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Agency Problems in Irrigation Water Transfer: Who Works for What?

John D. Wiener

Abstract: In the West, transfer of irrigation water to urban use is an inexorable change due to urban growth even without climate change. This may affect increasing areas of the rest of the U.S., as irrigation has spread to areas formerly cropped with rainfall only. There are a variety of important problems with these transfers, ranging from unknown and under-studied biological impacts (see Wiener et al. 2008 for short survey of one area), to the lack of baseline information and cumulative impact understanding for social as well as biological impacts in areas from which water is transferred. These problems are especially difficult in areas where urbanization is not creating new economic activity. The rural areas of origin are often poorly organized to represent their own interests, and may not have any enforceable interests where negative externalities are threatened but not legally recognized. The receiving areas, however, are represented in many cases by an agency such as a water department or district which is an agent in the economic sense as well as in the legal sense. These agencies commonly see themselves as holding a fiduciary obligation to acquire water at the least cost possible. The presentation will review the situation described here, and then make an argument that the agency (in the economic sense) is misconceived as too narrow where there are actually substantial constituent/rate-payer interests in other aspects of the outcome. In the West, under prior appropriation water law, the issue of public interests is often effectively absent or trivialized into a few fragments, and the mythology of markets legitimates treatment of large metropolitan water agencies as equivalent to a farmer buying a few more shares of a neighbor's rights in an irrigation ditch. In modified riparian water law permit systems, the problem is not necessarily solved, but may be more obscure due to different procedures and participants in the transfer process. The agency problem – economically and legally – is in its representation, or non-representation of the range of other interests involved. Finally, the role of researchers in ameliorating this problem will be discussed.

Introduction and explanation of this extended abstract

This extended abstract takes advantage of the high level of knowledge of water issues in the membership of the Universities Council on Water Resources, to pursue a somewhat unusual goal. For about a dozen years, the author has been pursuing improved water management in western agriculture through increased use of climate information, and following the issues that arose in that pursuit. The winding trail has led through issues of water law and water market organization, and the problems of innovation in agriculture, to issues in the attention deficit regarding the ecologies created by the distribution of agricultural water and the displacement of pre-development and pre-flow-regulation conditions. The series of inquiries is summarized in materials posted on the author's web-page, and in presentations made to organizations and meetings for different purposes and with different goals (see postings and listings at www.colorado.edu/ibs/eb/wiener/). The cumulation of all of this is a larger task than a presentation can encompass, though the recommendations to rural Western U.S. irrigators are largely summarized in an extended presentation to the Ditch and Reservoir Company Alliance

(posted). The hand-out accompanying this presentation is a series of one-page summaries which also offer a form of cumulation of the inquiries so far (the occasionally up-dated summaries are also posted). They include details about the kinds of alternatives to traditional water transfers which have been developed. It is argued that there are important opportunities for improved outcomes, in several kinds of values and interests. The author's recommendations are not much removed or especially advanced over those of many others, and work reported in all sorts of publications, from the National Research Council to formal peer-reviewed journals, to popular and "gray literature". The work on water marketing, for example, is strong and rich, but progress in development of institutions has considerably lagged the theory (Howe 2000, Western Water Policy Review Advisory Commission 1998, National Research Council 1992).

Who will act for the public interests? This is one of the most difficult problems is treated here in a form which may be, at the worst, dismissably anecdotal, but hopefully sufficiently provocative to describe the problem and argue for a new response. In essence, this is the problem of municipal officials acting as if their role is not different in important ways from that of any other purchaser of water rights. There is no reason in prior appropriation water law, beyond perhaps conscience or altruism, for any given buyer of water rights to pursue the public interest at the expense of self-interest. Some states impose review of transfers of water by officials who are charged with consideration of impacts to the public interest, but many do not or do not in a meaningful way (Getches 1999; for Colorado, Corbridge and Rice 1999). The lack of serious treatment of public interests in western water law may be best shown by the late adoption of in-stream flow rights programs (Charney 2005), which are still not as strong as one might hope (Trout Unlimited 2002, 2003). One might argue on the other side that environmental issues only came to salience fairly late, and that the response in water law was not much out of line with other responses, such as the hotly-contested processes of implementation of the Clean Water Act, Clean Air Act, or Endangered Species Act, but that tends to indicate that the whole set of environmental issues and interests has been largely regarded as just another obstacle annoyingly stuck in the path of those seeking to take care of business or running the government (and indeed that invokes a huge literature into which we will not go). So, where there is no state commitment, why should a city be asked to act differently?

