

## How Much Water for Agriculture?

California's continuing drought comes at a time when the state has experienced extraordinary population growth as well as increased concern for the environment. These competing pressures have led to new proposals designed to encourage the transfer of substantial water supplies from agricultural to urban residential use. Most recently, State Sen. Richard Katz (D, Los Angeles) has proposed legislation that would permit agricultural water users to sell their contracted or groundwater supplies to the highest urban bidder and pocket whatever profits might accrue from the sale. Discussion of this proposal has, thus far, neglected serious questions regarding the wisdom of such proposed water transfers.

A curious aspect of this discussion is the alignment of leading environmental organizations and advocates in support of inter-basin water transfers to support even more urban development. There was a time when environmental advocates pointed out that such transfers, like the case of the Owens River watershed, led to enormous damage to the "source region" and fueled environmentally harmful growth in the periphery of already developed areas.

This new alignment of environmentalists and developers sees agricultural water use as both wasteful and harmful to the environment. Their approach is to take as much water away from agriculture as possible and divide it between new urban development and environmental uses. But no one is questioning the underlying assumptions of this perspective. Are their assumptions correct?

### The Myth of Agricultural Water Waste

Most Californians believe that residential users are "more efficient" consumers of water than is agriculture. Indeed, in viewing a flooded agricultural field one is tempted to conclude that most of the applied water is being wasted. But careful examination of actual water use does not support this widely held view.

Direct measures of water use show that irrigated agriculture in California uses water just as efficiently, and by some measures, more efficiently than residential consumers. Records of water consumption by residential users in the Sacramento area indicate that such use amounts to 1,000,000 gallons per acre each year. In contrast, a single acre of land devoted to irrigated crop production in California requires, on average, about three acre-feet per year (this equals a volume of one acre of land covered with water to a depth of three feet). Since one acre-foot holds 327,000 gallons, the volume of water used on one acre of irrigated land is just under 1,000,000 gallons, the same amount as required by residential users!

Acre for acre, irrigated agriculture is just as efficient as is residential development. The main reason that agriculture uses such a large fraction of the state's water supply is that a very much greater amount of land is in irrigated agricultural production today than is in residential use. But the main point is that no water can be "saved" by converting irrigated land to residential development.

Another factor overlooked in such discussions is that residential waste water is hazardous and must be treated before it can be returned to the environment. In striking contrast, most of the water applied in crop irrigation either directly recharges the groundwater table, evaporates into the atmosphere, is used by plants in evapotranspiration, or flows back into surface streams. While it is true that some agricultural return-flow is contaminated with pesticides or naturally-occurring metals or salts, most is naturally recycled for continuing use.

### **How Large is the Agricultural Economy?**

Both urban development interests and environmental advocates have argued that agriculture is a minor sector of the California economy and that it makes no sense to have 85% or more of our state's water consumption used for crop production. The Gross State Product for 1986 showed that Farms accounted for just \$8 billion out of a total of \$534 billion, or just 1.5%. As a corollary, it is argued that the production of such crops as alfalfa, irrigated pasture or rice is nothing short of foolish in a desert, especially when urban residential users are forced to conserve.

Underlying this argument is the supposition that residential water consumption is a "higher beneficial" use than is the irrigation of crops. Californians often view themselves as pioneering trends that are ultimately adopted by other Americans. California is the most urban of all of the states with some 97% of its population residing in urban areas. The continuing decline of small, agricultural communities across the U.S. is seen by many as part of a "sad" but natural evolution to a "higher" form of social organization: metropolitan areas that are hubs for suburban commuters.

It usually comes as a shock to Californians to discover that the Golden State is also the nation's leader in agricultural production and that its share of national crop production has experienced major increases in recent decades. This paradox of high and increasing agricultural output together with extreme urbanization is merely a reflection of the pattern of land use. Only a very small portion of the state's land is urbanized, but it holds an enormous population. Meanwhile, vast areas of the state are in irrigated crop production and they are extraordinarily productive, often planted to high value crops such as vegetables or fruit.

Careful examination of the role of agriculture in the California economy belies the simple-minded arguments that the agricultural economy is not significant. For example, California's farmers received about \$17.5 billion from the sale of their crops and livestock during 1989. This is about four times larger than the world-wide box office receipts of the entire U.S. motion picture industry. Yet no one argues that the film industry is of minor significance to the California economy.

Moreover, the farm production value described above is a minor share of the ultimate impact of our state's agricultural production. At the present time farmers receive less than 25% of the shelf price of each dollar spent on groceries. This implies

that California's farm output correspond to consumer expenditures of more than \$70 billion. Whether the associated jobs are in trucking, processing, distribution or marketing, the agricultural economy "trickles up" in ways that are neither visible nor widely understood.

Moreover, many farmers argue that the prices they receive for their crops are deliberately kept low by policies dictated by the major food processing companies and enforced through government action. If farmers were to receive a "fair share" of the food dollar the multiplier effect described above would tend to increase the economic impact of the farm sector.

No single instance of the lack of understanding of the agricultural economy more extreme than in the case of discussions of irrigated pasture and alfalfa production. Reisner, among others, argues that irrigated pasture produces less than \$75 million per year for the California economy but uses several million acre-feet of irrigation water. He argues that this is an uneconomic investment when compared to the potential value of urban development. Similar arguments are made regarding the production of alfalfa hay.

