



The Water Report™

Water Rights, Water Quality & Water Solutions in the West

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COLORADO RIVER BASIN IRRIGATION

THE FUTURE OF IRRIGATION ORGANIZATIONS IN THE COLORADO RIVER BASIN

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"The best reformers the world has ever seen are those who commence on themselves."
George Bernard Shaw

INTRODUCTION

Irrigated agriculture has a long and productive history in the Colorado River Basin. Development of widespread irrigation infrastructure began in the late 1800s and expanded rapidly with the advent of federal reclamation efforts. A vast number of private, quasi-governmental, and governmental entities — which for purposes of this article will be collectively referred to as "irrigation organizations" — form the bedrock of irrigated agriculture throughout the basin.

Ranging from small, private "ditch companies" covering only a few hundred acres to large, legislatively created, quasi-governmental units covering hundreds of thousands of acres, these irrigation organizations manage the majority of surface water rights to Colorado River water. Until recently, most irrigation organizations in the Colorado River Basin could focus on providing reliable water to farmers and ranchers, and maintaining and operating their irrigation infrastructure. However, the context in which these irrigation organizations operate has changed drastically in many areas of the basin, and the drivers of that change are getting stronger.

This article briefly explores key changes and pressures and what they might mean for the future of irrigation organizations in the Colorado River basin. It also discusses how irrigation organizations might prepare for the future in ways that will accommodate changing water demand and supply patterns while either sustaining or transforming local agricultural economies.

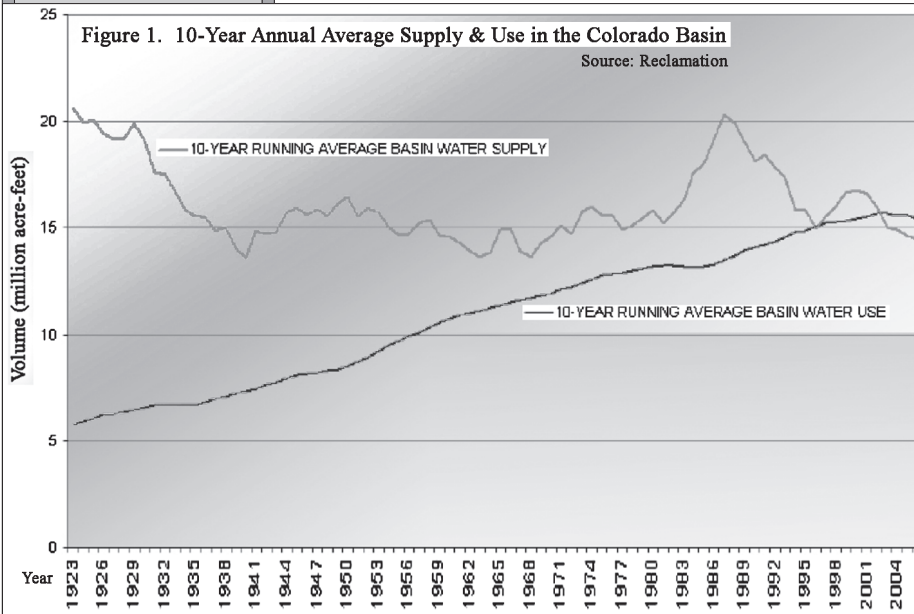
Irrigation organizations with substantial control over their water rights have an important window of opportunity to determine their future in a way that helps sustain viable agricultural communities, while adjusting to shifting water demand patterns and other forces affecting irrigated agriculture in the basin. Using a proactive, business plan approach to explore various reform options is likely to be preferable to reactive approaches, especially in areas where municipal demand is putting near-term pressure on agricultural water use. Options for reform range from the irrigation organization itself negotiating water contracts or sales with non-agricultural buyers in a way that benefits irrigator's bottom lines; to allowing individual irrigators to do so under a plan that maintains the viability of the organization; to the bolder option of fully decoupling water rights from infrastructure.

Irrigation Adaptation

Over the last few decades, several factors have affected the availability, use, and economic conditions of water currently permitted for irrigation. All of these forces are at play in the Colorado River Basin, where average annual use already exceeds annual average supply (Figure 1).

