

**URBAN PURCHASES OF WATER FROM FARMS:
IS THE MARKET THE ANSWER TO WESTERN WATER SCARCITY?**

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Traditionally western agriculture has joined other regional interests to obtain federal support for water supply projects. California's Imperial Irrigation District and the city of Los Angeles formed the coalition that pushed through the Hoover Dam, and similar coalitions have backed every large western water development project. We can see that this coalition was successful because virtually all of the high-potential sites for water and power development in the west have their dams and reservoirs in place. New water for the fast-growing sector of western municipal and industrial water users will have to come from some other source. The attention of western cities has turned to their former partners, the farms, as a source of new water supplies.

URBAN ACQUISITION OF IRRIGATION WATER RIGHTS

The first purchase of agricultural water by a western city was probably the acquisition of Owens Valley by Los Angeles, which began in 1904. Thirteen percent of the water supply for the Metropolitan Water District of Southern California (MWD) still comes down the Los Angeles Aqueduct from the Valley.¹ In the intervening 85 years, Los Angeles has been forced to purchase virtually the entire valley, sever the water rights, and sell or lease the property back. The transfer of water out of Owens Valley has given rise to many lawsuits, several still pending, to dynamitings and threats of violence, and to a local resentment of Los Angeles that is still strong.

The most recent acquisition of agricultural water for urban use may be the purchase of large tracts of land in La Paz County, Arizona by Phoenix, Scottsdale, and other central Arizona cities. The cities expect to pump La Paz County ground water and transport it through the Central Arizona Project to their service areas. Scottsdale bought the Planet Ranch on the Bill Williams River in 1985, Phoenix bought 14,000 acres including two towns in the McMullen Valley at the end of 1986, and there are daily rumors of new purchases in La Paz County by developers or by municipalities. A rash of community

meetings, legislative hearings and the formation of rural water-defense groups reveals a deep concern on the part of La Paz citizens for the consequences of these purchases.²

New Mexico itself has three interesting agricultural water transfer cases: El Paso's application to appropriate large amounts of ground water from the Hueco and Mesilla Bolson in the Lower Rio Grande Basin;³ Albuquerque's standing offer of \$1000/acre foot for upstream surface water rights in the Rio Grande;⁴ and the unique Sleeper case, in which the sale of an acequia right to a resort for snowmaking was found to be a threat to a unique and precious state resource, the cultural heritage of northern New Mexico.⁵

The impacts of these purchases on the source communities are complex and tied to water-use practices in western agriculture and the ways in which irrigated agriculture has affected the social and economic structure of western communities. A review of the origins and development of irrigation in the West will be useful before we turn to the question of community impacts.

WATER USE ON WESTERN FARMS

Both Bureau of Reclamation (BuRec) policies and the appropriations doctrine have contributed to an illusion that irrigation water is low cost. The federal government came into the western water picture at the turn of the century when private farmers, local districts and state irrigation projects had failed to extend irrigated acreage in the West beyond the 3.6 million acres or so of relatively easily irrigated land that had come under the ditch by 1889.⁶ The Reclamation Act of 1902 was to be funded initially by revenues from sales of federal lands and later through sales of water to farmers.⁷ Reclamation was enormously successful on the engineering front; its economic successes were less impressive. Water payments were originally to cover the project costs over a repayment period of ten years, without interest. In 1910, the Reclamation Fund received a \$20 million loan to keep it from bankrupting;⁸ in 1914, the repayment period was extended from ten to 20 years;⁹ in 1921, Congress passed a resolution to allow farmers in arrears to receive water deliveries,¹⁰ and by 1922, 60% of the irrigators with contracts with the Bureau were defaulting on their payments;¹¹ in 1924, repayment was extended to 40 years;¹² and in 1939, repayment was extended again, to 50 years, and water prices were adjusted according to "ability to pay," with the difference to be made up with revenues from hydroelectric projects.¹³

Repayment, as a percentage of the costs of BuRec projects that are allocated to irrigation, averaged between 20-31% in the period 1949-1977, depending on whether

inflation is accounted for or not.¹⁴ If there are other water users who would pay more than cost for the BuRec irrigation water, the percentage of *opportunity cost* paid by farmers is even lower. In 1970, one third of the irrigated acres in the 17 western states were supplied with low-cost water under BuRec contracts.¹⁵