Parallel to the environmental parts of the public interest, there are social impacts from water transfers, (Howe and Goemans 2003, Howe 2000; Howe 1998; Governor's Commission 2000) just as there environmental impacts, and the same question arises. Colorado has a long history of not passing laws that would require thorough examination of social and economic impacts of water transfers, with some small progress fairly recently (Wiener 2007). There has been a great deal of discussion about how to make some changes, in the Statewide Water Supply Initiative process, and the Interbasin Compact Commission process, but there has been no major substantive change in what happens. The state has no water plan and no interest in having one, so far, in marked contrast to other states (e.g. the California process and plan, coordinating a massive enterprise, 2005). Where the law makes no distinction between a city of hundreds of thousands and a private individual as far as acquiring water and transferring it, what reason would a city have for going beyond the requirements?

There is, in the simplest case of economic agency, no conflict between the interests that the agent (actor) pursues. An individual has a goal, as far as a transaction goes, and seeks to meet that;

there may be complicated combinations of factors reconciled in goal formation for the individual but the general idea is that entry into the market is in pursuit of a goal (Lea, Tarpay and Webley 1987). But where the agent is representing someone else, there may be different interests and things can be complicated. The idea of agency here is not meant in the full formal sense in economics, but in the sense lawyers use the term as acting at least in part on behalf of some set of interests. Agency interest analysis most often appears, perhaps, in work considering the conflicts of interest between those of the agent and those for whom the agent is supposedly working; one thinks of problems such as stock brokers whose interests are in more transactions, rather than fewer better transactions if the commission on a transaction is the broker's reward. Such problems are also becoming increasingly obvious to all in such things are management versus share-holder interests in corporations. (Bebchuk and Fried 2003; Jensen 1998 provides a very accessible review.)

Who does a municipal water buyer or manager represent? That is the point of this paper, based not on working through examination of training materials for organizations like the American Water Works Association, but on observations of many years of meetings in public, and some private discussions which were not held with any eye to their being data and will not be described. The point argued is that municipal officials are taking a very narrow view of their role resulting in a very unfortunate behavioral outcome in which the public interest is not examined beyond the interest of an assumed selfishness on the part of ratepayers.

Context and description of the problem: water transfers are not all the same!

There is no doubt that rapid urban population growth has created enormous pressure on water supplies in the Western U.S., as illustrated in the U.S. Department of the Interior's "Water 2025" initiative (U.S. Department of the Interior 2005 et al.). This illustration of the impending supply problems as identified in 2003 is particularly interesting for several reasons. First, it reflected perceptions of the problems of "developing" (meaning, finding, one supposes) "new" water (meaning, one supposes, water supplies not already allocated to human uses). The problems with finding unallocated water are manifold, including difficulties in siting storage, even with new approaches in aquifer storage (Luecke et al. 2003, Western Water Policy Review Advisory Commission 1998). There are also difficulties in finding water not already allocated; in western prior appropriation water law, given the extent of existing allocation and over-appropriation of many water flows, the only unclaimed water may be that in very high flows, which may be sufficiently rare that conventional surface storage may be less efficient than in the past, even without the increased evaporative loss which seems almost inevitable due to warmer temperatures (IPCC 2008; Western Water Assessment 2008; CCSP 2008).

