Rural Development in Indian Country

Is cheap irrigation water a cost-effective approach?

by Robert A. Young and Roger Mann

Low income and high unemployment are common problems on native American reservations in the arid Southwest. The federal government, under its trust responsibilities to native Americans, attempts to break the deepening poverty spiral and to provide viable reservation economies and opportunities for tribal members to achieve a reasonable standard of living. Native American tribal governments and Congress share the West's conventional wisdom that introduction of irrigated agriculture assures rural economic development, including (1) numerous additional jobs on farms, (2) spinoff employment and business activity in nearby communities, and (3) a high social rate of return to public capital. These three expected outcomes, combined with an assumption that irrigated agriculture helps create the self-sufficient local communities of the Jeffersonian vision, have served to justify public subsidies to irrigation. Native American tribes, accepting the above theses and responding to federal incentives, have sought public appropriations for irrigation projects to help advance their economic aims.

The Interior Department carries out the federal irrigation water development program for native Americans, facilitated by two key entitlement and incentive provisions. Indian reservations may acquire water rights based on the "Winters Doctrine" (named for a 1908 Supreme Court ruling). The court asserted the principle that when the reservations were created, sufficient water was implicitly reserved to fulfill reservation needs. Later Supreme Court decisions granted native Americans reserved rights to irrigation water based on the Practicably Irrigable Acreage (PIA) concept. Reserved rights and the PIA principle bestow high-priority rights to water, based simply on a court-approved claim of economic feasibility of proposed irrigation projects. Second, in the Leavitt Act of 1932, Congress freed native American tribes from obligations to repay the capital costs of constructing federal irrigation projects (although tribes are responsible for some costs of preparing prospective lands to receive water and for project operations). The federal government's cheap irrigation water policy provides (perhaps even more than it has for non-Indian irrigation developments) most of the funds for capturing, storing, and transporting the water that may result from successful Indian claims.

Although we fully endorse the goal of an improved standard of living for native Americans, we are skeptical of subsidized irrigation water supply as an appropriate public policy for achieving that end. We advance here an alternate set of hypotheses regarding the regional development benefits of irrigation projects. Even if the above potential outcomes (expanded on-farm and off-farm employment and high rates of return) might once have been accurate, they have been overtaken by the technological and organizational realities of contemporary agricultural production. In the century or more since the federal government began its policy to encourage irrigation in the West, the nation's agricultural economy has changed dramatically. Most agricultural output occurs on large, technically advanced and labor-efficient farms. Second, the regional economic spillovers from farm production have declined as machinery and chemicals produced elsewhere have substituted for local labor. Also, farmers and households increasingly make purchases in regional retail centers. The lack of additional low-cost sites possessing favorable soils and climate, and the continuing decline in inflation-adjusted crop prices eliminate the opportunities for high-return investments in agriculture.

Resolution of these competing views of the efficacy of irrigation development will affect not only many native American tribes, but also federal and state taxpayers. Much of the impetus for irrigation development on native American reservations is due to the policy which requires no cost-sharing for capital investments and, under recent practice, limited repayment of operating and maintenance costs.

Under the policy, the major tribal expense is for lobbyists, attorneys, and consultants. The tribes petition the courts for entitlements and Congress for construction and operating funds on the basis of economic feasibility. Since the tribal costs are but a small fraction of claimed economic benefits, it would be irrational for the tribes to respond other than as they have.

Therefore, extensive subsidy of irrigation deserves more examination than it has yet received. Public subsidies can be justified if the resulting activities generate legitimate values to society unavailable without the subsidy. A review of both the changing conditions of agricultural production and previous experience with federal irrigation on native American reservations will help in this assessment. If our analysis is correct, enhancing the economic status of native Americans can perhaps be better served by channeling federal policies toward native Americans into activities that make more productive use of scarce capital and water.

