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Water Project Subsidies: How They Develop and Grow

Like similar water projects, the Columbia Basin Project was intended to benefit poor families and bring irrigated agriculture to an unsettled, arid region. As it turned out, however, the project took more money from low-income taxpayers nationwide than it distributed to low-income farmers within the project.

Federal or state governments have played a major role in planning, financing, and constructing water development projects throughout the West. The justification for government involvement has been that water projects contribute environmental, economic, and social advantages not adequately considered, or provided, by private developers. Under this rationale, many water projects have been built by the US Army Corps of Engineers and US Bureau of Reclamation when private developers would have considered such ventures too unprofitable. These agencies have covered deficits (costs exceeding revenues) with funds from taxpayers, who are expected to enjoy the widespread public benefits from the projects.

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Public cost sharing makes projects that would not have been feasible or cost effective on their own both attractive and profitable to irrigators.

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Federal cost sharing for western water projects can go beyond paying out of public funds for public benefits, however, and become an implicit subsidy to a small number of direct private beneficiaries. The Columbia Basin Project (CBP), a major Bureau of Reclamation project for eastern Washington, is a case in point–an example of federal financing that became, in effect, a subsidy of irrigation development for private interests.

Subsidies Defined

subsidy *n.* a grant by a government to a private person or company to assist an enterprise deemed advantageous to the public
subsidize *v.* to aid or promote (as a private enterprise) with public money
–Merriam Webster's Collegiate Dictionary

Cost Sharing and Subsidies

In the US economy, it is not uncommon for the government to make certain goods and services available at less than the full economic costs of supply. "Cost sharing" is common when a government water project provides public benefits (flood control, recreation, or fisheries enhancement) and also supplies water or produces power that is valuable and directly profitable to private firms and individuals. Private beneficiaries are expected to pay the costs of facilities that serve them exclu-

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sively, plus their share of joint costs for facilities that benefit more than one group of users. Because of public cost sharing, irrigation developments that would not have been feasible on their own became profitable for the irrigators.

Authorized procedures for evaluating federal water projects are meant to ensure that projects are funded and built only when the estimated total benefits–public and private–exceed project costs (Water Resources Council 1979). Theoretically, this net-benefits criterion also applies to each separable component of the project: it is determined whether net benefits would be greater *without* a component, and private or identifiable public beneficiaries are required to pay their share of project costs. Private beneficiaries, paying their full share of costs, join the project only if convinced that their benefits (i.e., revenues) will be greater than their costs, and projects are not built with any private component having benefits below costs.

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In practice, such elegant harmony is seldom achieved. First, public benefits such as recreation can be exaggerated by project proponents; with total project benefits thus appearing greater than reality, a larger share of joint costs can be allocated for repayment by the public, thereby reducing the real cost obligations to be borne by private interests. A second source of breakdown comes through direct subsidy, or below-cost pricing, which reallocates costs from private beneficiaries to public beneficiaries or general taxpayers. (The term *subsidy* is generally associated with direct payments to defray particular costs or to add to revenue received by a producer.)

The economic effect of explicit subsidies is to provide a resource or product to the buyer at less than its true cost. In some cases, the lower costs are needed to make it profitable to operate an activity that would be unfeasible if its full economic costs had to be paid. In other cases, subsidies may be used to augment the incomes of a deserving group or to make an essential item more affordable.

In the Columbia Basin Project, one objective was to create profitable farming opportunities for poor families. Another important objective was to establish viable irrigated agriculture and associated economic activities in a largely unsettled semiarid area.

Subsidies and Economic Efficiency

Economists are generally opposed to subsidies because of the adverse effect they have on the efficient use of resources to produce as much as possible of the goods and services valued by consumers. In a free-market economy, people allocate their limited budgets among available alternatives by purchasing those items that most enhance their individual welfare. In an ideal market, consumer goods and basic resources (land, labor, energy, capital, water, and so on) receive market values reflecting the preferences of all market participants. If willingness to pay for a good exceeds its cost of production, it is produced. An important outcome is that scarce or limited resources are guided into the production of those goods that maximize the collective welfare of all citizens.

Now envision what happens when a resource, such as water, is available for group A to use without having to pay its full social cost because another group or the general public is required to pay part of that resource cost. Group A is being "subsidized," and it will use more of the resource than if it did pay the full cost or market value for that resource. Resources are no longer allocated according to the collective wishes of all citizens, and collective welfare is likely to be less than possible.

