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The Central Valley Water Project Improvement Act and water markets

New federal water laws change the rules for allocating federal water in California between agricultural, urban, and environmental uses. Some of the rules stimulate water markets. But the authors of these two articles see the legislation's effects on water markets and on people's welfare somewhat differently. Other states in the west and elsewhere, where environmental and urban interests compete with agriculture for limited water, will want to carefully watch the outcome of this new legislation.





Two steps forward— one step back

On October 30, 1992, President Bush signed Public Law 102-575 1992 HR 429 into law. This omnibus water act includes rule and financing provisions affecting 30 water projects in 13 Western states. Importantly, the statute fundamentally changes the nature of federal water policy for the Central Valley Project (CVP) in California, and these changes might well be a precursor for policy changes affecting other federal projects in the Western states.

Title XXXIV, the Central Valley Project Improvement Act (CVPIA), protects fish and wildlife resources, contains new rules for water transfers, introduces a tiered pricing system for federal water sales, and revises time tables for federal water contracts. The seemingly radical reforms of the legislation have farmers, consumers, economists, and water agency officials wondering if the changes will turn out to be mostly cosmetic, or if a new day has really arrived for federal water policy, especially relating to water markets. Our view is that the rule changes, which some herald as a major improvement in federal policy, fall far short of achieving market allocations that are needed if water is to move to its high-

est-valued uses. Here, we identify the act's major achievements and shortcomings with respect to water markets.

The competitive market system is said to be efficient because scarce resources are attracted to their highest-valued uses. The "invisible hand" guiding market transactions produces a welfare improvement for both buyers and sellers. Markets presume property rights; owners of resources must be clear about what they own so that they know what they can legally exchange. However, those who might be affected by resource use, but do not hold legal rights, can gain if they can induce the political process to deliver benefits through regulation. This regulation is one of the principal and most worrisome aspects of the new legislation.

The Central Valley Project Improvement Act

Economists have argued for at least three decades that institutional rigidities and market exchange restrictions have impeded efficient water allocation in the West. It is not surprising that water reform often originates in California. California residents have more to gain from functioning water

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markets than residents of any other state because water is such a vital resource in this most populous state with such a large and diverse economy.

The CVPIA lists seven purposes of the act. The first two (a and b) are to protect, restore, and enhance fish and wildlife and their habitats. Viewing the act in its entirety, there is no question that fish and wildlife interests dominate the issues addressed by the act.

The three purposes that deal with markets and water-use efficiency are

"...(c) To improve the operational flexibility of the Central Valley Project; (d) To increase water-related benefits provided by the Central Valley Project to the State of California through expanded use of voluntary water transfers and improved water conservation;... (and) (f) To achieve a reasonable balance among competing demands for use of Central Valley Project water, including the requirements of fish and wildlife, agricultural, municipal and industrial and power contractors."

Purposes (c) and (d) of the act seem to weaken federal regulatory control of CVP water allocations and give water users themselves more power to decide how water is used. Hence, at first blush, the act appears to be a major step forward in promoting efficient water market transfers not previously allowed. On closer reading, however, we doubt that this will be the final result.

In the case of the CVP, the Bureau of Reclamation obtained a water-use permit from the California Water Resources Control Board which administers water rights and exchanges in the state. The Bureau then contracts water out to the water districts which have a statutory obligation to deliver the water on a pro rata basis to ultimate



users such as irrigators. In effect, the ultimate users cannot be denied water provided to the districts by the bureau and, therefore, have a use right.

To satisfy instream interests affected by water allocations, but who do not own the water rights (such as recreational and fish and wildlife interests), the act contains complicating restrictions that will impede, not promote, market transfers. The last of the stated purposes, "to achieve a reasonable balance among competing demands for use of Central Valley Project water," almost assures that water will not be market allocated.

In the absence of significant externalities, a market will move water to its highest valued uses whether the allocation is "reasonable" or "balanced" or not. A "reasonable balance," is a political objective meant to justify modifications to free market allocations. By giving state and federal regulatory agencies power to decide what in their view is a "reasonable balance," the act opens the door to political manipulation that inevitably lead away from efficient water allocation.

One step forward: Transfers

The act takes a major step forward to promote market transfers of federal water that will promote efficiency:

"All individuals or districts who receive Central Valley Project

water under water service or repayment contracts, or exchange contracts entered into prior to or after the date of enactment of this title are authorized to transfer all or a portion of the water subject to such contract to any other California water user or water agency, State or Federal agency, Indian tribe, or private nonprofit organization for project purposes or any purposes recognized as beneficial under applicable state law."

