# DELTA FLOOD RISK MANAGEMENT ASSESSMENT DISTRICT FEASIBILITY STUDY

*Prepared for:*

***Delta Protection Commission***

***State of California***

*Prepared by:*

*M.Cubed, Abbott & Kinderman LLC, CONCUR,Inc., Ecology & Environment, Northwest Hydraulics, Phoenix1, TCW Economics, and Robert Twiss*

*DRAFT – December 1, 2016*

This page left blank intentionally

# TABLE OF CONTENTS

# ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| AB | Assembly Bill |
| AJE | alternative justifiable expenditure |
| BBA | benefits-based allocation |
| BDCP | Bay-Delta Conservation Plan |
| Cal OES | California Office of Emergency Services |
| Caltrans | California Department of Transportation |
| CCED | California Conservation Easement Database |
| CDFW | California Department of Fish and Wildlife |
| CESA | California Endangered Species Act |
| CFA | Mello-Roos Community Facilities Act of 1982 |
| CFD | community facility district |
| CM | conservation measure |
| Commission | Delta Protection Commission |
| CSFMRA | California Chapter of the American Society of Farm Managers and Rural Appraisers |
| CVFPB | Central Valley Flood Protection Board |
| CVFPP | Central Valley Flood Protection Plan |
| CVP | Central Valley Project |
| CVPIA | Central Valley Project Improvement Act |
| Delta | Sacramento-San Joaquin River Delta |
| Delta Conservancy | Sacramento-San Joaquin Delta Conservancy |
| Delta ER Program | Delta Flood Emergency Preparedness, Response, and Recovery Program |
| DLIS | Delta Stewardship Council's Delta Levee Investment Strategy |
| DRMS | California Department of Water Resources' Delta Risk Management Study |
| DSC | Delta Stewardship Council |
| DWR | California Department of Water Resources |
| EBMUD | East Bay Municipal Utility District |
| EIP | Early Implementation Program |
| EPMC | equal percentage marginal costs |
| ERP | Ecosystem Restoration Program |
| FEMA | Federal Emergency Management Agency |
| FESA | Federal Endangered Species Act |
| FESSRO | FloodSAFE Environmental Stewardship and Statewide Resources Office |
| GHAD | Geologic Hazard Abatement District |
| GIS | geographic information system |
| GRR | General Re-Evaluation Report |
| HMP | Habitat Management Plan |
| I | Interstate |

| | |
|---|---|
| LMA | Local Management Agency |
| MHHW | mean higher high water |
| MW | megawatts |
| NFIP | National Flood Insurance Program |
| PG&E | Pacific Gas and Electric Company |
| PL | Public Law |
| PUOF | proportionate use of facilities |
| RD | Reclamation District |
| SCFRRP | Small Community Flood Risk Reduction Program |
| SCO | State Controller's Office |
| SCRB | separable-cost, remaining benefits |
| Special Projects Program | Delta Special Flood Control Projects Program |
| SPFC | State Plan of Flood Control |
| SSIA | State System-wide Investment Approach |
| Subventions Program | Delta Levees Maintenance Subventions Program |
| SWP | State Water Project |
| SWRCB | State Water Resources Control Board |
| UFRRP | Urban Flood Risk Reduction Program |
| USACE | United States Army Corps of Engineers |
| USBR | United States Bureau of Reclamation |
| VSL | Value of a Statistical Life |

# EXECUTIVE SUMMARY

The Delta Flood Risk Management Assessment District Feasibility Study (DFRMADFS or the Study) identified the most feasible finance mechanisms that could be deployed to generate revenues to pay for maintenance, repair, rehabilitation and improvements (or more generically, levee "work"[1]) or other means of reducing flood risk. These include a Delta water user fee or conveyance fee, and a Delta flood protection fee—in combination with the current system of local assessments and state funding (general obligation bonds and general fund) and federal funding where available. Implementing one or more of the new fees would help move toward a levee funding system based on the "beneficiary-pays" principle—that levee beneficiaries should pay for the share of flood protection costs that matches their received benefits.

This feasibility report is based on a "fatal flaw" analysis—after eliminating those potential mechanisms that are infeasible, we are left with those that might work best in various situations to capture Delta levee beneficiaries. The authors recognize that given the complex political environment, there can be no simple "yes or no" answers to the question of whether any particular mechanism is feasible. Feasibility is considered here by looking at the overall potential for a mechanism to collect revenue from beneficiaries, and working within the current constitutional framework.

***We emphasize that this analysis is not intended as a recommendation to replace the current funding programs or cost shares under the Delta levees subventions or special projects programs. It is also not a recommendation to proceed immediately to implementation of the identified mechanisms. Rather, it describes the results of a beneficiary-pays-based analysis that screened existing mechanisms for broad feasibility in a variety of contexts. This report should be used to set the stage for future in-depth analysis and deliberations among stakeholders.*** The range of

[1] For the purpose of this feasibility study, we do not distinguish between benefits of levee maintenance and levee improvements. The different levels of benefit and appropriate cost share would need to be addressed in a subsequent study of implementation issues.

opportunities and challenges described herein underscore the importance of moving ahead with further stakeholder and agency analysis in an implementation study.

The current approach to paying for Delta levee work does not collect funds from all beneficiaries in proportion to the benefits conferred and tends to obscure the relationship between benefits and costs. Although the principle of "beneficiary-pays" has long been discussed as a basis for paying for water infrastructure, the State has not adopted policies to implement true beneficiary-pays for Delta levees. This Study examined a range of financial mechanisms that could remedy this mismatch between funding and benefits of Delta levees, and characterized the challenges associated with implementing a beneficiary-pays-based approach to funding Delta levees.

This Study demonstrated that the current approach to paying for Delta levee work effectively recovers associated costs from some beneficiaries (local landowners and the general public) in rough proportion to the benefits and/or costs of providing flood risk reduction and protecting the State's broader interests (such as supporting the State's economy and ecosystem restoration). The existing approach relies primarily on:

- Reclamation districts that assess Delta property owners based on their proportionate share of flood risk reduction benefits; and
- State and federal[2] funding that reflects the general public benefits of all flood risk reduction, as authorized by various California and federal statutes. Because California relies mainly on General Obligation bonds, funding for levee work has been episodic, varying with the provisions in each bond act.

However, these existing finance mechanisms do not include significant revenue from beneficiaries that receive significant private benefits and that are located primarily outside of the Delta—namely, water exporters and linear infrastructure owners and users. To apply the beneficiary-pays principle, the state would need to collect revenues from these two groups, which would necessitate implementing one or more new financing mechanisms, as described below.

[2] Most Delta levees do not qualify for federal funding, which is administered by the U.S. Army Corps of Engineers. However, such funding is not "impossible" because the USACE has outlined a path to restoring such funding, but it could be difficult to achieve the specified standards.

**Delta Flood Protection Fee**: This would be a state property-based charge levied in a manner akin to the existing Fire Prevention Fee in the State Responsibility Area.[3] The beneficiaries covered by the fee, depending on its structure and breadth, could include: *property owners in Delta communities, in-Delta water users, and infrastructure owners*. As with the Fire Prevention Fee, this would require new state legislation and could be imposed on each parcel or structure in the covered area. As with the Fire Prevention Fee, beneficiaries who currently are or would be paying other levies or charges for flood protection benefits would receive a credit against the Flood Protection Fee so as to keep those beneficiaries whole.

**Delta Water User Fee**: This user fee would be based on the volume of water diverted from or discharged into the Delta. The beneficiaries subject to this fee could include: *in-Delta water users, water exporters, and upstream dischargers*.[4]

**State Water Project (SWP)/Central Valley Project (CVP) water conveyance fee**: This would be administered in one of two structures: either (1) a user fee or (2) a lease payment for using Delta channels (similar to transmission capacity pricing for natural gas pipelines). This fee or lease payment would apply to *water exporters*, who could pay through amendments to SWP and CVP contracts. A lease payment for the use of the leveed channels to convey fresh water would be based on the State Lands Commission's authority to lease state lands for commercial, industrial, and other purposes, per Public Resources Code Section 6501.

Each of these potential mechanisms presents challenges for implementation within California's web of legal and regulatory constraints on fees, taxes, and assessments. In addition, there is not yet agreement on the methods and data needed to calculate

[3] "The State Responsibility Area (SRA) Fire Prevention Fee was enacted by Assembly Bill X1 29 in July 2011. The law approved the new annual Fire Prevention Fee to pay for fire prevention services within the SRA… Effective July 1, 2014, the fee is levied at the rate of $152.33 per habitable structure, which is defined as a building that can be occupied for residential use. Owners of habitable structures who are also within the boundaries of a local fire protection agency will receive a reduction of $35 per habitable structure." (Source: http://www.firepreventionfee.org/ )

[4] In-Delta and upstream dischargers may be excluded from this fee due to the difficulty in measuring the amount of water used and discharged by this subgroup, but that we cannot *a priori* exclude them without further empirical research.

current flood risk and estimate benefits. Some types of benefits, such as the indirect economic effects of Delta levees, or the value of ecosystem restoration, are difficult to quantify and different perspectives can produce widely varying calculations. However, the clear need for Delta levee maintenance and improvements, combined with the episodic nature of bond funding, should motivate further exploration of these financing mechanisms.

## Key Findings

1. A full list of benefits and beneficiaries from flood protection and ancillary activities includes *many entities and individuals who reside outside of the Delta*. In some cases, the benefits to those outside of the Delta exceed the benefits to in-Delta parties.
2. Assessment districts, such as reclamation districts, rely on property-based assessments, which cannot reach the beneficiaries that do not own property in the Delta. Assessments are subject to Proposition 218 and associated case law; other statutes constrain the formation and operation of assessment districts. These constraints appear to render a Delta-wide assessment district infeasible for the purpose of collecting revenue from non-contributing beneficiaries.[5] Therefore, by definition *they cannot and will not reach the full array of Delta levee beneficiaries*.
3. A *Delta-wide assessment district is likely infeasible* for two reasons:
    a. It cannot capture revenues from all beneficiaries of flood protection in the Delta because many of them do not control taxable property to be assessed in the Delta; and
    b. It would face significant legal and political hurdles to cross jurisdictional boundaries such as counties and special districts in order to apply to all property owners in the Delta. Most importantly, the benefits vary significantly across geography and beneficiaries, making assigning cost responsibility so complex that it would likely violate state law. The San Francisco Bay Restoration Authority rejected that approach for this reason.
4. New "portfolios" of financial mechanisms would be needed to address the full range of Delta levee beneficiaries and financing needs. However, no one

[5] There may be other reasons to pursue formation of a Delta-wide assessment district, such as to improve consistency in assessment methods, improve planning and coordination among reclamation districts, coordinate emergency response, or other governance reasons. However, exploration of those issues was outside the scope of this Study.

existing agency or authority has the capacity to guide and administer the full range of mechanisms that will be needed.

5. Reclamation districts can continue to be the primary means of collecting revenues from local property owners for whom flood protection benefits accrue from in-Delta activities and purposes, e.g., farming behind levees or owning property in local communities. Whether infrastructure owners with property in those reclamation districts pay sufficient amounts given the benefits accruing to outside-of-Delta activities and purposes requires further examination.

6. Significant statewide benefits accrue primarily from (i) maintaining and restoring habitat and the Delta as a place, and (ii) the ripple effects of regional economic activity on the state economy. State general fund and general obligation bond funds are the sources for paying the cost shares associated with these public benefits.

7. In those parts of the Delta where islands form the fresh water conveyance corridor or provide a salinity barrier, water exporters derive significant benefits from the levees constructed for flood protection. The exporters do not currently pay directly to maintain these levees. The magnitude of those benefits should be further evaluated with specific analysis of the different ways that levees affect water exports.

8. Similarly, linear infrastructure owners (e.g., pipelines, railroads and highways) benefit from levees in some stretches of the Delta. These facilities typically span several islands and tracts. Because of varying ownership and regulation of these forms of infrastructure, we could not conclude whether it is feasible to establish separate levies or charges for each type of infrastructure. More likely, a Delta Flood Protection Fee would better capture revenues from these beneficiaries.

9. For other beneficiary groups, such as recreationists or upstream flood control agencies, the amounts of additional revenue from new finance mechanisms may be trivial, or the linkage of benefits sufficiently tenuous that it may not be worthwhile to collect revenue from these beneficiaries. Instead, their benefits can be added to the larger public beneficiaries group for cost allocation purposes.

10. In situations where there are large State interests in a local island, the cost allocation determined by State cost-sharing formulas may not mesh with the allocation methods dictated to reclamation districts by assessment law and Proposition 218. This situation can limit the ability to raise sufficient revenues and to pay the allocated share by a local district for levee work.[6]

[6] We also identified other situations where conflicts among cost allocation rules can create uneven allocations and either shortfalls or surpluses in overall revenue requirements. Because these allocation methods are often dictated in the State Constitution, resolving these disparities will require reconciliation steps after the cost allocation. The current ability to pay assessment for subventions is one current example of such a step.

## Recommendations

The next step should be to study the details of the identified new fees, and determine how they could be implemented. The implementation study should be conducted as a collaborative effort, jointly convened by the Delta Protection Commission, the Department of Water Resources (DWR), the Delta Stewardship Council (DSC), and the Central Valley Flood Protection Board (CVFPB).

The implementation study should generate principles for integrating existing funding sources and new financial mechanisms, as well as detailed descriptions of how to implement a beneficiary-pays-based approach to financing levee work. These descriptions would be the basis for negotiations among stakeholders aimed at generating agreement on a set of policy and legislative changes necessary to authorize and implement the beneficiary-pays approach. These changes might include:

- A legislative statement of policy and intent, and adoption of a similar policy statement by the California Natural Resources Agency; and
- A strategy for resolving conflicts between using transparent and equitable cost allocation approaches and following the cost allocation method required by constitutionally imposed limits on fees and assessments (legislation will likely be needed).

Throughout the implementation study, the results of current policy efforts (the Delta Levee Investment Strategy and the Central Valley Flood Protection Plan) should be incorporated into the beneficiary-pays framework. This will ensure that the development of financing mechanisms aligns with priorities for levee improvements.

# CHAPTER 1 INTRODUCTION

Delta levees benefit a full range of users ("beneficiaries") other than Delta property owners. In addition to protecting property from flooding, Delta levees form the backbone of the regional road system, ensure the continued existence of Delta towns and communities, and protect habitat for wildlife, including threatened and endangered species. They form a network of channels that entice boaters to explore the inner reaches of the Delta and support a long-standing tradition of hunting and fishing. And they carry fresh water to the pumps that supply water to the farmers of the San Joaquin Valley and to residents of southern California. They also bear stress from these users, including damage from ship and boat wake, and increased flood flows from upstream communities and storm water runoff.