In public water projects, efforts to advance special objectives or to help favored groups often take the form of a cost subsidy from government or reallocation of costs among beneficiary groups. That is, project costs are not paid by project beneficiaries in proportion to the estimated benefits they receive. Subsidies are often given to gain participation of a key group in a project that is believed will enhance national economic efficiency or provide some desirable redistribution of wealth and income. But the subsidized group will use more of the resource–water, in this case–than if paying its full cost.

The problem with public-funded subsidies is that direct beneficiaries may find a project profitable and attractive for them even though total project costs exceed total benefits. Beneficiaries can prosper even though the project is, on balance, an inefficient money loser. Through political influence, the beneficiaries can move in their favor

decisions and capital expenditures that would otherwise be financially unfeasible.

The less able the beneficiaries to pay project costs, the greater the subsidy needed to move the project forward. When costs exceed benefits for the whole project or for specific subsidized groups, resources are being consumed to produce less than had the resources been put to their best alternative use in the economy. In essence, political choice thwarts the role of markets to efficiently allocate resources to their most socially productive uses, and overall economic efficiency is lowered.

The Columbia Basin Project

The Columbia Basin Project began in the 1930s to bring water to the arid lands of eastern Washington. Originally planned and authorized to irrigate more than 1 million acres, the project, which includes Grand Coulee Dam, stalled in the 1970s at around 540,000 irrigated acres and remains incomplete today. The project illustrates the uncertainty of accounting resulting from multiple and conflicting objectives and the income shifts that follow.

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In the 1930s, when the Columbia Basin Project and Grand Coulee Dam were authorized, the US faced depression, high unemployment, and low agricultural prices.

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CBP History and Objectives

The idea of irrigating the Columbia Basin was considered long before the Bureau of Reclamation came into the picture. Missionaries and other early settlers irrigated crops on a small scale at sites where it could be done easily and cheaply; lands at higher elevation or requiring canals of considerable length, capacity, and cost were left dry. Irrigation of these lands had to await a project on a scale large enough to allow construction costs to be spread over a wide acreage (Whittlesey et al. 1981: 7).

The initial impetus for the CBP was local and agricultural–the search for a feasible means of bringing irrigation water to Columbia Basin lands. The elevation of these lands and their distance from the Columbia River led project planners to consider gravity canals from the Cascade Range across the Columbia River canyon to the west and, more seriously, from the Pend Oreille River, 130 miles to the northeast.

Support grew for the Pend Oreille River proposal when people recognized that a canal could also be used to convey water to Spokane during the winter to produce power. In about 1918, however, the potential for hydropower at the Grand Coulee Dam site attracted support from a broader base of regional industrial interests (Marts 1961: 3). In 1932, an Army Corps of Engineers report on the Columbia River proposed multidam, multipurpose development for the river, in which Grand Coulee Dam was a key structure providing upstream storage for power and on-site power, as well as irrigation water for the Columbia Basin lands to the south.

Competition between the Pend Oreille gravity canal and Grand Coulee Dam proposals was settled by President Roosevelt in 1933, when economic recovery funds were allocated to begin construction of a low dam at the Grand Coulee site. Funds for unemployment relief under the National Industrial Recovery Act were used to begin construction (Marts 1961: 3). Subsequently, in the 1935 Rivers and Harbors Act, Congress authorized construction of a high dam, changing the plans to provide not only power and water for irrigation, but also flood control, recreation, and water storage (Whittlesey et al. 1981: 9).

In the 1930s when the CBP was authorized, the United States faced the Depression, high unemployment, and low agricultural prices. The federal government looked upon irrigation projects as a way to promote economic development and settle poor farmers on the land. Both Congress and President Franklin Roosevelt emphasized the project's role as an employer and settlement opportunity for unemployed and indigent people throughout the nation. The 1937 Anti-Speculation Act initially directed the CBP toward small farms by limiting the size of individual project farms to an average of 80 irrigable acres with a minimum of 10 acres for part-time farm units. Landholders with more than 80 acres of irrigable land had to sell the excess to new settlers at preproject, dryland values.

