



A Methodology to Assess and Evaluate Rainwater Harvesting Techniques in (Semi-)Arid Regions

Ammar Ali (1), Michel Riksen (1), Mohamed Ouessar (2), and Coen Ritsema (1)

(1) Wageningen University, Soil Physics and Land Management Group, The Netherlands (ammar.ali@wur.nl), (2) Institut des Régions Arides, Tunisia

Arid and semi-arid regions around the world are generally facing water scarcity problems due to lack of precipitation and unpredictable rainfall patterns. For thousands of years rainwater harvesting (RWH) techniques have been applied to cope with water scarcity. Many researchers have presented and applied different methodologies for determining suitable sites and techniques for RWH. However, there is still little attention given to evaluation of the performance of RWH structures. The aim of this research was to design a scientifically-based and generally applicable methodology to evaluate and assess the performance of existing RWH techniques in (semi-) arid regions. The methodology takes engineering, biophysical, and socio-economic criteria into account to assess the performance of RWH using the Analytical Hierarchy Process (AHP) supported by Geographic Information System (GIS). The Oum Zessar watershed in south-eastern Tunisia is used as a case study site to test this evaluation tool. The performance of 58 RWH locations (14 jessour and 44 tabias) in three main sub-catchments of Oum Zessar watershed were assessed and evaluated. Based on the criteria selected, 60% of the assessed sites received scores indicating moderate performance, 36% of the sites showed low performance, and only 4% received good performance scores. The results very accurately represent the real performance of each site. This integrated methodology, which is highly flexible, saves time and costs, and is easy to adapt in different regions, provides a scientifically based analytical tool to support designers and decision makers aiming to improve the performance of existing and new RWH sites.