



Thematic Week: Water Economics and Financing

Thematic Axis: Water Markets

Title: Beyond Water Marketing Myths

Author: Griffin, Ronald C.

Department of Agricultural Economics, Texas A&M University, USA.

Summary:

The challenge in isolating the opportunities and pitfalls of water marketing is to accurately apply available doctrines and experiences. This is an arena in which loose rhetoric and unrefined arguments have contributed confusion. The goal here is to move beyond marketing myths by compiling clear information about pivotal elements of the marketing versus nonmarketing debate. The primary concepts are defined and applied, and some general evidence emerging from actual water markets is assembled. The discussion concludes with an abridged list of available insights.

Key words: water marketing, water policy

1. Dismissing the Extreme Positions

The prospects for getting good public service from water marketing – and there certainly is some appeal – cannot be understood until terms and experience are well applied. Likewise, the disappointments of water marketing (WM) are not genuinely revealed when ideological doctrine is permitted to overshadow facts. There are two broad ideologies that clash over this topic. They produce opposing opinions on the merits of WM. Neither of the ideologies is sufficiently grounded in the facts of water scarcity to hold our attention, but they are worthy of note so that their inherent confusions do not mislead judgments of WM.

Anti-water-marketing dogma usually espouses a forceful, water-is-different-from-ordinary-commodities view that is attained by overextending our biological requirements for water (resulting in non-needs being classified as needs), confusing capital scarcity with water scarcity, and/or citing the general public's alleged entitlement to water. There is a lot of false imagery that may underlie these views (Kelso 1967), obscuring both the nature of water scarcity problems and the true character of available policy approaches. Water marketing opponents may add other supporting arguments for good measure, but these arguments tend to be secondary to their primary concerns (and weakly founded too).

To move into central territory quickly, two brief points will complete my review of this ideology. First, it must be acknowledged that supplying water is a notoriously capital-intensive process. Often, the pivotal social problem is the scarcity of capital for pumping, capturing, processing, and conveying water, or for collecting and treating wastewater. This is not a problem to which the notion of water marketing is even applicable, and it is a mistake to confuse the privatization of *facilities* with the assignment of private property in water. Owners of a privatized facility need not and commonly do not own marketable water rights, because privatization has rarely overlapped with legal systems of private property rights to water. Second, regarding the ideal that all members of the public have a right to water, all people do have this right if a government's political process decides they do, just as a society may decide all people have a right to food, a threshold wage, a roof, grazing land, health care, etc. Yet, this sidesteps the question. Societies often manage important resources by creating private property in these resources, presumably motivating better responses to the scarcity of these things. Ultimately, all resources are publicly owned since even private property requires public sanction. Private property is simply an institutional instrument by which a government might advance its people's welfare. This strategy has often been successful for nonwater goods. Moreover, it is not uncommon for a government to partition a resource or commodity – assigning private rights to a portion of it while keeping the remainder within the public domain (such as private land and park land). Whether a full or partial private property strategy can be usefully applied to naturally occurring water is the question at hand, so it is not helpful to reject WM on the grounds that it conflicts with public rights.

A polar ideology is forwarded by those who hold fast the belief that economic performance is best advanced by a market system. Mainstream economists often advocate this view, as do probusiness and freedom-of-choice factions. These groups express a faith in market performance. Some have difficulty in appreciating why water might be different, because a market system appears omnipotent to them. Advanced degree economists even have an indisputable, mathematically developed theorem proving that a market system for all commodities will result in a formally efficient economy. Consequently, economists and their students are well indoctrinated about the power of markets, so much so that they may begin to neglect the special conditions that are required for this ideology to be applicable. That is, the theorem has conditions, and – here is the tripping point – some of these conditions are unmet when the commodity under consideration is water. This pitfall is well appreciated within certain specialty fields of the economics discipline, yet these specialists are in the minority, and their messages are too inaccessible or unwanted to be

Beyond Water Marketing Myths

influential among the market-faithful crowd. Thus, the critique here is that water is sufficiently different to derail disciplinary ideology about market performance.

Thus, truth lies somewhere in the middle.

