

## **Towards a rational water management and utilization of water resources in arid zones: application to the Jordan Rift Valley**

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**Abstract** The Jordan Rift Valley is a hydrologically closed basin with large parts under arid conditions. Nevertheless, the main economic activity is agriculture that critically depends on the availability of water. Freshwater and saline water co-exist in the aquifers, with a very sensitive equilibrium between them. The area suffers from water scarcity, and sustainability of the water resources utilization seems impossible under the actual demand situation. In order to increase the overall yield all existing water sources (freshwater, brackish and effluent) have been classified as valuable water sources. An inventory of the available water sources of all qualities, alternatives for their utilization and the implementation of a multi-criteria decision making procedure based on the Saaty's Analytical Hierarchy Process (AHP) were used for selecting the most appropriate alternative that increases the overall yield and allows the optimization and preservation of the water resources.

**Key words** Jordan Valley; arid zone; groundwater; IWRM; Analytic Hierarchy Process; water supply; Israel; Jordan