Nonfederal western water allocation institutions also demonstrate a commitment to making water available to agriculture on easy terms. In order to legitimize investment in diversion and distribution works for irrigators and mines, appropriation doctrine based the right to water on beneficial use, rather than on location by a stream.¹⁶ In many western states, beneficial use does not imply "conservative" use, so that irrigators with appropriative water rights have no incentive to conserve their water. Irrigators may even lose the right to water recovered by investment in ditch lining, better distribution systems, improved grading, etc., on the grounds that it is no longer applied to the beneficial use on which the right is based.¹⁷ Ground water rights which arise from the rule of capture similarly reduce the apparent cost of water by eliminating the opportunity cost of future uses of water from the irrigator's accounts.¹⁸

IRRIGATED AGRICULTURE AND THE RURAL ECONOMY

The subsidy of irrigation water in the West has not had the envisioned effect of creating a region of yeoman farmers. Where agriculture is most productive, in California, Arizona, and Texas, the high fixed costs of irrigation are spread out over much larger farms; more pesticides, fertilizer and energy are used to guarantee the high crop yields that will cover the fixed costs, with the result that large amounts of agricultural capital leak out of the rural areas into the hands of agrichemical producers in other regions. In a recent Office of Technology Assessment (OTA) report, Dean MacCannell asserts that this drain is so severe that improvements in the agricultural economy are actually associated with deterioration in the rural community. He says:

In our own studies, we have found depressed median family incomes, high levels of poverty, low education levels, social and economic inequality between ethnic groups, etc., associated with land and capital concentration in agriculture. ... The absence of a middle class at the community level has a serious negative effect on both the quality and quantity of social and commercial services, public education, local governments, etc. ... large-scale farm operators tend to bypass local public and commercial services and establishments, preferring to shop in distant cities and to purchase education, police protection and recreation, etc. from the private sector for their own exclusive use...

If this evolution is permitted to proceed unchecked, the United States will soon have a high technology, heavily capitalized agricultural production system embedded in a rural society which is structurally similar to the Third World. Moreover, this arrangement will increasingly appear to be an intentional product of national policy.¹⁹

The status of the typical "common man" in the more successful agricultural regions of the West has become one of farm laborer rather than small farmer. In 1944, Walter Goldschmidt, a California sociologist, warned that when the size of a farm exceeds a family's ability to provide the main source of labor and management, agricultural income becomes disassociated from the rural community and generates social inequality and poverty. Recent studies such as the OTA report seem to confirm the Goldschmidt hypothesis. The huge seasonal labor pool required to harvest the crops on the large farms has created a migrant rural proletariat whose wages are kept below poverty levels by the availability of legal and illegal Mexican labor at low wages.

In those regions where large-scale agribusiness predominates, local communities lack the public and private infrastructure associated with self-government. Ironically, these already weak communities will be hardest-hit by changes in the local economy arising from sales of agricultural water.

In areas of the West where agriculture has been less profitable, particularly New Mexico, the concentration of farm sales on very large farms has been less severe. While New Mexico was not included in the MacCannell study, comparisons can be made between New Mexico and Arizona farms, for example, that indicate a difference. Average annual value of sales per farm in 1982 was \$63,079 in New Mexico; \$208,197 in Arizona. Distribution of sales is also more even across New Mexico farms than across Arizona farms. The dollar value of average sales per farm, for instance, on farms with annual sales below \$15,000 was \$3,538 in 1982 in New Mexico, higher than in Arizona, where it was \$3,221. The situation is reversed for farms with annual sales above \$100,000, where the average in New Mexico is \$352,903; in Arizona it is \$727,469.²⁰ The conflict of interest reported by MacCannell and others between agricultural producers and rural citizens dependent on agriculture-related incomes is probably less serious in New Mexico than it is in Arizona.

