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Marketing Conserved Water

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MARKETING CONSERVED WATER

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Water law scholars have long supported water markets for addressing critical water needs, especially in arid regions like the western United States, and that support seems to be growing among policymakers as well. But translating academic theories about water markets to the field has proved challenging. To be sure, water can be transferred from one use to another use in all western states, but water markets in those states are not presently capable of providing prospective buyers with a reliable source of water when and where they need it. The reasons are myriad, but are primarily related to the high transaction costs and significant lead times needed to consummate transfers. Under the current system, no municipal water supplier in the western United States can guarantee its customers the water they demand if they are forced to rely on the availability of water on the open market.

Remarkably, Australia has managed to adapt its water rights system in such a way that water markets have flourished. The water rights regime in the western United States is different in some significant ways from the Australian system, and thus it is unrealistic to think that the western states can duplicate Australia's experience and success. But there are important lessons to learn from an Australian

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transfer system that has cut approval times for temporary transfers to less than five days and for permanent transfers less than twenty days.

One way for western states to make progress towards developing functioning water markets is to cabin the scope of a marketing program so that it has a better chance of garnering the support of affected parties, and in particular the farmers who will be selling their water to cities for domestic and industrial uses. By focusing on "conserved water"—defined here as water that was previously but is no longer consumed by the water user—states will find it easier to adopt reforms that can provide farmers with incentives to make some portion of their water available for other uses. Farmers can keep farming even as they find ways to use less water to grow profitable crops.

Agricultural scientists have made great progress towards identifying and refining techniques for maintaining stable crop production even while using less water. These techniques, which include deficit irrigation, crop switching, and rotational fallowing, have the potential to free up enough water to serve western communities for many years to come, even in the face of severe, sustained drought. But the law has yet to catch up with the science, and in most western states, transferring conserved water is not legally possible. Even where it is allowed, the process remains too cumbersome. This Article begins a discussion about overcoming the legal obstacles to marketing conserved water and suggests modest and practical reforms to current law that could finally open the western United States to robust water markets.

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I. INTRODUCTION

Irrigated agriculture dominates world water use, accounting for approximately 70% of water withdrawals and as much as 93% of water consumption worldwide.[1] Water consumption for agricultural use is especially high in the more arid regions of the world where it has the greatest potential to create tension with other water needs, especially for domestic use.[2] And as the demand for water grows and as water resources become scarcer, the importance of developing strategies that can move agricultural water to other uses has become increasingly urgent. Yet wholesale reform of current legal limits on water transfers seems unlikely, in

1 KERRY TURNER ET AL., ECONOMIC VALUATION OF WATER RESOURCES IN AGRICULTURE 3 (2004); UNITED NATIONS WORLD WATER ASSESSMENT PROGRAMME, UNITED NATIONS' WORLD WATER DEVELOPMENT REPORT: BACKGROUND BRIEF (2012), *available at* http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/SC/pdf/WWDR4%20Background%20Briefing%20Note_ENG.pdf; *see also* IGOR A. SHIKLOMANOV, WORLD WATER RESOURCES: A NEW APPRAISAL AND ASSESSMENT FOR THE 21ST CENTURY 24 (1998) (noting that in 1998 agriculture accounted for 67% of total water withdrawal and 86% of consumption).

2 UNESCO, Facts and Figures from the United Nations World Water Report 4: Managing Water Under Uncertainty and Risk 1, 3, 5, 7, 10 (2012), *available at* http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/SC/pdf/WWAP_WWDR4%20Facts%20and%20Figures.pdf (discussing regions suffering from absolute water scarcity and noting that in Iraq, Oman, Syria, and Yemen, agriculture accounts for 90% of water use).

large part because of opposition from the agricultural sector to such reform.[3] For this reason, reform advocates should embrace a narrower effort that focuses on transferring "conserved" water, defined here to encompass only that portion of water that was previously consumed but that is no longer consumed in the agricultural enterprise. If so limited, conserved water transfers can be consummated without undermining the economy of local farming communities and for that reason should face far less opposition. They might even garner agricultural community support.

Several promising methods for conserving significant amounts of agricultural water have emerged from the work of agricultural research scientists, including, for example, deficit irrigation, crop switching, and rotational fallowing of land.[4] Providing farmers with economic incentives to adopt these strategies, however, has proved challenging in some parts of the world due in large part to the property rights regimes for water.[5] Specifically, where water rights are defined in terms of "beneficial use" for a particular purpose, and where transferring conserved water to other uses is constrained by law, as it is, for example, in the western United States, the market is not able to function in a way that promotes agricultural to urban water transfers, even where the transferred water is made available through water conservation by agricultural users.[6]

Australia has moved aggressively, and by most accounts successfully,[7] to promote water marketing in the Murray–Darling Basin as a way to address severe water deficits in the most populous region of that vast country. Australia's reforms have been far-reaching, going well beyond "conserved" water,[8] and they may not be practical in other parts of the world, including the western United States. Nonetheless, Australia's experience may offer lessons to the western United States and other regions of the world as they consider whether and how to use water markets to stretch what otherwise might appear to be inadequate water supplies.