However, the maintenance of this network of levees has largely been paid for by local land owners and state funds. This funding arrangement does not align well with the benefits conferred by Delta levees because some significant beneficiaries do not contribute (other than to the extent that sales, property, personal or corporate income taxes support California's General Fund). Nor has funding been adequate or consistently available to enable long-term planning for levee maintenance and improvements. Not surprisingly, there has been a long standing interest in adopting a "beneficiaries pay" basis for Delta levee maintenance and improvements. This Delta Flood Risk Management Assessment District Feasibility Study (DFRMADFS, or the Study) is a first step in evaluating how such a financial arrangement might work.

The study originated in the long-standing policy discussion about how to pay for Delta levees. The CALFED Record of Decision (August 2000) called for a benefits-based cost allocation for CALFED programs, as reflected in the CALFED Bay-Delta Finance Plan (2005).[7] The Department of Water Resources (DWR) has expressed its interest in a beneficiary-pays system for Delta levee improvement and maintenance by funding this Study. In addition, the Delta Stewardship

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

Council's Delta Plan (2013)[8] and Governor Brown's *California Water Action Plan* (2014),[9] call for a "…flood risk management assessment district … to provide adequate flood control protection and emergency response for the regional benefit of all beneficiaries, including landowners, infrastructure owners, and other entities that benefit from the maintenance and improvement of Delta levees, such as water users who rely on the levees to protect water quality."

This "Delta Flood Risk Management Assessment District Feasibility Study" (the Study) took a broad look at all the beneficiaries of Delta levees. It then determined the most feasible financing mechanisms that could implement a beneficiary-pays approach to flood protection and emergency preparedness in the Sacramento-San Joaquin River Delta (Delta).[10] Early in the Study, the project team looked at the legal constraints on assessment districts.[11] In the case of Delta levees, significant beneficiaries—public roads and highways that could not exist in the absence of the levees—do not pay assessments. And although not exempt, publicly owned lands, such as those owned by the Department of Transportation or the Department of Fish and Wildlife, typically do not pay assessments.

Levee improvements create intangible benefits that are not subject to assessment and which accrue to entities that lie outside the boundaries of the reclamation districts. These include the reliable conveyance of fresh water to state and federal water contractors. The State of California benefits from Delta levees by avoiding economic losses caused by floods and disruptions of the water supply. The State relies on Delta levees to support the continued existence of threatened and endangered species, to protect the scenic Delta landscape, and to benefit residents that recreate on Delta roads and waterways. These public benefits justify continued State expenditures to maintain and improve Delta levees. However, Delta levees

[8] Delta Plan Chapter 7, Recommendation RR R2. See also Appendix N, "Funding and Financing Options," http://deltacouncil.ca.gov/sites/default/files/documents/files/AppN_Funding%20and%20Finance_2013.pdf.

[9] See CNRA, CalEPA and CDFA, "California Water Action Plan 2016 Update," Sacramento, CA, http://resources.ca.gov/california_water_action_plan/, 2016.

[10] "Delta" in this report means the Legal Delta, unless designated otherwise, as specified in Section 12220 of the Water Code.

[11] State law limits the types of property that may be subject to an assessment. Water Code section 51200 states: "The assessments levied by a district shall include all lands and rights of way within the district, owned by the State or by any city, county, public corporation, or utility district formed under the laws of the State other than public roads, highways, and school districts" (emphasis added). In other words, real property within the district's boundaries, privately or publicly owned, can be assessed, with certain exceptions.

create private benefits that accrue to individuals who do not now pay directly for levee maintenance and improvements.

When the study began, it quickly became evident that assessment districts, while an important mechanism in paying for levees, could not reach many of the significant Delta levee beneficiaries—both public and private—to achieve the goal of beneficiary-pays. Consequently, the study examined many other potential financing mechanisms, including special taxes, user fees, and regulatory fees.

## Current Levee Funding

Delta levees require perpetual maintenance because of the condition of their foundations, and stresses caused by higher storm flows, subsidence, and tidal action. Estimates of the cost to improve Delta levees range from just over one billion to nearly three billion dollars to achieve the PL 84-99 standard.[12] These figures greatly exceed the amount of funding currently available and likely to be available under the current funding arrangements. And although the principle of beneficiary-pays has long been discussed as a basis for paying for water infrastructure, the State has not adopted policies or principles for an alternative to bond funding for Delta levees.

Delta levees depend on a mix of funding. For project levees (which are federal authorized projects within the State Plan of Flood Control (SPFC), and are owned by the State), some funding comes from the United States Army Corps of Engineers (USACE), with state cost-sharing requirements. However, the USACE recently found that structural flood risk management projects throughout much of the Delta were not economically justified. This, combined with increasing federal restrictions in a post-Hurricane Katrina environment, creates uncertainty about future federal funding for levee improvements.[13] State funding for project and non-project levees comes primarily from general obligation bonds (currently Propositions 1 and 1E), but these have a limited life span. DWR estimates that sufficient funds exist for approximately seven years' worth of subventions and special projects funding, though possibly at less than

[12] Delta Stewardship Council, "State Investments in Delta Levees," January 2015, p. 3.

[13] U.S. Army Corps of Engineers, *Delta Islands and Levees Feasibility Study*, April 2014.

current levels.[14] Local maintaining agencies, such as reclamation districts (RDs), assess local property owners for the costs of maintaining and improving levees. However, such assessments do not cover the full costs of levee improvements. Consequently, local agencies rely on state funding for both project and non-project levees.

Under the current financing approach, law and regulation set the share of levee project costs borne by state, federal, and local entities. For example, Water Code Section 12986 fixes the State's share of Delta levee maintenance and improvement projects in the subventions program at "no more than 75 percent of any costs incurred in excess of $1,000 per mile." For project levees that meet the USACE's requirements, [15] the federal government will pay between 50 and 75 percent of project costs, with more for levees in urban areas. These formulas implicitly value the public benefits—including protection of life and property, habitat, indirect economic impacts, and water supply—at between 50 and 75 percent of total costs for those projects where the state or federal governments participate. Consequently, general tax revenues pay for the state shares (and federal shares where applicable) on some levees. The local maintaining agencies (LMAs) typically pay for the remaining costs through assessments on property owners. Across all levee work which extends beyond that financed through special projects and subventions, those LMAs have borne about half of the total costs. [16] Because Proposition 218 and associated case law require assessments to be based on the special benefits derived from a project (rather than pro-rata shares of total project costs), local agency revenues are limited, and may not be sufficient to pay for the local share of jointly-funded projects and maintenance.

[14] Personal communication, David Mraz, DWR, September 8, 2016.

[15] Note that recent changes in USACE policy, discussed below, now make it much more difficult for projects levees in the Delta to qualify for federal funding.

[16] State Controller's Office data from Delta Stewardship Council July 23-24, 2015 Meeting Agenda Item 15 Reclamation District Funding and Financing report. Available at http://deltacouncil.ca.gov/docs/delta-stewardship-council-july-23-24-2015-meeting-agenda-item-15-reclamation-district-funding. An important amendment is that many of these RDs provide services beyond levee maintenance such as delivering water and managing drainage; however this appears to be less than 10% of the RDs revenues. Accounting for the costs and revenues of those additional services will change the relative share of levee costs somewhat, but not substantially.

## Concurrent Planning Efforts

The timing of this Study is critical, occurring while two other flood risk management planning efforts are underway. Consequently, this Study has the potential to strongly influence State policy decisions that will affect investments in Delta levees and state policy on paying for flood risk management.

**The Delta Levee Investment Strategy (DLIS):** Over the last two years, the Delta Stewardship Council has developed a planning tool to identify the priorities for state investments in Delta levees. Grouped in three tiers, the priority tracts and islands represent the Council's determination of those levees that pose the greatest risk to state interests – people, property, water supply, ecosystem protection, and the Delta-as-an-evolving place. In July 2015, the Council adopted "Delta Flood Management Investment Strategy Principles," which included the creation of a Delta flood risk management assessment district "with the authority to charge all beneficiaries."[17] The Principles included "Approaches to Implementing Flood Management Investments." Among others, the guidelines called for assessing the beneficiaries of regional infrastructure (#4), and that the investment strategy should allocate "levee maintenance and improvement costs to beneficiaries in proportion to their benefits…"(#7). This Study describes how those guidelines could be carried out. And although a Delta assessment district might improve governance issues, this Study documents that it will not advance the beneficiary-pays approach, nor generate additional revenue over that which is currently collected by the existing reclamation districts.

**The Central Valley Flood Protection Plan (CVFPP) Update 2017:** The 2012 Central Valley Flood Protection Plan (CVFPP) proposed an investment approach for flood management in the areas protected by the State Plan of Flood Control (SFPC), which includes project levees in the Delta. The CVFPP called for identifying potential beneficiaries of flood risk management projects, and for equitably distributing project costs among beneficiaries, within the constraints of state and federal cost sharing rules.[18] The 2017 update is underway, with a draft Plan due in December, 2016. According to CVFPB staff, the draft plan will include a finance plan that outlines options

[17] Available at http://deltacouncil.ca.gov/docs/delta-flood-management-investment-strategy-principles

[18] 2012 CVFPP, Public Draft, December 2011, page 4-37.

for funding the estimated $14 to $17 billion of investments in system maintenance and improvements needed. Options may include variations on the types of user fee or Flood Protection Fees recommended in this Study.

# CHAPTER 2 OVERVIEW OF APPROACH AND METHODS

This Study evaluated the feasibility of financing options, including an assessment district, to pay for Delta levees based on the "beneficiary-pays" principle, which means that levee beneficiaries should pay for the share of flood protection costs that reflects their received benefits. Consequently, the study took the following approach to evaluating financial mechanisms:

1. Identify the broad range of Delta levees beneficiaries;
2. Estimate the value of benefits received from Delta levees and assign those values to various categories of beneficiaries;
3. Determine the beneficiaries' share of levee improvement costs (cost allocation); and
4. Identify a broad range of financial mechanisms that could generate revenue to pay for those costs, and screen them for their use and relevance to the varied situations in the Delta.

As the study proceeded, a small group of stakeholders advised the team by providing feedback on work products and the results of the feasibility analysis. The results include broad conclusions about the feasibility of several financial mechanisms, as well as suggestions for additional analysis and next steps.

This Chapter provides an overview of the methods used in this Study—Archetypes, Beneficiaries Analysis, Cost Allocation, and Screening Financial Mechanisms. More detailed descriptions may be found in the appendices to this report.[19]

## Simplifying Complexity with "Archetypes"

This Study used five "archetypes," or constructed examples, to create realistic but hypothetical situations to aid in testing the financing mechanisms.[20] Each of the archetypes comprised assorted Delta levee beneficiaries with varying degrees of risk tolerance and needs for levee

[19] Many of the appendices were presented in earlier drafts to stakeholders as Project Memoranda for their review. Summaries were presented in a series of four workshops covering the building blocks and then findings of the Study. Additional appendices include technical discussions and analyses that were the supporting background and basis for those Project Memoranda.

[20] The archetypes are described in more detail in Appendix A.

improvements. Consequently, each archetype had different funding requirements. The archetype approach allowed the project team to:

- Identify the uses and/or users that are deriving the most benefit in typical Delta settings;
- Determine differences in the conditions or location that would affect the level of risk and cost of remedy;
- Determine the revenue capacity and revenue generating potential of the candidate finance mechanisms;[21] and
- Identify administrative and legal issues that would affect the feasibility of financial mechanisms (e.g.: federal, state, or private ownership, mixed ownership, and issues of liability).

The five archetypes[22] are as follows:

1. Island-centric with uses consisting mainly of agriculture, habitat, and recreation.[23]
2. Cross-Delta and in-Delta infrastructure, where protection will require coordinated development involving many islands.
3. Through-Delta water conveyance and in-Delta water use.
4. In-Delta mixed use, including low-density housing, small communities, and commercial activities.
5. Islands close to areas now undergoing, or designated for, urban development.

## Delta Levee Beneficiaries

Unlike previous studies of the benefits of Delta levees, this Study explicitly identified a wide range of potential benefits and beneficiaries (including public and indirect benefits such as transportation networks, water supply conveyance, and ecosystem services), rather than

[21] "Revenue capacity" is the capacity to generate revenues relative to total revenue requirements. "Revenue generation potential" is the potential to generate additional revenues beyond current levels, including new revenues.

[22] The study team designed the archetypes to simulate current levee maintenance and upgrade concerns, basing them on actual islands that represent those concerns ("referent islands"). The archetypes consist of key characteristics, such as land use, number and type of structures, presence of infrastructure, location in the Delta, although the referent islands remain anonymous. Where several referent islands were used to form the archetype, geographical information system (GIS) analysis yielded measurements for the key characteristics (e.g., levee type by miles, acreage, inundation depths, and land use). Rough estimates of the cost of levee improvements were derived from the California Department of Water Resources' Delta Risk Management Study (DRMS) (available at CDWR, Delta Risk Management Strategy, http://www.water.ca.gov/floodsafe/fessro/levees/drms/ ), as well as estimates provided from the DLIS study and certain stakeholders.

[23] We recognize that islands are not in fact isolated but are dependent on broader economic, transportation and hydrologic processes. However, funding for levee maintenance has been based the condition of individual islands or tracts, and some financing mechanisms may continue to be applied in this way.

lumping most beneficiaries together under the public benefits of levees. By casting a wide net for beneficiaries, this Study maximized the number of potential beneficiary/financial mechanism combinations, which were then screened for legal, political, economic, and institutional feasibility in the five archetypes.

According to the beneficiary-pays principle, beneficiaries should bear responsibility for project costs in some proportionate manner to the benefit they receive from the project. This Study defined beneficiaries as people or organizations who own, use, or control assets for specific purposes (i.e., activities) that benefit from flood control measures in the Delta. For example, growers on Delta islands benefit from the levees that protect farming activities from flooding. Some purposes consist of individual or private transactions from which economic value can be readily estimated (e.g., sale of agricultural products from protected lands); others create broad public benefits for which a price is not easily determined (e.g., protection of ecosystems or the existence of the Delta as a unique place). This Study linked the beneficiaries to purposes and estimated the benefits by analyzing the economics associated with those purposes.