TRENDS WITH THE MOST PERVASIVE EFFECTS ON AGRICULTURE INCLUDE:

- Competition for water from rapidly growing urban areas dependent on Colorado River water or looking to the Colorado as a source of supply for future growth



- Suburbanization that is fragmenting previously contiguous areas of farmland served by irrigation organizations, posing new challenges for irrigation system management and maintenance
- Aging irrigation infrastructure and the associated high costs of repairs, combined with decreasing federal and state funding for such work
- Aging farmer and rancher population
- Growing proportion of farmers and ranchers that depend on off-farm income
- Water supply uncertainty associated with climate change-induced variability, including potentially longer droughts
- Growing public support for ensuring that rivers have healthy instream flows for recreation, fish and wildlife
- Potentially reduced federal funding for farm subsidies, conservation programs, and disaster payments

Pressures

Any one of these factors has significant implications for irrigated agriculture. Combined, they promise an uncertain and volatile future, where pressures exterior to irrigation organizations will cause internal policy change. Urban areas and conservation interests are going to increasingly be looking to lease or buy water from agriculture; irrigation organization budgets are going to be facing increased stress as repair needs mount and operational issues become more complex; aging farmers may be looking to “cash out” by releasing their land and water for development, further fragmenting farm and ranchland; and persistent drought may affect the continued viability of marginal farm and ranch operations, especially if there is less federal funding for disaster assistance.

In the face of these changes and uncertainties, irrigation organizations themselves will be at the center of a potential storm. Many irrigation organizations are the actual owners of surface water rights, and have the authority to decide whether those rights can be leased or sold and under what terms and conditions. In other irrigation organizations, especially mutual ditch companies, farmers themselves have more say about the disposition of rights. Because irrigation organizations are charged with maintaining their infrastructure, the budget challenges — and pressures to raise fees on members or farmers within the organization — will fall on organizations’ governing boards if other sources of funding are not available.

For many reasons, however, many irrigation organizations have yet to take a strategic view of their operations, including how they might benefit from more active participation in voluntary, compensated transactions of surface water rights.

FACTORS THAT HAVE PREVENTED FORWARD-LOOKING PLANNING TO DATE INCLUDE:

- Short-term operational and maintenance tasks that fully occupy the small staff and volunteer boards that administer many irrigation organizations
- Reluctance to wade into water transfer issues where frank discussions can initiate discord among irrigators or alarm local businesses dependent on irrigated crop production
- Managers and directors whose tenures and experiences developed under an earlier and different set of challenges
- Lack of resources to engage in mid- and long-term business plan development that could evaluate how the organization’s clients would best benefit from the economic value of its water rights
- Wariness about developing new relationships with conservation groups offering to help cost-share infrastructure improvements that can meet both operational needs and enhance stream flows
- Complex federal and state laws and rules governing water transfers
- Regulations or policies internal to the irrigation organization that make transfers difficult

There are exceptions, of course, as some larger irrigation organizations have confronted these issues sooner and had more resources to deal with them. (PVID side bar).

In general, however, there appears to be much more room for irrigation organizations to take the lead in developing new models for approaching these serious challenges to the future of irrigated agriculture.

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THE CASE FOR LEADERSHIP

**Irrigation
Adaptation****Storage
& Delivery****Historical
Requirements****Valuable Assets****Water Markets****System Repairs****Pro-Active
District**

Most Colorado Basin irrigation organizations are several decades old. At the time of their creation, water storage and delivery infrastructure was in high demand. Developing this infrastructure required cooperation among landowners and often with government agencies. This is true of the early private organizations, later organizations created by state legislatures (with taxing, eminent domain and other authority), and those established to carry out the distribution and irrigation functions of US Bureau of Reclamation (Reclamation) projects.

The basin's irrigation organizations were generally established when there were few to no constraints on water availability, except the lack of infrastructure to store and deliver it. There was little significant competition for water from cities. The water itself, granted via permits from the state, was essentially free. However, the capital investments to obtain this water were costly.

Thus, most irrigation organizations were designed as nonprofit ventures to sponsor construction and operation of infrastructure. Their focus has remained on financing and repayment of debt incurred for this construction and on raising sufficient funds — either through water rates, taxes, or a combination — to operate these irrigation works.

Now, however, the relative scarcity of infrastructure and water are reversed. Infrastructure abounds, though much of it is in need of serious and expensive repairs, but water is increasingly scarce, as rivers become fully appropriated, demand in the municipal and environmental sectors grows, and extended droughts reduce available supply. That means that the water rights held by irrigation organizations or their individual members have greatly increased in value. These rights can and should be managed as a valuable asset for the benefit of the organization and its members. It is the irrigation organization itself that is best positioned to move forward with internal reforms that create the flexibility necessary for it and its members to realize the full value of their water rights.