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3 *See, e.g.*, TERESA A. RICE & LAWRENCE J. MACDONNELL, AGRICULTURAL TO URBAN WATER TRANSFERS IN COLORADO: AN ASSESSMENT OF THE ISSUES AND OPTIONS 2–5 (1993), *available at* http://scholar.law.colorado.edu/cgi/viewcontent.cgi?article=1063&context=books_reports_studies.

4 Bruce Aylward, *Environmental Water Transactions: Reducing Consumptive Use*, *in* ENVIRONMENTAL WATER TRANSACTIONS: A PRACTITIONER'S HANDBOOK 106–07 (Bruce Aylward ed., 2013), *available at* http://www.ecosystemeconomics.com/Training_files/Ch_7_EWTs-Reducing%20Consumptive%20Use.pdf.

5 *See id.* at 108 (explaining the difficulty of implementing incentive programs).

6 *See, e.g.*, RICE & MACDONNELL, *supra* note 3, at 6–7 (explaining the limitations on water transfers under Colorado law). These economic disincentives are often reinforced by a political system that tends to favor and protect historic agricultural users.

7 *See, e.g.*, M.W. Rosegrant et al., *Water Markets as an Adaptive Response to Climate Change*, *in* WATER MARKETS FOR THE 21ST CENTURY: WHAT HAVE WE LEARNED? 46 (K. William Easter & Q. Huang eds., 2014); MICHAEL D. YOUNG, ENVIRONMENTAL EFFECTIVENESS AND ECONOMIC EFFICIENCY OF WATER USE IN AGRICULTURE: THE EXPERIENCE OF AND LESSONS FROM THE AUSTRALIAN WATER REFORM PROGRAMME 8 (2010), *available at* http://www.myoung.net.au/water/publications/OECD_Lessons_paper.pdf.

8 *See, e.g.*, YOUNG, *supra* note 7, at 6, 18.

This Article begins by examining the opportunities for conserving water in the agricultural sector. It asks not only what the opportunities are but also what the technical and legal obstacles might be. It then pivots to a discussion of the Australian experience with water marketing. In particular, it asks whether that experience can help inform an effort to implement narrower reforms that would promote agricultural water conservation by farmers in the western United States and other parts of the world. This leads to a fulsome discussion of strategies for resolving the technical and legal obstacles to conserved water transfers in the western United States. The Article concludes with a review of specific institutional and legal reforms that might be employed to overcome the current obstacles to a robust water market.

II. WATER SAVINGS FROM AGRICULTURAL WATER CONSERVATION

Not all agricultural water conservation is alike. Water losses that are reduced through more efficient delivery systems and application techniques may shrink water withdrawals and limit run off from irrigated lands but they can also increase water consumption.[9] Depending on where the agricultural lands are situated, such efficiencies can also deprive downstream users of water that they would otherwise receive in the form of agricultural return flows.[10] Likewise, efficiencies can sometimes have adverse ecological consequences, such as where natural streamside vegetation is removed to reduce evapotranspiration.[11] On the other hand, some promising water

9 Several methods can be used to change the amount of water withdrawn during delivery application. Ditch lining is the installation of an impervious material, such as urethane or concrete, in an existing or newly constructed field ditch. TEX. WATER DEV. BD., WATER CONSERVATION BEST MANAGEMENT PRACTICES GUIDE 226–27 (2004), *available at* http://www.twdb.texas.gov/publications/reports/numbered_reports/doc/r362_bmpguide.pdf. Conservatively, concrete linings should be able to salvage 80% of the seepage that would occur in an unlined ditch. *Id.* at 227. Center pivot irrigation describes a number of sprinkler technologies where the sprinkler system can rotate around a fixed pivot. *Id.* at 231–32. Depending on the type of system used and the system replaced, new systems can be up to 50% higher in application efficiency. *Id.* Drip irrigation systems allow water to flow directly onto the soil, or into the root zone of crop plants. *Id.* at 234. For corn, researchers in Kansas have found that subsurface drip irrigation has the potential to reduce water needs by 25%. F. R. Lamm et al., *Water Requirements of Subsurface Drip-Irrigated Corn in Northwest Kansas*, 38 TRANSACTIONS OF THE ASAE 441, 447 (1995), *available at* http://www.ksre.ksu.edu/sdi/reports/1995/WaterReq.pdf.

10 UNITED NATIONS EDUC., SCIENTIFIC, AND CULTURAL ORG., WORLD WATER ASSESSMENT PROGRAMME, THE UNITED NATIONS WORLD WATER DEVELOPMENT REPORT: WATER AND ENERGY 60 (2014), *available at* http://unesdoc.unesco.org/images/0022/002257/225741e.pdf. *See also* Frank A. Ward & Manual Pulido-Velazquez, *Water Conservation in Irrigation Can Increase Water Use*, 105 PROCEEDINGS OF THE NAT'L ACAD. OF SCI. 18215, 18219 (2008).

11 *See, e.g.*, Se. Colo. Water Conservancy Dist. v. Shelton Farms, Inc., 529 P.2d 1321, 1327 (Colo. 1974) (holding that water salvaged through the removal of non-native tamarisk was still subject to the call of the river). The court's decision was partially driven by a policy interest; it considered "whether the granting of such an unique water right will encourage denuding river banks everywhere of trees and shrubs which, like the vegetation destroyed in these cases, also consume the river water." *Id.* at 1324. However, there are circumstances in which removal of

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