

# California Water Markets

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## California Water: A Brief History

*"Whiskey's for drinking; water's for fighting over"*

*-Mark Twain*

The mid-1800's saw a vast influx of settlers into California intent on finding large amounts of gold. Soon the sparsely populated state began growing rapidly, and before long another natural resource came into high demand...water. At the onset, California adopted a policy of "prior appropriation," also known as "first in time, first in right." The seemingly limitless resources in the new state needed little regulation, and claiming water-or diverting it to your property- was perfectly legal provided you were the first on the land.

However, soon the state began to grow, taking on agriculture as its primary industry. With most of the state being quite arid, massive irrigation systems were necessary. Water allocation was quickly becoming a serious issue, and in 1859 the California Supreme Court legalized its transferability, writing, "The ownership of water as a valuable property, distinct sometimes from the land through which it flows may be transferred like other property" (Schiller and Fowler 1999). The idea of private water had been adopted and by 1910 private irrigation companies were successfully irrigating most of the state.

The 20<sup>th</sup> century saw vast increases in water demand, as both the agriculture industry and California's cities grew rapidly. The Central Valley Project, built in the 1930's, includes hundreds of miles of waterways and irrigates over 3 million acres while providing water to 2 million urban residents. Similarly, the State Water Project implemented in the 1960's covers the entire Bay Area, and the San Joaquin Valley.

At the same time, a whole new crop of worries appeared. Even as the population skyrocketed, the Progressive and Populist movements were calling for large water subsidies and public control of the state's waterways. Meanwhile, John Muir and the Sierra Club were demanding water preservation. The fight for Hetch Hetchy Valley signaled the beginning of a true conservationist movement.

By the 1970's water, or "liquid gold" as it came to be called, had become a premier issue in California. Farmers and cities were demanding ever more water at lower prices, while the environmental movement had taken full swing. Heavy top-down controls such as the Clean Water Act were put in place. The California Environmental Act of 1970 called for no new construction of water development projects until proponents had conducted a review of possible environmental consequences. The monumental decision to save Mono Lake showed that the public value of a water ecosystem outweighed private property rights.

Today, Californians number over 35 million and this number is expected to rise to 50 million by 2025 (Totten 2004). Agriculture has expanded into a multi-billion dollar industry and the rise of biotechnology and the computer industry has strained the state's water supplies even further. To make matters more complicated, nearly 2/3 of the state's population is located in the south, while most precipitation falls in the more rural northern third. In all, water shortages in the state are expected to exceed 3.9 trillion gallons per year by 2020 (Public Citizen 2004).

To deal with these allocation issues and the fact that California sees large swings in its precipitation (extended droughts are not uncommon) more flexible policy became needed. A myriad of laws govern the water supply, making allocation and conservation difficult and expensive. In keeping with the trend towards privatization that defined the 1980's the idea of creating a market for water arose. The fundamental idea of a market is that each individual will make the decisions based on their own wellbeing. This, in turn, leads to an efficient market price, distributing the good in the best manner for society. In theory a water market will put surface water in the hands of the highest bidder, ostensibly leading water to be conserved while going to higher value uses, while equating supply with demand (Hundley 2001).

In practice, results have been mixed. While in some areas the markets have vastly improved efficiency, elsewhere, other issues have surfaced. Environmental quality and justice issues have arisen, while the ethical implications and technical complications of putting a price on a public good continually make water a sticky issue in California. Having put this issue in a historical vantage, we

will give a brief description of the markets themselves, and follow with a discussion of the winners and losers in a market system, keeping environmental and social implications in mind. Finally, we will delve into the current conditions in California, and make some policy prescriptions that may give insight into how to best institute stable governance of California's most precious resource.

### Water Markets in California

Proponents of a long term California water market cite economic efficiency as one of the major advantages to installing a market system for California's limited supply of water. Those who value water above the market price will purchase water, while those who value it less may increase conservation efforts, or find substitutes. The difficulty of designing a water market system is defining *ownership rights* of California's water. These property rights must be well defined and enforced by law in order for the market to function (Lee 1999).

