

A GIS-based approach for identifying potential sites for harvesting rainwater in the Western Desert of Iraq

Ammar Adham a,d,n , Khamis Naba Sayl b,c , Rasha Abed a , Mohamed Arbi Abdeladhim a , Jan G. Wesseling a , Michel Riksen a , Luuk Fleskens a , Usama Karim e , Coen J. Ritsema

Abstract

People living in arid and semi-arid areas with highly variable rainfall and unforeseeable periods of droughts or floods are severely affected by water shortages and often have insecure livelihoods. The construction of dams in wadies to harvest rainwater from small watersheds and to induce artificial groundwater recharge is one of the solutions available to overcome water shortages in the Western Desert of Iraq. The success of rainwater harvesting (RWH) systems depends heavily on their technical design and on the identification of suitable sites. Our main goal was to identify suitable sites for dams using a suitability model created with ModelBuilder in ArcGIS 10.2. The model combined various physical factors: slope, runoff depth, land use, soil texture, and stream order. The suitability map should be useful to hydrologists, decision-makers, and planners for quickly identifying areas with the highest potential for harvesting rainwater. The implementation of this method should also support any policy shifts towards the widespread adoption of RWH