ECONOMIC AND PLANNING ISSUES RELEVANT FOR THE MANAGEMENT OF INTERSTATE WATER RESOURCES

Ronald G. Cummings

AUTHOR: Professor of Economics and holder of the Noah Langdale Jr. Eminent Scholar Chair in Environmental Policy, Policy Research Center, College of Business Administration, Georgia State University, Atlanta, Georgia 30303.
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Abstract. Prices can be used as an effective tool for providing incentives for efficient water use. Under ideal conditions prices will reflect the true scarcity of water in a region and can then provide extraordinarily valuable information as to "efficient" patterns of intrastate and interstate water uses. Water markets can provide such prices. The strengths and weaknesses of water markets are reviewed in this paper.

INTRODUCTION

Over the last decade the notion of sustainable growth and development has become an increasingly topical issue for discussion and debate among scholars and policy makers. As we approach the new millennium, our interest in this notion is undoubtedly stimulated by a growing awareness of the degraded nature of natural and environmental resources that will be passed on to those who will populate that new millennium--our future generations. In the case of water resources, in terms of both quantity and quality, these concerns are made manifest in a number of ways. Examples of interest to this forum are tensions between states that arise from a growing awareness of limited water supplies in interstate streams, and efforts by affected states to protect their access to these vital resources to the end of promoting sustainable future economic development for *their* citizens.

When interstate conflicts over shared water resources arise, notwithstanding the forum used in efforts to resolve them--the courts or negotiation processes--each state will have the burden of demonstrating its present and future needs for water within a very specific and well established legal context. This context is one wherein the state must make clear its efforts to wisely manage its water resources. The state has the burden of demonstrating by compelling evidence that its water use is efficient (Sherk, 1989). In more legalistic terms that are clearly consistent with our concerns for "sustainability," and drawing on the words of Justice Holmes (in *New Jersey v. New York*, 283 U.S. 336, 1931 at 342), it has the burden of demonstrating by compelling evidence that there is no waste of "the treasure of the river." Such evidence typically relies upon the state's comprehensive water plan and its legal and regulatory mandates for the conservation and reuse of water.

Particularly compelling evidence of efficient water use can result from a state's reliance on what is typically thought of as a "Western" institution: water markets (Saliba, Bush, Martin and Brown, 1987). A number of writers, primarily legal scholars (Sherk, 1991), have noted the extent to which evolving water laws in the riparian East and the prior-appropriation West appear to be converging. With the "regulated-riparian" system evolving in Eastern States, we then see the evolution of circumstances which *could* provide one of the basic requisites for an effective market institution: fungible water rights. While, unlike conditions extant in a prior appropriation system, a regulated-riparian system does not establish a system of property rights in water, its water use permits could indeed be accorded the status of a marketable usufructuary right. *All else equal*, there can be little question as to the efficiency of water use in a system wherein water rights are allocated *via* markets. Of course, the fact of the matter is that "all else" is *not* equal. While there are indeed gains that can accrue to a state from reliance on water markets, there may also be many sources of potential costs.

As I have reflected on the topic of central interest for this year's Georgia Water Resources Conference, and on the topic of interest for this particular panel, I thought that it might be timely to take up the question as to the extent to which some form of a water market might play a useful role in the Southeastern States. The relevance of this inquiry for our panel's discussion derives from the fact that a functioning water market can *not* be confined to a state's boundaries. The Supreme Court has made clear its position that water is an article in commerce, in which case any state law or regulation affecting water use that has the effect of discriminating against citizens of another state will be scrutinized under the provisions of the Commerce Clause of the U.S. Constitution (Johnson and DuMars, 1989). Thus, any water market is necessarily interstate, and the efficacy of such markets must be assessed accordingly.

I must make clear that in raising this question, my intention is not to advocate the use of water markets. I am motivated to raise this question by my conviction that the interests of

state water planners are best served by their consideration of all possible tools that are available to them for their use in promoting efficient water use. I will then proceed by addressing a necessarily limited number of questions regarding the efficacy of water markets. My questions necessarily reflect my experience, and my experience with water planning has been in Western States. Thus, while the questions that I will raise are those that are of primary concern in the West, I cannot and do not claim that they are those that will be of most importance in this part of the country. Again, in raising these questions my intent is simply to provoke interest and discussion as to the potential tractability of shaping some form of a water market that might be useful in Southeastern States like Georgia.

QUESTIONS REGARDING THE EFFICACY OF WATER MARKETS

How Might Water Rights Be Established?

It is typically the case that existing water use permits are considered as conferring some sort of a *de facto* usufructuary right to permit holders. For the functioning of a water market, state legislation would be required that provides for the transfer of permits among willing buyers and sellers.

