The value of water: Optimizing models for sustainable management, infrastructure planning, and conflict resolution*

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ABSTRACT

For any country with a seacoast, the possibility of seawater desalination puts a ceiling on the value of water. And that ceiling can be surprisingly low — so low that, with rational thinking, the assertion that the next war will be about water is the repetition of a myth. But the important lesson here is not that desalination is an answer to water disputes, it is that water is not beyond price and that thinking about water in terms of its value rather than in terms of quantities and ownership leads to powerful results. Together with colleagues, we have developed models on that basis: the first, called “WAS” for “Water Allocation System” was developed in the late 1990s for Israel, Jordan, and Palestine; the improved version, “MYWAS”, for “Multi-Year Water Allocation System” is now in development and use by the Palestinian Water Authority. In both versions, water is treated as a special commodity with the user enabled to impose constraints reflecting social values that are not private ones. MYWAS takes a list of possible infrastructure projects and returns advice on which ones should be built, at what time, in what order, and to what capacity. It also can be used to guide aquifer management and to study the effects of climatic uncertainty and climate change. Beyond this, the models lead to a plan for cooperation in water — a plan in which all parties benefit, buying and selling short-term permits to use each others’ water. Water disputes thus become win-win situations rather than zero-sum games. Further, while use of this system does not affect any party’s ability to assert claims to water rights and water ownership, we show that participation need not wait for such claims to be settled. Water is a soluble problem. We illustrate results for Israel, Jordan, and Palestine.

Keywords: Water value; Optimal management; Infrastructure planning; Dispute resolution

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