The transfer of an unknown amount of irrigation water to urban use is almost certainly unavoidable with continued rapid urban growth; in Colorado detailed demographics-based water demand projections were provided by the Statewide Water Supply Initiative (Colorado Water Conservation Board 2004) with some up-dating on the "gap" between supply and demand now in progress. In Colorado, the study suggested that between 12 and 23 percent of remaining irrigated lands could be dried up to meet the increased urban demands (Colorado Water Conservation Board 2004), but there are two problems with this estimate. First, any such estimations are very difficult without knowing more about the ownership and real control of

water rights than is public knowledge. This is a private very competitive market, in which information about options, contracts, rights of refusal or anything else need not be disclosed unless and until they are relevant to a transaction for which water court approval is sought. So, we don't know much about the seniority of the water rights which are still "on the market" and not yet optioned by municipal or industrial buyers. So, the reliability of what is still available may be less than ideal, since seniority is reliability – the less senior, the less reliable and the higher the volume of rights needed to provide a firm yield of "wet water". Second, as the more junior water rights are purchased, it is logical to expect that higher and higher acreages will be affected. This is because less reliable water would logically be used as supplemental and less intensive applications on what are closer and closer to dryland crops. So, there may be some rough parity of farm-gate sales value involved in moving a smaller but more reliable senior water right versus a larger but less reliable junior water right, but the areas with management change may be considerably larger; no direct information on this has been found (the closest available information is in Bauder and Waskom 2005). Adding climate change to the pressures from urban growth can almost certainly only increase the pressure to transfer. (Perhaps ironically this pattern may spread along with increasing use of irrigation in other areas where urban growth also combines with climate variation to create drought in effect or aggravate drought conditions; Morren 1983; Herrmann Ed 1992). And, there is no known estimate of the socio-economic impacts of ending only a quarter, let alone more of the remaining irrigation.

Impacts of transfers already made are not well known. Newcomers to western water law may be surprised to learn that transfer of irrigation water in prior appropriation states (led by Colorado but hardly alone) has traditionally meant that enforcement of the transfer would be easily accomplished through visual inspection: no more water could be applied to the land from which the water was moved. This is known informally as "buy-and-dry". Some formerly irrigated land has been used for dry-land cropping, but some has effectively been abandoned, with some undesirable consequences (Western Water Policy Review Advisory Commission 1998; and for a Colorado example, see Mestas 2008). The environmental dimensions of water transfers are largely unstudied and unknown in the rural West. The pre-European riparian areas have been dramatically changed (Crifasi 2002, 2005), as well as most of the land surface to some extent (Riebsame 1990; Baron Ed., 2002; Brown et al. 2005). Pre-development hydrology from the headwaters to the Plains has been changed enormously (Wiener et al. 2008). Because so little water development has fallen under the requirements of the National Environmental Policy Act, environmental impact statements have been remarkably few, and recent, while major transfers even now that lack a sufficient federal nexus are undertaken with no examination of baseline conditions or cumulative impacts of changes in the environment. Similarly, there is reasonable understanding of the means of analysis and issues that should be considered for socio-economic impacts of water transfers, (Water Transfer Guidelines Committee 2008), but only very limited study. Social impacts are different in areas from which water is transferred but which are not urbanizing or experiencing a new economic activity (Howe and Goemans 2003). The rural areas of origin are often poorly organized to represent their own interests, in terms of having very limited funding, aggravated by shrinking tax base and shrinking population in many cases, and in the author's opinion, ideologically disinclined toward considerations of the public interest. The City of Boulder has taxed itself since 1967 to support protection of open space and mountain parks, and holds over 45,000 acres now (City of Boulder 2009); and the County has also invested seriously (County of Boulder 2009) ; in contrast, there is almost no public open space in the