The ten categories of beneficiaries used in this Study are as follows:

- Community Beneficiaries;
- Agricultural Land Owners, Producers, and Water Users;
- Municipal Water Providers and End Users;
- Infrastructure Owners and End Users;
- Upstream Dischargers;
- Instream Water Diverters;
- General Public Beneficiaries (including recreation);
- State and Local Governments and Special Districts;
- State Economy; and
- Other Indirect Beneficiaries.

## Allocating Costs

Flood protection, like national defense, creates benefits that cannot be easily divided among beneficiaries. Levees that protect one resident or parcel from floods also protect neighboring residents and parcels. Some levees form a fresh water conveyance corridor, or control salinity

levels in Delta waters. Such broad benefits accrue to most of the beneficiaries listed above, but are difficult to apportion to beneficiaries because they are not explicitly valued, as there are no transactions to set market prices. As a result, a different mechanism must be used to allocate the total costs of flood protection to the various beneficiaries (both local and remote).

This Study evaluated several methods available for allocating costs consistent with the beneficiary-pays principle.[24] Some methods use *alternative costs* or *physical measures of use* to allocate *costs* of levee improvements, while others use measures of the *benefits* derived therefrom for allocation, and a third uses a combination of these. Selecting a cost allocation method requires considering equity, feasibility of implementation, and the legal constraints that apply to the associated finance mechanism (fees, assessments, taxes, etc.).

Where legal constraints create inconsistencies in cost allocation methods, structured stakeholder negotiation may be needed to determine how to resolve the inconsistencies, possibly through legislation. Applying a beneficiary-pays-based approach raises the important policy question of whether the State should adjust its cost share formulas to be consistent with the cost allocation and financial mechanisms that can be used at the local level.

A more detailed analysis will need to be conducted and the outcome examined by stakeholders and decision makers to determine which cost allocation methods best meet these guidelines.

## Screening Finance Mechanisms

This Study's approach to identify and screen finance options involved three phases:

1. Collect data and determine levee funding requirements (what cost needs to be covered?);
1. Identify beneficiaries and assign benefits and cost responsibility (who pays and how much?)
2. Identify and evaluate possible financing mechanisms (how will a levee project or investment program be paid for over time?)

In the first phase, the project team gathered information to use in developing the archetypes and reasonable assumptions about future levee improvements, the associated costs, and the timing of the necessary investments. Timing of investments comes into play because feasibility

[24] Cost allocation methods and issues are described in detail in Appendix B.

depends on whether a financial mechanism, such as a user fee or a tax, can generate the amount of revenue required over the investment period. In other words a financial mechanism may need to support modest investments over a long time frame. Alternatively, the financial mechanism might need to pay for significant capital investments to bring flood protection up to current state and federal standards, carried out in a relatively short timeframe (such as the current work being undertaken by the Sacramento Area Flood Control Agency). Each of the five archetypes used for this Study included a set of Delta levee beneficiaries with varying degrees of risk tolerance and requirements for levee improvements, and consequently, different funding needs. In order to analyze the feasibility of financing mechanisms to pay for a range of investments, the team developed cost estimates for two "bookend" scenarios—low-cost and high-cost—for levee improvements in each archetype.

The second phase entailed allocating the costs of levee improvements to the beneficiaries, and determining who should pay. The many beneficiaries of Delta levees have different risk tolerances for flooding, ability to pay, and willingness to pay for flood protection. As described above, under "Allocating Costs," selecting a cost allocation method required considering equity, implementation feasibility, and legal constraints associated with the financial mechanism being evaluated.

In the third phase, the project team used a screening process to identify the most promising financial mechanisms for each archetype.[25] This entailed selecting candidate financing mechanisms that covered the range of beneficiaries in each archetype, and evaluating each mechanism for institutional, legal, economic, and political viability:

*Institutional Considerations*: This screen identified the candidate organizations that could implement the financing mechanism, including development, legislative approval, regulatory activities, assessment, collection, and reporting.

*Legal Requirements:* This screen considered whether the financing mechanism could be applied under current law, and what legal restrictions or requirements must be met (such as a nexus study or voter approval requirements). If the mechanism would require new legislation, we identified the authority (State legislature, Congress, or local district) and vote requirement needed. In some cases, the legal screen eliminated a mechanism from further

[25] The screening process is described in greater detail in Chapter 7.

consideration due to conflicts with constitutional or federal requirements that would be difficult to overcome.

*Economic Issues:* This screening evaluated the cost responsibility and revenue limits of the most promising mechanisms that had passed the institutional and legal screening. Under the assumption that a portfolio of mechanisms would be needed to capture revenues from the most significant Delta levee beneficiaries, we employed the five constructed archetypes (described in Appendix A) to allocate costs among beneficiaries. The archetypes also illustrated how well revenues would match with expected costs in these different situations, which allowed us to determine the total coverage and sufficiency of candidate mechanisms. Several candidate mechanisms, such as a recreational fee, were dropped because the amount of potential revenues would not justify the effort to implement the measure. The use of archetypes offered further insights into the broader feasibility of particular mechanisms throughout the Delta.

*Stakeholder and Political Support:* We considered the political feasibility of those mechanisms that survived the first three screens, as well as the rationale for initial support or resistance to various mechanisms. We acknowledge that stakeholders may have different perspectives on the feasibility of the mechanisms; this will need to be addressed in any future implementation efforts through a stakeholder process and in the legislative arena.

# CHAPTER 3 CONTEXT FOR FINANCING FLOOD PROTECTION

This chapter describes the current setting for Delta levee financing. In particular, this chapter outlines key State constitutional and statutory provisions that limit State and local government agencies' ability to raise revenue to maintain and improve Delta levees. It describes existing constraints on property-related fees and taxes. This sets the stage for the subsequent analysis of applying the beneficiary-pays approach across the spectrum of Delta levee beneficiaries.

This Study considered all general categories of financing mechanisms as candidates for a beneficiary-pays approach because there are precedents of several types of financing applying to a beneficiary. We cannot say, for example, that only assessments should be considered for agricultural beneficiaries. This is because agricultural beneficiaries have also paid parcel taxes in certain settings in addition to their flood control assessments. Moreover, there is still substantial uncertainty over the interpretation of key provisions of Propositions 218 and 26, and this uncertainty prevents firm conclusions about the applicability of several finance mechanisms for funding levee improvements and maintenance.

## Summary of Available Financing Mechanisms

Propositions 13, 218, 26, and associated case law have imposed significant limitations and procedural requirements on government's ability to raise revenue. This section summarizes the state and local revenue generation mechanisms most commonly used in California to finance infrastructure and describes how these mechanisms may be employed to finance levee maintenance and/or improvements (this Study uses the term "levee work" to include both maintenance and improvements). The mechanisms are organized into the following broad categories:

- Assessments
- General and special taxes
- Impact fees
- Property-related fees and charges
- Regulatory charges
- User fees

Different constraints apply to each of these categories, depending on whether they are employed by state, regional, or local government agencies. Consequently, each type of funding varies in how it may be applied to levee maintenance and improvements.[26]

## Financing Mechanisms Defined

The following definitions generally describe state and local government revenue options. Voter-enacted initiatives—Propositions 13, 218, and 26—have used these terms or phrases inconsistently, thus blurring the guidelines for how and for what purpose a particular revenue measure should be categorized. The initiatives, associated case law, and statutes sometimes provide more particular or varied definitions.[27]

> **"Assessments"** refer to any levies or charges imposed on real property by an agency. They include, but are not limited to, special assessments, benefit assessments, maintenance assessments, and special assessment taxes.[28] Assessments are levied based on the benefits to assessed real property created by a government service or public improvement.[29]
>
> **"Impact Fees"** are charges imposed as a condition of land development (e.g., building permit, rezoning or conditional use permit or subdivision approval), intended to fund public facilities and services necessary to serve the new development. Common examples include city park and road impact fees. Impact fees are not for general revenue purposes, and they must be based on a reasonable relationship between the development project and the facility or service to be provided. This reasonable relationship is commonly referred to as the "nexus." [30]
>
> **"Property-Related Fees and Charges"** lack a precise definition, but as result of Proposition 218 are broadly considered to be any fees or charges *other than* an ad

[26] A summary of specific legal issues and constraints is provided in Appendix C. The key considerations for each category are shown in a table format in the appendix.

[27] The impact of Propositions 13, 218, and 26, along with associated statutes and case law, is a complex area of law and legal practice, which is greatly simplified for the purposes of this chapter.

[28] California Constitution, Art. XIII D, Sec. 2.

[29] Note that there is not a requirement that benefits exceed costs; however, "ability to pay" studies, such as those usually conducted as part of levee project planning and financing, typically incorporate such a requirement.

[30] "Local Agency" ordinarily includes cities, counties, special districts, and any other local or regional governmental entity. (California Constitution, Art. XIIIC, sec. 1.)

valorem tax,[31] special tax, or assessment that an agency imposes upon a parcel or person as an incidence of (i.e., connected directly to) property ownership. An example of such a fee would be a groundwater augmentation charge collected from overlying property owners.[32]

**"Regulatory Charges"** are charges imposed by a public agency in conjunction with implementing a regulatory effort such as required monitoring of air and water quality, or a charge imposed on an entire industry to fund a mitigation program, such as a fee to pay for lead paint removal.

**"Taxes"** (general and special) are charges on real property that historically are not tied to any particular service or benefit provided by the public agency. As a result of voter-approved initiatives, a "general tax" is any tax imposed for general governmental purposes. A "special tax" is any tax imposed for specific purposes, including taxes placed into the general fund for particular purposes. Taxes by special districts are now considered to be "special taxes."

**"User Fees"** are fees collected in response to the use of a governmental service or facility, such as application processing charges or rental of public property such as a sports facility. These services must be separable from direct use of the property itself. Utilities, such as water, sewer and electricity, fall into this category because use varies without direct relationship to the property's characteristics.

## Applications and Limits of Financing Mechanisms

### *Assessments*

Assessments are used by cities, counties, and special districts to fund a variety of government activities. Funded activities include parks and recreational improvements, landscaping, and street lighting. Assessments can be utilized to fund ongoing and recurring expenses, as well as the repayment of bonds sold to finance long-term capital expenditures.

[31] "Ad valorem" refers to a tax determined as a proportion of property value.

[32] Pajaro Valley Water Management Agency v. Amrhein (2007) 150 Cal.App. 4th 1364

Assessments have historically served reclamation districts (RDs) as the primary tool for local funding of levee improvements and maintenance. RDs are special districts of limited powers, formed to protect distinct geographic areas, and are administered by an independent governing body, separate from city and county governments. RDs are some of the oldest forms of government recognized under California law and are formed under general statutory authority or by special legislative acts. [33]

Assessments are based on and levied in accordance with the benefits provided to affected properties by a governmental service or activity. Proposition 218 (1996) constrained local agencies' use of assessments by imposing both procedural and substantive requirements for new assessments.[34] These include a requirement that only special benefits (and not general benefits) may be assessed, and that assessments must be based on a detailed engineer's report.[35] This report must quantify the proportional special benefit derived by each parcel.[36] Special benefits are identified as separable from those conferred generally to the surrounding community or beneficiaries outside of the assessment district. The assessment cannot exceed the reasonable cost of the special benefit conferred upon the parcel.

Procedural steps added by Proposition 218 require the agency proposing the assessment to conduct a hearing with notice to the property owner and to conduct a ballot protest proceeding prior to imposing the assessment. If the ballots opposing the measure exceed those in support, the assessment may not be imposed. Ballots are weighted in accordance with the proportional financial obligation of each parcel. Thus, property owners have a direct role in determining whether or not a locally imposed assessment can go forward.

Proposition 218 requirements apply to "local agencies," which includes cities, counties, special districts, and regional governmental agencies. The State does not directly exercise assessment authority for levee improvements. Were the State to create a new regional agency for purposes

[33] Water Code sections 51320-51349.

[34] Certain pre November 6, 1996 assessments are exempt.

[35] Engineer's reports have long been required, but are now the only avenue available for using assessments.

[36] For a recent example of an engineer's report that calculates the special and general benefits, see Chapter 5 of the Sacramento Area Flood Control Agency's "Engineers Report, SAFCA Consolidated Capital Assessment District No. 2, June 13, 2016." Available at http://www.safca.org/assessments.html .

of imposing assessments to fund levee improvements, the new agency would have to follow the same approval process and conduct the same engineer's analysis of special and general benefits required under Proposition 218. In the case of a regional assessment district covering the entire Delta, it would be challenging to determine the special benefit for each parcel in the region, and to establish the nexus between the cost and the amount to be assessed.

### *General and Special Taxes*

The law pertaining to general and special taxes has evolved over the last four decades, starting with the enactment of Proposition 13 in 1978, followed by Propositions 218 in 1996 and 26 in 2010. Combined, these initiatives created the following framework for the imposition of taxes, both general and special.

Proposition 13 added Article XIIIA to the California Constitution, capping, and in many situations lowering, the property tax revenues collected by cities, counties, and school and special districts. This measure established a maximum cumulative ad valorem tax rate of one percent based on assessed value of the property, with annual reassessment escalation limited to no more than two percent until a property is sold or ownership is significantly modified. Proposition 13 also required local voter approval for special taxes and restricted the California Legislature's ability to enact new taxes by imposing a requirement of a two-thirds vote in both legislative houses. Proposition 13 authorized cities, counties, and special districts to enact "special taxes" following a two-thirds vote of the qualified electors, although the measure did not define "special" taxes.

Proposition 218 supplemented Proposition 13. Under Proposition 218, a majority of voters must approve new general taxes, and two-thirds of the qualified voters must approve local special taxes. The voter approval requirement limited the ability of local agencies to rely on new tax measures to generate new revenue to pay for services or infrastructure. The measure also clarified the use of the initiative process to repeal locally imposed taxes, assessments, fees, and charges, adding a level of uncertainty regarding the long-term reliability of new revenue measures.[37]

[37] Repealing such charges related to repaying bond indebtedness is restricted.

Proposition 26 took a sweeping approach to taxes, defining "taxes" to include any local levy, charge, or exaction, effectively expanding the voter approval requirement to more local government actions. Proposition 26 exempted some fees and charges—those potentially relevant to levee funding are:

- Charges imposed for a specific benefit conferred to the payor that is not provided to those not charged, or for services provided, subject to a limitation that the charge not exceed the reasonable cost to the government of providing the benefit or service.[38] Levee maintenance could fall within the scope of "benefits" conferred or "services" provided and would not be curtailed by Proposition 26, although the scope of the proposition has not been fully litigated.
- A charge imposed as a condition of property development, as is the case with impact fees (discussed below).
- Assessments and property-related fees imposed in compliance with the provisions of Proposition 218 discussed above (i.e., engineer's report, protest, and/or voter requirements).[39]

Thus, Proposition 26 leaves in place local options for levee financing through assessments (discussed above) or impact fees (discussed below) but constrains the use of new taxes through its two-thirds voter approval requirement. Local levee maintenance charges (based on the reasonable cost of the government) may also qualify as benefits or services exempt from treatment as a local tax as long as the benefits or services are not provided to non-payors.