In 1943, when the Columbia Basin Project was reauthorized by Congress, construction was put in the hands of the Bureau of Reclamation, which brought financial issues clearly under the provisions of the Reclamation Project Act of 1939. As the project moved forward, design as well as cost allocations continued to be strongly influenced by local agriculture, regional industrial power, and national sociopolitical welfare concerns.

The objectives of a federal project, their achievement, and repayment responsibility look different at local, regional, or national levels (Marts 1961: 2). In the project area itself, local owners of land, labor, and capital are the principal beneficiaries. Regional interests in the CBP include other irrigation, fishery, hydropower, and business and financial interests of Washington State and the Pacific Northwest. Some of the regional players are beneficiaries, but many may also contribute heavily to the project in the form of financial or resource sacrifices. The rest of the nation has provided much of the capital for the project and achieved certain welfare and political objectives. Interests at each of these levels played a major role in the long period of project discussion and formulation preceding construction of Grand Coulee Dam in 1933 and throughout irrigation development.

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Cost shifting made the CBP more financially feasible and secured irrigators' support as well as their success.

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Cost Allocation and Planned Repayment

Total construction cost for Grand Coulee Dam and the CBP, in 1940s dollars, was estimated at $487 million (Marts 1961: 5), to be apportioned as $342 million (70%) to irrigation, $144 million (30%) to commercial power production by the federal hydropower system, and $1 million (less than 0.005%) to flood control and navigation.

The 1939 Reclamation Act, in keeping with federal rules, authorized the payment of the entire $1 million flood control and navigation costs from federal funds without requiring reimbursement from any beneficiary group. For agricultural repayment obligations, the act allowed an annual rate of repayment that would not interfere with meeting a minimum family income standard. With the earning capacity of irrigated lands and the necessary costs to live on the land taken into account, the irrigators' ability to pay for construction costs was estimated to come to $85 per acre over a 40-year period. This $85 construction charge–plus all annual operation and maintenance charges, including irrigation pumping costs–was to be paid over 40 years at 0% interest, beginning after a 10-year "development period." The farmers were also to be responsible for all drainage costs exceeding the $8 million allowed for drainage in the total construction budget.

Since the original plan called for irrigating 1,029,000 acres, repayment by irrigation interests was expected to total $87.5 million, or 18% of overall project cost. The difference between the amount originally allocated to irrigation and the farmers' repayment obligation ($254.5 million) was assigned for repayment by commercial power production. To pay its own allocation plus this irrigation deficit, the federal hydropower system was to assume $398.5 million (82%) of total project cost, to come from two sources: interest and the sale of electricity.

Unlike irrigators, the federal hydropower system had to pay interest on the annual outstanding balance of its share of investment costs. This interest–3% per year–would ordinarily have been returned to the Treasury General Fund but was instead assigned to paying capital debt on the remaining irrigation portion. This accounting transfer had the same, if less obvious, effect as a direct congressional appropriation to irrigation. The Eisenhower administration, however, as one of its first acts in the water resources field, reversed the decision and disallowed use of interest payments on power debt to offset irrigation costs (Marts 1961). The effect was to shift a burden of about $70 million allocated for repayment from the federal treasury (national taxpayers) to a repayment burden from the Grand Coulee power account (regional electricity customers).

Thus, farmers were permitted to repay only a fraction of total irrigation capital construction costs. Moreover, because the CBP today is only half completed–and costs have greatly increased over time–actual repayment by irrigators constitutes an even smaller portion of the total. Since farmers were not required to pay any interest on delayed repayment of the $85 per acre or for the portion of irrigation costs assigned to others, the subsidy they received was even higher. These decisions effectively shifted cost obligations from the local level (irrigators) to the regional (power user) and national (taxpayer) levels, where the cost burdens would be less noticed. The cost shifting made the project more financially feasible for irrigation and secured irrigators' support as well as their success.

Repayment by irrigators had supposedly been frozen in 1945, with signing of irrigation repayment contracts between the federal government and district organizations representing water users. In the mid-1950s, however, controversy broke out

Sprinklers irrigate alfalfa fields throughout the West, here near Dupuyer, Montana. Photo © 1995 by John Stern.

when it was discovered that drainage requirements to keep the land in production would be much greater than the $8 million originally expected and that the Bureau of Reclamation was preparing to install the drainage facilities and charge landowners for these additional costs. It was estimated that including added drainage costs would increase the repayment obligation to several times the originally agreed-upon $85 per acre. Landowners were understandably disturbed by this prospect and appealed to Washington Senators Henry Jackson and Warren Magnuson.