All is not quite so simple, however. The change in use of water *can* result in "externalities" or third-party effects; evolution of the "Public Trust Doctrine" related to Western water use is discussed below. The point that must be appreciated for our purposes is that water markets as we know them in the U.S. are not strictly bi-party transactions. There is a third party to any transaction who is charged with assessing the effects of the transaction on third parties, or more generally on "social welfare." In the West, this third party is the State Engineer; when water in federal projects is involved, there is a *fourth* party to a proposed transfer: the Bureau of Reclamation. A proposed transfer of water rights must be approved by this fourth party. Any proposed sale is advertised in the newspapers, and a hearing is scheduled by the State Engineer. Any party that feels that its interests might be adversely affected by the transfer can present testimony regarding such effects at the hearing. This process, which requires the state's representative to weigh the asserted gains and losses to society associated with the proposed transfer, can become very complicated and, in some cases, very expensive.

For existing or newly issued water use permits, the "quality" of such permits, and therefore such rights, may vary from one permit-holder to another, reflecting differences in such things as the number of years remaining before the permit must be renewed and legal/regulatory conditions on the permit (e.g., conditions requiring a conservation plan). Water rights traded in Western water markets also vary in "quality," reflecting differences in priority dates, dates at which rights were established *via* an individual putting water to beneficial use. Of course, prices for water rights will reflect differences in the "quality" of rights.

Markets in Riparian States

As mentioned above, water markets can *not* be confined to a state's boundaries. There are a number of other legal questions that would require consideration if one were to seriously contemplate the establishment of water markets in riparian states. I will simply mention a few of these (see Sherk, 1991). In instances where the sale of a usufructuary right involves a substantial change in the location of water withdrawals, would such changes affect the riparian rights of upstream or downstream users and would such affects be tolerated under riparian law? Changes in site of use would require particular scrutiny in terms of their possible effects on instream water uses mandated under federal law (e.g., the Endangered Species Act, the Clean Water Act, and the Coastal Zone Management Act). Related to the discussion above concerning "conditioned" water rights, it must be noted that virtually any water right is conditioned by the compatibility of its use with federal statutes. Under riparian law, what are the limits to a state's ability to "regulate" water use--would the establishment of water markets be viewed by the courts as an impermissible transfer or abrogation of a state's rights and responsibilities to regulate (particularly) interstate streams?

Who Would Be The Likely Participants In A Water Market?

Typically, the major buyers of water rights are municipalities and industrial entities. There are instances in the West where private environmental organizations have purchased substantial water rights for the purpose of preserving instream flows. Major suppliers of rights are typically found in the agricultural sector.

This pattern of buyers and sellers can give rise to a number of problems, some of which are discussed below. I might point out here that requisites for a well-functioning market include "small" transactions costs and "many" buyers and sellers, conditions that are often violated in the West (Brajer, *et al.*, 1989). In terms of transactions costs, earlier mention was made of the potential extraordinary litigation costs arising from the process of a state's approving a proposed water transfer. In terms of many buyers and sellers, Western water markets are often dominated by a single buyer--a large municipality--who can effectively fix prices. This is the case, for example, in the State of New Mexico's Middle Rio Grande Valley wherein the City of Albuquerque effectively fixes prices (for almost a decade, the City has pegged water prices at $1,000/acre foot).

What Are The Externalities Associated With Market Transfers Of Water: How Can *Society's* Interests In Water Use Be Taken Into Account?

Critics of water markets, and there are many, point to

weaknesses in such markets as they reflect considerations related to externalities and equity. For example, in most western states municipalities are exempt from the payment of property taxes imposed by counties. It has been argued that the market acquisition of rural water rights by municipalities can have the effect of deteriorating the tax base of rural county governments (Shupe, *et al.*, 1989). As an example, a common practice (particularly in Colorado and Arizona) by which water rights are obtained by a municipality is its purchase of farmland which has water rights associated with it. This means of acquiring water rights removes lands on the county government's tax rolls, with the potential result of eroding its ability to maintain social infrastructure.

As noted earlier, a great deal of opposition to the idea of allowing water rights to be transferred via markets derives from the wide range of potential externalities associated with the transfer of water rights, particularly in cases where the transfer results in a change in the location of use. Typical external effects relevant in these regards include effects on: fish and wildlife habitat; the protection of aquatic life; recreation; aesthetic beauty; navigation; water quality; access to public waters; and minimum instream flows. While some argue that such externalities might be taken into consideration in water markets via the careful construction of water rights and market institutions (Anderson, 1983), equity considerations lead many to question the efficacy of water markets notwithstanding efficiency benefits which might derive from their use. Brown and Ingram (1986 at p. 15) argue that unfettered water markets will threaten both environmental quality and the rights of nonurban constituencies by ignoring the non-economic values of water; Mumme and Ingram (1989) see water markets as "..nothing less than a program for the redistribution of control over western water...toward those parties most able to purchase scarce water rights," and a number of scholars are particularly concerned with water markets as a source for increasing social conflicts (Folk-Williams, Fry and Hilgendorf, 1985).