2. Assembling Facts and Open Questions

If we can openly examine water marketing without prelabeling it wicked or saintly, where is there a positive role for marketing to play and how are we to discern those circumstances? We can converge upon answers to these questions by applying two types of information. First is the conceptual details that outline the choices before us. Second is the experience that has been accumulated with actual water markets. These two sources of knowledge produce the finding that water markets can improve water management in many situations, yet administrative controls and limits are needed.

Conceptual Details for a Proper Debate

To properly apply economic principles to the issue of WM, respect of certain definitions is mandatory. Concepts to be addressed immediately include dichotomies about (1) publicly owned goods versus public goods; (2) public good water uses versus a private good water uses; (3) market versus nonmarket failures, and (4) natural water as it occurs in the environment versus the processed water that is received by end users.

Public property in water does not infer that water is a public good. Ownership and commodity character are technically distinct matters. These are two separate concepts, yet public *goodness* (when actually present) does raise suspicions about private property's ability to assist water scarcity problems.

It is appropriate to rely on strict economic doctrines when examining market performance properties. One requirement is to appreciate economics' careful illumination of public goods. Definitionally, a pure public good is both *nonrival* in its use and *nonexclusive*. Acting in concert, these two properties limit the ability of a market to produce and allocate a commodity efficiently. Hence, the more a given water use takes on these two public good attributes, the less likely it is that water marketing is a beneficial instrument for managing that use.

It is a gross oversimplification to label water as a public good, yet some *uses* of water do constitute public goods. To get the matter correctly resolved, one must emphasize the different uses of water as distinct units or commodities and then ask the nonrivalness and nonexclusivity questions. Consider a farmer using water for irrigation. As a result of this irrigation, some of the applied water evaporates or transpires into the air or seeps into the soil and is gone (rivally consumed) relative to alternative users in the area. The remainder of this irrigation water may return to the originating watercourse as runoff, yet likely at a downstream location where it is unavailable to alternative users in the irrigator's vicinity. Again, the farm's use of water is rival with others, and it is therefore not classifiable as a public good. Nor is the farmer's use of water nonexclusive, as well practiced administrative options are available for denying/limiting/pricing water to the farmer. [Notice that both properties are assessed with respect to the technical character of the good without regard to in-place institutions and procedures.] The same facts generally hold true for water used by households. A household is rivally using water relative to other households and other users in its service area. Water quality tends to be diminished rivally by most ordinary uses as well. Water users are also rivally consuming the nonwater resources, such as energy, that were applied to transform naturally occurring water into the processed water received by end users. Considered carefully then, there are various degrees of rivalness between water-using sectors, depending on relative locations and the nature of their use. The fact that there is "return flow" from

Beyond Water Marketing Myths

users to the original watercourse or to other watercourses does not establish water as a public good, though it is the root of important externalities that bear upon potential market performance (and potential nonmarket performance too).

Public good *uses* of water do exist, but even these tend to be nonrival only within their use category. For example, water kept instream for biodiversity or recreational support may be nonrival and nonexclusively enjoyed by its human beneficiaries, yet this same water is rival against out-of-stream uses to which this water could be alternatively applied. In some ways, hydropower water use may be nonrival with other local water uses such as water supply or instream flow preservation. Yet, these same uses do not agree on the preferred timing of reservoir releases thereby injecting a degree of rivalness.

Where public good uses truly exist, the potential performance of water markets becomes suspect. People participate in markets because their rivalness and potential exclusion motivate it. Markets are less respectful of public good values and will underprovide these goods if given the opportunity. The fact that some public good uses of water do exist in all notable basins (and for many aquifers too) immediately infers that *marketing is not an acceptable, stand-alone instrument for managing all water in a region*. With respect to the public good components of this issue, one attractive approach can be to partition the resource, setting aside a quantitatively defined portion of the water where marketing is not allowed to affect allocation. With this strategy, if the water resource is subject to seasonal or weather cycles as is common, then thoughtful rules are needed to define the boundaries between privately and publicly owned water under all reasonably imaginable circumstances.