Changes in the agricultural economy

The U.S. government has, since the mid nineteenth century, pursued policies that increased the productive capacity of the nation's agricultural sector. Before the early twentieth century, a growing and more prosperous population needed more food. But by the 1920s, technological advances and new land development had caused excess food production capacity and, as a consequence, low commodity prices. Except for a few interludes, this situation of excess supply has persisted. Beginning in the Great Depression, federal policies have attempted to control output of basic commodities and raise farm incomes. The Interior Department's programs that encourage irrigated agriculture thus run counter to the Agriculture Department's supply-control policies.

Although the Interior Department's irrigation development programs are intended to produce many small independent farms, today's profitable farms must be large enough to be cost-efficient and need to employ up-to-date managerial expertise and technology.

Luther Tweeten, professor of agricultural economics at The Ohio State University, has recently written that an investment of two million dollars is now required to yield a competitive return on labor and capital in farming. Recent Department of Agriculture reports show that large farms (gross sales of over $100,000) produce 80 percent of all farm revenues, but account for only 15 percent of farm numbers. Most of the income of families on the remaining smaller farms comes from off-farm sources. The majority of these smaller farms tend to lose money from operations, and they focus primarily on rural lifestyle values.

Most prospective irrigation projects will be relatively expensive to build and will not have the advantage of the best soils and climate since the most attractive sites have already been developed. For example, the proposed Animas-La Plata Project on the Colorado-New Mexico border—designed to serve the Southern Ute and Ute Mountain Ute tribes as well as non-Indian interests—will likely incur federal capital costs in excess of $8,000 per acre irrigated. However, if completed, it would yield an asset (irrigated farmland) the private market would likely value at less than $1,500 per acre. The project would pump water up as high as eight hundred feet into the neighboring river basin, making it one of the most energy-intensive irrigation projects ever built in this country. The proposed site is not on particularly productive or level soils, and at over 6,000 feet above sea level, is has a very short growing season and limited cropping and marketing opportunities.

Many advocates of irrigation for native Americans envision an emphasis on specialty vegetable and fruit production, because such products appear to generate a high return over operating costs and employ large amounts of labor. However, the high gross margins are misleading. They represent a return not only to water, but to the high market and production risks and the entrepreneurial skills inherent in specialty crop production. Moreover, specialty crops rarely account for more than a small fraction (less than one-fifth) of irrigated acreage in the West, so there is no reason to assume that there is a shortage of fruits and vegetables that federal incentives are needed to alleviate.

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In modern farming, both on-farm and related off-farm labor needs are smaller than generally recognized. Mechanized farms now require much less labor than in earlier years, and income of hired farm workers tends to be low, erratic, and seasonal. At about six to ten worker-hours per acre per year for typical field crops, 200 to 300 acres provide only the equivalent of one worker-year (2,000 hours) of employment. The public's investment cost for the Animas-La Plata Project mentioned above will likely to be in the range of $1.5 to $2 million per direct farm employee, fifteen to twenty times the capital investment per job in, for example, private sector manufacturing.

Regional off-farm employment and income linked

to agricultural production has also declined with the changing economy. Irrigation project proponents claim that farm incomes and employment are multiplied by as much as seven times in the regional economy, a figure unsubstantiated by careful economic studies. Increasingly, both production and consumption purchases by farm families take place in regional centers, limiting the local economic impact—a point illustrated by the decline of small rural communities throughout the nation.

Continuing the historical practice for evaluating non-Indian projects, estimates of economic benefits and costs by irrigation project planners in the Interior Department and by consultants hired by the tribes for PIA evaluations tend to be biased in favor of project feasibility. Income projections are overly optimistic in not anticipating the continued

technology-driven decline in real farm commodity prices and assuming an unrealistically large proportion of high-income specialty crops. Federal supply-control programs send price signals falsely indicating scarcity for some crops. The actual resource requirements to build Interior Department water projects have typically been underestimated, so even after adjusting for inflation, realized construction costs tend to significantly exceed planning estimates. In pricing resources, project planning procedures systematically understate the true opportunity costs of capital for construction, labor for producing crops, energy for pumping water, and water itself for offstream and instream (hydropower, recreation) uses elsewhere in the basin.

Experience with irrigation in Indian country

A review of the actual performance of several Interior Department projects serves to confirm the above assessment of the limited rural development potential of irrigation projects.