Proposition 26 also affected the State's ability to raise revenue by compelling a two-thirds vote in both houses of the Legislature for new taxes.[40] The proposition contains broad language expansively defining State taxes, similar to the language used for local government taxes, and contains similar exemptions from the definition of "taxes." State-imposed charges for levee maintenance (again based on the reasonable cost to the State) may similarly qualify as a benefit or service to the payor that would not be treated as a tax (and thus would not trigger the supermajority vote in both houses). The supermajority requirement could be a significant

[38] Traditionally, special benefits of levees have been viewed as accruing entirely to the parcels directly protected by those levees. The expansion of the list of beneficiaries of flood control is a recent innovation, and has not yet been addressed by the courts.

[39] California Constitution Article XIIID, sec. 1.

[40] California Constitution Article XIIIA, sec. 3.

hurdle to employing a State-imposed charge for levee improvements, depending on how the courts interpret Proposition 26.

Special taxes are a feature of community facility districts (CFDs), which are taxing districts administered by government agencies but not independent special districts. Special taxes are frequently used in conjunction with new development to finance infrastructure and maintenance, authorized by the Mello-Roos Community Facilities Act of 1982 (CFA).[41] The reason for the more frequent use of special taxes in new development is that the initial property developer controls the voting power in the district before residents move in and can readily satisfy any required voting/protest provisions. A significant distinction between CFA special taxes and other revenue tools is that CFA taxes are not limited by the rigors of the benefit analysis (assessments), nexus (impact fees), or reasonableness (user charges). Special taxes (except those used to retire bonded debt) can be repealed by the voters in future years as a result of Proposition 218. As these special taxes are closely linked to new land development, the utility of CFD special taxes in the Delta Primary Zone is very limited, although they may apply to urban development in the Secondary Zone.

General taxes can be used to repay debt from general obligation bonds issued for flood protection improvements, such as those described in Chapter 2.

### *Impact Fees*

In 1986, the California Legislature enacted the Mitigation Fee Act, Assembly Bill (AB) 1600, which created a uniform process governing the adoption, collection, and accounting for "impact fees."[42] These fees are defined as those imposed either on the basis of broadly based legislative enactments that establish a uniform fee applicable to a type of development activity (for example, a city's impact fees for major roadways) or on an ad hoc basis, as determined by the specifics of a particular development project. These fees are used to finance the construction or rehabilitation of public capital facilities. When adopting or imposing a fee obligation as a condition of approval, a local agency must make certain findings as to the purpose of the funds,

[41] Government Code section 53311 et seq.

[42] Gov. Code section 66000 et seq.

the use of the funds, and the reasonableness of the fee considering the relationship between the project and the public facility. AB 1600 codified the constitutional doctrine that impact fees must be reasonably related, or have a "nexus" between the project or activity upon which the fee is imposed and the facility to be financed. As a general proposition, impact fees collected from new development cannot be used to remedy existing facility deficiencies. For example, impact fees probably cannot be used to address levee maintenance shortfalls, but such fees could be used to upgrade or replace a levee, or build a new levee. Once fees are collected, a local agency must periodically affirm the purpose of the fee and reasonable relationship between the fee and facility to be constructed.

The Mitigation Fee Act applies to locally imposed impact fees assessed against new land development activities in which fee revenues are used for levee construction or rehabilitation. Cities and counties have the inherent constitutional authority to adopt and impose impact fees, but special districts may only do so if they are granted specific legislative authorization by the California Legislature.

As impact fees are tied to new land development activities, restrictions on development within the Delta's Primary Zone reduce the potential for impact fees to serve as a significant revenue source, although they may apply in the Secondary Zone. The State does not generally impose impact fees, but that does not mean that this option is unavailable.

### *Property-Related Fees and Charges*

The controlling legal authority pertaining to property-related fees and charges was added by Proposition 218.[43] This proposition established, among other provisions, new procedural and substantive rules applicable to local agencies when imposing charges based on property ownership. Generally, the following limitations apply to property-related charges for services:

- Certain property-related charges must be preceded by mailed notice to the property owners coupled with a right of protest. This step allows the property owners to veto the proposed charge by majority protest. This voting is weighted, based on the relative potential assessment that would be applied to each property owner. Thus, a property

[43] California Constitution Article XIII D, Section 6.

owner potentially subject to a greater property-related charge has more voting power as compared to another property owner facing a lower charge.

- Revenues cannot exceed the proportional costs required to provide the property-related service.
- Fees cannot be charged for general government services (e.g., police, fire) that are otherwise available to the public.
- Services for which fees are charged must be readily available to the property.
- New property-related fees and charges[44] would be subject to approval by either a majority of the property owners or two-thirds of the registered voters.

Note that in contrast to assessments, in which costs are allocated in proportion to the *benefits* accruing to the property from the service or activity, property-related fees and charges are allocated based on the *costs* of providing those services or activities to each particular property. In addition, assessments can be approved by the local agency's legislative body, subject to protest, while property-related fees and charges must be approved by the electorate, as described above.

As a funding option for new levee improvements, the requirement that the service "be readily available to a property" may function as a constraint on the use of locally imposed property-related charges for levee-related work, as the connection between the service and the parcel is less tangible and apparent as compared to other services such as water delivery. Future improvements by definition may not be "readily available now," whereas ongoing levee maintenance would be a current activity with current benefits. The court cases have dealt with active services like turning on a spigot for water; the "service" of reduced flood risk is less tangible and immediate.

### *Regulatory Charges*

These charges typically occur in conjunction with a regulatory endeavor and would not include revenue collected for general purposes. Proposition 26, passed by California voters in 2010, comprehensively defined as a tax "any levy, charge or exaction,"[45] triggering voter approval at the local government level (or passage by a two-thirds vote in the legislature for state-imposed

[44] Other than charges for sewer, water, and refuse collection.

[45] California Constitution Article XIII C, sec. 1 (local agencies) and Article XIIIA, sec. 3 (state).

charges) unless the tax was specifically exempted from the scope of the proposition. These exemptions include charges for regulatory programs subject to the limitation that the charge cannot exceed the reasonable cost of the benefit, service, or activity provided,[46] and the revenues cannot be used for general fund purposes. The State Legislature can delegate the authority to raise such fees to state and subordinate regional agencies.

As an example, the State Water Resources Control Board uses several regulatory fees for a variety of programs,[47] as do the Regional Water Quality Control Boards. Such fees typically pay for administrative costs, but have been used for specific projects.

### *User Fees*

As a general proposition, user fees cannot exceed the reasonable cost of providing the benefit, service, or regulation, and thus cannot be relied on for general revenue purposes.[48] Typically, user fees are limited to utility, permitting, or access fees that involve one-on-one transactions between a client and the government agency. User fees are also covered by the limitations of Proposition 26, as discussed above under General and Special Taxes. User fees and charges for services delivered to a property may be subject to Propositions 218 and 26 as property-related charges. User fees would have a narrowly defined role as a financing tool in the Delta; they are typically associated with the use of public facilities such as boating facilities.

[46] California Constitution, Articles XIIIC Section 1(e) and XIIIA sec. 3

[47] See http://www.waterboards.ca.gov/resources/fees/.

[48] Proposition 26 does not include a "reasonable cost" limitation on use of property.

# CHAPTER 4 BENEFICIARIES OF DELTA LEVEES

Unlike previous studies of the benefits of Delta levees, this Study explicitly considers in detail a wide range of potential benefits and beneficiaries, including public and indirect benefits such as transportation networks, water supply conveyance, and ecosystem services. The project team employed this approach to fully explore the effects of applying the beneficiary-pays principle to financing Delta levee improvements. Identifying and evaluating the beneficiaries to which benefits accrue required describing how beneficiaries are linked to purposes and how benefits are estimated by analyzing the economics associated with those purposes.

## Types of Beneficiaries and Benefits

Linking benefits, and therefore beneficiaries, to flood protection activities involves tracing economic relationships that may not be immediately obvious. As described in the DWR's *Handbook for Assessing Value of State Flood Management Investments*[49] categories of benefits of flood risk management include inundation-reduction benefits, intensification benefits, and location benefits. Typically, a benefit analysis for a flood risk management program focuses on evaluating the inundation-reduction benefits, which include the benefits associated with reducing damages (property, natural resources, or human health) associated with existing or future land uses. Reduced damages are most often reported in annualized terms (expected annual damages). Intensification benefits measure the potential value associated with improving the suitability of a particular land use for development (without changing the land use), whereas locational benefits can occur if flood protection measures result in the potential changing (presumably increasing the value) of a particular land use. Each of these benefits may then induce other economic benefits.

Flood protection benefits to beneficiaries can be differentiated and categorized in many ways, depending on program purpose or the types of actions subject to a benefits analysis. We used the following categories as a means to capture all of the potential beneficiaries of investments in Delta levees and their relationships as follows:[50]

[49] California Department of Water Resources. *Handbook for Assessing Value of State Flood Management Investments.* 2014.

[50] These categories are based on DWR's approach to characterizing categories of levee benefits, California Department of Water Resources. Economic Analysis Guidebook, January 2008. Appendix D describes how these categories are applied to the beneficiaries used in this Study.

- ***Primary and secondary benefits –*** As an economic concept, *primary benefits* are the increased value of goods and services to beneficiaries immediately affected by a flood control project or program. Benefit categories include flood risk management, water supply, water quality, and recreation. *Secondary benefits* of constructing flood control facilities are the values of goods and services that subsequently accrue to other parties (beneficiaries) that interact with the primary beneficiaries. Secondary benefits can include changes in economic activity (e.g., regional or state-level jobs and income) and fiscal effects, such as taxes or other revenues, that are important to local stakeholders.[51]
- Benefits can be separated geographically into ***direct, extended, and peripheral***.[52] *Direct* benefits are primary benefits realized in the immediate locality that is being protected against flooding, e.g., agricultural land next to a levee. *Extended* benefits are benefits affecting neighboring beneficiaries connected in some networked fashion but directly impacted by a flood event. Highways and pipelines are examples where the impacts are felt elsewhere directly. *Peripheral* benefits can be primary (e.g., water exports) or secondary (e.g., state economy) but outside of the Delta..
- ***Private and public goods realized as benefits*** – "Goods" are commodities or services that can be used to satisfy human wants and that have exchange value. Characteristics of *public goods* are non-excludability (i.e., it is not possible to exclude non-payers from consuming the good) and non-rivalry in consumption (i.e., consumption of a good by one consumer does not diminish the benefit to other consumers). If a "good" does not have both of these characteristics, it is considered a *private good*. Goods can fall across the spectrum of these definitions; for example, fishing in the Delta can diminish the availability of the fish to others, but it can be difficult to restrict access to the fishery. This myriad of goods confers benefits on beneficiaries who use them.
- ***Tangible and intangible benefits*** – *Tangible benefits* can be quantified in monetary or other quantifiable units (such as loss of Delta smelt habitat), whereas *intangible benefits* cannot be directly expressed in quantifiable terms or metrics (for example, trauma or reduced peace of mind resulting from a flood event).

### A Note on Public Beneficiaries

Generally, the project team strived to use categories of beneficiaries, terms, and definitions consistent with the principles and approaches used in recent flood protection studies conducted for the DWR.[53] However, this Study uses the term "public" to convey that the

[51] This typology follows regional economic input-output analysis. In that framework, *direct* effects (akin to primary) arise from immediate economic activity. The secondary benefits are broken down further into *indirect* effects derive from transactions with directly-affected parties, and *induced* effects are more broad, general economy-wide impacts from changes in direct and indirect activity.

[52] We emphasize that two of these terms which were included in the requested scope of work for this Study, "extended" and "peripheral" benefits, do not have applicable definitions in the flood protection or economic impacts literature that we have reviewed. Consequently, we have defined these terms specifically for use in this Study.

[53] We use the DLIS Technical Memorandum 2.1 as the starting point for constructing categories of beneficiaries, as directed in our scope of work. Then, to better meet the economic valuation needs of our study, we have expanded the categories identified in the DLIS Technical Memorandum 2.1. In the original contractual scope, estimates of expected annual damages in the Delta from flooding events were to be developed in the DLIS. The project schedule for the DLIS study, however, has been

benefits (or costs) cannot be easily assigned to specific individuals or entities. In this context, "public" does *not* refer to publicly-owned enterprises such as municipal water agencies or utility districts—those are considered "private" entities because the benefits can be assigned to specific individuals who privately enjoy them; that is why those enterprise agencies are able to charge utility rates.

## Summary of Potential Beneficiaries

Beneficiaries are entities that generally own, use, or control assets used for specific purposes (i.e., activities) that benefit from Delta flood control measures. For example, farmers (beneficiaries) avoid flood damages (benefit) to their fields where they grow crops (purpose or activity) through the protection of Delta levees. Some of these purposes are part of individual or private transactions or activities for which economic value can be readily estimated (such as land values or the buying and selling of agricultural products); other purposes create more broad public benefits for which a price is not easily determined (such as the value of public enjoyment of habitat, as well as the various concurrent benefits from enjoying species existence and recreation). The benefits that these beneficiaries derive from flood control and levees are described in detail in Appendix D.

This Study considered ten broad categories of beneficiaries:

- Community Beneficiaries
- Agricultural Land Owners, Producers, and Water Users
- Municipal Water Providers and End Users
- Infrastructure Owners and End Users
- Upstream Dischargers
- Instream Water Diverters
- General Public Beneficiaries (including recreation)
- State and Local Governments and Special Districts
- State Economy
- Other Indirect Beneficiaries

extended so this project is moving forward with a different method of estimating those risks. That method is described in Chapter 6.

Table 4-1 lists the complete set of beneficiaries of Delta levees used in this Study, including subcategories of beneficiaries and the types of benefits received. The Table also indicates the geographic location of beneficiaries as follows:

- In-Delta, as defined by the legal boundaries of the Delta (ID);
- Other areas within the Bay-Delta region but outside of the Legal Delta (OBD);
- Upstream of the (legal) Delta (UD); and
- Downstream of the Delta (DD).