A pivotal dilemma for the decision between marketing and nonmarketing styles of water management is the choice between market and nonmarket failures. While public good issues are not as ubiquitous for water as is commonly claimed (because of confusion about the meaning of public goods), any reallocation of water between two parties has the potential to affect third parties (externalities). Potential externalities can be listed for both surface water and ground water scenarios, but such lists are too long for inclusion here (Griffin 2006, sections 4.3, 7.5, 7.6, 7.11). The important matter is that the stability of water molecules – which are not destroyed in use – and hydrology guarantee third-party influences, so externalities are not avoidable by either market or nonmarket management systems. The market-oriented accommodation for these problems is to conduct trade in an open forum in which (a) proposed water trades are publicly and formally announced, (b) potentially harmed third parties are given the opportunity to lodge objections, and (c) an agency of government then rules on the acceptability of each trade by applying pre-established guidance that hopefully includes attention to streamflow effects. This is an imperfect process, but it is also indicative of the issues encountered by *every* nonmarket system of reallocation. The information costs of such decision processes can be high, due to the vagaries of water flows and the effects of these flows, and all such information costs reduce the net gains achieved through reallocation. Information costs, called transaction costs in economics, are different for the different approaches, and these costs are differently distributed across members of society as well.

In light of these facts, it is tempting to adopt a head-in-the-sand posture and prohibit any modifications to a region's historic allocation of water. Unfortunately, a growing population, rising technology, evolving economy, and changing climate place mounting costs on such a strategy. That is, a no-change approach constitutes only a temporary "solution" with costs that commonly rise to intolerable levels over time as tension rises over scarce water and expensive structural options are proposed.

A sobering challenge voiced by promarketing supporters is "Even if there are market failures present, why will nonmarket institutions do a better job of managing water?". The logic here is that

Beyond Water Marketing Myths

it is not sensible to compare water market performance against idealized outcomes which are not achievable by any available management system. So, what can nonmarket policies truly achieve?

Nonmarket systems of water, which may be styled as participatory, bureaucratic, judicial, administrative, executive, or voting processes, also cause externalities in reallocation. That is, third parties exist for these political approaches, and the information costs of addressing these complexities can easily be as large as those accompanying water marketing. We should strive to be realistic in appraising nonmarket programs. Clearly, nonmarket alternatives tend to substitute political power for the economic power that drives marketing (not that political and economic power are independent). Nonmarket results are not necessarily efficient, and for good or bad they install their own unique biases. Rent seeking can be more viable under political approaches. Corruption and side payments are possibly worsened. Wolf (1979) points out that among the roots of nonmarket failures are instances in which symbolism is valued more highly than effectiveness (very true where water is concerned?!), possibly resulting in conflicting stated objectives, high costs of operation, and deficient accomplishments. "Derived externalities," unintended consequences of government action, emerge as possible problems (Wolf). Nonmarket mechanisms also are capable of generating distributional inequity, though in this case people are disadvantaged by their lack of political power while "well organized constituencies" are treated preferentially (Wolf). Consequently, constituency membership becomes valued and people are induced to spend effort and money on enhancing their group status. Even judicially oriented systems of assuaging water conflict, such as the Riparian law approach become tedious and expensive for participants as growing water scarcity raises the stakes and litigation becomes frequent. Throughout all imaginable policies for managing water, there are third parties to be considered as well as unique information costs to be incurred; this is dictated by properties of the water resource rather than the properties of WM.

As a final paramount dichotomy, recall the earlier observation that water markets address the management of scarce water. This is a separable task from issues of managing infrastructural systems. Water marketing is initiated by assigning private property in natural water, but private water rights need not be accompanied by facility privatization and vice versa. For the sake of limiting confusion, it is best to reserve the word "privatization" for instances of capital management. As an instructive example, the sale of trucked water by a private operator is not water marketing in the sense emphasized by the inquiry here. The trucker has applied his truck and fuel to alter the natural water resource and add value by relocating it; it is this service that the trucker is marketing. Water marketing as applied in this paper refers to the potential exchange of natural water before any optional value-adding occurs.