Short-term, it might seem easier for irrigation organizations to resist reform in order to avoid internal controversy or roil relations with nearby businesses depending on irrigated agriculture. That outlook may not serve the organization or its members well. Municipal areas are growing and hold the bulk of political and economic power in all the basin states. State and federal decision-makers are ultimately unlikely to deny the water demands of these cities, even if they do impose strong conservation measures to reduce consumption. Many irrigation organizations, however, lack a proactive approach to initiating participation in water marketing. This means they are foregoing opportunities to design a positive future for themselves.

There is still time for irrigation organizations to get ahead of the game, but that window is beginning to close. In fact, the higher value of increasingly scarce water resources is already generating change. Thirty years ago, there were very few transactions among agricultural water right holders and municipal or conservation buyers. Now, water law and policy have evolved to open the door to transfers, both temporary and permanent. Water rights transfers are happening throughout the West at large and small scales, both to satisfy changing local demand patterns and, in some cases, to move water from an irrigation area to a city *outside* the irrigation area boundary. In the Colorado River Basin, most of the transfer activity to date, with some notable exceptions, has been focused in the Lower Basin, but more and more the role of voluntary, market-based transfers and options such as water banking are under discussion in the Upper Basin as well.

Another factor generating interest in transfers is that valuable water rights — managed well — can help generate funds for system repairs. In many of the basin's older, smaller irrigation organizations, funding these repairs is beyond the reach of farmers themselves. Moreover, substantial funding is not likely to be forthcoming from deficit-ridden federal and state governments in the foreseeable future. So, for example, temporary or long-term leasing of some water to municipalities for instream flow purposes may generate revenues for infrastructure and efficiency repairs that can benefit the irrigators' bottom line.

Palo Verde Irrigation District (PVID)

One example of a larger, pro-active district is the Palo Verde Irrigation District (PVID), which is located along the main stem of the Colorado River. In 2005, PVID secured a 35-year deal with the Metropolitan Water District of Southern California (MWD) to lease between 30,000 and 120,000 acre-feet of water per year when needed by MWD. Both farmers and PVID itself receive payments from MWD. In individual contracts with MWD, farmers received an upfront payment of \$3,120/acre and receive \$700/acre when they fallow land to provide water requested by MWD. Participation by farmers is completely voluntary, but annual fallowing is capped at 30% of PVID's acreage. The District itself receives some funding from MWD to cover costs associated with the fallowing program. MWD also invested \$6 million into a community improvement program which is managed by a local community organization. (For more information, see www.westgov.org/initiatives/water/373-water-papers, presentation of Bill Hasencamp, MWD, October 28, 2011).

REFORM GOALS

**Irrigation
Adaptation****Fiscal Integrity****Public Policy****"Implied Values"**

What principles should be observed in designing optimal reform options for irrigation districts? First, preservation of fiscal integrity is important. It is necessary to generate revenue sufficient to cover operation and maintenance costs, plus basic planning and administrative functions. Second, the infrastructure should provide for the most practicable efficient delivery and use of water, including adequate monitoring of diversions and use. Third, each organization's policy should encourage irrigators to make production and water use decisions that maximize their opportunity to make a profit. These decisions include, among other things, type of crops grown, whether to fallow or not, irrigation technology and water application rates.

In addition to these considerations, which are internal to the irrigation organization itself, there are public policy considerations relevant to design of reform options. From a societal and overall economic perspective, it would be generally desirable to achieve a better balance among urban, agricultural, and environmental water values. That is, it may not be desirable over the long-term to have vast differences in "implied values" of natural water used for different purposes. (Implied value is obtained by subtracting value-adding conveyance and processing costs from rates charged to clients. Failure to equalize implied value is analogous to a gas station having different fuel pumps for different classes of customers: i.e. one pump with a fuel price based on free crude oil and the other pump with fuel price based on crude's market value.) This objective is not met when irrigators served by irrigation organizations are experiencing a zero implied value for natural water, as is common, while urban entities are paying large sums to develop additional supplies.

Conversely, housing and commercial growth should not be incentivized by undervalued water, especially in areas where preservation of agricultural water provides for food production, environmental goods, quality of life, and other benefits.

**Preservation
Values**

Lastly, given the already extensive alteration of many of the natural stream and river systems in the Colorado Basin, it has to be acknowledged that water for environmental flows has significant economic value. Preserving and restoring healthy flows helps maintain robust fish and wildlife populations, which in turn generate economic benefits in the form of preservation values, recreation, and tourism. These flows and their benefits are sometimes easier to provide in tandem with maintaining agricultural operations and open space than if the water is taken off the lands for use in subdivisions or commercial or industrial developments. Convergent agricultural and environmental interests can be a motivating factor for many conservation organizations to enter into water market transactions with irrigators.