Another issue inherent in structuring markets is which form the market will take. In general California has pursued two different types of markets. The first system is a water market, which involves water as a commodity. In this system water is simply sold to the highest bidder, which will usually be cities or environmental conservation organizations. The second system is a water transfer system in which water is only traded between farmers and agricultural communities (Haddad 1999).

Despite efforts, California has had difficulties adopting a long-term water market. Currently, short-term markets exist in which farmers sell water rights at a certain quantity, for short period of time, usually during drought periods. These short-term markets have historically been successful as lots of trading has taken place. They are also usually very efficient as they allow buyers to buy as much as needed, and prevent farmers from over pumping.

Long-term markets on the other hand differ from short-term markets in that transactions occur on prearranged terms, and do not need to be renegotiated each time. In long term markets contracts are created, bought, and sold to ensure water reliability of an area's future. Long term markets have proven difficult to achieve as variable factors such as prices, weather, pests, and

business profitability make coming to a long term market equilibrium difficult. Generation equity is also a problem. Many feel that the current generation should not be made to pay a contract for a future generation's water. Furthermore, a contract based on future payment plans is designed on rates of growth that may not be accurate. Long term contracts can also have significant effects on the environment, as a substantial long term change in water availability, as opposed to short term change, can have high impacts on an ecosystem (Haddad 1999).

The first historically successful short-term water market was in the Westlands Water district. A 1992 drought left the district short on water, and a transfer system was adopted which led to over 3,500 transactions. Farmers contacted each other by phone or in person, and closely watching prices, adopted a true water market.

Despite other similar successes, the adoption of a long-term water market in the state has proved difficult. To better comprehend the complexities of such a market, it is advantageous to see both sides of the issue. Why has the idea of a market brought about such great controversy? Who are the winners and losers?

#### Benefits of California Water Market

In California, the presence of the water market has provided many benefits to both buyers and sellers. Sellers, mainly farmers, are able to make a profit from the transactions and buyers, mainly urban sectors, are able to benefit from increased water availability. Those who benefit from the California water market include farmers, urban water wholesalers, the California Department of Water (California Drought Bank) and wildlife organizations such as the California Department of Fish and Game. In addition to ensuring that there is an adequate water supply for interested parties, the California water market provides economic and environmental benefits.

“Water markets are not a source of water supply, but rather, there are a way of matching supply and demand” (Schiller and Fowler 1999). The demand comes from urban centers where water resources are limited and agriculture water users supply most of that demand. In most years,

farmers provide at least 90% of the supply to the water market (Hanak 2004). The presence of the water market provides these urban water buyers with increased water availability and the farmers who sell the water, a profit incentive. Consequently, under conditions of continual water shortages, urban centers are able to purchase adequate water for their residents without increasing California's overall consumption of water.

Economic benefits from the California Water Market occur when water is traded from low-value to higher value uses. This usually means from irrigated agriculture to higher value horticulture and to industrial and urban use (Horn 2003). Although, the sale of water results in lost jobs around agricultural areas, it has been suggested that the overall economic benefits statewide will increase. In 1991 the California Water Bank estimated that although 1600 jobs were lost in areas selling water, 5400 jobs were created in areas purchasing that water, resulting in a net economic benefit of 104 million dollars (Horn 2003). Additionally, individual farmers who choose to sell excess water have reported increased farm incomes as a result of the water market transactions. For example, in a case study of both Yolo and Solano counties, average farm profit increased by 4% in Yolo County and 6% in Solano County (Coppock and Kreith 1993). Because there is a demand for excess water and profit gains, farmers have the incentive to improve water management practices and conserve water.

