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BOOK REVIEW

Megdal, S.B., Varady, R.G. and Eden, S. (Eds). 2013. Shared borders, shared waters: Israeli-Palestinian and Colorado River Basin water challenges. CRC Press/Balkema. ISBN: 978-0-415-66263-5 (Hbk); 978-0-203-59768-2 (eBk). 293 pp. \$99.95.

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The three co-editors of this book state their "ambitious premise: that a coherent and useful set of information and analyses can emerge from a set of chapters treating an analogous set of issues in two similarly situated but distant and distinctive regions of the world" (p. 275). The regions in question are the State of Arizona in the United States, on the one hand, and the existing State of Israel and the nascent State of Palestine in the Middle East, on the other.¹ The book emerged from a workshop hosted by the University of Arizona in 2009 with the support of UNESCO that focused on water management and policy issues in the three areas. The attendees came from a wide range of disciplines united by their interest in examining the differences and similarities of "transboundary water management and cross-border cooperation in comparable environmental settings: natural scarce water resources under high pressure from various sectors" (p. ix).

It is indeed ambitious to believe that, a unified message might emerge and, if the book only partly realises that ambition, it is not for lack of effort. After all, it took some millions of years for that comparable environmental setting to develop without a bit of human assistance, and only about 100 years for the policies, practices and conflicts over water to develop, all a result of intense human action.

Apart from introductory and concluding notes by the editors, the book comprises 17 chapters organised into five sections. Section 1 is entitled 'Water Development: Infrastructure and Institutions' and contains three chapters that, for the most part, look backwards in order to tell us how we got to where we are today. I mean no disrespect when I say that they tell us who did what and to whom, and what difference it made. They are extremely valuable as an interpretive record that is too often obscured by efforts to avoid speaking about the inequities and environmental errors of the past.

Section 2 on 'Political and Economic Perspectives on Water' contains four chapters that, for the most part, look at the present to indicate how institutions (in the broadest sense of the term) deal with the present situation. Here the differences between the two regions become more apparent with three of the four chapters devoted to Israel-Palestine. Two of the chapters focus on water pricing with centralised pricing in Israel and decentralised pricing in Arizona. (Because water pricing in Palestine is divided between centralised pricing in the Ramallah-East Jerusalem-Bethlehem area, and local pricing

¹ Hereafter I use the term Israel-Palestine simply to avoid burdensome repetition. By this bit of short-hand, I mean only two political entities operating in the same geographical area. The fact that one is a formal state and the other a nascent state has no effect on the review.

and traditional exchanges elsewhere, it is difficult to generalise at this time.) The other two chapters focus on the options for reaching cross-border agreements in the face of conflict and uncertainty. Border issues in Israel-Palestine are contentious in a way that has little comparability with the Arizona-Mexico border region. Perhaps for this reason, the latter is discussed in a chapter in Section 1.

Section 3, 'Learning from Comparison,' somewhat surprisingly, contains only three chapters. Also somewhat surprisingly, two of these focus on areas that otherwise receive little mention in the book: water conservation and environmental ('instream') flows. In each case, the authors show that, despite differing histories, institutions, and policies, results are not all that different. With some exceptions – nature reserves in Arizona; drip irrigation in Israel – neither region stands out for either protecting environmental flows or promoting water conservation. There is no chapter devoted to water conservation in Arizona. Not only is this a gap but intriguing questions, such as why residents of Phoenix use 37% more water per capita than do residents of Tucson, are left unanswered. Sections 4 and 5, respectively 'Challenges, New and Old: Climate Change and Wastewater' and 'Expanding Water Supplies: Promising Strategies and Technologies', are a bit confusing as wastewater appears in both. The three articles on wastewater might better have appeared together in one section and the two articles on climate change and the two on desalination in another, possibly entitled 'New Challenges and New Technologies. (Reuse of wastewater, with or without treatment, is hardly a new technology.)

Apart from water conservation, wastewater reclamation and selective reuse are likely the biggest opportunity for Arizona to expand its available supply of water, yet it is one area where Arizona and Israel have followed different paths. Israel has a highly developed wastewater collection and reuse system with some 75% of municipal wastewater treated and reused, mainly for irrigation, some for aquifer recharge; it now accounts for one-third of all water used in Israel, far above the 4% in Arizona. One of the best parts of this book is the exploration of why, on the one hand, this difference persists between Israel and Arizona, and, on the other, between Israel and Palestine. The book also deserves credit for including a full chapter on longer-term effects of continued use of treated effluents on soils. Another case of the law of unintended ecological consequences seems to be that "all was not well in the land of milk, honey and recycled effluents..." (p. 221).

Two chapters look at projected impacts of climate change in Palestine and semiarid North America, the latter including Arizona. Palestine presents a worse case than Israel because of the significantly greater role of agriculture in the Palestinian than in the Israeli economy, and it is agriculture that will first feel the brunt of effects from climate change. Though the two chapters differ, perhaps because of the different scales – the North American takes a general approach and the Palestinian, a quantitative approach – results are very similar both in expected impacts and proposed mitigation measures.

The two final chapters review desalination experiences and opportunities. The main source in Arizona is saline water, most likely groundwater, whereas in Israel it is sea water. This creates a trade-off in costs: saline water is less expensive to desalinate than sea water, but disposal of salt-rich brines is less expensive in coastal areas than inland. At present, five relatively small 'desal' plants exist in Arizona, whereas Israel is one of the world leaders in the application of reverse osmosis technology with an annual capacity of 580 million m³ with more under construction. For both political and economic reasons, this pattern of small, locally appropriate desal plants in Arizona and large nationally important desal plants in Israel is likely to persist for at least another decade or two.

My primary concern about the book is the relatively light treatment given to water efficiency and water conservation, which are likely the cheapest and largest sources of 'new water' available either to Arizona or to Israeli-Palestine. (Briefly, water efficiency refers to cost-effective options whereas conservation adopts a triple bottom line – economic efficiency, social equity and ecological sustainability. Installing drip irrigation on a specific farm is an efficiency decision; deciding how much irrigation to accept in a given region is a conservation decision.) Study after study in a range of semiarid regions shows opportunities for cutting existing water use by 30% or more with cost-effective, off-the-

shelf technologies. Lacking are appropriate institutions, conservation pricing and a combination of communication and education to encourage and, ideally, promote widespread implementation. A chapter comparing the extent to which Arizona and Israel-Palestine have adopted efficiency and conservation measures, and exploring why they have not yet adopted more forceful policies would have complemented other chapters in the book.

It is difficult to identify individual chapters as outstanding, but, provided my selections are recognised as reflecting my personal values for both literary quality and substantive information, I feel free to choose my three favourites. Naama Teschner and Maya Negev provide as good a short history of water development in Israel as can be found anywhere else. Samer Alatout challenges the usual assumption that scientific methodologies are objective, and argues, instead, that "science speaks truth to power". And David Schorr demonstrates that neither Arizona's decentralised, nor Israel's centralised property systems, has been effective at protecting environmental flows.

Clearly, Medgal, Varady and Eden have produced a very useful book for anyone who studies or makes policy for water in semiarid ecologies. Whether it turns out to be an important book depends on whether it is really used. Certainly the price of US\$100 is going to be a barrier. As with any edited book, individual chapters vary in quality, though all tend to be information-heavy, as indicated by an 11-page index, three pages of 'acronyms' (more accurately, acronyms and initials), and two pages of definitions. Though the focus is on Arizona and Israel-Palestine, the judgements and the results are applicable much more widely. We still have much to learn about management of water in semiarid areas, and this book makes a big step forward.

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