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Franklin M. Fisher, Annette Huber-Lee, Ilan Amir, Shaul Arlosoroff, Zvi Eckstein, Ammar Jarrar, Anan Jayyousi, Uri Shamir, Hans Wesseling, Munther J. Haddadin, Salem G Hamati. *Liquid Assets: An Economic Approach for Water Management and Conflict Resolution in the Middle East and Beyond.* Resources for the Future, 2005. 242 pp. $39.95 (paper), ISBN 978-1-933115-09-2.

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Middle Eastern Water Problems More Rhetoric than Reality

Liquid Assets is an important and useful book. It is important because it addresses a very important topic: the use and allocation of water in Israel, Palestine, and Jordan. It is useful because Franklin Fisher, Annette Huber-Lee, and their nine co-authors not only do a very good job of describing their technical approach but also because they directly and clearly address the political dimensions of water in the region. This book should not only be read by those interested in the political economy of natural resources in the region; it should be read by anyone who wants to understand how to make a thorough analysis of optimal water allocation in any part of the world. (Hear that, Californians?)

Here are their main conclusions: (1) Israeli-Palestinian cooperation over water (*not* exchange in water rights) can create benefits of about $100 million per year; (2) most Israeli desalination is not âworth it,â except in drought years;(3) without cooperation, desalination is necessary in Gaza; and (4) recycling plants in Gaza and the West Bank are a good idea.

Note this important implication of their conclusions: despite the political rhetoric (water rights, water security, human rights, thirsty children, etc.), the authors estimate âthat the value of the water in dispute between Israelis and Palestinians is considerably less than $100 million per year. Such amounts ought not to be a bar to agreement between nationsâ (p. 62). In other words, the âproblem of waterâ is not that big–about ten dollars per person per year, which ensures that economic constraints will not block negotiation. This quantification is useful as a counterbalance to the âlife or deathâ significance that partisans attach to their positions (but see more below).

As many would guess, the story behind the book is fascinating. In the preface, the authors describe how scholars from Israel, Jordan, Palestine, the United States, and the Netherlands worked together on the Middle East Water Project. After an early stage of establishing the project (1993â96), they worked on it until 1999, when the Al Aqsa Intifada (the âSecond Intifadaâ) stopped their work. This book summarizes what they accomplished.

The authors' main goal is to describe the supply and demand for water in the region. They use data and (reasonable) parameters to recreate the physical and economic space under which water is–and can be–allocated within and among countries in the region. They then use GAMS (General Algebraic Modeling System) to calibrate and estimate âoptimalâ water allocations. These allocations are then compared to actual patterns of water use to estimate system inefficiency. The GAMS model also allows them to find bottlenecks in the system–places where high âshadow valuesâ indicate that additional water or infrastructure would be valuable.

GAMS models are tricky to work with, calibrate, and explain, but they are sometimes the only way to see how a complex system works. Although the authors do an *excellent* job–their writing on water economics and simulations is some of the clearest I've ever read–the complexity of the topic and method of analysis is not for the *Freakonomics* crowd (I spent thirty minutes trying to understand table 5.2.2!). Overall, I think that they have used the best tool available and done an outstanding job explaining their method, assumptions, and results.

The book is divided into two parts. In part 1 (chapters 1â4), the authors discuss general methodology, their Water Allocation System Model, an agricultural submodel, and international conflicts and cooperation. In part 2 (chapters 5â8), they report on water use and efficiency *within* Israel, Palestine, and Jordan, as well as the value of bi- and multilateral cooperation among these countries. The institutional details of part 2 are very interesting, but–sadly–they confirm the destabilizing impact of subsidies for agricultural water use. Agricultural water users in Gaza pay only 2â4 cents per cubic meter (m^3) of water and consume two-thirds of Gazaâs available water supply. I really wonder what Gaza's leaders are thinking when their policies lead to this outcome. The authors do not necessarily say this, and in many places in this book they state many facts and then leave the drawing of conclusions to the reader. (The clearest example of this "diplomacy" is when they evaluate water supplies in East Jerusalem, giving that area to Israel in chapter 5 and to Palestine in chapter 6. They also point out that this exercise is mostly political, as the value of *water* under dispute in East Jerusalem is trivial.) That same situation (subsidized/cheaper agricultural water) is repeated to a lesser degree in Israel (relatively well managed) and Jordan, a country that has only 191 m^3 of water per capita–far below the United Nations Environment Programme's 500-m^3 threshold of âabsolute scarcity.â It is more sad than surprising that Jordanian farmers use 70 percent of that country's water, perhaps because they only pay 1.4 cents per m^3. (Recall that desalinated water costs \$0.60â1.00/m^3.) In chapter 8, the authors calculate and estimate the costs and benefits of various infrastructure and cooperation options. Although desalination has been touted as the be-all-end-all for the future, it is merely the solution to a worst-case scenario that would be necessary if–as we've seen for too long–politicians continue to fight among themselves and against the best interests of their people.

I hope that more people read this book. Then I hope that they take their copy into the legislatures, newspapers, courtrooms, and palaces and use the analysis to shift the debate away from "unbearable costs" and towards feasible solutions. It is obvious that the barrier to an economic, social, and environmental allocation of water is neither money nor technology but mere will. And when they do decide to âfix things,â the first people they should call are the authors of this book.

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