**Table 4-1 Beneficiaries of Flood Protection in the Sacramento/San Joaquin River Delta**

| Category of Beneficiary/Entity | Type of Benefit(s) | Primary Regions* |
|---|---|---|
| Community Beneficiaries | | |
| Delta Residents | Avoid/reduce potential for loss of life. | ID |
| Delta Commercial and Residential Property Owners | Avoid/reduce potential for property damage. | ID |
| Delta Public Facilities | Avoid/reduce potential for property damage. | ID |
| Delta Schools | Avoid/reduce potential for property damage. | ID |
| Local economy | Avoid/reduce disruptions on local economic activity. These are secondary beneficiaries. | ID |
| Agricultural Land Owners, Producers, and Water Users | | |
| In-Delta Agricultural Operators | Avoid/reduce potential loss of revenue; avoid/reduce potential loss of property value. | ID |
| South of Delta and North Bay Agricultural Water Users | Avoid/reduce potential for water supply disruption. | OBD, DD |
| Municipal Water Providers and End Users | | |
| In-Delta Municipal Water Users | Avoid/reduce potential for water supply disruption. | ID |
| South of Delta Municipal Water Users | Avoid/reduce potential for water supply disruption. | DD |
| Infrastructure Owners and End Users | | |
| EBMUD | Avoid/reduce potential for damage to Mokelumne Aqueduct; avoid/reduce potential for water supply disruption. | ID, OBD |
| Oil and Gas Companies | Avoid/reduce potential for damage to in-Delta property; avoid/reduce potential for supply interruptions to Bay Area and Northern California. | ID, OBD |
| Power Plant Owners | Avoid/reduce potential damage to in-Delta property; avoid/reduce potential for supply interruptions to the electricity market. | ID |
| Electricity Infrastructure Owners | Avoid/reduce potential for damage to in-Delta property; avoid/reduce potential for supply interruptions to the electricity market. | ID, OBD |
| Telecommunications Companies | Avoid/reduce potential for damage to in-Delta property; avoid/reduce potential for service interruptions to local users. | ID, OBD |

**Table 4-1 Beneficiaries of Flood Protection in the Sacramento/San Joaquin River Delta**

| Category of Beneficiary/Entity | Type of Benefit(s) | Primary Regions* |
|---|---|---|
| Railroad companies | Avoid/reduce potential for damage to in-Delta property; avoid/reduce potential for freight interruptions to agricultural markets and Ports of Stockton and West Sacramento; avoid/reduce potential for service interruptions in passenger rail lines. | ID, OBD |
| Caltrans and State Highway Users | Avoid/reduce potential for damage to in-Delta property; avoid/reduce potential for disruptions to truck freight operations. | ID, OBD |
| Ports of Stockton and West Sacramento | Avoid/reduce potential for disruptions to port operations and businesses that utilize port services. | ID |
| Upstream Dischargers | | |
| Wastewater dischargers | Avoid/reduce potential for costs of alternative storage, treatment, and discharge methods. | ID, UD |
| Storm water dischargers | Avoid/reduce potential for incurring costs of alternative storage, treatment, and discharge methods. | ID, UD |
| Other Indirect Beneficiaries | | |
| Hydropower owners and operators | Avoid or reduce potential reductions in hydropower production on water bodies that would be affected by flood protection and water supply operations, through requirements for greater flood control storage requirements. | UD, OBD |
| General Public Beneficiaries | | |
| Public concerned for the protection/restoration of Delta ecosystem resources (as indicated by their willingness to pay) | Avoid/reduce negative impacts on aquatic and terrestrial resources that provide a wide array of goods and services supported by functioning ecosystem resources. | ID, OBD, UD, DD |
| Commercial and recreational fishing | Avoid/reduce potential harm to aquatic and aquatic-related terrestrial habitat that support fisheries. | ID, OBD, UD |
| Recreational participants (water contact and non-contact water-based activities), including Delta residents and out-of-area visitors | Maintain high quality recreation conditions by protecting the quantity and quality of water resources and other resources that support recreation opportunities and activities. | ID, OBD, UD |
| Delta as Place beneficiaries (visitors and residents) | Maintain Delta-as-Place values by protecting the Delta's geography of low-lying islands and tracts, rural heritage, agricultural economy, coexistence of unique native ecosystem with expanding cities in a region characterized by maritime ports, commercial agriculture associated with maintaining rural life-style, opportunities for recreation and tourism, and a multicultural tradition, legacy communities and family farms. | ID, OBD |

**Table 4-1 Beneficiaries of Flood Protection in the Sacramento/San Joaquin River Delta**

| Category of Beneficiary/Entity | Type of Benefit(s) | Primary Regions* |
|---|---|---|
| State and Local Government and Special Districts | | |
| State government | Avoid/reduce secondary impacts from disruptions to services and revenues through the Delta; reduce long-term system maintenance costs. | ID, OBD, UD, DD |
| Local government | Avoid/reduce secondary impacts on local government entities from disruptions to services and revenues in the Delta region; reduce long-term system maintenance costs. | ID, OBD, UD |
| Special districts (e.g., reclamation and flood protection) | Avoid/reduce potential cost impacts from unexpected disruptions to services and revenue losses; reduce long-term system maintenance costs. | ID, OBD, UD |
| State Economy | | |
| Ripple effects | Avoid or reduce disruptions to statewide economic activity, as measured by industrial output, jobs, and personal income. These are secondary beneficiaries. | ID, OBD, UD, DD |

Key:
Caltrans = California Department of Transportation
DD = Downstream of the Delta
EBMUD = East Bay Municipal Utility District
ID = In-Delta, as defined by the legal boundaries of the Delta
OBD = Other areas within the Bay-Delta region but outside of the Legal Delta
UD = Upstream of the (legal) Delta

## Geographic Context and Risk Considerations

The value of benefits of flood protection from Delta levee investments depends on the geographic location of the beneficiary. For example, the indirect benefits received from Delta levees by upstream beneficiaries such as the Sacramento Regional County Sanitation District or Sacramento Area Flood Control Agency depend on these agencies' ability to discharge treated wastewater or stormwater into Delta waters. If these entities could not move the floodwaters downstream they would be inundated; if the Delta levees are not high enough to accommodate those flows, those agencies would have to pay damages to the Delta landowners for diverting floodwaters onto Delta islands. The value of a fully functioning Delta levee system to these beneficiaries depends on the costs of alternative disposal options and methods of reducing river discharges. These indirect benefits to upstream beneficiaries fundamentally differ from the more direct flood protection benefits received by agricultural operations and landowners in the Delta.

Geographic location helped to determine appropriate monetary (and non-monetary) values for Delta levee beneficiaries. Location was also critical in assessing the feasibility of different funding mechanisms for different types of beneficiaries. Although Delta levees provide flood protection benefits to state and national beneficiaries, this Study did not attempt to include the value to potential beneficiaries outside of the State.

These geographic distinctions correlate to some degree with the primary/secondary and direct/extended/peripheral distinctions of benefits and beneficiaries. Beneficiaries in the Delta are more likely to receive direct and primary benefits, while those outside of the Delta are more likely to be peripheral and secondary.

# CHAPTER 5 BENEFITS AND COST RESPONSIBILITY

According to the beneficiary-pays principle, beneficiaries should bear responsibility for project costs in some proportionate manner to the benefit they receive from the project. This Study defines beneficiaries as people or organizations who own, use, or control assets for specific purposes (i.e., activities) that benefit from flood control measures in the Delta. For example, growers on Delta islands benefit from the levees that protect farming activities from flooding. Some purposes consist of individual or private transactions from which economic value can be readily estimated (e.g., sale of agricultural products from protected lands); others create broad public benefits for which a price is not easily determined (e.g., protection of ecosystems or the existence of the Delta as a unique place).

To trace the relationship between benefits and costs, the study used a three-part economic analysis:

- Estimate costs for flood protection projects in "archetypes," which are examples of Delta conditions used in this Study to screen feasible financing mechanisms.
- Identify beneficiaries of the Delta levees in each archetype, and quantify their potential benefits from flood protection projects.
- Describe available cost allocation methods, pros, cons, and constraints of using them, and identify the most appropriate to be used in the archetypes.

The screening process for financing mechanisms used the results of this economic analysis to evaluate various financial mechanisms (see Chapter 7).

## Using the Beneficiary-Pays Principle to Allocate Cost Responsibility

In general, the benefit of flood control measures is the reduced risk to beneficiaries. Although we can calculate the value of reduced risk, that value is uncertain, as it depends on predicting the likelihood of flooding. In contrast, other types of levee benefits are more tangible and readily measured and valued, such as water supply. Regardless, the basic process for moving from benefits to cost responsibility is similar across types of benefits.

**Figure 5-1 Process for Estimating Benefits and Allocating Cost Responsibility**

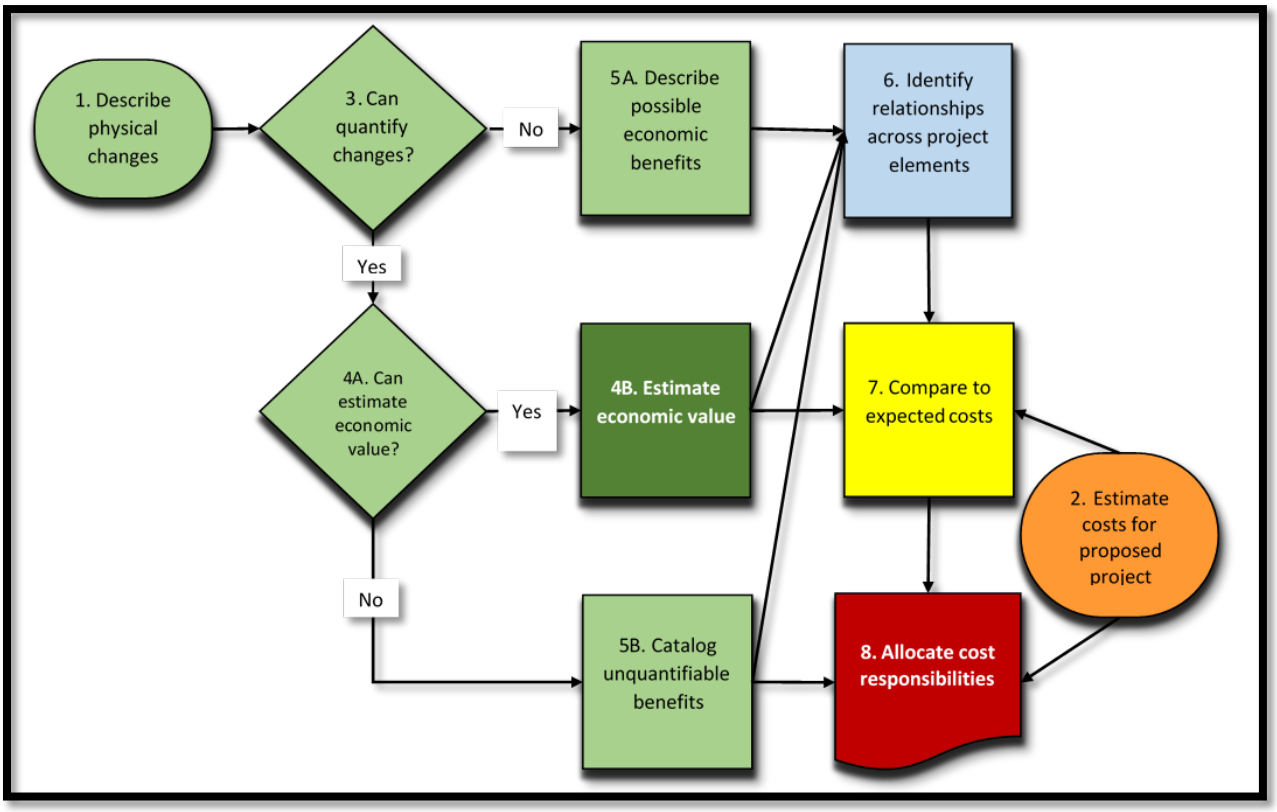



Figure 5-1 illustrates this Study's steps to describe and estimate the benefits of flood control measures, then use those benefit estimates to allocate cost responsibility. The results then feed into the evaluation of candidate financing mechanisms (described in Chapter 7) to collect the needed revenues. The steps are described below.

1. **Describe expected physical changes.** List and describe all physical changes that are expected to occur because of a particular flood control measure or project (e.g., decreased flood risk, increased fish population, decreased salinity, increased water supply, etc.). A physical change may benefit all or some beneficiary groups, or it may benefit some but impose costs on others.
2. **Estimate costs for proposed project.** Estimate costs and put them in a timeframe comparable to the expected benefits. For example, if the costs are terms of an upfront investment in new levees, the benefits will be aggregated over the expected lifetime of the levee.
3. **Quantify expected physical change.** Where data are available, provide quantitative estimates of the physical change (e.g., reduced flood risk per 100 years, salinity reduction at Banks pumping plant of 15 milligrams per liter in July, an increase of 250 acre-feet of water supply deliveries to out-of-Delta agriculture).
4. **Estimate the economic value of the benefit.** Where sufficient data exist, include an estimate of the net economic value of the physical changes described and quantified in steps 1 and 3. For example, raising a levee could improve flood control but could also

reduce available fishery habitat. The analysis should consider both values and compute the net benefit. If the improved flood risk exceeds the value of the lost fish habitat, then the net benefit would be positive.

5. **Describe unquantifiable economic benefits.** We expect that there will be insufficient data to quantify all of the expected benefits, either because a physical change is not readily identifiable (e.g., a species count does not change) or because the economic benefits are not easily measured (e.g., determining the value of the Delta as a unique place). For such benefits, we can describe their possible timing, distribution, magnitude, and certainty. For example, the continued existence of legacy communities in the Delta produces societal value that is not easily expressed in monetary terms. Benefits such as the creation and protection of habitat are also difficult to quantify, although there are methods for estimating their value. (For more detail on estimating the value of benefits, see Chapter 6).
6. **Identify interrelationships between project elements that jointly produce a range of benefits.** Levees may provide multiple benefits from multiple purposes, some from purposes that do not readily yield measurable economic benefits. Maintaining channel integrity to improve aquatic habitat, which is a benefit for which there is no private transaction information, and to facilitate water conveyance, which is priced through utility rates, is one possible example. These interrelationships, or "joint products," enter into the cost allocation step below.
7. **Compare quantified economic benefits to expected costs.** Summarize how the economic benefits that can be quantified compare to the estimated costs. Non-quantified benefits exist that can improve the benefit-cost ratio to justify these expenditures. However, because the archetypes are only examples, we still evaluate financing mechanisms despite an unfavorable benefit-cost ratio for a levee project.
8. **Allocate cost responsibilities.** There are several options for cost allocation, in large part dictated by legal requirements specific to a financing mechanism. We use different methods as we move through the different levels of funding authority, from federal to state to local, due to differences in practices and legal authorities. In Chapter 6 we present several cost allocation methods, with the rationale and expected key challenges.

