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network.

In the final chapter, *Politics and Biopolitics*, the author proposes a concept of ecological governance. This concept views water in ecological terms in addition to seeing it as a resource input to water supply systems. The most widely-promoted alternatives to privatization – the human right to water and various forms of community water-supply management – address redistributive concerns in economic and social terms. They overlook, however, important environmental aspects of the urban water crisis: water scarcity, threats to water quality, and ecological sustainability. The author argues that policy makers must take these environmental issues into account in order to successfully address the urban water crisis. Environmental concerns are central to the livelihoods of the urban poor because degraded environmental quality is costly in both health and economic terms. Ecological governance, therefore, incorporates environmental concerns to better remedy both the social-economic and the ecological injustices suffered by the urban poor.

Privatizing Water offers novel insight into the contemporary debate over urban water supply management. The first part of the book provides an analysis of the conventional public-versus-private delivery models and examines the limitations of both models. The second part of the book puts forth a new framework for examining the urban water crisis that incorporates a human right to water, community participation, and ecological governance. The book would be an asset to policy makers involved in urban water issues and to anyone interested in water law and environmental justice.

Richard Lynch

Aline Baillat, *International Trade in Water Rights: The Next Step*, IWA Publishing, London (2010); 242 pp; \$142.20; ISBN 978-1-843-39361-0; paperback.

Aline Baillat holds a Ph.D. in International Science from the Graduate Institute of International and Development Studies in Geneva. She developed the thesis for this book during her doctoral research from 2003 through 2008. The book explores the consequences of classifying water as an economic good in domestic water policies and the subsequent effect on international watercourse management.

The *Introduction* discusses the effect of property regimes on international watercourse management. Baillat states that water is a multi-property regime resource because multiple users, both public and private, compete to use watercourses for a multitude of purposes. Baillat focuses on the question of how to allocate property rights among competing users, particularly for international watercourses. She argues that a lack of clearly-defined water rights along international watercourses could lead to an inequitable distribution of

water resources. Finally, Baillat lays out her research method and divides the book into three parts: *Water as an Economic Good in Domestic Water Reforms*, *Trade in Water and International Water Law*, and *Market-Based Solutions along International Watercourses*.

Part One, *Water as an Economic Good in Domestic Water Reforms*, tracks the worldwide trend of treating water as an economic good.

Chapter One, *The International Recognition of Water as an Economic Good*, discusses the recent trend in watercourse management of moving away from the historical view of water as a basic human right to treating water as an economic good. Baillat explains that this paradigm shift resulted from a change to demand management policies. Historically, societies attempted to move water from water-rich areas to places where water was scarce. However, these practices became overly expensive and damaging to the environment. Economic models were developed to meet these challenges; however, the models have failed, due largely to the difficulty of accurately calculating the cost of water. One example is the calculation of opportunity cost. Opportunity cost is the value of water at its highest alternative use. The calculation produces the cost associated with scarce water resources.

In the water market approach, which places water in a commodities-type trading system, the introduction of opportunity costs help to regulate demand and ensure efficient allocation of resources. The current trend in water market pricing models is to now include opportunity cost. However, challenges exist in determining opportunity cost across different water users, like agricultural and retail water. Essentially, these disparate users are not comparing the same product. Therefore, in these cases, policy makers should use the net marginal benefit calculation (marginal benefits minus marginal costs) to derive a figure more representative of actual opportunity cost. Baillat points out that the World Bank seems to endorse opportunity cost price models, and the leading trend in water markets is toward the formalization of water rights and the introduction of trading systems.

Chapter Two, *Evolution of Water Rights and Domestic Water Reforms*, begins by tracking the evolution of water law through Roman, English, French, and American courts. Baillat next discusses possible domestic water reforms, which treat water as an economic good through license and permit systems. Licensing and pricing policies require a comprehensive approach and usually use an advanced administrative method to fix prices. However, administrative pricing models do not incorporate opportunity cost, which means the model fails to account for the scarcity of the resource. International watercourses compound these challenges. Baillat suggests that policy makers, increasingly, have presented water markets and tradable water rights as the most appropriate vehicles in international water reform.