However, in any rural community where transferable water rights are owned by irrigators, a potential conflict of interest exists. If farmers, often in dire straits financially, stand to gain by selling water rights to nonlocal municipalities, the effect on the rural community of the export of local water is not likely to be fully incorporated

into the farmer's decision to sell. An Arizona farmer who sold her land in the McMullen Valley to Phoenix put the farmer's position succinctly: "It just isn't good business to raise cotton that nobody wants with water that everybody wants. If it's not good business, it's not good farming."²¹ At the same time, the sale of 14,000 acres of irrigated land in McMullen Valley to Phoenix took 10% of the taxable property in La Paz County off the tax rolls and raised a wide spectrum of concerns for the local community.

CONCENTRATION OF URBAN DEMAND

The attractiveness of agricultural water to municipal water managers depends on (1) the legal security of the water right that the city acquires and the legal liabilities that the city may incur; (2) the physical security of expected water deliveries to satisfy that right; (3) the cost of transporting the water from the rural area-of-origin to the city; (4) quality of the water; (5) the cost of ownership of the water right; and (6) the likelihood of political opposition of the water transfer. The first three conditions particularly tend to concentrate urban purchases in a localized rural area.

1. Legal Security of the Water Right: The procedure for acquiring and maintaining a legal right to water varies across the western states, but most states impose conditions on water rights that differ from those on other types of real property.

- Most prior-appropriations rights are forfeit if they are not used over a statutorily-defined period, so a water right must be exercised to be maintained, encouraging use of water which is not needed.²²

- In Arizona, both surface and ground water rights are appurtenant to the land, though the location at which they are used may be changed. In order to maintain a water right, the rightholder must own the land to which the right is appurtenant. This means that any entity that wishes to acquire water rights must also become a landowner.²³

- In Colorado, Arizona, Nevada, and Utah, the rights to water which is saved through conservation measures may not be sold, limiting the transferability of water.²⁴

- Virtually everywhere, transfers of water rights are possible only if protected third party interests, such as those in return flows or ground water levels, are shown not to be injured. Since actual effects on third party interests are not known with certainty, the security of transferred rights is always threatened by possibly affected interests.

All of these legal qualities operate to maximize the impact of the transfer of agricultural water -- the purchased right must be used, whether it is needed or not; the purchaser may be forced to acquire land as well as water; it will be much easier to purchase water by extinguishing an existing use than by agreement to a conservation and exchange plan; and it is often easier and safer to buy out affected third-parties than to show noninjury.

2. Availability of Secure Water Supplies: Security of water deliveries where seasonal and annual flows are highly variable comes from three major sources: stored water, with security increasing with the size of the storage project; appropriative rights with early dates, particularly in major streams; and ground water. Much of the stored water in the West is under contract with the Bureau of Reclamation; while this water may become transferrable in the future, it is not at present.²⁵ Early priority water is much sought after -- the earliest priorities in the West are associated with Indian reserved rights which has an uncertain status as to transferability.²⁶ This leaves ground water. The ground water resource is not subject to seasonal variations as surface waters are; this security makes ground water supplies an attractive water source for municipalities.

3. Cost of Transport Concentrates Urban Demand: Urban purchases tend to concentrate in rural areas located near existing transport facilities, either natural stream beds like the Rio Grande, or public canals like the Central Arizona Project (CAP). Even where water rights are to be moved through exchanges instead of physical transport, purchases concentrate in areas where such exchanges may be made (along the Rio Grande or the Colorado River, for example).

While the total amount of agricultural water that can be absorbed by cities is small relative to total agricultural water use, these three factors will tend to concentrate urban demand in areas small enough to be heavily impacted by sales of water rights to cities.