Since water is a valued commodity, farms have the incentive to invest in measures that increase water efficiency and reduce waste. This trend towards improved water management was evidenced by an increased investment in water saving technology by 19% in Yolo County and 11.5% in Solano County (Carter et al 1994). Additionally, some water districts have assisted farmers with improved water saving technology. Bob Muir informed us that the Metropolitan Water District of Southern California has financed improvements in agricultural water management practices for farms in the area in return for the water that has been saved, which is 100,000 acre feet per year (personal interview).

Improved water management practices, on behalf of farmers, provide an important environmental benefit: improved water quality in response to reduced agricultural drainage water.

Water that is applied to farmland in excess of crop needs eventually drains back into large bodies of water. This runoff, containing a vast array of sediments, salts, fertilizers and pesticides, can be a very detrimental pollutant to rivers and aquifers (Horn, Carter et al. 1993). A reduction in this pollution source improves water quality for consumers that utilize the same water source or are located further downstream. Consequently, the impact of the California Water Market leads to improved agricultural practices that in turn have a positive impact on the environment.

### Water Market or Racket?

*“Leaving the fate of the soil and people to the market would be tantamount to annihilating them” -Karl Polanyi*

Although we have seen that there are indeed advantages to a market system for water, it would not be prudent to enact water-market legislation without first examining the potential downsides of such a market. Enthusiasm for a market should be tempered by the knowledge that the market is not perfect, and it can, as much evidence shows, negatively impact the environment and local economies. Environmental concerns include diminishing surface and ground water quantities, subsidence caused by aquifer depletion, and the destruction of waterfowl habitat. Economic concerns include regional revenue, individual, and third-party losses. The most frightening possibility is that the market could prove detrimental to current social institutions because of the ethical questions implicit in such a system.

Records show that the water transfers executed by farmers in Solano and Yolo counties during the 1991 drought did have significant affects on the counties’ environment and economy (Coppock and Kreith 1993). In fact, it is estimated that the surface water transfers accounted for 36% of the total groundwater depletion that year. Ground water depletion is dangerous for two reasons: it can cause land subsidence (which can deplete aquifer storage capacity), and it reduces the local water supply for future generations. Unfortunately, there is much scientific uncertainty as to when subsidence occurs, so many refuse to accept it as a legitimate cost. As Hempel wrote, “Politics dominate when science equivocates” (Hempel 1996).

Other environmental concerns abound. Of the 10 million birds that migrate south each year along the Pacific Flyway from Russia, Alaska, and Canada, over 60% of them make their winter homes in the valley; however, California has lost over 95% of its wetlands due mostly to agricultural use of the valley's water. Many birds have come to rely on rice fields and the excess water from various other crops (Coppock and Kreith 1999). When farmers fallow their land, they deny many animals dependent on their fields habitat and nourishment. As such, the California Audubon Society has formed an unusual alliance with rice companies encouraging farmers to grow this water-intensive crop because it provides the best opportunity for wetlands restoration.

Advocates claim that water markets are win-win situations for both farmers and urban consumers; however, in both Solano, and Yolo counties the economy, as measured by revenue numbers was down 3.5% and 5% respectively in years of water transfers (Coppock and Kreith 1999). There were simply less transactions for equipment, machinery, fertilizer, and labor when lands were fallowed. Fertilizer companies also showed a 25% loss in profit on years of fallowing. (Hannak 2004). Perhaps these are natural and even desirable adjustments, but market enthusiasts should realize that local economies can be adversely affected by water markets, even if some individual farmers make more money.

There are also ethical grounds on which water should not be traded or at least monitored carefully. As the California office of the public citizen group wrote, “[A] movement to treat water as a commodity is always resisted by agricultural communities” (Public Citizen 2004). Marc Faye, a local farmer writes, “I always felt that water was somewhat like air—it is there to be used for beneficial purposes. This implies that when I’m through with it, I put it back in the system and the farmer downstream gets to use it. It bothers me to think that someone could sell the right to use that water, and then have it, in effect, disappear so the farmer downstream doesn’t get to use it” (Coppock and Kreith 1999). Perhaps Polanyi was correct when he assumed that people removed from a resource, such as urban dwellers, have no mechanism for sensing potential devastation (Polanyi 1944).