Negotiations between the districts and the federal government resulted in a new 1963 repayment contract, stipulating that the federal government would assume and pay all drainage charges in return for landowners' paying a construction charge that increased from $85 to $131.60 per acre, payable after 10 years and over a 50-year, rather than 40-year, period at 0% interest. This contract brought the average annual repayment charge to $2.63 per acre, where it remains today.

Present Accounting

Inflation and added drainage costs pushed the average cost of irrigation development to about $1500 per acre by the early 1970s, when the first half of the CBP was completed. At $2.63 per acre per year over a 50-year period, agriculture's obligation toward these costs has a present value of only $22.00 at a 6% discount rate, or about 1.5% of the $1500 cost. The power system is repaying all remaining irrigation capital costs, bringing its total repayment to more than six times the cost of the power component; power must pay 3% interest to the treasury only on the unpaid balance of the investment in power production. The federal treasury (taxpayers) then pays the interest cost of the entire irrigation capital subsidy, which translates into another large subsidy. For example, by the time the $1500-per-acre capital cost is repaid by irrigators and power around year 2023, an interest subsidy exceeding $6000 per acre, at a rate of 6%, will have accrued.

A 1980 independent study by the Department of the Interior provided an alternative measure of the subsidy to irrigation. According to this study, the total subsidy to irrigation in the CBP was 96.7% of investment cost (USDOI 1980, vol. 1: 19).

Concerns about current project accounting become particularly relevant to decisions about completing the second half of the Columbia Basin Project. Serious efforts continue to have federal and state funds committed to completion. Clarifying project accounting and its ultimate effects on resource allocation and efficiency of use is important to guide and evaluate proposed actions.

Farm Size and Ability to Pay

Original Bureau of Reclamation estimates of farmers' ability to pay for irrigation construction costs were derived by deducting a minimum family living allowance from net farm income and then arbitrarily reducing the remainder by 25% to further reduce their repayment obligation. When these calculations were made, no consistent set of rules existed for estimating the farmers' capacity for capital repayment, leaving bureaucrats and politicians considerable freedom to estimate the project's financial feasibility.

The project was designed for small farms, 40–120 irrigated acres, to maximize settlement oppor-

tunities, although according to Reclamation studies, large farms would be able to pay significantly more per acre for construction costs. In the end, size restrictions were gradually relaxed until allowable farm size reached 960 acres (land owned and leased) for a married couple. Moreover, the Bureau does not strictly enforce the 960-acre limitation; some farms are much larger, and average farm size is more than 500 acres. Individual farmers in the project probably number fewer than one-sixth of what the original planners envisioned. Hence, the welfare objective–maximizing family farm numbers–has largely been abandoned. Moreover, the present average project farm would have an ability to pay substantially more for irrigation water than was obligated by early planners. Yet despite this increased ability to pay and increased costs, payment responsibilities have not changed since 1963.

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Energy Impacts

The multipurpose Columbia Basin Project was intended to provide hydropower as well as irrigation, navigation, and flood control benefits. Because power was initially abundant and inexpensive, early project planning and policy development gave little concern to competition between irrigation and hydropower. As developers sought ways to make the irrigation portion of the project more viable, more costs were shifted to hydropower. In addition, energy to lift water from the Columbia River and deliver it to farms was priced very low, resulting in additional subsidies to irrigation. Water diverted from behind Grand Coulee Dam for irrigation is lost for further in-stream hydropower use, meaning still more losses (costs) for regional power users.

Since 1985, irrigation withdrawals from the Columbia River have averaged about 2.6 million acre-feet per year (4.64 acre-feet per acre) (Svendsen and Vermillion 1994). About 3.3% of the 80 million acre-feet of annual flow in the Columbia River at Grand Coulee is diverted for irrigation; this diversion requires about 4% of the dam's annual power production. Twelve large pumps lift water 280 feet from behind the dam into Banks Lake. Some water is then lifted farther after it leaves Banks Lake, requiring the irrigation districts to operate 240 pumping plants across the project. All the energy used for pumping water to project farms is provided by the Bureau of Reclamation at a cost of 0.9 mills per kilowatt-hour (kwh). The current regional cost of replacing pumping power (i.e., the opportunity cost) is about 30 mills per kwh, or more than 30 times the cost to irrigators. The pumping power subsidy amounts to about $55 per acre per year–about $30 million per year for the project.