Water Marketing Experiences

If one is serious about looking for it, there is ample evidence of water marketing being conducted in various world locations. Without conducting a survey, I have encountered documentation of WM in Australia, Chile, India, Mexico, Pakistan, and Spain (Cruse 2008; Easter, Rosegrant, and Dinar 1998; Maass and Anderson 1978). Authorized and unauthorized markets are said to exist in the Middle East (Ahmad 2000). The same is likely true in other regions. Some of these markets may have few participants, but even small water markets can yield important benefits when the gaps between buyer and seller values are large.

Focusing on U.S. experience, the range of marketing is demonstrably wide. Marketing occurs in various forms here, depending on what is allowed in different jurisdictions and what traders wish to accomplish. U.S. law does not enact water marketing. Rather, the 50 U.S. states make their own determinations. Water law in eastern (wetter) states is not supportive of marketing, because law in these states remains founded on common property (Riparian doctrine). This is slowly changing with rising scarcity having the strong potential for motivating institutional change. WM cannot be

Beyond Water Marketing Myths

called a predominant activity in the drier, western half of the U.S., but most of the 17 western states do allow water marketing in some form(s) and marketing can be observed in these states. Surface water is more often marketed than ground water, but both market types exist. Interestingly, the path to marketing has not always been purposeful in these places. Often, either rising scarcity of the water resource or payment obligations for new water developments led to the creation of enforced permits to specific quantities of water. Once transferability of these permits is allowed apart from land, a market might easily arise.

Permanent exchanges (sales) occur in some of these markets, whereas others involve only seasonal or short-term reassignments (leases). Leases can be longer, in which case contractual agreements are written. Some marketing is required to employ a public sector intermediary (banks). Traders may establish long-term contracts specifying exchanges that are contingent on dry-period conditions (options). U.S. irrigators are the usual sellers or lessors of water, and cities or environmental interests are the usual buyers or lessees. Environmental transactions usually involve governmental agencies or nonprofit groups leasing water for the purpose of instream flow augmentation during low-flow periods.

Although a specific listing of noteworthy markets risks injustice to the many more isolated markets, there are higher volume surface water markets in central and southern California, northern Colorado, and southern Texas. For good reason, some seasons or years support more active markets than others in these places. Other interesting markets occur in the expanding-population areas of Nevada, Arizona, New Mexico, and Colorado. Burgeoning markets include the Snake River basin of Idaho and the Edwards Aquifer of Texas.

Western U.S. marketing is sufficiently widespread that for many years a monthly trade publication has been devoted to summarizing transactions (www.waterstrategist.com). Such information is desired by the many brokers and private sector agents who provide transactional services to water right buyers and sellers. New water markets are arising all the time. New market arrivals may be the result of policy changes, or rising scarcity may induce traders to take fuller advantage of existing transferabilities. Where cities can secure ownership of their wastewater discharges, a new variety of WM is emerging.

In Texas, multiple, operationally distinct water markets are the result of different water laws for different regions (Griffin 2009). Texas is the second largest state (larger than France or Spain) and the second most populous. Five of Texas's cities are among the twenty largest in the U.S., and growth-induced pressures upon water resources have been a serious concern. Two of the several distinguishable water markets in Texas are the "Valley" surface water market (lower Rio Grande valley) and the Edwards ground water market. Features and results of these markets include the following.

Lower Rio Grande Valley Market

- high growth, semi-arid region
- most water used for irrigation
- two-level correlative shares legal system with urban priority over agriculture
- very modest reservations or attention to public uses of water
- market is almost 40 years old; sales and leases are common
- highly reduced externality conditions; return flows are minor
- majority of current urban rights were obtained from irrigators using this market
- high population growth accommodated by WM; no new reservoirs; large cost savings!
- current value of permanent water right is around \$2000/acre-foot (\$1620/1000 m³)