But no urban food shopper directly purchases either alfalfa hay or irrigated pasture at the supermarket. On the other hand, dairy products such as milk, ice cream and yogurt, as well as all other livestock products would not be available were it not for irrigated pasture and alfalfa. When viewed in this light, it is only proper to consider the value of farm cash receipts for cattle and calves and dairy products, which amounts to \$3.9 billion, not the "insignificant" amount suggested by Reisner. As California's population has grown there has been a corresponding growth in the marketing of livestock and dairy products in the state: it is now the nation's largest single market for these products. At the present rate of growth of the dairy industry it now appears that California will replace Wisconsin as the dairy state by the turn of the Century. Reisner's rhetoric is good but he is a poor at economics.

## **What Water Policy Makes Sense?**

### Groundwater Management is Needed

California water policy is presently governed by more than one thousand individual water, irrigation, water conservation and other districts. Individual water users are also free to pump groundwater whenever they see fit. Thus, as agriculture has suffered serious cutbacks in surface supplies - zero deliveries for agricultural purposes to State Water Project service areas this year - increasingly farmers are drilling new wells.

The complete absence of planning or controls regarding our groundwater basins means that users can continue to draw out more than is recharged each year. Only Arizona has enacted strict controls on groundwater. California needs to develop a groundwater management plan with strong controls.

### Strict Enforcement of Acreage Limitation is Needed

The 1982 Reclamation Reform Act sought to remedy the failures of the Federal government to distribute the benefits of water project development as widely as possible by limiting the amount of subsidized water that a single user could receive. Historically, the bulk of the benefits of Federally subsidized water in California have been captured by a relatively small group of landowners and farm business operators who have benefitted from virtually unlimited amounts of subsidized water.

Yet, even the new 960 acre limit that replaced the earlier 160 acre limit, has not been properly enforced. Large farm businesses have simply set up "paper farms" of 960 acres each and established farm management companies to run the whole operation. Strict enforcement of the intent of Congress, even new laws, are needed to send the message that unlimited water subsidies are no longer to be allowed.

#### Multi-tiered Water Pricing Would Encourage Conservation

Water pricing in California does not encourage conservation. Continued circumvention of limits on the amount of Federally subsidized irrigation water that a single user may receive frustrates efforts to use market mechanisms to stimulate conservation. When huge ranches, such as the J.G. Boswell Company, can readily circumvent the intent of Congress to limit the amount of their water subsidy, the wrong signal is being sent to the marketplace.

If prices for irrigating more than 960 acres with Federally subsidized water were set sufficiently high and strictly enforced, then conservation measures would become a necessary consideration for agricultural water users. Already, the limits set by drought conditions have encouraged many Central Valley fresh market tomato producers to switch to drip irrigation, both reducing overall water consumption as well as increasing crop yields.

#### Loan Funds for Conservation Technology Are Needed

The Reclamation Reform Act of 1982 mandated that district electing to adopt the 960 acre limit provisions of acreage limitation would be required to develop district-wide conservation plans. But no mechanism was provided for the implementation of these plans. A loan fund should be created to enable districts to borrow funds to invest in these conservation measures. The resulting water savings could readily be used to repay the loans. Paradoxically, some small districts have developed water conservation plans but lack the resources to implement them.

Small farmers have historically been the sector of agriculture most lacking in capital resources. This is as true for conservation technology as it is for other types of equipment. If loan funds were available to limited-resource farmers to implement conservation technologies then substantial water savings might be available at the individual farm level.

#### Water Meters Are Needed in Agriculture and in Urban Settings

California developers as well as other entrepreneurs, have brought an unusual degree of optimism to the state. Opportunity is seen as unlimited. Resources are thought to be limitless. Nowhere is this supposition of limitless abundance more clearly seen than in the almost irrational opposition to the required use of water meters.

Yet the widespread adoption of water metering by all users is an essential step in monitoring and controlling use. Arizona imposed this requirement on agricultural users in the context of the adoption of the statewide groundwater management plan. It is now possible to enforce that law's limits on pumping using direct measures of such withdrawals.

#### Water Agencies Must Abandon Their "Use It or Lose It" Contracts

In circumstances of adequate supplies, water users find that allocations not used may be assigned to another party. This "use it or lose it" policy tends to force districts or individual users to err on the side of larger water use.

This philosophy is an outcome of a planning process that allocates water supplies based on unrealistically optimistic appraisals of available supplies. Vashek Cervinka, of the California Department of Food and Agriculture, has pointed out that tree ring observations suggest that the most recent one hundred and fifty years period has experienced a more abundant annual rainfall than is the case for the previous several hundred years. This suggests that water supply allocations which arbitrarily assume that the most recent period is "normal" are likely to result in overcommitments of available supplies.

If dry years are considered to be normal, water management practices would be forced to change. But this would affect urban users as much as it would those in agriculture. Development interests could not be permitted to go forward with residential plans without assured water supplies.

And underlying the whole approach of all parties, agricultural as well as urban interests, is the perspective that everything would be fine if we just built another dam. But each time another dam is completed it is a relatively short period before its supplies are found to be inadequate for expanding needs. William Mulholland, the engineer who guided the Owens Valley water project for the Los Angeles Department of Water and Power, is reported to have once said, "If you don't store the water, you won't need it."