Arkansas Valley of Colorado outside of city block parks, a few easements for fishing access, and Bent's Old Fort, Boggsville Historic Area, and the State Park and access to John Martin Reservoir and some others; the Comanche National Grasslands are not a park (Public Lands Interpretive Association 2009). The counties have some power to review large developments, but have not been known to interfere with water transfers. There is a very limited sense of "public interest" in rural Colorado; ironically, the most unifying event in the last decade may have been the U.S. Army efforts to radically expand the size of the Pinon Canyon military training area, prompting thorough coverage on many occasions in the Pueblo Chieftain, the dominant regional daily, the Ag Journal published in La Junta, and the local weeklies, due to the threat to ranching operations and families. Tanks in and people out is a long way from considerations like those identified in the Water Transfers Guidelines Committee report. But, so far, no efforts to implement that report have been claimed, despite a frenzy of water-related activity including large municipal activities (Woodka 2009).

The receiving areas, however, are represented in many cases by an agency such as a water department or district which is an agent in the economic sense as well as in the legal sense. These agencies commonly see themselves as holding a fiduciary obligation to acquire water at the least cost possible. This was the statement often repeated by representatives of municipal water agencies throughout the three years of first monthly and then occasional meetings of the South Platte and Arkansas Basin Roundtables, and then three of the four Statewide Technical Roundtables of the Statewide Water Supply Initiative (Colorado Water Conservation Board 2004 et seq.), and affirmed in private conversations with many officials. This was also the position taken in the early discussions of the Water Transfers Guidelines Committee in the Arkansas Basin Roundtable under later legislation establishing on-going basin discussions (Wiener 2007 has description of both of these processes). Other work reports on the values of water suppliers, and they do not seem to include a wide sense of obligation to public interests defined beyond low water rates and reliable supplies (Rayner et al. 2005).

Because of the high transactions costs in the water market, as well as the lack of transparency, deals made tend to be secretive until set (Associated Press 2005, Olinger and Plunkett 2005), and larger rather than smaller for municipal buyers (Howe and Goemans 2003). The acquisition of thousands and thousands of acre-feet drying up thousands of acres of irrigated land is treated legally exactly as the transfer of one acre-foot drying up a third of an acre. (An acre-foot in SI units is 1.23 megaliters; an acre is 0.405 hectare.) The costs rise dramatically because of the fact that any holder of a water right – but not others, regardless of third-party interest unless specifically authorized by statute – can object to a transfer in the water court proceeding for a decree allowing change of use and place of use of water. A large transfer will stimulate a large number of objections, since impacts or concerns may be widespread. The transferor must prove in the water court that there is no adverse injury to others (Corbridge and Rice 1999; Getches 1999, generally; other states have less use of formal court proceedings and more use of administrative tribunals or permitting processes, but moving water is not cheap anywhere). This results in practical terms in a great deal of engineering and legal expense (Howe et al. 1990), which in turn has resulted in substantial economic inefficiency (Howe and Goemans 2003). In practical terms, the author concludes that this high transactions cost is one reason for municipal officials to resist adding any more cost to making water acquisitions. Yet, the costs of acquisition from agriculture are still likely far lower than any alternative (Nichols et al. 2001).

But there is no obligation on cities to do any more than anyone else, regardless of the scale of the transfer or its impact, with the exception of potential requirements imposed by counties should they act (Craig 1995; C.R.S. § 24-1065.1-101 et seq.); so far, this has not posed many obstacles to water transfers though there have been some agreements reached with improved outcomes for some areas of origin in the alpine recreational counties (Associated Press 2005, Jaffe 2008).

But what is going on is essentially this: there is no state water plan and precious little substitute for planning (Wiener 2007), and the big utilities are acting in roles that a state would be expected to fill – if the state were a player and asserted defense of a public interest set of concerns beyond the in-stream flow program and defending the water rights as private property, but no private property values that are affected by exercise of water rights.