Indeed, there is growing evidence that water law in Western States is becoming increasingly influenced by considerations related to equity or, more generally, to the idea that water has a communal value. The idea here is that water is so essential to western society that any transfer of water rights must be subject to close scrutiny by representatives of the general public for assessments of the potential impacts of the transfer on traditional cultural patterns of communities. A number of western states have institutionalized public interest provisions regarding water rights transfers in their water codes; the State of New Mexico was the first western state to do so, providing in 1907 that the State Engineer could disallow a water transfer "...if in his opinion the approval thereof would be contrary to the public interest." (Sec. 28, c. 49 Laws, 1907) In the case of California, the state constitution was changed in 1928 to reflect public interests in water: "The general welfare requires...that the waste or unreasonable use...of water be prevented, and that the conservation of such water is to be exercised...in the interest of the people and the public welfare...." (California Constitution, Art. X, S.2). The court's acceptance of what has become known as the "public trust doctrine" as it relates to the public's interests in water rights transfers is seen in the 1985 *Shokal v. Dunn* decision (707 P.2d 441, Idaho, 1985). In this case the court: accepted an extraordinarily broad view of the potential components of public interests; set out the provision that duty to protect the public interest "...is related to the larger doctrine of the public trust" (at 447-8, footnote 2); and established that the burden of proof is upon the applicant for a water market transfer to demonstrate that "...the (proposed transfer) is either in the local public interest or that there are factors that overweigh the local public interest in favor of the (transfer)" (at 450).

Does Enforcement Become An Issue With Water Markets?

The simple answer here is: yes, it is an issue that requires careful consideration. Not only with water markets but in instances where water managers attempt to impose regulatory limits on water use, non-compliance--and thus the need for enforcement mechanisms--*can* be a non-trivial problem. Unfortunately, means for dealing with this problem in many Western states have had the effect of reducing the efficiency gains sought in market transfers. Thus, in states like New Mexico a farmer (e.g.) who sells x-acre feet of water rights must retire from irrigation the number of acres that the x-acre feet of water could irrigate; thus, even if the farmer is presently applying water at the extensive margin (earnings from the marginal application of water is very low), he cannot use his remaining water rights more efficiently *via* reducing water applications per acre in an amount that would total x-acre feet. The rationale for this practice is that it simplifies enforcement (at least in principle): for enforcement purposes, it is easier to verify reduced irrigated acreage than reduced water applications/acre.

More *Limited* Uses Of Water Markets?

Let me conclude my brief discussion of issues related to water markets with the following thought. It occurs to me that even if one rejects the use of water markets as a general means for allocating water resources in a region, there may still exist "special" cases where markets might--I emphasize *might*--play a role. It is often the case that the source of a large part of contention between states sharing an interstate stream arises from the question as to how water is to be allocated during periods of drought. Let us then ask the question: could such contention be ameliorated, if not eliminated, by something akin to a futures market wherein particularly vulnerable entities (such as municipalities and industry) could purchase calls on water resources during such periods from willing, less vulnerable holders of water use permits?

CONCLUDING REMARKS

The goals of sustainable development pose unique challenges for natural resource and environmental planners and managers. If these challenges are to be met, policies governing the use of resources must emphasize goals related to conservation and reuse. In the case of resources shared by one or more states, we must hope that considerations related to the management of interstate streams will reflect these concerns. Whether one's focus is on interstate or intrastate streams, however, water managers are faced with the need to shape regulations and policies so as to provide water users with strong *incentives* for efficient water use. Among the tools available to them for this purpose are tools with the character of a "stick" and/or a "carrot." Examples of "stick-like" tools are seen in policies recently adopted by the City of El Paso, Texas. City ordinances now provide for limits (and fines for limit violations) on landscape watering, outdoor watering, and non-commercial car washing; water uses that spray or flow into streets or right-of-ways are prohibited, and the repair of any water leaks is required within 5 days. Water prices are examples of "carrot-like" tools available to the water planner. Again, the City of El Paso provides examples of this set of tools. Arguably (DuMars, 1986) as a direct response to increasing water scarcity, the City has substantially increased water rates over the last three years: water and waste water rates to industrial users (using about 35 a.f./month) increasing from some $575/a.f. in 1992 to almost $1,000/a.f. in 1994. The City also introduced a plumbing code that requires the use of ultra-low flow fixtures for replacements and new construction; introduced a "cash for your commode" rebate program which provides a 75% rebate (up to $100) for the replacement of existing facilities; and introduced a number of water conservation educational programs. As a result of these sets of policy changes, per-capita water use in El Paso has declined by some 20% (El Paso Water Utilities/Public Service Board, 1994).

In many cases, prices can be used as an effective tool for providing incentives for efficient water use. Moreover, at least under ideal conditions, they will reflect the true scarcity of water in a region and can then provide extraordinarily valuable information as to "efficient" patterns of intrastate and interstate water uses. *If* prices are to be used for this purpose, the planner's problem is how information regarding such prices is to be obtained. A reliance on water markets offers one means for resolving this problem--all else equal, the strength of a water market is in providing clear signals as to the scarcity value of the resource. There is an obvious trade-off however. The weakness of water markets is in the *other* problems which they may create, a few of which were considered above. Hopefully, our discussions today can serve the purpose of stimulating considerations relevant for assessing this trade-off.

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