**Redesign
Potential**

Given that a "clean slate" situation for redesign or reform of irrigation organizations is not politically realistic, how much room is there for advancing these principles, and how might irrigation organizations go about analyzing whether various reforms in water rights transferability are appropriate for their particular situation?

First Steps**FIRST STEPS TO DETERMINING ORGANIZATIONAL REDESIGN POTENTIAL ADDRESS TWO QUESTIONS:**

- 1) What constraints currently exist on the irrigation organization's ability to transfer water rights?
- 2) What are the pros and cons of various reform options to increase flexibility for transfers — from minor to more aggressive — for the organization itself and for its members/water users?

**"Buy & Dry"
Cooperation****Lower Arkansas Valley Super Ditch Company**

A desire to get ahead of the game is one of the core motivations behind the Lower Arkansas Valley Super Ditch Company (Super Ditch Company). Assisted by funding from Colorado's innovative Agricultural Transfers program (<http://cwcb.state.co.us/LoansGrants/alternative-agricultural-water-transfer-methods-grants/Pages/main.aspx>), irrigators in the Lower Arkansas River basin initiated this cooperative effort in 2008 after a period of aggressive efforts by municipalities to acquire irrigation rights under a "buy and dry" model (i.e. cities buy up irrigated lands and transfer the water rights to municipal use). The Super Ditch Company is managed by a board of directors elected by participating irrigators (participation of irrigators is voluntary). The Super Ditch Company is empowered to negotiate water leases, helping both to increase irrigators' negotiating leverage with municipalities and ensuring that irrigators all get a fair deal in terms of compensation. In forming the Super Ditch Company, irrigators cited PVID's example as a model. The first pilot lease for the Super Ditch Company will be for 500-acre feet with the City of Fountain. (For more information, see www.westgov.org/initiatives/water/373-water-papers, presentation of Peter Nichols, October 27, 2011).

CONSTRAINTS

Irrigation
AdaptationTransfer
Constraints

Water rights management in Colorado River Basin irrigation organizations is constrained by state law, each organization's legislative charter and internal rules and, for those receiving water from Reclamation projects, the terms of their federal contracts. In all cases, transfers of water rights from one use or place of use to another generally have to be reviewed by the state water agency and statutory conditions are in place to govern such transfers.

The irrigation organizations that are the most likely candidates for near-term reform are private mutual companies, where irrigators own clear shares of water rights. Decisions in such organizations are generally made by majority vote, making it easier to modify water management rules. Given that many mutual districts are small and may not have sufficient staff or resources to examine the pros and cons of more flexibility on water right transfers, working together within watersheds to conduct the relevant analyses could be helpful.

Internal Rules

Second in line for reform are those irrigation organizations where the state has not statutorily restricted transferability of the water rights held by the organization. In these cases, it is often the internal rules or charter of the organization that imposes the most constraints on transferability. Ultimately, the organization's board (which is often elected by farmers and other landowners within the district's boundary) can change those rules and charters once they become so inclined.

Third in line would be irrigation organizations that face restrictions on transfers as a consequence of the state law by which they were created. In these cases, state legislative action may be required to alter the restrictions, potentially a more arduous and time-consuming, though not impossible, process.

Reclamation
Authorization

Fourth in line are likely to be those irrigation organizations that receive water under contract from Reclamation. **[Editor's Note:** For Reclamation situations, the authorization under which the particular federal project was created governs how the water is used, generally including specific provisions that set forth the "authorized" uses.] Some Reclamation projects have been reauthorized to allow the water to be used for multiple purposes beyond irrigation and to set out specific procedures for transferability of project water (e.g. the Central Valley Project Improvement Act of 1992) and there are some areas where Reclamation has sanctioned unique transfers (usually among irrigators or for leasing of water for instream flows). However, achieving flexibility in irrigation organizations that depend solely on federal project water can be a complex, controversial and time-consuming undertaking. Successful approaches developed in less complex situations (i.e. non-project irrigation organizations) could provide good models, however, for eventual reform in Reclamation project areas.

REFORM OPTIONS

Transfer
Options

There are several types of reforms that would add flexibility for market-based transfers of water rights currently held by irrigation organizations and/or their members. Most options fall into two broad categories: (1) the irrigation organization itself negotiates transfers with nonagricultural buyers and pursues various measures for finding transferable water within the organization's domain; or (2) the irrigation organization assigns water rights to their clients and allows these right holders to transfer their water to other parties under terms and conditions set by the irrigation organization. In some situations, the irrigation organization may be faced with a dynamic of rapidly declining irrigation and booming suburbanization. In these instances, there might be an opportunity for the organization to evolve into a broader water supply utility.

