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Franklin M. Fisher, et al., Liquid Assets: An Economic Approach for Water Management and Conflict Resolution in the Middle East and Beyond

Kathleen Potter

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tions to build upon notions of water tenure established in the older legal systems.

Chapter 10, *Routes to Water Rights*, argues that imposition of water rights by third parties (potentially consultants and bureaucrats) results in inefficient and often ineffective water use agreements. Transaction costs impact negotiation efforts for implementing water management policy. Lower transaction costs directly result in more successful policies. Using local rights and context, or legal complexity, rather than economic drivers, can result in a more efficient and feasible framework for water rights.

Chapter 11, *Analyzing Water Rights, Multiple Uses, and Intersectional Water Transfers*, relies on examples from India, Nepal, and Sri Lanka to argue that studies of intersectoral water transfers from agricultural to non-agricultural use in Western industrialized nations do not necessarily provide a useful model applicable for developing countries. The United States and Europe have well established regulatory and market processes for transfers that are not present in developing nations. To understand the viability of transfers in developing nations, the authors espouse using a perspective of legal pluralism, which considers the interplay of legal and social frameworks. The authors review the basic concepts of legal pluralism and discuss the ways rights and laws change in the context of intersectoral transfers.

In Chapter 12, *Water Rights and Legal Pluralism*, the editors draw upon the essays collected in this volume to show that an analytical method should consider the full context in which water control is situated, and that this context varies substantially based on local circumstances. An understanding of the dynamic activities of people's daily lives in specific contexts provides the broadest view of water rights. As a result, water policy imposed by academic and bureaucratic sources can achieve only modest results, especially in developing countries where control of water is an important source of power.

Although the essays in *Liquid Assets* do not employ a standard legal analysis structure, the collection presents a well-researched alternative understanding of the way laws affect the daily lives of water users. The legal complexity approach, while often deeply immersed in cultural theory, seems best suited for demonstrating the complicated relationship between state regulation and deeply embedded cultural notions of water use, especially applicable in developing nations. The book thus offers the most insight for those pursuing an interdisciplinary approach to law.

Paul Rodney

Franklin M. Fisher, et al., Liquid Assets: An Economic Approach for Water Management and Conflict Resolution in the Middle East and Beyond, Resources for the Future Press, Washington, D.C. (2005); 242 pp; $ 39.95; ISBN 1-933115-08-4, hardcover.

In *Liquid Assets: An Economic Approach for Water Management and Conflict Resolution in the Middle East and Beyond,* Franklin M. Fisher, Annetter Huber-Lee, Ilan Amir, Shaul Arlosoroff, Zvi Eckstein, Munther J. Haddadin, Salem G. Hamati, Ammar M. Jarrar, Anan F. Jayyousi, Uri Shamir, and Hans Wesseling provide a history of the Middle East Water Project and address the ways that an economic approach to water consumption can resolve disputes and lead to better water management. The authors begin with two key starting points: first, water scarcity is a matter of cost and value, not merely of quantity; second, the value of water and its scarcity will be different in different locations.

Part I of the book—Chapters 1 through 4—focuses on methodology. Chapter 1 describes the economic principles that can usefully be applied to water disputes, allocation, and management. This first chapter begins with the premise that competitive markets lead to an efficient and, in some sense, optimal allocation of resources, and economic analyses provide useful guidance on water management. The authors use shadow values, scarcity rents, basic theorems, and cost-benefit analyses to further make their point. Chapter 2 describes the Water Allocation System ("WAS") Model, which is a tool users can employ to analyze the consequences of various decisions and alternate circumstances, including private water demand, naturally occurring supply, treated wastewater, infrastructure and capital costs, and public policies toward water. The authors provide mathematics for this model in the chapter's appendix. Because of the significant differences between water consumption for households and agriculture, Chapter 3 explores the need for and usefulness of an agricultural submodel. In addition, Chapter 3 provides a mathematical representation of an agricultural submodel, applies the agricultural submodel to Israeli data, and discusses benefits and problems of agricultural sub-models. Chapter 4 addresses international conflicts and suggests ways that modeling efforts and accompanying analysis can be used to resolve water disputes. Notably, the authors suggest that if property rights in water are seen to be reducible to monetary values, negotiations over water can cease being limited to water itself and can be conducted in a larger context where water's value is measure against other things. Further, the authors posit that the availability of seawater desalination means that the monetary value of disputed property rights will generally not be very large. Moreover, the authors point out that water agreements that simply divide water quantities are fixed-quantity agreements that amount to a zero-sum game, whereas if permits were used and traded, especially when cooperation involves the construction of mutually beneficial infrastructure, the gains to all parties can increase and be greater than the value of the value of water property rights themselves. The authors' ultimate hope is for cooperation and trust in place of conflicts over water.

Part II—Chapters 5 through 8—addresses the detailed results of WAS models for Israel, Palestine, and Jordan, though not before thoughtfully discussing sensitive issues one would expect to arise regarding terminology, settlements, and ongoing political conflicts. The authors make their best efforts to remain fair and neutral to the extent this is possible.

Chapter 5 applies the WAS model to Israel and discusses the various assumptions and costs and benefits of infrastructure projects. The WAS model employs data from 1995 and covers water consumption and water demand curves, as well as supply data and the existing conveyance system. Chapter 5 also provides a section on administrative pricing versus competitive allocation and data projections for 2010 and 2020. Chapter 6 addresses the results for Palestine, beginning with a brief discussion of natural features and data on water consumption, population, and available water supply, including existing infrastructure. Following this, the authors provide an analysis of the current situation, as well as projections for future conditions, with analyses of several possible scenarios for Palestine's future. Again, the model results are based on data from 1995, and there are projections for 2010 and 2020. Chapter 7 presents important background and the results of the application of the WAS model to Jordan, which the authors note is one of the most arid countries in the world. The results of this application, based on 1995 data, confirm Jordan's need for a new infrastructure to control for leakage and to bring additional supplies to Jordan's urban areas. The authors also evaluate the projects that are most cost-effective and provide projections for 2010 and 2020.

Chapter 8, the final chapter, addresses the value of cooperation and ways WAS models can be used to resolve water disputes. The authors conclude that if water and water disputes are monetized and analyzed in terms of economics, taking full account of water's social and national value, which may exceed its private value, and each party can use its own version of WAS models to evaluate the consequences of different water agreements, there will be more cooperative agreements that are most beneficial to all.

Kathleen Potter

William Ashworth, Ogallala Blue: Water and Life on the High Plains, W.W. Norton, New York, NY (2006); 416 pp; $26.95; ISBN 0-393058-42-5, hardcover.

A body of water that stretches under 174,000 square miles and eight states garners many creative metaphors. Jim Goeke, a hydrogeologist and professor at the University of Nebraska offers one of the more instructive comparisons in William Ashworth's *Ogallala Blue.* To Goeke, the Ogallala Aquifer is like an elephant in a dark room: "the man who feels the elephant's trunk thinks the animal is like a hose, the