If transfers do in fact occur, the consequences are indeed likely to be important. Typically, agriculture consumptively uses about 80 percent of California's developed water, but generates only 8.3 percent of the state's income. Urban residents generally pay between \$450 and \$1,000 per acre-foot of water, whereas farmers pay about \$15 per acre-foot for water from the federal CVP and an average of about \$55 from the State Water Project (Rosenbaum). These figures strongly imply water misallocation between uses and possible gains from trade for both agricultural and urban users were market transfers permissible.

Other evidence suggests sizeable benefits from market transfers. As California cities grow, they seek additional water supplies at minimal costs. Water marketing is by far the least costly

way of meeting new demands as shown in the following table.

Estimated cost per acre-foot for additional urban water

Reclamation	\$125-825
Water Marketing	\$65-135
Conservation	\$290-360
New Reservoirs	\$270-800
Desalination	\$900-1,000

**Second step forward:
Water pricing**

A second step forward introduces a three-tiered pricing system for federal agricultural water and denies automatic renewal of the 40-year contracts at heavily subsidized prices.

The prices for each of the three tiers depends on the contracted price, the quantity of water used, and the CVP's full cost (explained later) as follows:

"(1) the first rate tier shall apply to a quantity of water up to 80 percent of the contract total and shall not be less than the applicable contract rate; (2) The second rate tier shall apply to that quantity of water over 80 percent and under 90 percent of the contract total and shall be at a level halfway between the rates [of the first and third tiers]... (3) The third rate tier shall apply to that quantity of water over 90 percent of the contract total and shall not be less than the full cost rate."

This feature of the act increases allocative efficiency and water conservation. The marginal price on the third tier is at the full-cost rate and is much higher than prices ordinarily paid. The full-cost of a federal project includes interest costs on project capital that have traditionally been excluded when determining repayment charges for irrigation. Of course, the third-tier price is the relevant price at the margin. The

upshot is that irrigators will substantially reduce the quantity of water used as the marginal price increases, especially in the long-run (Gardner). Water conserving irrigation techniques and practices will be fostered, effectively stretching water supplies and postponing the need for expensive new development. In addition, in the past, subsidized water made it profitable to farm poor lands—poor due to slope, soil quality, and other characteristics.

Although the three-tiered pricing system will encourage farmers to conserve water, allowing unrestricted transfers would be still more efficient. Transfers at market determined prices would allocate water to highest value uses and provide the same incentives for water conservation as does the three-tiered system. And unrestricted transfers avoid the transactions and

water transfers in principle, in reality it gives fish, game, and wildlife interests special powers not accorded to other uses. For example, the CVPIA mandates that 800,000 acre-feet of CVP water, about 13 percent of the total, be dedicated annually for fish, wildlife, and habitat restoration. This amount could irrigate over 200,000 acres of cropland producing cotton or tomatoes. The act also creates a \$50 million fund for environmental restoration, which will be acquired from fees levied on agricultural and hydro-electric power users (Schneider).

One California reporter says of the act: "what is more revolutionary than water transfers is the elevation of wildlife to a status equal to other uses" (Reinhold). Fish and wildlife interests, however, are hardly treated equal in the act; they are not required to com-

The act contains complicating restrictions that will impede, not promote, market transfers.

enforcement costs of a tiered pricing scheme.

The tiered pricing policy does, however, help taxpayers because the prices on the second and third tiers of water use will be higher than current contract prices and thus the water subsidy will be lowered. The government could, of course, implement both market transfers and the tiered pricing policy. The important thing for markets to function effectively is that repayment obligations to the government be clear and unchanging, and passed on to successive buyers of water, so that market participants know their future obligations.

A step back: The blocking power of fish, game, and wildlife interests

Although the act appears to promote

pete in the market for water resources like municipal, industrial, and agricultural users. In fact, the act guarantees water even if other uses suffer.

We have heard at least two rationales for regulating water allocations. The public may not know, or even be able to ascertain, the true costs of using water in alternative uses. Hence, with only a partial accounting of costs, the market could not efficiently allocate water. Neglected costs could impose environmental damages on future generations. Therefore, it is argued, a regulatory body must guard against the costs of public ignorance. But this approach fails to appreciate that markets work precisely because they do provide opportunities for individuals to express relative valuations. That is precisely what they do when water interests make and accept market offers.



Markets allow for millions of water users to vote by their participation, whether they use the water for environmental, industrial, municipal, or agricultural purposes. In the absence of market prices, regulators cannot know precisely the valuations of anyone except their own, even if an honest attempt is made (a big if) to ascertain the interests of the public.