Impacts of Water Reallocation on Rural Communities

These impacts take a number of forms, and may include erosion of the tax base, environmental effects, loss of income and weakening of local institutions, loss of political authority, and decay of community trust in due process and fairness of the water allocation system.²⁷

Tax Base Impacts: Often the first loss felt by the exporting region is loss in tax base. This loss has two sources. First, many water importers are municipalities so that the lands or real property rights they hold are not taxable. If water rights purchases or purchases of land for the purpose of acquiring water rights are concentrated in a particular county or political subdivision, a significant share of the local tax base can be wiped out in a single transaction. Phoenix's purchase of the McMullen Valley area of La Paz County in December of 1986 took 10% of the County's taxable land off the tax rolls; up to 32% of the private land in La Paz County could be purchased for its water rights.²⁸ In 1945, the city of Los Angeles owned 98.84% of the private farmland in Owens Valley and 88% of the town property,²⁹ creating obvious problems for local government revenues. This situation eventually led to the passage of a constitutional amendment making municipal water-supply property in California taxable.³⁰

Second, the reduction in agricultural and associated sales in the exporting area reduces assessed values, sales, and income, and further depresses tax revenues. Assessment rates are often limited by law, so that loss of tax base cannot be made up by raising taxes. For rural areas that are not yet incorporated, the loss of potential tax base can foreclose the opportunity for self-government. Without taxable property, townspeople can't incorporate, hire administrators, make collective decisions on matters that affect their lives.

Environmental Impacts: Purchases of either surface or ground water raise environmental issues. For surface water, instream flow conditions downstream of the urban diversion will be impacted. The results may include environmental degradation, loss of wildlife habitat, loss of recreational opportunity, economic and environmental losses due to degradation of water quality, and increased flood hazard. A sale of ground water rights from a farmer to a city may increase the level of long-term depletion of the aquifer and reduce the residual stocks left for future water uses in the area-of-origin, since the city can afford to pump at much greater depths than are justified by returns to irrigation water.

The retirement of agriculture on the land is another source of environmental impact. Cultivated lands in an arid climate do not revert to their natural state when they are abandoned. Dust, Russian Thistle (tumbleweed) and other nuisance weeds typically invade the once-cultivated land, imposing costs on neighboring farms and business and giving the area a look of poverty and neglect that may discourage transition of the land into nonagricultural uses.³¹

Income and social effects: The exporting region loses not only the incomes of the producers who sell their water, but also the incomes which depend on the producers--sales in the agricultural supply sector and production in agricultural processing industries as well as the local expenditures of farmers and employees of farm-related businesses. On the other hand, importing regions gain production in municipal service sectors and urban industry. The transfer represents a regional redistribution of direct and indirect incomes from rural to urban areas. Market theory tells us that the incomes lost to the rural areas will be less than those gained by the urban importers so long as importers are required to pay the purchase price; however, the loss of secondary incomes may still be a severe blow to the exporting region that should be addressed in the transfer decision.

The loss of secondary incomes in Owens Valley as a result of the purchase of water in that area by Los Angeles which began in 1904 amounted to a localized depression. The area of Laws, Round Valley and Bishop, California, within the valley, suffered a 20% decrease in population between 1920 and 1930; six elementary schools were closed and six others were consolidated; sales volumes for Bishop merchants fell by more than 50%. The reparation claims against Los Angeles included claims for damages due to loss of income from merchants, laborers, barbers, Indian farm laborers, medical personnel, etc. These claims were eventually settled by Los Angeles purchasing most of the town properties as well as the agricultural lands to which the water rights were attached.³²

Weakening of Local Institutions: The viability of water-related institutions in the exporting region may be threatened by transfers, with a significant impact on quality of rural life. The Middle Rio Grande Conservancy District in central New Mexico and the Elephant Butte Irrigation District have contested the right of their members to sell their water rights as individuals. Such sales threaten the political viability of the district in an era of high demand for water rights.³³ Culture itself may be seen as a water-related institution. A recent decision in the New Mexico Court of Appeals barred a transfer of agricultural water rights to a ski resort on the basis that the transfer was contrary to the public interest. Judge Encinias said, in that decision:

This region of northern New Mexico and its living culture are recognized at the state and federal levels as possessing significant cultural value, not measurable in dollars and cents. The deep-felt and tradition-bound ties of northern New Mexico families to the land and water are central to the maintenance of that culture....I am persuaded that to transfer water rights, devoted for more than a century to agricultural purposes, in order to construct a playground for those who can pay is a poor trade, indeed.³⁴