The lost hydropower from water diversions for irrigation constitutes another cost imposed on the region. An acre-foot of water behind the dam can produce 1015 kwh of power, now worth more than $30 at replacement cost as it flows through Grand Coulee and other hydropower dams to the ocean (Butcher et al. 1986). Based on current levels of diversion, the lost hydropower is valued at $127 per acre per year, adding to the regional cost of power and the regional burden of the irrigation project. Thus, the regional energy impact of the project has grown to $182 ($55 + $127) per acre per year, or about $98 million per year for the CBP as a whole. The eventual impact of the subsidy for pumping energy and of lost hydropower was simply not recognized in 1938 when the permits for irrigation diversions were granted, and power was cheap and abundant.

Another unexpected energy subsidy arose from subsequent hydropower development within the Columbia Basin Project itself. Energy is captured at a 165-foot drop that exists at one point in the main canal delivering water to farms. Hydroelectric power from a 92-megawatt facility, developed jointly by the irrigation districts in 1985, is sold at present energy replacement costs. Irrigation district revenues from these power sales exceed the district's total bill for the subsidized power used to lift water into the irrigation canal and serve to further reduce the costs that CBP farmers pay for irrigation water.

Income Distribution Effects

The original goal of the Columbia Basin Project was income redistribution and employment opportunities for disadvantaged groups. Not only were farm units restricted in size, but military veterans were given preference for buying farm units on federal lands, and the price at which private lands could be sold was controlled to secure potential appreciation in land value for the small private settler. The economic and social

benefits that the project would provide constituted a major justification for the subsidies required to make the project financially feasible for these beneficiaries.

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About 3.3% of the annual flow

in the Columbia River at Grand Coulee is

diverted for irrigation, requiring about 4% of the dam's

annual power production.

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Like similar water projects, the CBP did benefit some deserving families, but it has turned out to be generally ineffective in improving the lot of the nation's lower-income citizens. A 1970s study (Infanger and Butcher 1974) concluded that the project provided less additional income for low-income project participants than it took from other low-income people throughout the nation to fund the subsidies. The ineffectiveness of water projects to redistribute income stems in part from the difficulty of "targeting" project benefits to low-income persons. Substantial capital assets and managerial skills, uncommon among low-income persons, are required to take full advantage of a project-produced farming opportunity. As a result, the federal tax revenues required to cover the interest subsidy are so large that even low-income taxpayers, nationally, pay more in extra taxes than low-income farm families receive in benefits.

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Unlike the original settlers,

later landowners, who pay high prices for irrigated land,

gain no direct benefits from the subsidies.

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The political pork barrel also plays a role. The reason for proceeding with inefficient and heavily subsidized projects may not be the redistribution of income and wealth from rich to poor as much as the hope of redistribution from many taxpayers, each paying a small share of the costs, to a few locally concentrated beneficiaries, each receiving a large share of the benefits. The principle resembles a state-operated lottery. In an irrigation project, however, the winners are predetermined by their economic linkage to the project, the losers by being involuntary taxpayers or electricity ratepayers.

The irrigation portion of the project was never intended to repay its full share of costs. But the decisions made throughout planning and development had the effect of increasing irrigation subsidies far beyond the expectations of early planners.

Who Gains from the CBP

For farmers, CBP benefits first appear as increased net returns per acre, which ultimately translate into higher values for irrigated land. Compare CBP farms and the dryland wheat farms directly east of the project. Incomes of individual farmers and farm workers in the irrigated project area are no higher–in fact, they are often lower–than incomes of farmers and farm workers in the dryland area. Irrigated farms are smaller (about 25% as large) and more numerous, however, with land values in the project area ranging from $1000 to $1500 per acre higher than comparable dryland values. This difference, minus the cost of on-farm irrigation systems ($300–500 per acre), is a measure of cumulative gains to landowners from project-supplied water.

Yet the net gain in land values ($700–1200 per acre) comes to only a fraction of the total subsidies to CBP irrigation, indicating that most of the subsidy has served to offset excess construction costs rather than to transfer wealth and income to irrigators and landowners. The original settlers accrued most of the gain in land value created by the project; subsequent landowners who must pay more to buy irrigated land gain no direct benefits from the subsidies. The subsidy amount that exceeded this accrued wealth to original landowners has given little benefit to anyone, except for short-run employment during construction.

