Financing Strategies and Guidelines for Funding Water Resource Projects

Water project financing is a continuously evolving process that must adjust to variable economic and political conditions while maintaining a sufficient revenue stream to repay project costs. Given the many challenges associated with finding sufficient, reliable sources for water resource financing in the future, there are a few fundamental strategies and guidelines that should be considered.

Ensuring that the benefits of a project are greater than the costs has long been a fundamental guideline for water resource projects, and cost-benefit evaluations should continue to be an integral part in water project financing for California. Before a decision is made to proceed with project implementation, planners should have confidence that the investments made will be justified by the resulting positive impacts.

Unfortunately, traditional cost-benefit methods sometimes fail to accurately capture the range of benefits created by water resource projects, which is why it is vital that future cost-benefit analyses make a concerted effort to carefully characterize all project benefits. Although describing the benefits of a project may appear to be simple, in practice the process can be nearly impossible. Part of the difficulty is associated with benefits that have non-monetary value, such as habitat protection or aesthetic improvement. Although these features can be of considerable value, assigning a dollar figure to them always involves a certain amount of educated guessing, even with the use of the most advanced economic techniques.

Cost-Benefit Analysis

Cost-benefit analysis **(also called benefit-cost analysis) is a procedure used to assure that the value of the outputs exceeds the value of the inputs. Cost-benefit analysis is an evaluation technique used to aid decision makers in determining the economic worth of a project (U.S. Army Corps of Engineers, IWR Report 91-R-11).**

Another challenge associated with benefit characterization involves the term “benefit” itself. For some, certain project actions should be considered as new benefits, with repayment responsibilities falling on the parties receiving the benefits. For others, the same project actions might be considered mitigation for past harms created by another entity, and that entity should be responsible for project costs. Inherent in this disagreement is the idea of a “baseline” – another term that has been defined differently by various groups – used to establish a time or set of conditions from which to start counting contributions and project actions.

To overcome these difficulties, California water planners must first develop a clear, consistent, and mutually agreed-to vocabulary that can be used in financing discussions. Unless agreement is reached as to what items should be defined as project benefits, for example, the cost-benefit analysis system breaks down. The determination of who should repay project costs is also dependant on accurately describing benefits, since beneficiaries cannot be identified if there is no agreement on the benefits themselves. Once the terminology is defined and a list of benefits is determined, the benefits can be characterized. Where benefits can be quantified, whether in dollar figures or in another countable form, they should be. Where benefits are more abstract and difficult to measure quantitatively, they should still be characterized as best as possible. For

instance, while the species protection benefits of fish screens may be difficult to describe in dollar amounts, it may still be possible to describe the impact in terms such as fish migration improvements and survival rates. The California Bay-Delta Authority is currently developing a system for characterizing benefits and developing financing options that could be a useful reference statewide for these efforts.

While characterizing project benefits and conducting cost-benefit analyses may be painstaking, those actions will also be vital, particularly given the economic realities of today. Under the current fiscal environment, every project must be scrutinized to ensure that benefits justify expenditures. As a result, it is especially important that project planners have invested the time and effort to adequately describe the benefits of program actions and estimate project costs. If project proponents wish to seek funding from federal or state sources, they must be able to present a defendable and comprehensive list of benefits to prove to legislators that appropriations are justified. Local sources also demand to know where their taxes, fees, and other revenues are going, and what they are getting in return. In all cases, there is a strong need for a transparent process of identifying and describing project benefits, and determining the relative balance of costs and benefits.

Historically, the State of California has used public funds to pay for a large number of water resource projects, as has been the case through the first four years of the CALFED Bay-Delta Program. Recently, however, local agencies have begun to play an increasingly important role in financing water projects as federal and state funds have become depleted and less reliable, and as local groups have gained expertise in planning and financing responsibilities. There has also been a growing movement to ensure that public moneys are not used to create unfair advantages for private interests, especially when those advantages come at the expense of taxpayers.