The redistribution of political authority over resource use: Local government's ability to implement rational water-use policy and planning may be seriously impaired by export of resources outside of the political jurisdiction. In New Mexico, for example, the state takes an active facilitating role in water management through the state engineer, who issues permits and allows transfers in accordance with his powers under state law. The state engineer may require that such rights be exercised in a manner which promotes the public welfare and conserves the state's natural resources. In 1980, El Paso sought to appropriate unappropriated ground water from the Mesilla-Bolson basin in southern New Mexico, and the federal District Court in El Paso v. Reynolds³⁵ found New Mexico's statutory prohibition of out-of-state exports unconstitutional on the basis of violation of the Commerce Clause. The decision placed New Mexico in a situation where an appropriator whose water uses are not under the jurisdiction of the state engineer sought water rights under state law. The ability of the state engineer to implement water planning and policy with respect to the water appropriated by El Paso is severely limited relative to instate water users. The decision has given rise to changes in the New Mexico law and to an ongoing reconsideration of state water policy to determine how to protect New Mexico's interests under the new situation.

Fairness and Due Process: Finally, important social effects depend on whether the transfer is perceived as following due process. Where the transfer is seen as unfair or underhanded, exporting communities are often torn by internal conflict and a pervasive feeling of helplessness and victimization. In Owens Valley, this phenomenon reached its apogee. A 1928 report observed:

... the Valley is, even today, a hotbed of suspicions, prejudices and hatred. Suspicions are mutual and widespread. The Valley people are suspicious of each other, suspicious of newcomers, suspicious of city men, suspicious, in short, of almost everybody and every thing... Owens Valley is full of whisperings, mutterings, recrimination and suggestion of threat of one kind or another.³⁶

Tucson's purchase of agricultural land for water in Avra Valley has given rise to similar distrust and resentment, though not nearly so violent. Avra Valley farmers feel that the city's presence has contributed to the declining profitability of agriculture in the area, and businesspeople in the community of Marana, which serves the valley, have closed up shop due to declining sales, for which they hold the city's purchases accountable. At a recent conference on rural/urban water transfers, the mayor of Marana expressed the town's feeling of powerlessness:

Tucson started buying up all the land to the west of us and to the south of us for water rights. ... they kept on buying and kept on buying till it looked like we were going to be surrounded and we started to wonder well what's going to happen to our water table when this town starts growing, which it is now, so we are in a dilemma there. Tucson [even] has control of our effluent. ... and we don't feel that's right. I don't know what we can do about that either ...³⁷

Many of these impacts cannot be quantified. The loss of community trust that results from a perception that due process has been violated, the loss of political authority or deterioration of social infrastructure as a result of removal of water decisions from the local area, cannot be captured as dollar values. Other consequences, secondary income effects and lost tax revenues, for example, can be quantified. These values may be small relative to the benefits accruing to the importing municipality. The magnitude of these costs speaks to the efficiency of the new allocation. However, in equity terms, these costs should be given weight if they are important in the context of the small rural economy, regardless of whether they are counterbalanced by benefits elsewhere.

CONCLUSIONS

The question -- is the market the answer to Western water scarcity? -- seems to have contradictory answers:

Rural western communities have become water-dependent as a result of public provision of cheap agricultural water to farms; cities are increasingly in need of the water that is being applied to low-valued uses on farms because it is so cheap. Taken together, these statements indicate that facilitating the purchase of rural water by cities is a good thing.

On the other hand, the movement of water out of the countryside will have strong impacts in rural areas that will not fall on the farmers who are selling water (whose price will be met), but on the public sector, the business sector, local institutions and the environment. Ironically, the rural public sectors, business sectors, local institutions and even rural environments have been weakened in many areas by the dynamic of irrigation agribusiness, which does not return profits to the local community and creates a class division in the countryside.

The resolution of the contradiction lies in a policy that facilitates transfers of water, but which does so in a way that provides for a rural voice in the transfer decision.