Chapter Three, *Water Market Systems*, compares characteristics of water markets throughout the world. A water market is an institutional design that facilitates the reallocation of water among different uses through voluntary exchanges between buyers and sellers of water

rights. Baillat uses the following criteria to characterize and compare different water markets: (1) issuance of water rights; (2) definition of water rights; (3) water reduction risk assignment; (4) procedures in case of a shortage; (5) transfer procedures; (6) environmental protection; (7) right to return flow; and (8) dispute over water uses. Baillat concludes that the water reforms implemented by most countries are insufficient because water resources are not easily measurable or controllable. She notes, further, that U.S. policies treating water as an economic good have been associated with the inclusion of water resources into the public domain of the state. As such, policy makers who wish to establish water markets at the international level would require states to recognize international watercourses as common property.

Part Two, *Trade in Water and International Water Law*, focuses on the principles governing international watercourses and international trade law's interference with using international watercourses for non-navigation purposes.

Chapter Four, *The Property Regime of International Watercourses*, focuses on identifying the property regime of international watercourses using existing international water law. Baillat first argues that international water law is not adequately developed. Specifically, she explains that not enough countries have ratified the 1997 United Nations Convention on the Law of Non-Navigational Uses of International Watercourses, the most significant attempt at defining the property regime of international watercourses. Further, the current body of international law has failed to address issues like priority of use, compensation, and future use. In addition, the international water agreements that do exist are deficient because they do not represent all affected riparian states or they lack adequate enforcement mechanisms.

Baillat next delves into international water transfers by examining a proposed transfer agreement between Turkey and Israel. If the countries consummate the agreement, it will be the first international agreement for the sale of bulk water. Baillat then contrasts the Lesotho Highlands Water Project, a non-commoditized international water transfer agreement between the Kingdom of Lesotho and South Africa. She concludes the chapter by stating that the increasing need for nations to transport water over large distances at great cost signals a growing water scarcity and shows that nations have begun treating water as an economic good. Accordingly, she states that it is prudent to develop a property regime for international watercourses that incorporates water rights for all upstream and downstream riparians to ensure equitable apportionment.

Chapter Five, *The Relationship Between International Trade Law and International Water Law*, states that international trade law ("ITL") conflicts with international water law ("IWL") when a common property regime for an international watercourse is not established. International trade law is ill equipped to deal with the nuances of water transfers because it disregards the complex web of public

interests associated with natural water, unlike a readily tradable commodity, which requires no such evaluation. Baillat highlights the conflicts created when international trade law and international water law intersect by analyzing water transfer controversies in the Great Lakes region of the U.S. She first lays the groundwork of international water law in the region by describing the 1909 Boundary Waters Treaty (“BWT”), which established the International Joint Commission (“IJC”) to control matters that affect the flow and use of the Great Lakes. Second, Baillat examines the differing opinions between the Great Lakes Governors and the IJC on water trade. She notes that the IJC makes a clear distinction between water in “its natural state” and water “entered into commerce,” but the IJC still fails to make such a distinction between trade in water and trade in water rights. Finally, Baillat shows how the 2005 Great Lakes-Saint Lawrence Agreement and Compact (“2005 Agreement”) wrestled control of the Great Lakes Basin away from the IJC and, in the process, empowered the regional states and provinces. Baillat concludes that shifting power to the regional authority was an effective way to avoid potential future diversions of Great Lakes waters to the United States’ Southwest under the United States’ Dormant Commerce Clause.

Baillat emphasizes how the case, *Sporhase v. Nebraska*, illustrated a poorly defined property regime that created a conflict between state and federal public interests. In *Sporhase v. Nebraska*, the Supreme Court of the United States held that water is an article of commerce; however, water’s special characteristics exempt it from scrutiny under the Commerce Clause. Baillat analogizes the holding in *Sporhase* to her previous discussion of the 2005 Agreement, concluding that the 2005 Agreement establishes a clear property regime, which vests water rights in the regional public interest.