These fears may indeed be coming to fruition. In San Diego, a subsidiary of Vivendi, the world's largest media conglomerate, has purchased 45,000 acres of farmland in the Imperial Valley. They plan to store 83 billion gallons of water and then sell it to San Diego. This constitutes 8% of San Diego's water supply. Should large corporations be able to own the rights to water because they can afford it? Most consumers would find something disconcerting about receiving a public resource from a private company. And many experts concur. UCLA professor Norris Hundley told us that water entrepreneurs are not seeking just, "humdrum profits. They are convinced that great financial enrichment lies in the world's increasingly scarce water supplies."

#### A Continuing Debate: The Situation Today

Today, water in California is dominated by the state and requires state approval on all transfers, including both actual water transfers as well as rights transfers. The state's primary goal is to protect the public interest, therefore, it regulates all water transactions. Its highest concern is domestic use and second is irrigation. To assure proper allocation, state law provides that municipalities are only allowed to acquire water for municipal purposes. In addition, the state supports development as long as it does not interfere with the established environmental standards, including, national wild and scenic river systems, state and federal designated wilderness, and "critical condor habitat" by US Fish and Wildlife Service.

The state of California acknowledges that efficient use of water depends on clearly defined property rights for use and transfer. Yet, to ensure public welfare, from both locations of export as well as import, the state is required to approve all transfers. To help facilitate efficiency practices, the state departments are mandated to encourage voluntary transfers of water, water rights, and offer technical assistance to identify and implement water conservation practices.

The state is engaged in conservation efforts through the legal process. For example, it passed a recent law requiring all urban users to install water meters by March 1, 2013 and charges will be

based upon volume. On the other hand, to assure equity, the state assures that all urban water suppliers are able to meet their needs.

In the state's efforts to become more efficient it intends on continuing the incorporation of both market mechanisms as well as community leadership in water management. Communities are best able to assess their needs, monitor, and fund supplies. Localities are also in the best position to assure social and economic justice in its communities. It is the state's goal for local communities to manage their own water. Localities will decide on the course of action and the state will assist in moving water and oversee public protection (Department of Water Resources 2004).

In an interview with Michael Warburton director of Public Trust Alliance, he addressed concerns regarding privatization of the water resource. If water is privatized and then sold at profit, it will be allocated to those who can pay, and those who cannot will suffer the loss of a basic guaranteed right as citizens. The problem becomes increasingly complex as the population grows. If a farmer in the community owns the water rights and he decides to sell, the whole community suffers. Only small portion of the population holds water rights compared with the number of citizens.

It is here where the true shortcomings of a market system for water come to light. Despite possible improvements in efficacy, can we live with the possibility that there may be citizens who simply cannot afford water? Do we want large media conglomerates dictating water supply and quality? Can we stand here and espouse the benefits of a completely free market while aquifers are depleted and animal habitats destroyed?

Surely, some fundamental basics of the market should be maintained and developed. The case of the Westlands water district shows the potential of short-term markets in times of drought. However, that was water transfers purely among farmers. On this sort of scale the basic advantages and incentives of a market help conserve water and put decision making in the hands of the state's agrarian base. At a county level this type of system should be adopted when needed and for irrigation purposes.

However, on a large scale a water market brings with it many dangers. Water is a fundamental need of both humans and other animals. A true market may put huge profits into the hands of a few while leaving the majority of citizens struggling to pay for water. (This can be seen in Cochabamba, Bolivia where water privatization led to a 200% increase in price, and widespread rioting). Surely research into how to incorporate some basic market incentives into the water debate will lead to the advantages of conservation and higher value use. For now, however, markets should stay on a local county basis and be applied to transfers. Meanwhile, the state must continue to work on defining property rights, examining environmental issues, and subsidizing enough water for every citizen.

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