



The Water Evaluation and Planning Tool (WEAP): An Overview

Key findings

WEAP models and initial WEAP representations of regional and sub-basin water systems in the Jordan River basin were developed

The GLOWA Jordan River project has led to many useful WEAP applications throughout the JR basin, including:

- WEAP applications in the Upper Jordan River catchment (Briefing 2.3)
- Planning tool for the Palestinian Water Authority, supported by An Najah University (Briefing 2.5)
- WEAP coupling with the MODFLOW groundwater model for the Western Mountain Aquifer (Briefing 2.6)
- Central planning tool in Jordan's National Water Master Plan

integrative approach when analyzing the water resources of a region, such as was needed for the GLOWA Jordan River project. WEAP allows for the testing of different scenarios (situations varying in water supply, demand and quality), informing adaptive management strategies.

WEAP is used to develop and assess a variety of scenarios involving different physical changes to the regional water system, such as transfers or desalination, as well as socio-economic changes, such as population growth or policies affecting water allocations. The implications of these variables can be evaluated with WEAP's graphical display of results.

The WEAP tool was chosen for use in the GLOWA Jordan River project because of its intuitive and user-friendly interface, transparent data structure, its

integrative approach to water and land management (Figure 1), and its ability to accommodate available data as well as scientific models. For more specific or detailed analyses, e.g. on aquifer dynamics, water quality management, integrated water and energy planning, WEAP may be dynamically coupled to more specialized models.

GLOWA scientists, together with stakeholders from Israel, Jordan and the Palestinian Territories have developed conceptual WEAP models and initial WEAP representations of the regional and sub-basin water systems (Upper Jordan River WEAP, Western and Eastern Lower Jordan River WEAP).

Research Methods

The WEAP development for the Jordan River basin can be described as a nested approach, whereby various levels of scale are considered (sub-basin

Overview and Objectives

The Water Evaluation and Planning (WEAP) tool is a computer model based on waterbalance accounting principles, used to test different climate and socio-economic scenarios and adaptation options for water management. Use of WEAP is central to ensuring an

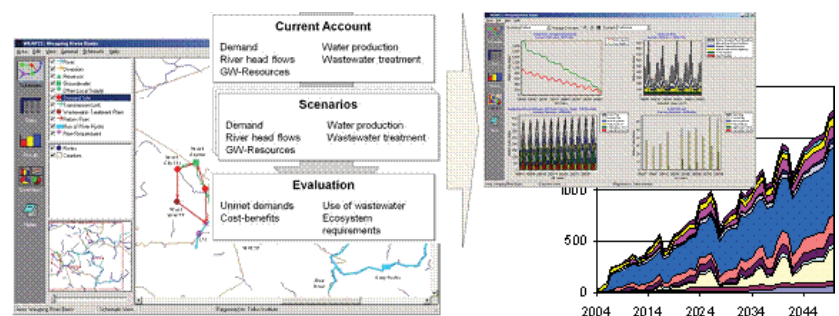


Figure 1: WEAP is characterized by a graphically well-organized display, a transparent set-up into current account and scenario conditions and a powerful set of display options to analyse results (e.g. impact of management decisions).

to basin). This nested approach to WEAP accommodates data of variable resolution and facilitates data sharing between different institutions.

The WEAP applications start from sub-catchments, addressing very specific local management options. These smaller-scale models have been developed by the respective national partners e.g. for the Upper Jordan River (Sivan et al. 2007), the West Bank (Almasri et al. 2009), Jordan Valley (Haering et al. 2009) and the Amman-Zarqa basin (Al Omari et al. 2011). Applications at higher levels, up to basin scale (Hoff et al. 2011), use aggregate information from sub-regional WEAP simulations (Figure 2).

Since its development, the GLOWA Jordan River project has led to many WEAP applications in the region. We have seen an increase in specialist knowledge throughout the project and in related research, governmental and non-governmental institutions (see Key findings).

A set of coordinated WEAP training courses has been held and integrated with graduate programs by An Najah University, University of Jordan and the Arava Institute. WEAP applications in the Jordanian Ministry of Water and Irrigation and the Palestinian Water Authority are linked to eco-hydraulic and socio-economic models developed by the GLOWA JR project (e.g. TRAIN, TRAIN-ZIN and SAS subprojects).

WEAP specialist training and scientific model integration (e.g. coupling climate, eco-hydraulic or socio-economic modeling) have been coordinated by the University of Tübingen in cooperation with the Stockholm Environment Institute.

Conclusions

The existing applications combined make WEAP a de-facto standard integrated water resource management tool in the Jordan River region, and represent the most significant tool introduced by the GLOWA Jordan River project. Numerous regional scientists and water managers have become proficient with WEAP, providing a strong base for further harmonization of planning efforts and consolidation of data.

Scientific model integration and basin-wide data exchange – a precondition for finding sustainable and politically viable water management solutions – have been fostered by the GLOWA Jordan River project via WEAP. Stakeholders have continuously stated the importance of an ongoing exchange between scientists and stakeholders, and introducing WEAP has improved the ability of these parties to engage in productive consultation and dialogue.

Current WEAP activities and the GLOWA Jordan River network of researchers and stakeholders provide an excellent base for transboundary initiatives addressing a sustainable water management and promoting cooperation in the Jordan River region.

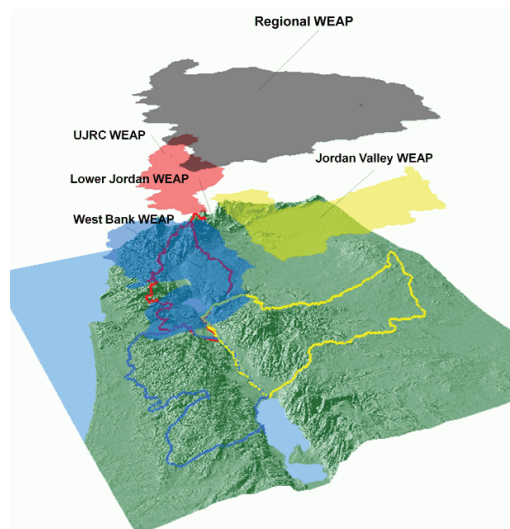


Figure 2: Visualization of the nested approach in GLOWA JR.

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