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# An Integrated Approach to Groundwater Exploration Using Remote Sensing and Geographic Information System

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## ABSTRACT

In this study, an integrated approach was implemented using Geographic Information System (GIS) and Remote Sensing technique for locating promising areas for groundwater exploration. This method is based evaluating a set of hydrological, geological and topographical parameters that influence the natural occurrence of groundwater. As a result, a ground water potential map (GPM) was generated by modeling these parameters. Groundwater potential map results were classified into three classes that describe the potentiality of each cell in the study area for groundwater exploration. These classes are; high, moderate and low groundwater potential area. It was found that about 7% of the study was classified as high potential areas which were found to be concentrated in the western part of the study area. About 79% of the study was classified as moderate potential for groundwater exploration. The rest of the study area (14%) was classified as low potential areas and concentrated in northeast and southeast part of the study area. These results were verified against existing well data and field observations. Furthermore, a sensitivity analysis was performed to study the effect of each parameter on the overall groundwater map using the effective weight and variation index. It was found that the slope parameter was the most effective among the five used parameters in the model.

## KEYWORDS

Groundwater Exploration; Groundwater Potential Map; GIS; Sensitivity Analysis; Jordan

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