ABSTRACT

Currently, desertification is a major problem in the western desert of Iraq. +e harsh nature, remoteness, and size of the desert make it difficult and expensive to monitor and mitigate desertification. +erefore, this study proposed a comprehensive and cost effective method, via the integration of geographic information systems (GISs) and remote sensing (RS) techniques to estimate the potential risk of desertification, to identify the most vulnerable areas and determine the most appropriate sites for rainwater conservation. Two indices, namely, the Normalized Differential Vegetation Index (NDVI) and Land Degradation Index (LDI), were used for a cadastral assessment of land degradation. +e findings of the combined rainwater harvesting appropriateness map, and the maps of NDVI and LDI changes found that 65% of highly suitable land for rainwater harvesting lies in the large change and 35% lies in the small change of NDVI, and 85% of highly suitable land lies in areas with a moderate change and 12% lies in strong change of LDI. +e adoption of the weighted linear combination (WLC) and Boolean methods within the GIS envi ronment, and the analysis of NDVI with LDI changes can allow hydrologists, decision-makers, and planners to quickly determine and minimize the risk of desertification and to prioritize the determination of suitable sites for rainwater harvesting