# CHAPTER 6 COST ALLOCATION METHODS AND ISSUES

This chapter discusses the assignment of cost responsibility and summarizes the legal considerations affecting cost allocation and finance mechanisms. It first describes where cost allocation fits into the analysis of the feasibility of a beneficiary-pays approach to financing levee improvements. It then describes the disconnect between the federal/state and local approaches to sharing costs for levees, and the legal constraints that apply to cost allocation at the local level depending on the type of charge, tax, levy, assessment, or fee. Finally, it describes additional issues that will need to be addressed after this feasibility study to implement a beneficiary-pays approach to financing Delta levees.

## The Current Two-Stage Cost Allocation Process

The existing cost allocation process entails two stages: the first stage divides *costs* among government entities, and the second stage allocates cost responsibility among local taxpayers based on *benefits* (or other criteria, depending on whether the revenues are to be collected via assessment, special tax, user fees, etc.).[54] Figure 6-1 displays this two-stage cost allocation process for project levees, and Figure 6-2 displays the process for non-project levees. More specifically:

1. In stage one, shares for federal, state, and local government contributions must be determined in the aggregate (not yet allocating the shares applicable to individual beneficiaries). This is done by applying the state and federal cost share formulas detailed in Chapter 2.
2. In stage two, the remaining local share of costs is allocated to individual beneficiaries, consistent with legal requirements. As described in Chapter 3, Propositions 13, 218, and 26 and associated case law restrict how cost responsibility can be allocated, depending on the type of charge, fee, tax, or assessment used to collect the revenue. Other constraints apply to local agencies such as special districts or counties.

[54] DWR has developed several reports and guidelines on cost-sharing with various beneficiaries, including: Department of Water Resources, Division of Flood Management, "Cost Share Guidelines for State-Local Cost Shared Flood Programs and Projects," Adopted to Comply with AB 5, Sec. 26, Cal. Water Code § 9625, Final, December 11, 2014, available at http://www.water.ca.gov/floodmgmt/docs/Cost-Share-Guidelines-Final-12-11-14.pdf. Other sources include Department of Water Resources, Delta Suisun Marsh Office "Delta Levees Special Flood Control Projects, Near-Term Guidelines for Providing Funding to Local Public Agencies," Final, February 2010; Department of Water Resources, "Delta Levees Maintenance Subventions Program 2016 Guidelines," August 26, 2016; and California Department of Water Resources, "Economic Analysis Guidelines," January 2008.

**Figure 6-1**

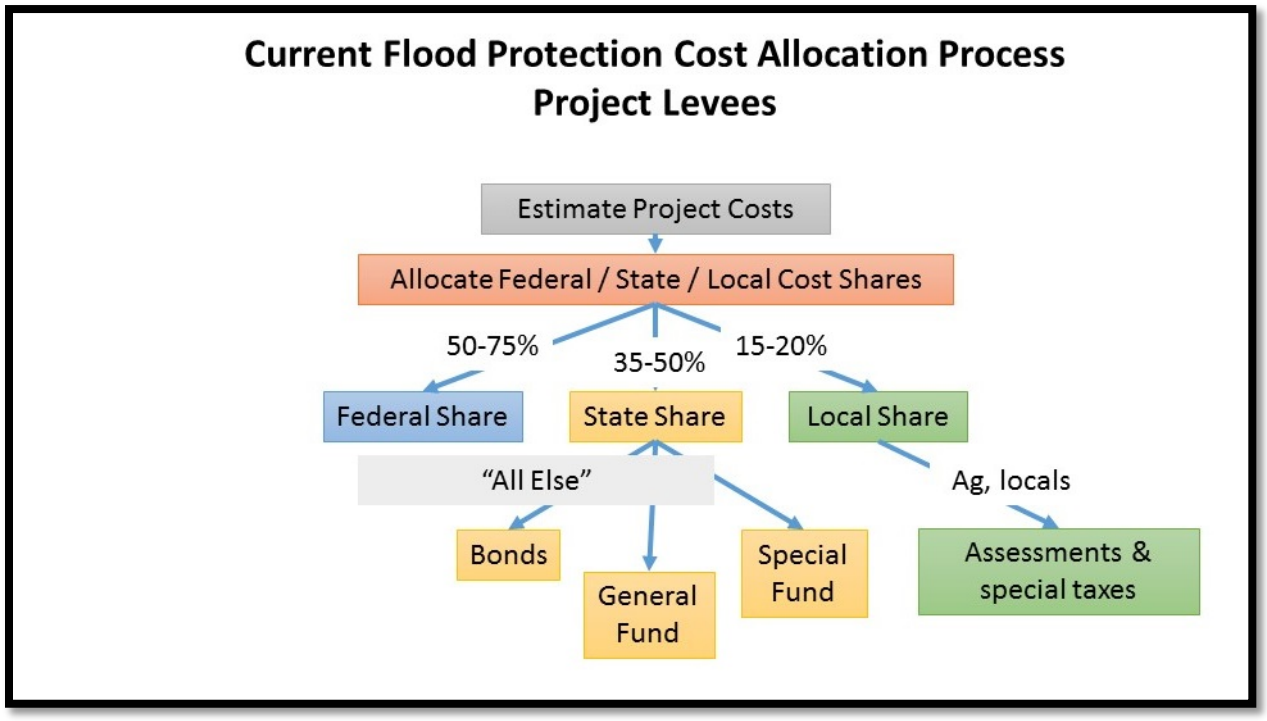
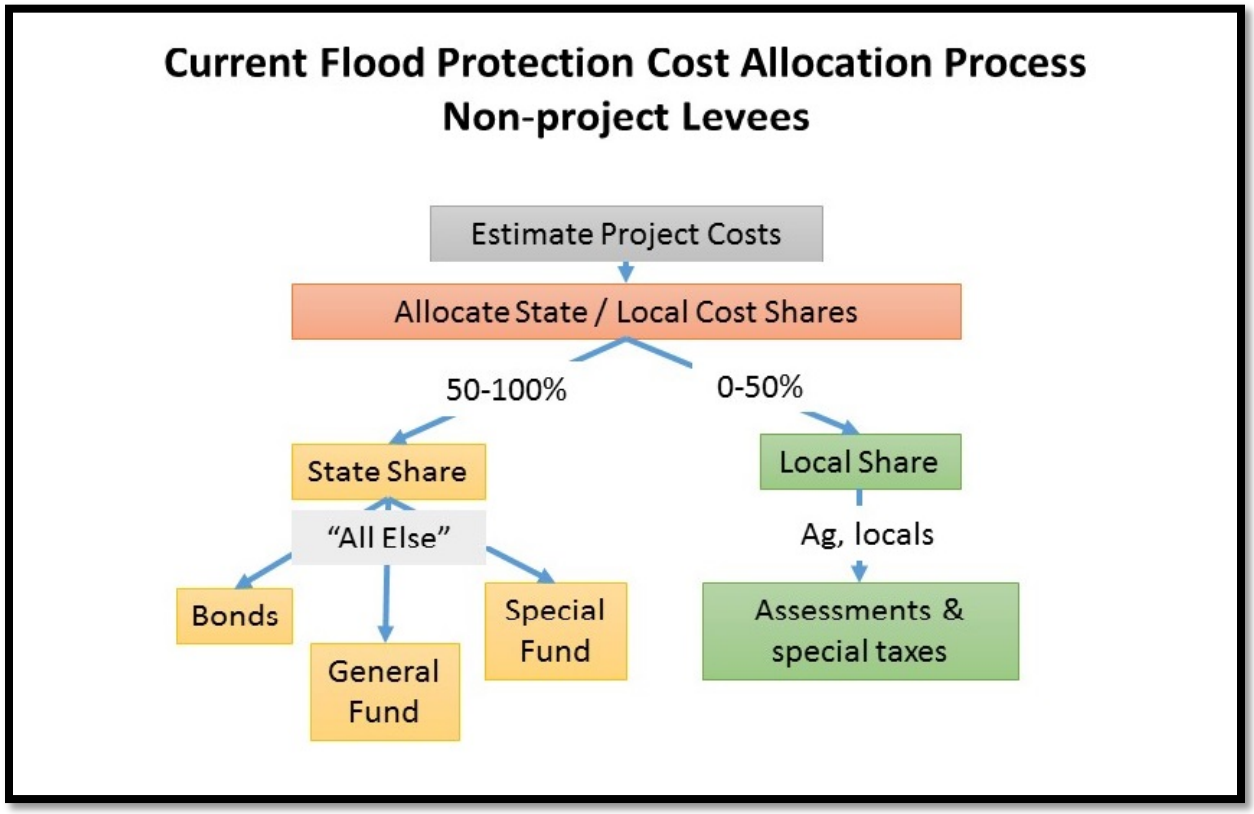



**Figure 6-2**[55]




[55] This figure reflects the Subventions Program only.

## Discrepancy between Federal/State and Local Cost Allocation Methods

There are discrepancies between the state and federal approach to setting cost shares and the State's rules that govern cost allocation for local financing purposes. In particular, RDs (which are limited to using assessments) must identify the *general benefits* that accrue to the public at large (including state and federal beneficiaries), as well as *special benefits* that accrue to individual property owners. In contrast, the federal cost share of levee projects is set by guidelines at 50% to 75% for projects that meet federal purposes, with higher shares for projects that protect urban areas.[56] The federal method relies primarily on distinguishing the different costs of flood protection for different *purposes* with specific percentages, while State assessment law requires that local cost allocation must be proportionate to the *special and general benefits* derived from the project, which may be unrelated to actual costs.

The State's cost share is set in statute using a cost-based approach. Water Code Section 12986 fixes the State's share of Delta levee subventions projects at "no more than 75 percent of any costs incurred in excess of $1,000 per mile." Essentially, that formula expresses a state policy that roughly 75 percent of subventions projects are in the public interest, and should be paid for by public funds, regardless of the benefits derived by the various beneficiaries, described above in Table 4-1 in Chapter 4. Local property owners pay the remaining costs. The state cost-share formulation does not consider general or special benefits, only costs. However, Proposition 218 and associated case law requires reclamation districts to base their engineer's report and subsequent cost allocation on special and general benefits derived from a project.

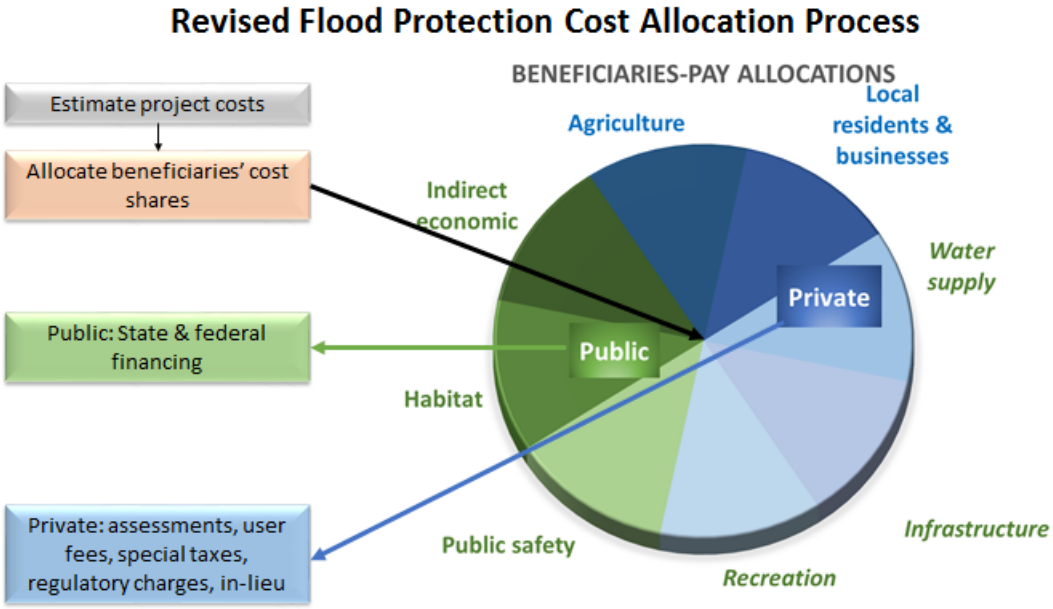
This discrepancy between state and local cost allocation methods can result in situations in which local agencies may have difficulty generating sufficient revenues to pay their share. RDs can only assess property owners for the special benefits, and there may a gap between the local share, determined under state cost sharing formula, and the amount that the RDs can collect from property owners. Reasons for the gap can vary, but include instances in which the general benefits are larger than the state or federal share formulas, and assessment exemptions for certain property types.

[56] California Department of Water Resources, Division of Flood Management, Cost Share Guidelines for State-Local Cost Shared Flood Programs and Projects, http://www.water.ca.gov/floodmgmt/docs/Cost-Share-Guidelines-Final-12-11-14.pdf , December 11, 2014.

## Using "Beneficiary-Pays" Principle for Cost Allocation

Figure 6-3 illustrates the potential outcome of a shift to a beneficiary-pays approach.[57] Rather than starting with the allocations among government agencies embedded in law and practice, the beneficiary-pays approach identifies the benefits accruing to various beneficiaries and matches financing mechanisms with those beneficiaries. Public benefits and indirect benefits to the state economy (shown as green wedges in Figure 6-3 below) accrue to large groups of beneficiaries, against whom it is difficult to apply a specific levy or charge. Such beneficiaries currently pay some of their share of levee costs through public funds, such as the State General Fund or bonds. Private benefits, such as flood protection to land and structures, accrue to beneficiaries that can be identified and could be directly charged a tax or user fee. Major categories of private beneficiaries who now pay indirectly through state and federal contributions include water suppliers and users, cross-Delta infrastructure, and recreationists (indicated as blue wedges with green labels in the pie chart in Figure 6-3).