To use public funds wisely, a benefit-based approach should be used that limits public expenditures to paying for actions that lead to public benefits, with a few important exceptions. Just as the characterization of project benefits is important for cost-benefit analysis and repayment options, carefully deciding what positive outcomes from a project should be classified as public benefits must also be a central part of the water resource financing process. Traditionally, public benefits have been

Public Benefits

Another way that benefits can be described is based on whether they are public or private in nature. Public benefits are generally associated with public goods, which economists have defined as items such as parks, certain types of roads, and national defense, which have two common characteristics:

1. **It is difficult for one person to prevent another from using a public good by using it for their own benefit (i.e. visiting a park does not usually prevent other people from also visiting).**
2. **It is difficult for the producer of the public good to prevent people who have not paid for it from using it (i.e. a bird watcher can benefit from protection of a bird species, even if they don't help pay for the protection).**

Within the water resource context, public benefits are normally associated with project purposes such as ecosystem restoration, certain types of flood protection, and aesthetic improvements. These benefits can be enjoyed by a large number of people, usually without diminishing the benefit. Since it is difficult to keep individuals from receiving the benefits without paying for them, public goods and their benefits are often paid for using public funds, such as tax revenues.

associated with features such as ecosystem restoration and other benefits that cannot be linked to a particular set of beneficiaries (see Box 4-xx). There may be other situations, however, that justify the expenditure of public funds for water resource initiatives.

The California Bay-Delta Authority is currently developing criteria to assist decision-makers in determining when public funds should be used to pay for projects under the CALFED Bay-Delta Program[1]. The preliminary list of conditions for spending public money includes the following situations (CBDA 2004):

1. Program actions are expected to yield significant, but very diffuse benefits that cannot be easily associated with specific user groups.
2. Program actions generate public goods such as environmental protection and enhancement, advancement of scientific understanding, and basic research.
3. Program actions catalyze local investment in new water management approaches and technology.

These three criteria serve as useful guidelines for determining when public funding is justified. As mentioned earlier, under a benefits-based approach it is difficult to assign costs for project features that result in benefits that are not easily linked to particular beneficiaries. For those types of projects, the general public has been, and should continue to be, a key contributor. Environmental, scientific, and research-oriented projects provide benefits that span a variety of groups, and all people within the State can potentially gain from those actions. In addition, innovative projects used to develop new technologies and improved methods have also received public funds in the past, and public funding should continue to spark new breakthroughs and advances in water resource management.

If other situations exist outside of these three categories where public funding is justified, it will be important that decision-makers establish why the general public should be asked to repay costs instead of those groups receiving direct project benefits. One example of an instance that would not fall in one of the three categories involves equity and environmental justice, as described later in this chapter. In general, however, public funds for water resource purposes should primarily be reserved toward funding projects that provide benefits widely across the general public.

Water financing decisions in California should be made in a way that distributes costs fairly across individuals based on their ability to pay for those expenditures, while also assisting certain groups with particular financial needs. The term *equity* is often used in economics to describe the level of fairness in which taxes impact people with similar ability to pay (horizontal equity) and different ability to pay (vertical equity) capabilities. With respect to water resource financing, equity can be described as the condition where beneficiaries with a greater ability to pay make a larger contribution to cost repayment than beneficiaries with a smaller ability to pay, given a certain increment of benefit. Under an *equitable* arrangement, a financially healthy industry might be expected to pay for the full cost of a 1 million gallon per day (MGD) water treatment plant, while a disadvantaged community might be assigned a fraction of full cost for an identical 1 MGD plant.

[1] California Bay-Delta Authority, "Draft Finance Options Report", May 2004.

Related to the idea of equity is the concept of Environmental Justice. The U.S. Environmental Protection Agency defines Environmental Justice as "the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies". In determining the distribution of costs for water resource initiatives, some economic techniques may recommend that certain groups pay for costs in amounts that are beyond their ability to pay. The principles of Environmental Justice and equity, however, would suggest that it may be necessary to use other funding sources to assist those groups in repaying project costs. These funds could come from other project beneficiaries willing to pay more than their share of costs in order to enjoy the benefits of the project, from other private sources (charities, donations, etc.), or from public funds.