Baillat next discusses water rights at the international level in a case between Texan irrigators and Mexico filed under Chapter 11 of the North Atlantic Free Trade Agreement, concerning the Rio Grande Basin. Over a period of ten years, Mexico withheld water of which the Texan irrigators claimed they were investors. At arbitration, the tribunal decided in favor of Mexico because the Texan irrigators were not investors in Mexico. Baillat contrasts this case with the Great Lakes case. The Texas case highlights the many layers of decision-making and management rules for an international watercourse, which ultimately led to a poorly constructed property regime. In the Rio Grande Basin, each country maintained water rights over the water within its borders, whereas in the Great Lakes Basin, the U.S. and Canada defined the property regime in favor of the public interest. Baillat ultimately concludes the chapter by stressing that clearly defining the property regime for international watercourses is important to avoid clashes between international water law and international trade law.

Part Three, *Market-Based Solutions along International Watercourses*, presents two domestic water market case studies, the Colorado River Basin and the Murray-Darling Basin, as bases for applying water

markets on the international level. Baillat uses domestic case studies because an international water market does not yet exist.

Chapter Six, *Economic Approaches to International Water Disputes*, begins by presenting Franklin M. Fisher's idea that conflict resolution in Israel and Palestine may be possible by monetizing the water resources there. Baillat criticizes Fisher's theory for failing to (1) recognize the substantial effect of agricultural subsidies; (2) address transactional costs; and (3) provide institutional and regulatory approaches. Baillat recommends a broad property regime be established that includes a common decision making body with a preference for water use rights instead of ownership rights.

Chapter Seven, *Colorado River Basin Case Study*, examines what form an interstate water market in the Rocky Mountain region might take and discusses the legal, environmental, and social consequences of such a market. The chapter begins with a description of the Colorado River Basin and then moves on to discuss the "Law of the River," which divides the basin into two sections: the Upper Basin (Colorado, Wyoming, Utah, and New Mexico) and the Lower Basin (Nevada, Arizona, and California). The 1922 Colorado Compact, the first water compact in U.S. history, allocated water equally between the Upper and Lower Basins. In 1990, the Lower Basin states exceeded their water allocation for the first time, which prompted negotiations over interstate transfers and a water bank. In response, Arizona created the Arizona Water Banking Authority ("AWBA") to secure Arizona's unused apportionment of the Colorado River, which it intended to sell to California and Nevada. The AWBA scheme seemed to contradict the beneficial use doctrine included in the Law of the River; however, the federal mandate of Intentionally Created Unused Apportionment ("ICUA"), created after the AWBA under the Secretary of the Interior, specifically counts water banking as a consumptive use. Further, ICUA allows the sale of water between states without Federal approval. As Baillat points out, the ICUA allows beneficial use to now be interpreted as commercial use, which is far from being widely accepted.

Next, Baillat discusses the Basin's drought plan and concludes that the negotiations concerned ownership rights as opposed to authorized uses. Baillat states that private ownership of unused water on the Colorado River is evidence of the lack of a common property regime. In addition, Baillat proposes a more equitable calculation of water deliveries to Mexico but states that the Bureau of Reclamation's preferred alternative recommendation is to let Mexico participate in the Intentionally Created Surplus Program ("ICS"). ICS is a conservation program that augments water storage in Lake Mead, allowing different entities to bank credits for later use. ICS can be created by tributary conservation, importing water into the system, and through system efficiency. Baillat believes that if Mexico is allowed to participate in ICS the Colorado River Basin could become the first international water market. Finally, Baillat states that the ICS program will provide more flexibility in the management of the Colorado River

Basin and that ICS credits may become tradable. However, in order for this market-based scheme to work, Baillat recommends that Colorado River water be defined as common property and a permanent decision-making authority be implemented to govern the entire Basin.

Chapter Eight, *Murray-Darling Basin Case Study*, contrasts Australia's interstate water trading system with that of the Colorado River Basin. The chapter begins with a description of the Murray-Darling Basin ("MDB"). The most significant accomplishment of the 1915 Murray-Darling Basin Agreement ("1915 Agreement") was establishing a commission to regulate the flow of the river. The 1915 Agreement, modified in 1992, brought about significant institutional reforms. In 1994, national reforms incentivized increased interstate competition in the areas of energy, water, and public works. Thus, water trading across state lines became a new standard in the MDB.

