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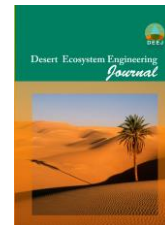
Determining the Suitable Areas for Groundwater Artificial Recharge Using Boolean and Fuzzy Models (Case Study: Sefiddasht Aquifer)

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Abstract

Over-exploitation of groundwater resources in Chaharmahal va Bakhtiari province led to prohibition of some plains in this province. One of these plains is Sefiddasht aquifer. Artificial recharge can be an effective method to raise the groundwater table and resolve the groundwater crisis in this province. The most important step for successful accomplishment of artificial recharge is locating suitable areas for artificial recharge. In this research, Slope, surface infiltration, alluvial thickness, alluvial quality and land use parameters were analyzed, classified and map of every parameter prepared using GIS. To overlay the affective parameters in artificial recharge, there were used Boolean and Fuzzy models. Results showed that 1.43% and 9.97% of Sefiddasht aquifer are suitable for artificial recharge based on Boolean and Fuzzy models, respectively. Using land use layer, these values decreased to 0.92% and 4.12% based on Boolean and Fuzzy models, respectively. So, land use is a limitative parameter in Sefiddasht aquifer.

Keywords: Artificial Recharge, Boolean Logic, Fuzzy Logic, Sefiddasht, Chaharmahal va Bakhtiari Provinc.

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