There are two particular groups in California for which equity and Environmental Justice principles should be used in making water resource financing decisions:

1. Disadvantaged communities
2. Tribal governments

For both disadvantaged communities and tribal governments, special considerations should be made in determining ways to fund water resource projects. For both groups, State funding may be needed in order to maintain equity in the development of water resources in California. While programs currently exist through which these groups can obtain public water project funds, such as DWR's Water Use Efficiency Program and the Drinking Water State Revolving Fund, greater effort must be made to ensure that all communities throughout the state are receiving safe and reliable water delivery and water quality services. New targeted programs that focus on these groups may need to be established to allow for greater access to public funding.

Besides allowing for better access to State funds, these groups must also be protected from the impacts of project implementation. Because disadvantages communities are often located in close proximity to existing and proposed infrastructure projects, they have at times been forced to bear a disproportionate amount of the indirect costs of implementation. State and local agencies must work to ensure that these groups are not unfairly treated when decisions are made on project location and configuration. Considerable efforts should be made to minimize the physical, economic, and social disruptions that can result from new water resource projects. Just as many environmental benefits are difficult to quantify in economic terms, the costs associated with community impacts can also be difficult to measure, but that does not diminish the importance of preventing vulnerable groups from suffering unjustly for the benefit of others.
For many water resource initiatives in California there is a strong need for reliable, long-term funding sources. Although public funding has paid for a large amount of project costs in the past, the scarcity and variability of public funds indicate the need for alternative sources. General obligation bonds can serve as useful tools for funding projects with widespread, public benefits, but over reliance on GO Bonds can lead to degradation of the State's credit rating, unfair subsidization of private groups, and higher repayment costs for taxpayers in the future. State appropriations also have a role in financing water resource projects that benefit the general public, but authorization requirements and the large degree of variability and uncertainty in year-to-year funding also suggest that alternative sources should be considered.

Identifying new funding sources may require looking more closely at financing tools such as revenue bonds, which link repayment with future project revenues and have provided a source of funding for the State Water Project for over four decades. These types of financing methods also adhere to a benefits-based approach, since the project beneficiaries contribute to project funding using the direct revenues obtained from the operation of the project itself. User fees of some form may also be a potential alternative, assessing charges based on the quantity of water diverted, the magnitude of retail water sales, using a fixed monthly fee, or by other methods. The CALFED Bay-Delta Program has been evaluating various forms of user fees since it was directed to do so by the 2000 CALFED Record of Decision (ROD), and work continues under the oversight of the new California Bay-Delta Authority. Local agencies could also continue to see increasing financial responsibilities as decision makers attempt to limit public fund expenditures.

A long-term funding source could also be used to help local agencies pay for the costs associated with developing Integrated Resource Plans. The State of Texas provides state funding for 100 percent of direct planning costs for its Regional Water Plans through a special grant program administered by the Texas Water Development Board. Over $20 million was awarded to the local agencies through state appropriations through this grant program from 1998 to 1999. In turn, the participating agencies pay for all of the administrative costs associated with the plans. California could establish a similar program, funded through state appropriations or other sources, to help provide consistent state financial assistance for IRP development.

Beyond traditional funding sources and mechanisms, more unconventional strategies could also be used to harness the advantages created through certain forms of water resource partnerships[2]. A few examples of partnering arrangements include the following:

- Infrastructure-for-Water Transfers
- JPA Bond Pool Arrangements
- Public/Private Partnerships

An **infrastructure-for-water transfer** is a type of financing partnership where one agency transfers a portion of its water supply for new infrastructure improvements that are paid for by another organization. One prominent example of infrastructure-for-water transfers in the State of California took place between Metropolitan Water District of Southern California (MWD) and the Imperial Irrigation District (IID), resulting in canal lining, on-farm management improvements, and other conservation measures in exchange for 106,000 acre-feet of annual supplies for MWD. These improvements often result in increased water efficiency for the group transferring its water, reducing or eliminating the need to seek replacement supplies. The increased efficiency can also limit damaging third-party impacts that can occur when water transfers reduce economic activity in the area of origin. The net result is new water supplies for the group funding the infrastructure work, and improved facilities and higher efficiencies for the agency transferring its water – all potentially without the need for public funds. Infrastructure-for-water transfers can be difficult to arrange because of the institutional and legal requirements that must be followed, but the benefits of completing a transfer can potentially justify the effort.