Several decades ago, on the Navajo Reservation in New Mexico and Arizona, and on the Southern Ute Reservation in southwestern Colorado, the Bureau of Indian Affairs initiated traditional small-scale, low technology irrigation. On about eighty traditional small developments totaling some 43,000 acres on the Navajo Reservation, outside analysts report that water delivery works have deteriorated, and less than 40 percent of the original acreage remains in production, mostly in hay and pasture. The average market value of output from the small family plots, averaging just seven acres each, could rarely exceed a few thousand dollars per year, and yield not even a subsistence family income. On the southern Ute Reservation, most of the project lands are in native pasture and hay, and in a recent year, about 60 percent were leased out to non-Indian ranchers.

The partly completed Navajo Irrigation Project would bring modern water and agricultural management techniques to over 100,000 acres. However, the project costs per acre so far are greatly exceeding the original estimates. Field crops—alfalfa hay, corn, dry beans, and small grains—make up most of the acreage, although potatoes and onions account for a quarter of revenues. Continuing Bureau of Indian Affairs and tribal subsidies for land development and water system operation have been necessary to keep the completed part in operation, and only a few hundred Navajos find direct employment on project lands. The need to minimize project operating losses has seemingly forced tribal managers away from emphasizing employment; in a recent year, the largest single land use category (23%) on project lands was for fallow or federal set-aside programs. If energy, capital, and labor costs were to be correctly priced at opportunity costs, the project shows a large negative return to investment, and would be bankrupt if subject to a market test.

The Colorado River Indian Reservation in west-central Arizona enjoys a more advantageous situation: level and productive soils, a long growing season, plentiful and secure water supplies, and closer proximity to California markets. Here again, however, forage crops (mainly alfalfa hay) represent the largest acreage, and only about 15 percent of the land produces specialty crops. The tribe leases about 85 percent of its irrigated lands to non-Indians, and few tribal members are employed in farming operations.

Similar failures to deliver anticipated returns can be found for recent non-Indian federal irrigation water projects. The Central Arizona Project, with a price tag approaching five billion dollars, will bring water from the Colorado River into the Phoenix-

Tucson region. The project is in a financial crisis because the requirement to repay but a small fraction of their share of the total project costs is bankrupting the farmer-operated irrigation district beneficiaries, and water demands are well below delivery capacity. The urban population in the three-county service region would have to grow to several times its present size to absorb the full allocation. Although not originally designed for native Americans, partly because of the favorable cost-sharing arrangements for tribal irrigation uses, much of the Central Arizona water is now set aside for use on reservations.

New approaches needed

A public subsidy policy for irrigation may have made sense in an era of inadequate food supplies and when agricultural development was an effective mechanism for stimulating regional economic growth in the arid West. Today, economic and technical evolution make a cheap water policy obsolete. Research-based advances in productivity have proven much more cost-effective than direct government investments in increasing food supplies. As was discovered in the centrally planned economies, private sector investment yields a higher rate of return to scarce capital and water. Furthermore, a development policy focused on agriculture is two stages behind the evolving economy. First agriculture and then manufacturing were dominant, but employment in both then declined with technological change. Improving living standards for native Americans in the post-industrial economy will call for new approaches.

We recognize that designing successful rural development programs in Indian country is a challenging task. As with many small rural communities in the West, native American reservations often offer only limited opportunities for stimulating economic development. Rather than focusing on "place-oriented" programs for native Americans, public funds would be much more effectively spent on "people-oriented" policies. In particular, resources would be better directed toward investments in education and training to help prepare native Americans with skills needed for the knowledge-based economy in the twenty-first century. Public policies should also work toward enhancing the effectiveness of institutions designed to encourage employment opportunities in the industrial and service sectors. In view of the escalating costs and doubtful returns of the irrigation approach, tribal, state, and federal governments would do well to rethink the whole issue of how to assure future native American access to a fair share of scarce western water and to an acceptable standard of living without wasteful expenditures on the outdated irrigation water development program. ◙

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■ For more information

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