



Management of graduate education

School of water and soil

Pasture and watershed group

Dissertation for obtaining a master's degree in the field of natural resources-watershed engineering

Title:

Evaluation and potential finding of underground water resources using hierarchical-fuzzy method (Fuzzy-AHP) and remote sensing data (case study: Dasht Bam-Narmashir)

Instructors:

Dr. Mohammad Nahtani

Dr. Mohammad Reza Dehmarde ghaleh no

Advisor:

Dr. Elham Rafiei Sardoi

Writing:

Afsaneh haghghi

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Abstract:

Potential of groundwater resources is one of the most important methods of water exploitation management to deal with water shortage, which is inevitable due to the growing need for water in the country. The first step in managing groundwater resources is to recognize the potential of groundwater. Fuzzy-Analytic Hierarchy Process (AHP) is also recognized as an important tool in natural resource management decisions, especially water resources management. In this study, AHP-fuzzy model and GIS were used to identify potential areas for potential groundwater resources in Bam-Normashir plain. Criteria such as rainfall, temperature, geographical direction, slope, land use, vegetation, distance from the road, distance from the river, distance from the fault, distance from the city and village, distance from wells and springs, soil texture and The permeability of the formation was selected for decision making and the weight of each of them was calculated and prioritized using AHP model. Then the desired layers were fuzzy and indicator maps were prepared using Arc GIS software, then the final groundwater potential map was prepared. Finally, the ROC curve was used to validate the groundwater potential map in the region, and the result of 79 of this curve indicates the high accuracy of this method in preparing the groundwater potential map in the study area. The results also showed that the regions with geological sub-criteria have the highest weight of 0.614 and climatic has the lowest weight of 0.117. The value of compatibility coefficient in this design was 0.07, which is a value less than 0.1, and indicates compliance with the opinions and judgments of research decision makers. Finally, the results showed that about 7.77% of the total area of the plain, equivalent to 755.54 square kilometers, is suitable for the implementation of groundwater potential detection systems. Also, 1.57, 31.71 and 58.98% of plain lands have very weak, weak and moderate potential for groundwater resources potential, which according to the results obtained in this study, about 7% of these potential areas Groundwater has and due to the dryness of this area and excessive pressure on groundwater resources, so scenarios to reduce the harvest and the necessary solutions such as measures to improve the irrigation system, methods to reduce evaporation and improve the cultivation system, extraction Used rainwater.

Key Word: Groundwater potential, AHP-fuzzy, Bam-Narmashir plain, remote sensing, GIS