**Figure 6-3 Proposed Revised Flood Protection Cost Allocation Process**




A key focus of this Study is to look more closely at the "general" and "public" benefits, as well as the federal and state cost shares implied by those types of benefits. Currently, those benefits are often not rigorously identified and quantified. This Study specifically describes those types of benefits. The cost allocation process described herein tests the appropriate levels of general

[57] The size of the pie slices do not represent economic value or cost responsibility—this figure simply represents how cost shares might be covered by the different financial mechanisms.

benefits in the types of settings represented by the archetypes described in the appendices. It also identifies to what degree a disconnect exists between the cost allocations developed in the first and second stages.

This feasibility study has adopted the following guidelines for selecting a beneficiary-pays cost allocation method:

- Follow a benefits-based approach as applicable under current law or consistent with economic principles where federal or state law does not set specific guidelines;
- Promote cost allocations that encourage participation; and
- Promote cost allocations that avoid or minimize unintended subsidies.

Other criteria for selecting a cost allocation method would need to be considered in implementing a beneficiary-pays approach. These could include:

- Achieving equitable allocations that reflect the circumstances of beneficiaries and other parties;
- Ease of application and administration; and
- Reliability of revenue collection over time.

Determining whether allocations are equitable is fairly subjective and may not be resolved until a more detailed analysis can be conducted and the outcome examined by stakeholders and decision makers. Ease of application and administration will depend on data and resources available when a mechanism is implemented (ease of understanding by decision makers and affected parties falls into this category). Reliability of revenue collection will depend on the underlying economics of the asset or activity being charged—for example, does agricultural land value remain steady? How much do water deliveries vary?

## Financing Mechanisms and Corresponding Cost Allocation Methods

Allocating cost responsibility among beneficiaries and taxpayers occurs primarily within a local jurisdiction, e.g., a reclamation district or a county. However, some beneficiaries such as water contractors benefit from the channels created by the levees, but they do not own property or assets within the jurisdiction of the reclamation districts that maintain those levees. This Study explores the mechanisms that may be appropriate for collecting revenues from those types of beneficiaries.

Chapter 3 described the various local and State government financing mechanisms available in California. In applying a beneficiary-pays approach, the law governing the type of financing

mechanism would determine the cost allocation method. For example, assessments are based on relative *benefits,* while property-related fees are based on relative *costs of service*.

To summarize, the available local and State government financing mechanisms and their implications for cost allocation are as follows:

**Assessments** are based on and levied in accordance with benefits to the affected property by the governmental service or activity funded by the assessment. Most relevant to cost allocation, *Proposition 218 requires that only special benefits (and not general benefits) may be subject to assessment*. The required engineer's report quantifies the proportional special benefit derived by each parcel. Special benefits are identified as separable from those conferred generally to the surrounding community. For example, a set of parcels may derive a lower risk from flood protection or may be more susceptible to a flood hazard than surrounding parcels. The assessment cannot exceed the reasonable cost of the special benefit conferred upon the parcel.

**"Taxes" (General and Special)** are charges on real property that historically are not tied to any particular service or benefit provided by the public agency and require a two-thirds vote of the electorate. In this case, *costs are allocated on the basis of the average tax burden incurred rather than in relation to either benefits or costs for flood protection*. Proposition 26 exempted some fees and charges from the definition of "taxes" (and thus the two-thirds vote approval requirement). Exemptions that may pertain to levee funding include charges imposed for a specific benefit conferred to the payor that is not provided to those not charged, or charges imposed for services provided, subject to a limitation that the charge not exceed the reasonable cost to the government of providing the benefit or service. Levee maintenance could fall within the scope of "benefits" conferred or "services" provided and would not be curtailed by Proposition 26, although the scope of the Proposition has not been fully litigated.

**Property-Related Fees and Charges** are considered to be any fees or charges *other than* an ad valorem tax,[58] special tax, or assessment, which are imposed by an agency upon a parcel or person as an incidence of (i.e., connected directly to) property ownership. An example is a groundwater augmentation charge fee collected from overlying property

[58] "Ad valorem" refers to a tax determined as a proportion of property value.

owners. Again, the controlling legal authority pertaining to property-related fees and charges was added by Proposition 218.[59] In contrast to assessments, *these fees and charges are allocated based on the costs of providing those services or activities to each particular property*.

For **User Fees**, these services must be separable from direct use of the property itself. Utilities, such as water, sewer and electricity, fall into this category because use varies without direct relationship to the property's characteristics. An example of a user fee in this situation would be a charge per acre-foot diverted or a kilowatt-hour transmitted using facilities that are benefited by a levee. As a general proposition under Proposition 26, user fees cannot exceed the reasonable cost of providing the benefit, service, or regulation, and thus cannot be relied upon for general revenue purposes.

## Cost Allocation Methods

All of the methods described here reflect a beneficiary-pays approach, and several are already in current use for allocating flood control costs. However, each differs in the ability to achieve different objectives. The candidate methods for cost allocation, described in detail in Appendix B, include:

- Separable-costs remaining-benefits (SCRB);
- Alternative justifiable expenditure (AJE) or equal percentage marginal costs (EPMC);
- Proportionate use of facilities (PUOF) or embedded costs of service (ECS); and
- Benefits-based allocation (BBA).

Federal and state guidelines direct the use of the SCRB method. However, because this method relies on a mix of costs and benefits, it is not consistent with state law requiring application of either a cost- or benefits-based allocation method for particular types of charges, taxes, fees, or assessments. The AJE and PUOF methods are cost-based allocations, the BBA is a benefits based method, and the AJE approach is a means of determining benefits by measuring the avoided costs of delivering services, such as flood protection.

Table 6-1 summarizes applicable legal requirements for the cost allocation methods. Appendix B describes each method in detail. We evaluate whether the legal requirements for the financing mechanisms, and the associated cost allocation methods, can be satisfied in the

[59] California Constitution Article XIII D, Section 6.

archetypes as a threshold test for feasibility. We also determine whether sufficient data are available to implement a specific mechanism.

**Table 6-1 Criteria for Selecting a Cost Allocation Methodology**

| Financing Mechanism Category | Corresponding Method | Current Prescribed Shares |
|---|---|---|
| Federal | | |
| Project Levees | Separable-costs / remaining benefits | 50%–75% |
| State | | |
| Project levees | Separable-costs / remaining benefits (discretionary) | 35%–52.5% |
| Non-project levees | Separable-costs / remaining benefits (discretionary) | 75%–100% |
| Local / State Agencies | | |
| Assessment | Benefits-based / Alternative justifiable expenditures | |
| General & Special Taxes | Proportionate use of facilities / Alternative justifiable expenditures | |
| Property-Related Fees and Charges | Proportionate use of facilities / Alternative justifiable expenditures | |
| User Fees | Proportionate use of facilities / Alternative justifiable expenditures | |
| Impact Fees | Proportionate use of facilities / Alternative justifiable expenditures | |
| Regulatory Charges | Agency-discretion (any method) | |

# CHAPTER 7 EVALUATING FINANCIAL MECHANISMS

This chapter describes how the Study selected candidate financial mechanisms and evaluated their feasibility in the context of the archetypes. For the specific purpose of evaluating the feasibility of various financing mechanisms, this Study developed "archetypes" representing five situations in the Delta. This approach greatly simplified actual Delta situations, yet allowed the team to determine how portfolios of financial mechanisms would perform under a beneficiary-pays approach.

This Study as originally envisioned was intended to run concurrently with the DSC's DLIS study. To keep the two projects consistent, the DLIS study was to provide Delta levee data for this Study, and this Study would provide guidance on cost allocation and available means of financing the DLIS' proposed investments. The DLIS study encountered issues that delayed release of products critical to this Study, and ultimately altered the approach of the DLIS. For this reason, we did not receive project cost estimates and a complete set of benefits values to fully construct the archetypes as envisioned. Instead this Study relied on older cost estimates from the DRMS study, with some specific supplements, and reasonable approximations of benefit values. Regardless, the evaluations using the archetypes afford acceptable comparisons of the magnitudes of beneficiaries' cost responsibilities.

## Candidate Financial Mechanisms

The study worked from a comprehensive set of possible financial mechanisms, grouping the mechanisms according to whether they were property-based, part of public financing, user fees, or regulatory charges linked to utilities or infrastructure. Table 7-1 displays the initial 50 candidate mechanisms, by beneficiary group and type of mechanism. Each of these mechanisms was considered in the context of legal requirements and restrictions (as described below under "Financial Mechanism Screening Process"). Candidate agencies for implementation were identified based on past practices or legal authority; these are only feasible choices and are not recommendations or preferences. The table denotes matches between mechanism and beneficiary with an "X." Due to the wide reach of general taxes, the

all beneficiaries are shown as paying some portion with grey shading. General public beneficiaries paying general taxes are shown in green shading.

**Table 7-1 EVALUATION OF CANDIDATE FINANCING MECHANISMS**

| MECHANISMS | Property-related | Assessment district | Delta-wide assessment district | State assessment district | Geological hazard district | Incremental tax district (e.g., Mello-Roos) | Delta Flood Prevention Fee | User Fees | Delta water user fee / AF | Agricultural discharge fee / AF | Groundwater pumping fee / AF | Delta gas severance fee | Delta boat registration tag | Fishing/licenses | Motorboat use fee | SWP/CVP Water Conveyance Fee | Water conveyance "capacity" pricing | Flood protection fee on cross Delta infrastructure | Earmark illegal diversion fines | Highway-related fees and tolls | Truck fees | Electronic tolls | Pollution fee (e.g. oil, braking particles) | Vehicle licensing fees | Regulatory charges | Delta Rail line use fee | CPUC fee on PG&E | Franchise fees | Oil and Gas severance fee | Commodity /Made in Delta fee |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **BENEFICIARIES** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Community Beneficiaries** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Delta Resident Personal Safety | | | | | | | X | | | | | | | | | | | | | | | | | | | | | | | |
| ommercial & Residential Property Owners | | X | X | X | X | X | X | | | | | | | | | | | | | | | | | | | | | | | |
| Delta Public Facilities | | | | | | | X | | | | | | | | | | | | | | | | | | | | | | | |
| Delta Schools | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Local Economy | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Agricultural Water Users** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| In-Delta Ag Operators | | X | X | X | X | X | X | | | X | | | | | | | | | X | | | | | | | | | | | |
| South of Delta Ag Water Users | | | | | | | X | | X | | | | | | | X | X | | X | | | | | | | | | | | |
| **Municipal Water Users** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| In-Delta Muni. Water Users | | | | | | | X | | X | | | | | | | | X | | X | | | | | | | | | | | |
| South of Delta Muni. Water Users | | | | | | | X | | X | | | | | | | X | X | | | | | | | | | | | | | |
| **Infrastructure Owners and End Users** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| EBMUD | | | | | | | X | | X | | | | | | | X | X | X | | | | | | | | | | | | |
| Oil and Gas Companies | | X | X | X | X | X | X | | | | | X | | | | | | | | | | | | | | | | | X | |
| Power plant Owners | | X | X | X | X | X | X | | | | | | | | | | | | | | | | | | | | | | | |
| Electricity Infrastructure Owners | | X | X | X | X | X | X | | | | | | | | | | | X | | | | | | | | | X | X | | |
| Telecommunications Companies | | X | X | X | X | X | X | | | | | | | | | | | X | | | | | | | | | | X | | |
| Railroad Companies | | X | X | X | X | X | X | | | | | | | | | | | X | | | | | | | | X | | | | |
| State Highway Users | | | | | | | X | | | | | | | | | | | X | | | X | X | X | X | | | | | | |
| Ports | | | | | | | X | | X | | | | | | | | | | | | | | | | | | | | | |
| **Upstream Dischargers** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Wastewater Dischargers | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Stormwater Dischargers | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hydropower owners and operators | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **General Public** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Public concerned for ecosystem | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Commercial /recreational fishers | | | | | | | | | X | | | | X | X | | | | | | | | | | | | | | | | |
| Recreation participants | | | | | | | | | X | | | | X | X | | | | | | | | | | | | | | | | |
| Delta as Place beneficiaries | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **State and Local Government** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| State Government | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Local Government | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Special Districts | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **State Economy** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Ripple Effect | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Potential Implementing Agency/Entity** | | **Local** | Reg | State | Local | Local | **DSC** | | **CSLC** | S, C | S, C | DOGGR | DMV | CDFW | CDBW | **D, S** | **CLSC** | State or DWR | SWRCB | | DMV | CT | SWRCB | DMV | | CPUC | CPUC | Local | DOGGR | Co-op |