Other, more aggressive reform options would include selling the entire district or dividing the irrigation organization in two parts: one to operate the existing irrigation infrastructure and the other to manage and engage in transactions with the water rights. The appropriate option will, of course, be highly situation-specific.

Incentives

In the first category, irrigation organizations could provide incentives to farmers to conserve water using on-farm strategies, either by charging for water on a volumetric basis under a structure sufficient to encourage efficient water use or contracting with farmers for a fixed amount of water that can be put in a transfer pool.

Volumetric
Pricing

A *volumetric pricing approach* would require an assessment of the market value of the water (i.e. the price would not be based just on recovery of costs for basic irrigation system operation and maintenance as is currently the case in most irrigation organizations.) While this would mean that each farmer would likely pay more per unit of water, it would also provide incentives to the farmer to be efficient and, if the irrigation organization could then lease or sell that conserved water for its market price, it could generate significant funds for maintaining infrastructure or distributing dividends (independent of water use). One important limitation to this is the ability to lease or sell "conserved water" under state law (see for example, Oregon's laws that allow this to occur: www.oregon.gov/OWRD/mgmt_conserved_water.shtml). Such transactions are more difficult under Colorado law, for example.

Irrigation Adaptation

Conservation Bidding

Decoupling Water Rights & Infrastructure

Vision & Courage

Alternatively, farmers could “bid” on how much water they would conserve (by on-farm efficiency measures, deficit irrigation, or even fallowing) and offer a price for that conserved water. The irrigation organization would review all the bids received and select the low-cost options, from the organization’s vantage, for generating water it would then lease or sell to outside buyers, likely at a price higher than it paid the farmers. The extra revenue could then be used to defray costs or distribute dividends.

Among the advantages of the latter approach is the irrigation organization can amass larger volumes of rights than individuals, providing better leverage in negotiations with potential buyers.

Under the second category, individual farmers would be empowered to lease or sell their rights outside the district as they desired, within a set of conditions designed to protect the operation and maintenance of the irrigation organization itself over the long-term. These conditions might include a requirement that buyers pay a price that covers the farmer’s legitimate share of irrigation infrastructure operation and maintenance costs (and that the irrigation organization would receive that money, either directly or from the farmer). They might also include a requirement that only a certain percentage of an irrigator’s right is transferrable in order to account for overall system storage and conveyance losses.

A bolder approach might involve decoupling the irrigation infrastructure from the water rights. That is, the infrastructure would be maintained and operated by one entity, and a separate entity would hold the water rights. The water right entity would be expected to produce a profit for its shareholders (the irrigators), selling water to both irrigators within the infrastructure organization and other users, on either a temporary or permanent basis. If the water right entity’s administrative overhead stays relatively small, irrigators as shareholders in the water right entity should be able to turn a reasonable profit by engaging in conservation and smart water use on their own fields to minimize their water cost and then benefitting as shareholders from the “outside the organization” transactions of the water right entity. Obviously, this kind of approach may only be appropriate in limited situations, such as where there is high demand from outside buyers and the irrigators themselves have the wherewithal to hold down their own water consumption via low-water use crops, high efficiency irrigation, or other means.

MOVING FORWARD

Irrigation organizations and their farmer and rancher members are an essential component of the economic base, quality of life, and heritage of the Colorado River Basin. But the Colorado Basin, like many others throughout the world, is not static. Farmers and ranchers face a host of challenges that are persistent and intensifying. Building the basin’s extensive irrigation infrastructure took enormous vision and courage. Sustaining irrigated agriculture in the face of increasing competition for water, suburbanization, climate change, restricted budgets, an aging farm population and other factors will take the same kind of vision and courage. Irrigation organizations, with their capacity to manage water rights and understand the needs of their client members, are ideally positioned to lead the reform efforts.

Reform won’t be easy, and there are constraints that cannot be addressed solely by the irrigation organizations. State water laws need to become flexible enough to efficiently facilitate high value, consensus-based market transfers of water, especially where such transfers provide multiple benefits such as meeting critical water demands, protecting or restoring healthy river flows, and keeping agricultural production viable. Policy mechanisms to reduce or mitigate the potential negative effects of transfers on surrounding rural communities also need to be improved. All these policy changes are likely to better reflect the interests of agriculture, though, if irrigation organizations are helping lead the way.

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