Re-defining the problem

The essential problem is that the cities are the moving part, so to speak, and the only players in the water game with real money and capacity to act. They are, however, being represented by water managers whose position is that they accept no special obligation, no different role than a rancher buying a field's worth of water from a neighbor on the same ditch. What's wrong with this massive default by the state? What's right with it, would be a better question. The state will be the default funder (and passer-through of bills) if there are endangered species act problems, as arose on the South Platte and Colorado Rivers, with big expenses only partly borne by the federal government. The state will be economically impacted by any limits or thresholds crossed that result in prevention of activities, but will do very little to anticipate them, and exercise very little quality control on supposedly local efforts. The cities meanwhile act with indifference, spouting the claim that they can't afford to pay more in competitive markets where their only obligation is the lowest water rates possible (with adequate salaries and facilities and so forth). The actors are not representing the huge range of citizen interests! The great majority of Colorado citizens live in the cities, and many are members of a host of environmental organizations which are working to counter the environmental impacts from urban water transfers (notably Audubon Society, Trout Unlimited, Ducks Unlimited, Environment Colorado, Sierra Club, and many others; less politically, heroic efforts are underway by The Nature Conservancy, the Trust for Public Land, and a raft of local organizations doing what they can). The citizens have voted more than \$3.8 Billion in local and state taxes for open space and conservation efforts (see "conservation vote" on website of Trust for Public Land). Every state has some form of agricultural preservation program (Hellerstein 2002), but how effective it is bears further inquiry.

The public interest will either be represented by the cities deciding that they will do better than "buy-and-dry" (see hand-outs or posting of summaries), or it will be largely ignored. So far, there has been a lot of rhetoric of doing better and moving water with less impact; e.g. all counties and the state legislature have endorsed a set of principles, called "Colorado 64 Principles", most recently adopted by the Interbasin Compact Commission. But, the Commission and the Basin Roundtables have no authority to intervene or limit any exercise of contract or transfer, and the net effect looks a great deal more like procrastination than anything else. There has been no serious identification of the public interests involved (e.g., disregard of the Water Transfer Guidelines report; Woodka 2009), and the market moves right along in

secret. All of the interests of the cities' citizens in all of the issues involved, except water rates, are basically not affecting the behavior of their agents, beyond talk, and a few experimental efforts as far as can be seen outside closed discussions. What will it take to get them to step up to the plate? One of the most frustrating aspects of this problem is that city representatives throughout the Statewide Water Supply Initiative discussions insisted that alternatives to "buy-and-dry" would all be more expensive, but two gaping holes complicate the assertion. First, no public information has appeared to the author, on requests or otherwise, concerning the financial analyses of "pay-as-you-go" long-term partnerships for managing water resources for flexibility and improved support of agricultural stability and maintenance of productive capacity. Second, there has been no disclosure and no evidence of success in scientific terms of revegetation of formerly-irrigated lands to either sustainable "natural" conditions now, or under changing conditions that must be expected from climate change on the large scale and climate change on the local micro-scales near irrigated areas. So we are asked to take the cities' claims at face value, but the market goes on regardless of the discussions.

It may be futile, but important opportunities for research appear in several areas, and they may be the only way to force raising the standards of care, by helping citizens bring more pressure on city agents whose concerns are not representative of the citizens. First, beyond some protracted abstraction, cities need to engage both scholars and citizens in specific placed identification of the public interest. The City and County of Boulder are decades ahead of the state. Research support for almost all other places is badly needed, in environmental as well as socio-economic issues. Second, researchers apparently are the only hope in almost all jurisdictions for really and truly developing the alternatives and literally mapping them, and doing what can be done to cost them out and make visible the potential for "doping it right" – which is to say, internalizing externalities where possible and at least identifying the range of interests, public as well as private. Third, there is an important political science and political economy issue in exactly how city resource managers are directed, and who defines the mission, and how to change that. Are city councils just not paying attention? Only motivated by easing through the next election? Convinced that lower taxes and lower water rates are the only goals in politics? If so, we are in worse trouble than we think, given that complete disregard of the future and public goods such as environmental quality. Our grandchildren might as well know how we did this to them.

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