

Robust approach for optimal positioning and ranking potential rainwater harvesting structure (RWH): a case study of Iraq

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Abstract

Rainwater harvesting (RWH) structure is considered as the best solution to conserve water for arid regions. The selection of RWH location is based on several key determinants such as hydrology, environment, topography, and socio-economic. This study proposed a robust methodology to identify and select the location of RWH using geographical information systems (GIS) and remote sensing (RS) with multi-criteria decision techniques in areas where data are scarce. Several thematic maps were extracted such as vegetation cover, soil group, slope, land use, and digital elevation (DEM). The RWH sites were ranked based on four major indexes: evaporation, cost-benefit, sediment, and hydrological index. Sensitivity analysis shows that the variance inverse (VI) and rank order method (ROM) considered all indices that effect ranking as compared to the analytic hierarchy process (AHP) and fuzzy-AHP. Sensitivity analysis also proved that the proposed method is suitable to be used for RWH site selection in arid regions