The Commission created a pilot water trade program, which the Commission reviewed in 2000. The review noted slow growth of water trading because of administrative problems and drought. In response to the National Water Initiative, an attempt to revive the 1994 reforms, the Commission expanded the pilot program. However, the states could not agree on a standardized system for interstate trading. The deadlock resulted in federal intervention through the Water Act of 2007 ("Act"). Under the Act, the Federal government wrestled management of the MDB away from the states. Baillat found that excessively-liberal water rights contributed to overuse of water resources in the MDB. Moreover, establishing a water market did not bring consumption rates back to sustainable levels. In fact, introduction of the water market increased water use. Baillat predicts the imposition of the Federal government into the MDB will create uniformity in the system and accelerate trading. Baillat concludes that the new Federal plan will likely lead to better outcomes than before, and Australia will remain an interesting vehicle by which to study the evolution of water markets.

The chapter concludes with an application of the lessons learned from the comparison of the CRB and MDB to international watercourses. First, Baillat notes that changing the definition of previously-allocated water rights in the CRB presents a significant obstacle to water reform because the 1922 Compact granted many water rights in perpetuity. Further, the lack of a unified governing body in the CRB substantially impairs the region's ability to create cohesive reforms. Conversely, the MDB did not grant water rights in perpetuity. In addition, the MDB more clearly defined its participants' water rights and did not face the obstacle of prior appropriation as in the CRB. However, water markets should not be expected to reduce consumption. Rather, Baillat states the lesson to draw from the aforementioned comparison is that policy makers must base interstate water markets on sustainable, scientific basin plans. Baillat doubts this lesson could apply to an international watercourse.

The final chapter, *Conclusion*, asserts that defining the property

regime around international watercourses is an essential step to resolving water conflicts. The distinction between trade in water and trade in water rights is critical. International watercourse governance requires a common property regime and strong institutional framework; without these in place, a sustainable water plan is unlikely to proceed.

International Trade in Water Rights: The Next Step tackles the complex notion of international watercourse management in a comprehensible way. Baillat cohesively links the theme of property regime to each theory she discusses in the book. She argues effectively that water use rights are better suited as a basis for water markets than ownership rights. Baillat's case studies of the CRB and MDB ameliorate the principal weakness of the book, the world's lack of an existing international water market to study. The book is a must-read for practitioners in the CRB and MDB and those interested in the future of international water markets.

Dustin Charapata

The World Economic Forum Water Initiative, Water Security: The Water-Food-Energy-Climate Nexus, Island Press, Washington D.C. (2011); 248 pp; \$30.00; ISBN: 1597267368; paperback.

The World Economic Forum Water Initiative's *Water Security: The Water-Food-Energy-Climate Nexus* ("Water Security") captures the progress of the call to action, initiated in 2008, by business leaders and the world's governments to engage in a discussion of the interconnectedness of water, economic growth, food, energy, climate, and human security. *Water Security* addresses the global water challenge based on years of collaborative work and debate among more than three hundred and fifty public and private actors, such as CEOs, water experts, NGO heads, scientists, and international officials. *Water Security* provides a troubled outlook on the world's water situation, stressing that current water practices around the world cannot continue for the next two decades or else much of the world may suffer harm to economic growth, human well being, and national security. However, *Water Security* also offers a positive outlook, and case studies that serve as examples for the way forward.

The *Introduction* lays out the basic problem: the world is running out of water. It also provides an overview of relevant data. For instance, the author states that global demand for food, water, and energy will increase due to population growth, economic growth, and urbanization in the next two decades. By 2030, two-thirds of the world's population could experience high water stress if current trends continue. The *Introduction* also discusses the effects of climate change on food supplies, employment, and income linked to the agricultural sector. The *Introduction* further explains that each of the first nine chapters provides a forecast and implications of the water crisis if the