More farm workers and tenant farm operators have had jobs in the region after irrigation. But workers and farm operators are a mobile resource, likely to be employed in some other location or some other occupation if the project did not exist. The net gain for these individuals from the existence of the project is the difference between what they would have made without the project and what they earned with the project in place. Farm workers and farm operators in irrigated projects have incomes similar to people employed in dry-

land farming or in other industries. Thus the net benefit for these individuals is generally small. Moreover, the number of farm owners has fallen over time to a small fraction of what was envisioned by project planners, and technology caused the substitution of capital (machinery) for much of the labor required in traditional agriculture, reducing employment opportunities.

Today we are seeing some new trends. The growth of fruit and vegetable production has spurred demand for seasonal labor that was initially supplied by migrant workers. Many laborers have now taken up permanent residence in the region, adding to state and local costs for public services but without stake in or benefit of farmland ownership.

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It would be a serious mistake

to forget the high costs of the first half of the project

and proceed with even more costly

project expansions.

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Who Pays the Subsidies

The Taxpayer

The largest contributor to irrigation subsidies is the federal taxpayer. By the time this capital investment is repaid, the interest foregone by the US Treasury, conservatively estimated at 6%, will total $6112 per acre, or $3.3 billion. Washington State taxpayers pay about 2% of this interest subsidy; the rest comes from taxpayers outside Washington.

Washington State taxpayers have also incurred another cost. In the 1970s, when hopes for completing the second half of the project were high, Washington voluntarily invested $15 million of taxpayer money into constructing the Second Bacon Siphon, needed to deliver additional water from Banks Lake to the new lands that would be irrigated with project completion. Project proponents expected this cost sharing by the state to help induce Congress to appropriate construction funding for the project's second half. Congress did not appropriate the money, however, and Washington taxpayers are left to repay capital and interest on a significantly underused investment.

Electricity Ratepayers

The total estimated cost shift from irrigation to hydropower is about $740 million in 1960 dollars (the difference between what farmers will repay and the average cost per acre of $1500). This sum may be regarded as additional revenue that must be collected from the sale of electricity to regional customers served by the Bonneville Power Administration (BPA). It is an amount that ratepayers have had to pay for electricity rather than for alternative consumption and development opportunities. This diversion has reduced the income and wealth of regional electricity users.

The regional cost of the capital subsidy from power revenues is not uniformly spread throughout the region but falls primarily on BPA customers, who account for about 60% of total regional power consumption. An irony of this redistribution is that most farmers and residents within the project area do not bear this burden, because they buy power from Grant County Public Utility District, which generates power at its own dam on the Columbia River and avoids buying power from BPA. Grant County enjoys some of the lowest power rates in the region and the nation.

Social Overhead

All major economic activities are accompanied by secondary effects. A large irrigation project like the CBP creates substantial demands for agricultural inputs and services, agricultural processing and marketing, consumer goods and services for farmers and support industries, and a full contingent of government and community services. Yet such secondary impacts are not properly called "benefits" because they are almost certainly accompanied by approximately equal costs of supplying the services (Barkley 1984: 4-2).

In 1950, when CBP water deliveries were beginning, central Washington was an arid region supporting only a small number of livestock operations, a sparse population, and little economic activity. From 1950 to 1980, regional irrigation grew from less than 20,000 irrigated acres to more than 730,000 acres, including 540,000 acres within the CBP. During this period, the population of Adams, Franklin, and Grant Counties grew from 44,493 to 96,814. Much of the growth in employment and economic activity took place not on farms but in nonfarm business in incorporated areas, where 56% of the population now lives (Barkley 1984: 4-3).

To the local community, this growth seems to be a valuable benefit induced by irrigation development. From the regional or national perspec-

tive, however, greater growth in the project area can be viewed as a displacement of growth that would have occurred elsewhere. Locally, the large increase in population and economic activity required support facilities such as highways, hospitals, post offices, schools, roads, utilities, banks, libraries, and so on. Since the area was mostly undeveloped before the project, investments in services, or social overhead costs, had to be made to turn the Columbia Basin into a functioning agricultural region (Corssmitt 1973; Barkley 1984). These secondary costs, corrected for inflation, amounted to an investment of $651 million (Barkley 1984: 4-4).