Beyond Water Marketing Myths

Edwards Market

- high growth, semi-arid region; little surface water
- most ground water is pumped for urban use; irrigation is second
- fractured limestone, high transmissivity aquifer
- correlative shares legal system initiated in 1993
- purpose of new legal system is to limit pumping so as to guarantee minimum spring flows at the aquifer's geologic outcropping for endangered species protection; thus, some of the aquifer's recharge is publicly reserved for natural discharge
- adjudication of property rights has been a several-year process; only recently solidified
- highly reduced externality conditions; local drawdowns are modest
- a market that has been quickly rising in activity and importance
- current value of permanent water right is \$5000-6000/acre-foot (\$4000-\$4900/1000 m³)

3. Lessons

Compiling available conceptual and observational evidence, partially identified above, here is a top ten shortlist of prominent findings that are interesting and advisory:

1. WM is not a reasonable, stand-alone instrument for addressing water scarcity.
 - a. One-way exclusions are useful for protecting portions of the natural resource from exploitation and market interference. Yet, it may be reasonable to allow purchases of privately held water to augment the public reservation.
 - b. Where conditions indicate significant externalities, governmental oversight of trading is necessary. Trade will have to suffer an approval process designed to limit detrimental externalities. However, this process is less effective in enhancing positive externalities.
2. WM functions very well where return flow (surface water) and local drawdown (ground water) externalities are slight. Under these conditions and presuming some set-aside of natural water for true public good uses, WM is a very compelling alternative.
3. As compared to confrontational, nonmarket alternatives, a unique accomplishment of WM is enabling reallocation that original users can support.
4. WM has the exciting side benefit of exposing people and public water managers to the value of natural water. WM causes expanding urban centers to incur an actual expense for additional water (over and above capital costs). Throughout most of the world, the prices charged for processed water include no value for scarce water. Water marketing has the potential to modify this odd and inefficient tradition by signaling to urban entities the value of water right assets used in water supply operations.
5. Water markets can operate along with water quality regulations as well as public reservations of natural water, seemingly as well as alternative nonmarket institutions.
6. WM requires accurate measurement of water use by all appropriators, accompanied by enforcement of permits. Of course, all serious nonmarket systems also require water use monitoring and rule enforcement.
7. Cultural familiarity and institutional capacity with enforced and respected property rights for resources such as land are crucial for the success of WM and the probability it will be adopted. This consideration may mean that WM is not appropriate for many areas of the world (yet?).

Beyond Water Marketing Myths

8. Due to the expense of water transport, most water markets are bounded by the spatial extent of natural watercourses and currently built conveyances. These boundaries infer that, as with the most immobile of resources – land, water right values can vary greatly from place to place.
9. To avoid paying for water rights in a well enforced water market, people will increase their exploitation of other nearby water resources, some of which may be hydrologically connected to the marketed body. Consequently, a movement to WM should envision broad changes.
10. The path to WM can involve hardships in settling the initial allocation of rights, yet the social payoff can be significant once this process is completed.

4. Bibliography

Ahmad, M., 2000. Water pricing and markets in the Near East: policy issues and options, *Water Policy*, 2, pp: 229-42.

Cruse, L., ed. 2008. *Water Policy in Australia: The Impact of Change and Uncertainty*, Washington, DC: Resources for the Future, 268 pp.

Easter, K.; Rosegrant, M. and Dinar, A. 1998. *Markets for Water: Potential and Performance*, Boston: Kluwer Academic Publishers, 298 pp.

Griffin, R. 2006. *Water Resource Economics: The Analysis of Scarcity, Policies, and Projects*, MA: The MIT Press, 402 pp.

Griffin, R. 2009. Texas water marketing and pricing. In *Water Policy in Texas: Management for a Diverse Land*, Washington, DC: Resources for the Future, forthcoming.

Kelso, M. 1967. The water-is-different syndrome or what is wrong with the water industry? Proceedings of the Third Annual American Water Resources Conference, pp: 176-83. Available: <http://ron-griffin.tamu.edu/reprints/kelso1967.pdf>.

Maass, A. and Anderson, R. 1978. *...and the Desert Shall Rejoice: Conflict, Growth, and Justice in Arid Environments*, Cambridge: The MIT Press, 447 pp.

Wolf, C. 1979. A theory of nonmarket failure: framework for implementation analysis, *Journal of Law and Economics* 22, pp: 107-39.