Mokhtaran plain. The GWM models were used for optimal management of Mokhtaran aquifer and aquifer behavior was considered linear. The results of this study showed that the model is able to optimize the average annual discharge of 87% compared to current conditions, the decline in groundwater levels greatly reduce. The maximum 6.878m in borehole # 18 is viewable. Also comparison drops in the optimal values of the optimization model and simulation results show that making optimal linear-behavior of aquifer isn't far from the truth.

Key words:

Aquifer, Groundwater Simulation, Optimization, USGS-GWM, Mokhtaran plain.



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**The Thesis Submitted for the Degree of M.Sc (in the
field of Water Resources Engineering)**

**Management of groundwater
operation in Mokhtaran plain using
GWM mathematical model**

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January 2013