Original project planning made no provision for social overhead investments. Thus wealth and income redistribution occur in ways that are often ignored by policymakers and project planners.

Effects on Efficiency

Subsidies and cost reallocations in the Columbia Basin Project made it possible for irrigated agriculture to eventually flourish and turn profits for farmers, even though total irrigation project costs substantially exceeded the benefits received by irrigators. The excess of total costs over total benefits represents a net loss in economic efficiency. Similar crops, or commodities of equal value, could have been produced elsewhere for less cost and the savings used to buy other valued commodities.

In addition, subsidized operating costs through cheap pumping power (0.9 mills/kwh) and sales of hydropower encourage irrigators to use more water and energy than would otherwise be justified. Efficiency is continually sacrificed because at least some of these resources could be more productively used elsewhere. The magnitude of this loss has not been estimated, but it is likely to be a significant fraction of the $98 million per year in costs to the hydropower system not paid by the irrigators.

Repayment arrangements and subsidies that shift construction costs to taxpayers and ratepayers entice irrigators to demand a project designed to deliver more water to farms than necessary or than they would demand if they were paying the full capital and operating costs. Greater-than-needed project capacity and subsidized operating costs allow irrigators to substitute cheap delivered water for their own capital, labor, and management.

Too Late to Go Back

The Columbia Basin Project was initially intended to provide farming and employment opportunities for as many small farm units as possible. The economics of irrigated agriculture were such, however, that it would have been financially unfeasible for the small CBP farms to repay the project's full construction and operating costs. Without subsidies and cost shifting, therefore, landowners would not have agreed to the repayment contracts, and the project would never have come into existence.

A large portion of project costs was reallocated or shifted from irrigators to electricity ratepayers and federal taxpayers (Table 1). A capital subsidy from regional ratepayers of roughly $740 million went to the project, along with an interest subsidy from federal taxpayers of $3.3 billion. In addition, an annual energy cost of about $98 million accrues to the region because of subsidized power for delivering water to the project. In part, these subsidies transfer income to the irrigators, but the largest portion simply goes to offset project costs that exceed the profits created for the irrigator beneficiaries.

With the substantial subsidies and cost reallocations, irrigated farms and associated businesses and communities prosper under the CBP. But the number of farming opportunities has been much less than expected because the average farm size has grown to about six times the size envisioned in early project plans. Furthermore, the total cost of water supply and irrigated crop production within the CBP has been much higher than the cost of producing agricultural products in other ways and at other locations. From a national perspective, then, there has been an economic loss because the water, energy, labor, materials, and other resources committed to this project could have produced more if they had been used elsewhere in more productive activities.

It is now too late to avoid paying the high costs sunk into

Table 1 *Estimated cost allocations for the Columbia Basin Project at its present size of 540,000 acres.*

	Who pays	Period	Yearly cost (million 1990s $)
Interest on capital debt for irrigation facilities, at 6%	Federal taxpayers	1960–2020	48.0
Repayment of capital debt for irrigation facilities			
Farmers' share	Landowners	1970–2020	1.4
Regional share	BPA[a] ratepayers	2010–2020	74.0
Pumping costs and lost hydropower	BPA ratepayers	from 1970	98.0

[a] BPA, Bonneville Power Administration

construction of the Columbia Basin Project and the development of irrigated farms. For existing irrigated farms, misallocations resulting from subsidized construction are generally not recoverable. Economic efficiency might be harmed rather than enhanced by increasing the fixed repayment obligation to farmers at this time. New development is another story. It would be a serious mistake to forget the high costs of the first half of the project and proceed with even more costly project expansions. Project expansion should not be considered unless the prospective irrigators are willing and able to pay the full costs of expansion, including interest and lost hydropower and lost fisheries.

Shifting costs from irrigators to others also distorts the normal economic incentive to use costly resources sparingly. Consequently, project irrigators use water and electricity for pumping more freely than if they were required to pay full costs of diverting the water from the Columbia River and delivering it to their farms.

Over time, the potential value of water in other irrigation developments and in other uses such as hydropower and fish survival has become significantly better recognized. Nevertheless, the secure and rigid allocation of water rights within the Columbia Basin Project effectively precludes project irrigators from taking advantage of opportunities to gain from transferring water to these higher-valued alternative uses. Improved water markets and more flexible water rights could help to change this picture. ■

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