Another rationale for regulatory protection of fish and wildlife allocations holds that the benefits are very diffused. The diffusion of relatively small benefits among many people makes it very costly for groups or coalitions to organize purchase water for their needs. It is true that widely dispersed benefits may characterize public goods, such as most environmental amenities, and therefore lead to the well-known free-rider problem. But recent water rule changes in California, as well as in other states, have enabled environmentalists and other instream users to purchase water rights. In fact, empirical evidence is plentiful that demonstrates that "market forces can create a setting for private sector innovation and initiative in pursuit of environmental quality" (Project 88).

A publication called *The Water Market Update* tracks transfers of water and has recorded several transac-

tions in which groups acquired water for environmental uses. The Montana Fish, Wildlife, and Parks Department purchased water to maintain trout populations during dry summers. Many different interests combined to purchase water rights for the support of riparian habitats in California. In cooperation with an irrigation district, the Nature Conservancy purchased water to support water flows on Colorado's North Poudre River. California's Grasslands water district and the Department of Fish and Game purchased water to support riparian habitat near Sacramento. The Nature Conservancy and the Upper Snake River Water Bank leased water to provide supplies for trumpeter swans in Idaho. This litany of market exchanges

wildlife, and probably the most pernicious for an efficient allocation, states:

"The Secretary shall not approve a transfer if the Secretary determines, consistent with paragraph 3405(a)(2) of this title, that such transfer would result in a significant reduction in the quantity or decrease in the quality of water supplies currently used for fish and wildlife purposes, unless the Secretary determines pursuant to findings setting forth the basis for such adverse effects would be more than offset by the benefits of a proposed transfer. In the event of such a determination, the Secretary shall develop and implement alternative measures and mitigation activities as integral and concurrent elements of any such transfer to provide fish and wildlife benefits substantially equivalent to those lost as a consequence of such a transfer."

In other words, don't diminish allocations that affect fish and wildlife, but if you do, be sure to implement measures that leave these uses unimpaired. There is no mention of costs or efficiency losses. We believe that it is inevitable that the efficiency costs of such a policy will be substantial.

The favored position given fish and wildlife interests in the CVPIA represents a definite step backward.

demonstrates that markets can allocate water for environmental uses.

The most obvious way in which the act hinders free market exchanges is through a complex set of 13 mandated conditions for a transfer. As an example, the one most closely identified with

The influences of fish and wildlife interests also have reached into the three-tiered pricing scheme of the act and will reduce its salutary effects on water allocation and conservation.

"The Secretary shall waive application of this subsection [the

three-tiered pricing scheme] as it relates to any project water delivered to produce a crop which the Secretary determines will provide significant and quantifiable habitat values for waterfowl in fields where the water is used and crops are produced."

The act also includes several amendments to the original CVP act of August 26, 1937. Each of the amendments turns the act in a direction that

argued, "If the Bush Administration can demand a free market in Moscow, it should be able to support a free market in California." We agree. However, the favored position given fish and wildlife interests in the CVPIA represents a definite step backward in the journey toward free water markets.

Conclusion

We argue that the CVPIA reforms in market transfer rules and water pricing to promote conservation and effi-

It is our view that restrictions on market exchanges will cost far more in efficiency losses than any benefits which they might provide.

insures that fish and wildlife needs are met even at the expense of other uses.

"(1)...by inserting 'and mitigation, protection, and restoration of fish and wildlife'. (2) ...by striking 'domestic uses;' and inserting 'domestic uses and fish and wildlife mitigation, protection and restoration purposes;' and by striking 'power' and inserting 'power and fish and wildlife enhancement.' 3) ...by adding 'the mitigation for fish and wildlife losses incurred as a result of construction, operation, or maintenance of the Central Valley Project shall be based on the replacement of ecologically equivalent habitat and shall take place in accordance with the provisions of this title and concurrent with any future actions which adversely affect fish and wildlife populations or their habitat but shall have no priority over them.'"

In the congressional hearing for the act, George Miller (D, California), the acts principal architect in the House,

cient water use will help push future legislation in the same direction. But the environmental features of the act could negate these positive influences and, in fact, could prevent them from occurring. Already "farmers in the Central Valley's southern part have been told they will get only 25 percent of normal irrigation water this year from the Central Valley Project

because of new laws and rules that divert water to protect fisheries and repair environmental damage to wetlands" (Reinhold). It is our view that restrictions on market exchanges will cost far more in efficiency losses than any benefits which they might provide.

■ For more information

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