Because rural communities will be impacted, perhaps severely, by retirement of agriculture and the export of their most basic natural resource, state water transfer policies should require that those communities be involved in the decision as to the terms, conditions and timing of transfer as well as the management of land, canals, and infrastructure owned by the importing municipality. Transfers of conserved water, leasebacks and contingency transfers which retain some water use and authority in the rural region of origin should be exploited as much as possible. And finally, we should take our time. Barring the case of prolonged drought in the immediate future, the water needs that most western cities seek to satisfy with rural supplies are needs for the future. The impacts of water sales on rural communities are still largely speculative, and the remedies for these impacts virtually unexplored. A gradual approach to facilitating rural/urban transfers is, at this time, low cost, and offers a high payoff on the learning curve.

On the rural side, it is imperative that local communities have a clear idea of how they are affected by local water use, of what their future local water needs are; what the water quality impacts of changes in water use are, what development they expect to see and what the water and other infrastructural needs of that development are, and how their fiscal situation will be affected by the water transfer, if they are to take advantage of having a role in the water-transfer decision.

This means that rural communities need to do a totally unfamiliar thing -- long-range water planning. This is not a small order. Farm communities lack the planning experience, the technical staff, the data base and the public education and issue-definition that urban water planners have built up over the years. Irrigation communities may be poorer in these areas than other rural areas due to the effects of concentrated land ownership. Nevertheless, rural citizens are the only experts on the effects of water, irrigation and water-related institutions on their own lives and environment. In order to minimize the negative effects of movement of agricultural water out of the rural sector and take advantage of the urban demand for water to create some positive effects, rural communities have to define their own options in terms of the future as seen through local eyes. This is a participatory, bottoms-up planning process by necessity, since information on impacts and mitigation can only be uncovered from the bottom. The bad news is that participatory planning is slow, demanding and difficult to structure. The good news is that a plan based on open airing of the objectives and options of those who will be affected by the plan is likely to be implemented because it is compatible with the reality of the local community.

The answer, then, is yes, markets may be a powerful strategy in coping with western water scarcity. When we choose to employ the market to achieve public objectives, it is important to realize that the market is an allocation tool, it does not itself embody any objective. Introduction of market changes when market forces have been stifled may result in sudden changes in land and water ownership that destabilize the region and stress already weak communities. The objectives of regional water allocation policy must be politically defined -- they will not be produced from market transactions by an invisible hand. Political support for rural community involvement in the transfer decision and technical support for rural water planning are critical to defining the objectives of western water policy.

ENDNOTES

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2. Transcripts, 1987.
3. Gross, 1984.
4. Water Market Update, January, 1987, p. 4.
5. Water Market Update, January, 1987, p. 9.
6. Reisner, 1986, p. 116.
7. Act of June 17, 1902, 32 Stat. 388.
8. Reisner, 1986, p. 120.
9. Act of August 13, 1914, ch. 247, 38 Stat. 686.
10. Pub. Res. of May 17, 1921, ch. 7, 42 Stat. 4.
11. Reisner, 1986, p. 121.
12. Act of May 25, 1926, ch. 383, 44 Stat. 636.
13. Act of August 14, 1939, ch. 418. 53 Stat. 1187. For a history of Reclamation policy and an analysis of ability to pay provisions, see Burness et al., 1980.
14. Burness et al., 1980, p. 821.
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18. Hirschleifer, 1960, p. 59-66.
19. MacCannell, 1983, p. 7-9.
20. U.S. Census of Agriculture, 1982, Table 11.
21. Personal communication, March 20, 1987.
22. Saliba and Bush, p. 60-62.
23. Saliba and Bush, p. 63-64.
24. Saliba and Bush, p. 64-65.
25. Ellis and DuMars, 1978.
26. Stoltzfus, 1987.
27. See Nunn and Ingram, in Water Resources Research, forthcoming.

28. Nunn and Checchio, 1987.
29. Ostrom, 1953, p. 127.
30. Ostrom, 1953, p. 135.
31. Meitl, Hathaway and Gregg, 1983 and Karpiscak, 1980.
32. Ostrom, 1953.
33. Gisser and Johnson, 1983.
34. In the Matter of Howard Sleeper, et al., Rio Arriba County Cause No. RA 84-53(C).
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36. Quoted in Ostrom, 1953, p. 130.
37. Billy Schlissler, In Transcripts, 1987, p. 19.

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