[2] For further information, see *Maintaining Momentum on California Water Issues: Business Leaders' Findings*, May 1996.

Joint Powers Authorities are arrangements where two or more agencies come together to share common responsibilities and utilize the coordination and management advantages inherent in JPAs. One particular advantage of a JPA is its ability to pool a number of separate smaller-scale bond offerings into a single financial instrument, resulting in smaller debt issuance costs and greater credit standing in the municipal bond market. **JPA bond pool arrangements** enable smaller agencies to gain access to debt financing that may otherwise be too costly or unavailable for smaller capital projects. One example of a JPA bond pool arrangement is the Financing Authority for Resource Efficiency of California (FARECal), which has helped finance water and electricity projects for cities, water districts, irrigation districts, and municipal utility districts throughout California. The benefits of bond pooling through JPAs must be weighed against the loss in local financing control and flexibility that is necessary to form a pool and the potential for credit erosion if too many high-risk participants join the JPA bond pool. In addition, a 1998 interpretation of state law[3] by the California Attorney General established limits on how JPA bond pools could be established and managed, which has removed the ability of some pools, including the California WateReuse Finance Authority, to take on new borrowers or finance additional debt. JPA bond pools may, however, still be created, as long as all participating borrowers are identified before the establishment of the JPA, and other requirements are met.

Another potential form of financing partnership that could be useful for water resource investments involves the use of the private sector to finance, design, construct, and/or operate a public service facility[4]. The use of **public/private partnerships** has become more controversial in recent years, particularly following the California energy crisis and with the ongoing litigation over Stockton's wastewater management, but there could still be potential to use adequately regulated forms of private sector participation to help finance water projects. The most widely identified advantage of public/private partnerships is greater efficiency brought about by competitive market forces and the incentive to innovate business practices. Private sector groups have also been shown to establish lower operating costs than public systems, and can provide more accessible financing for local agencies. Although many factors have been identified as the cause of the Californian energy crisis, the fallout from the event clearly points to the need for strong regulatory oversight with public/private partnerships. In addition, the fact that many forms of public/private partnerships exist with varying levels of private sector participation shows that there may be potential for smaller-scale private involvement, such as using developer financing to allow private sector financial assistance while maintaining public management and oversight.

As mentioned elsewhere, the California Bay-Delta Authority is currently developing financing options for the CALFED Bay-Delta Program, and state and local agencies should both participate in and use the results from this process to develop funding techniques throughout the state. By actively participating in CALFED funding discussions, agencies can ensure that projects have received adequate cost-benefit analysis, that benefits and beneficiaries have been correctly identified, and that cost repayment is equitable and benefits-based. For agencies outside of the CALFED scope, the financing strategies can still be useful for determining smaller-scale funding options and techniques.

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[3] California Attorney General Opinion No. 98-807, November 18, 1998.

[4] This definition is taken from Beecher,J.A., Mann,P.C., & Stanford, J.D. (1993). *Meeting Water Utility Revenue Requirements: Financing and Ratemaking Alternatives.* The National Regulatory Research Institute.

Just as other agencies can benefit from the ongoing efforts of CBDA, the CALFED finance work can also benefit from the lessons learned by local project financing experiences. Examples of innovative financing arrangements, some of which are described in other parts of this chapter, can be found throughout California. Many of these principles could be applied on a larger-scale, and may be useful for CBDA as their financing work continues to evolve.