**Table 7-1 EVALUATION OF CANDIDATE FINANCING MECHANISMS (Continued)**

| MECHANISMS | Impact fees | Groundwater pumping assessment | Groundwater pumping parcel tax | Development impact fees | Habitat conservation plan | Flood control plan akin to HCP | Habitat mitigation for SWP/CVP | Land trust support | Property covenants/set asides in exchange for investment | Delta periphery levees upgrade fee | Carbon sequestration/ capture | CATP Allowance Funds | Public benefits financing tools | General Fund | General/revenue bonds | Subventions | Federal financing | Regional financing agency | Sales Tax | Certificate of Participation | Tax dedicated zones, with revenues redirected to Delta (e.g. sales; tobacco) | Agricultural property tax redirection | Heritage Site related | Federal/UN funding support |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **BENEFICIARIES** | | | | | | | | | | | | | | | | | | | | | | | | |
| **Community Beneficiaries** | | | | | | | | | | | | | | | | | | | | | | | | |
| Delta Resident Personal Safety | | | | | | | | | | | | | | | | | | | | | | | | |
| ommercial & Residential Property Owners | | | | X | X | X | X | | | X | | | | | | | | | | | | | | |
| Delta Public Facilities | | | | | | X | | | | X | | | | | | | | | | | | | | |
| Delta Schools | | | | | | | | | | | | | | | | | | | | | | | | |
| Local Economy | | | | | | | | | | | | | | | | | | | | | | | | |
| **Agricultural Water Users** | | | | | | | | | | | | | | | | | | | | | | | | |
| In-Delta Ag Operators | | | | | | X | | | | X | | | | | | | | | | | | | | |
| South of Delta Ag Water Users | | X | X | | X | X | X | | | | | | | | | | | | | | | | | |
| **Municipal Water Users** | | | | | | | | | | | | | | | | | | | | | | | | |
| In-Delta Muni. Water Users | | X | X | | X | X | | | | | | | | | | | | | | | | | | |
| South of Delta Muni. Water Users | | X | X | | X | X | X | | | X | X | X | | | | | | | | | | | | |
| **Infrastructure Owners and End Users** | | | | | | | | | | | | | | | | | | | | | | | | |
| EBMUD | | X | X | | X | X | X | | | | | | | | | | | | | | | | | |
| Oil and Gas Companies | | X | X | X | X | X | | | | | X | X | | | | | | | | | | | | |
| Power plant Owners | | X | X | | | X | X | | | X | X | X | | | | | | | | | | | | |
| Electricity Infrastructure Owners | | X | X | | X | X | X | | | X | X | X | | | | | | | | | | | | |
| Telecommunications Companies | | X | X | X | | | X | | | | | | | | | | | | | | | | | |
| Railroad Companies | | X | X | | X | X | X | | | X | X | X | | | | | | | | | | | | |
| State Highway Users | | X | X | | X | X | X | | | X | X | X | | | | | | | | | | | | |
| Ports | | X | X | | | X | | | | X | X | X | | | | | | | | | | | | |
| **Upstream Dischargers** | | | | | | | | | | | | | | | | | | | | | | | | |
| Wastewater Dischargers | | | | | | | | | | | | | | | | | | | | | | | | |
| Stormwater Dischargers | | | | | | | | | | | | | | | | | | | | | | | | |
| Hydropower owners and operators | | | | | | | | | | | | | | | | | | | | | | | | |
| **General Public** | | | | | | | | | | | | | | | | | | | | | | | | |
| Public concerned for ecosystem | | | | | | X | | | | | | | | | | | | | | | | | | |
| Commercial /recreational fishers | | | | | X | X | | | | | | | | | | | | | | | | | | |
| Recreation participants | | | | | X | X | | | | | | | | | | | | | | | | | | |
| Delta as Place beneficiaries | | | | X | | X | | | | | | | | | | | | | | | | | | |
| **State and Local Government** | | | | | | | | | | | | | | | | | | | | | | | | |
| State Government | | | | | | | | | | | | | | | | | | | | | | | | |
| Local Government | | | | | | | | | | | | | | | | | | | | | | | | |
| Special Districts | | | | | | | | | | | | | | | | | | | | | | | | |
| **State Economy** | | | | | | | | | | | | | | | | | | | | | | | | |
| Ripple Effect | | | | | | | | | | | | | | | | | | | | | | | | |
| **Potential Implementing Agency/Entity** | | D, S or CSLC | D, S or CSLC | Local | Multi agency | Multi agency | CDFW or U | Cons | P, NGO | F/State | CARB | SGC | | **State/L** | **State** | CDWR | **USACE** | State | State/L | State | State | State | F/I | US / UN |

## Structure and Design of the Archetypes

The primary purpose of the "archetypes" was to assist in evaluating the financing mechanisms by simplifying the Delta's complexities and focusing on the beneficiaries most at risk, most levee-dependent, and most likely to be associated with an assessment, fee, or other finance mechanism. The archetypes also suggested the organizational structures that would be needed to administer implementation of the financing mechanisms.

Each archetype includes a mapped representation and an illustration of the features of interest, focusing on the features most likely to influence the viability of the alternative financial mechanisms being considered. These features include: levee type, land uses, exposure to inundation, channel characteristics, type of ownership, and whether solutions can be applied to individual islands or must be part of a broader multi-island or regional effort to be effective.

The five archetypes are as follows (Appendix A describes the archetypes in detail):

1. Island-centric with uses consisting mainly of agriculture, habitat, and recreation.
2. Cross-Delta and in-Delta infrastructure, where protection will require coordinated development involving many islands.
3. Through-Delta water transfer and in-Delta water use.
4. In-Delta mixed use, including low-density housing, small communities, and commercial activities.
5. Islands close to areas now undergoing, or designated for, urban development.

Not all financial mechanisms were tested in any one archetype because not all beneficiaries are present in all archetypes.

We then screened candidate mechanisms across a range of criteria using the steps outlined below.

## Financial Mechanism Screening Process

The screening process selected the most promising financial mechanisms, which were then further evaluated in the archetypes. Figure 7-1 displays the screening process, and Appendix E describes it in detail. In brief, the screening process follows the following steps:

1) Identify beneficiary groups;

2) Identify applicable mechanisms;

3) Assign mechanisms to beneficiary type;

4) Identify the implementing entities;

5) Estimate economic value at risk and the benefits of reducing that risk;

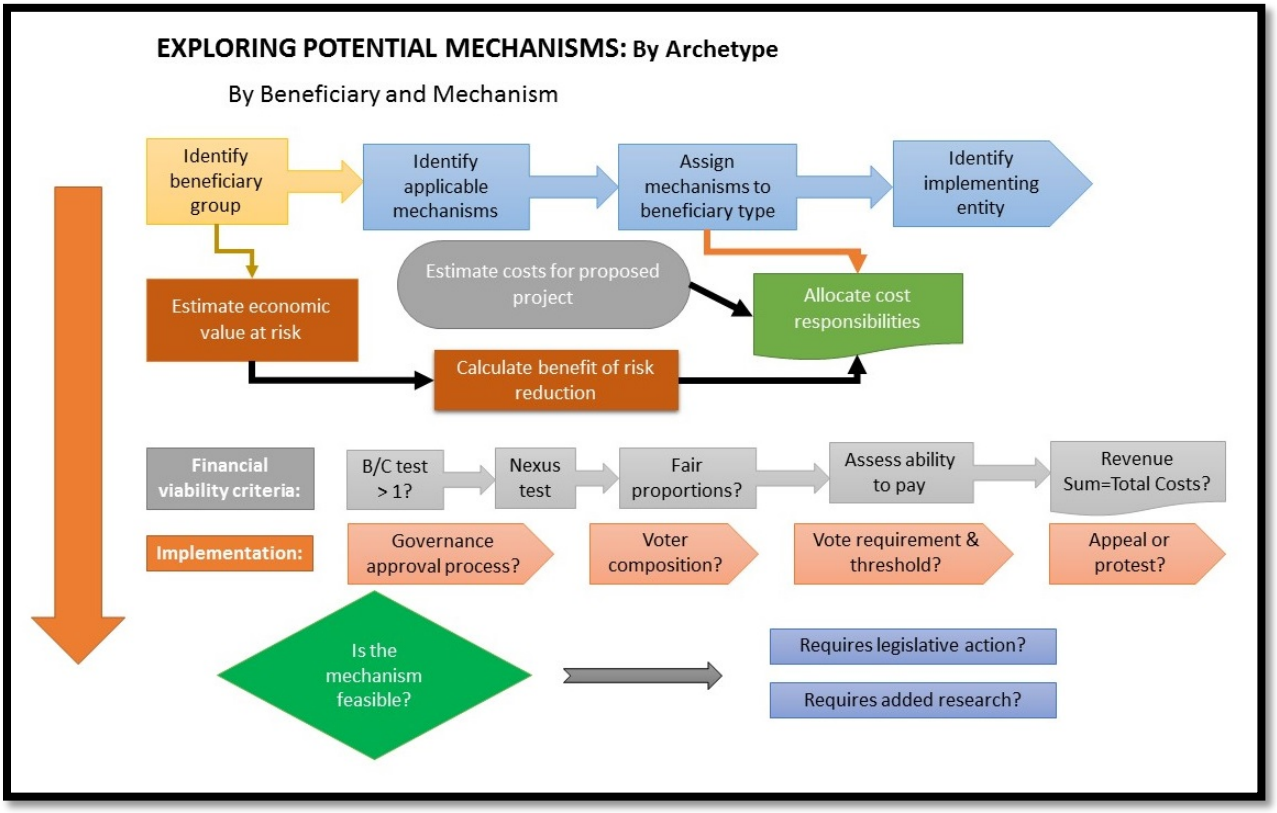
6) Estimate costs of proposed project;

7) Allocate cost responsibility;

8) Check financial viability; and

9) Set out the implementation steps.

**Figure 7-1 Financing Mechanism Screening Process**




This screening reduced the pool of 50 candidate financial mechanisms to eight. The surviving eight were then evaluated in the archetypes to determine their feasibility.

## Evaluation of Candidate Financing Mechanisms

We evaluated the candidate financial mechanisms for feasibility based on four criteria: institutional, legal, cost responsibility, and political/stakeholder support. These criteria elicited the opportunities, challenges, and barriers associated with each candidate mechanism. This section describes how the surviving mechanisms[60] fared in this evaluation.

This feasibility evaluation is a "fatal flaw" analysis—after eliminating those potential mechanisms that are infeasible, we are left with those that might work best in various situations to capture Delta levee beneficiaries. This section highlights some key considerations for the mechanisms that passed the feasibility screen, and recommends more refined analysis to determine whether and how they could be implemented. The authors recognize that given the complex political environment, there can be no simple "yes or no" answers to the question of whether any particular mechanism is feasible. Feasibility is considered here by looking at the overall potential for a mechanism to collect revenue from beneficiaries, including the costs of designing and implementing the mechanism, identifying and collecting revenues from specific beneficiaries (collectively known at "transaction costs"), and working within the current constitutional and statutory framework.

***We emphasize that this analysis is not intended as a recommendation to replace the current funding programs or cost shares under the Delta levees subventions or special projects programs. It is also not a recommendation to proceed immediately to implementation of the identified mechanisms. Rather, it describes the results of a beneficiary-pays-based analysis that screened existing mechanisms for broad feasibility in a variety of contexts. This report should be used to set the stage for future deliberations among stakeholders.*** The range of opportunities and challenges described herein underscore the importance of moving ahead with further stakeholder and agency analysis in an implementation study.

Tables 7-2A and 7-2B depict how the criteria from the multi-step process were used to screen candidate mechanisms for feasibility based on the criteria specified in this report. The tables are organized in the same manner as Table 7-1, with mechanisms broadly grouped by legal

[60] The eight mechanisms deemed sufficiently feasible in this analysis are described in more detail in the recommendations, Chapter 8. These mechanisms will require further research and discussion among stakeholders.

categories. Tables 7-2A and 7-2B show the mechanisms deemed sufficiently feasible to advance for further research and discussion among stakeholders.[61] Table 7-2A shows the first half of the evaluation process and lists likely responsible agencies or entities that could potentially implement the mechanism, and the legal requirements that must be satisfied to adopt and implement it. Table 7-2B shows the second half, which includes the determination of cost responsibility and relative revenue potential, and political considerations that are likely to arise before adopting the mechanism.

Tables 7-2A and 7-2B show the eight mechanisms that passed the screening and are thus recommended for future consideration. Appendix F includes all 50 of the mechanisms evaluated, and indicates at least one reason (highlighted in red) why a mechanism was eliminated from further consideration. Mechanisms that would require a change to the State Constitution were eliminated; other reasons for elimination included low potential for additional revenues, and high transaction costs relative to revenues.

[61] Certain mechanisms list references to other mechanisms; notations are provided to facilitate cross references. These are alternatives to each other that target similar populations of beneficiaries, but may have different characteristics.

## Table 7-2A - Funding Mechanisms: Opportunities, Barriers, and Challenges

| | Funding Mechanism/Groupings | Institutional<br>*Implementing entities with legal authority / potential capacity* | Legal<br>Governing statues and/or key restrictions / requirements | Governance approval | Voter composition | Vote requirement | Appeal or protest | Benefit-cost test |
|---|---|---|---|---|---|---|---|---|
| | **Property-related** | | | | | | | |
| 1 | Local assessment district *[e.g. existing reclamation districts]* | Local | Proposition 218 | City/County/ district | Local board | Majority | Weighted by financial obligation | Only special benefits can be assessed. Costs must be reasonably related to special benefits |
| 2 | Delta Flood Protection Fee | Delta Stewardship Council or Central Valley Flood Protection Board | Requires state legislation | California Legislature | Legislature | Majority or two-thirds, depending on outcome of ongoing litigation | Yes, depending on legislation | No |
| | **User Fees** | | | | | | | |
| 3 | Delta water user fee / acre-feet | SWRCB (if diversion fee) or DSC (if Delta use fee) | Federal/State water contracts; Prop. 26 | California Legislature; possible contract modification | Legislature | Majority | No | Charge must be reasonably related to cost |
| 4 | State Water Project (SWP)/Central Valley Project (CVP) water conveyance fee; | California Department of Water Resources (CDWR); or SWRCB | Federal/State water contracts; Prop. 26 | Legislature; possible contract modification | Legislature | Majority | No | Property use rates tied to fair market value |
| 5 | State Water Project (SWP)/Central Valley Project (CVP) water conveyance lease; i.e., transmission capacity pricing | State Lands Commission | Federal/State water contracts; Prop. 26 does not apply to use of government property | Legislature; possible contract modification | Legislature | Majority | No | Property use rates tied to fair market value |
| | **Public benefits financing tools** | | | | | | | |
| 6 | General Fund | State; Local | Requires legislation | California Legislature | Legislature | Majority | No | No |
| 7 | General/revenue bonds | State | Requires legislation; public vote | California Legislature / Electorate | Legislature / state voters | Majority | No | No |
| 8 | Federal financing | U.S. Army Corps of Engineers | Requires legislation | U.S. Congress | Legislature | Majority | No | Per USACE guidance |

## Table 7-2B - Funding Mechanisms: Opportunities, Barriers, and Challenges

| Funding Mechanism/Groupings | Cost Responsibility & Limits: *Cost allocation method* | Cost Responsibility & Limits: *Revenue capacity* | Cost Responsibility & Limits: *Revenue-generating potential, including timing; risks* | Stakeholder / Political Support: *Potential Feasibility/Prospects for Successful Implementation* |
|---|---|---|---|---|
| **Property-related** | | | | |
| Local assessment district *[e.g. existing reclamation districts]* | Benefits-based/Alternative justifiable expenditures | High | Low, unlikely to generate significant new revenues | Current practice under status quo; problematic if state subvention significantly reduced and/or need for substantially greater revenue levels |
| Delta Flood Protection Fee | Could be assessed on a per structure basis per the FPF. Must be net of existing contributions. | Medium | Medium, based on Assembly Bill 29X1, fire prevention fee. More likely to pay for operations and maintenance than capital expenses | Requires similar motivation as Rural Fire Prevention Fee. FPF presents precedential model passed by the Legislature. |
| **User Fees** | | | | |
| Delta water user fee / acre-feet | Proportionate use of facilities /Alternative justifiable expenditures | High | Bay-Delta Finance Plan (2004) proposed that SWP/CVP fund 15% of levee costs. | Similar to Bay-Delta Financing Plan user fee proposed in 2005, which identified levee financing as one component. |
| State Water Project (SWP)/Central Valley Project (CVP) water conveyance fee; | Proportionate use of facilities /Alternative justifiable expenditures | HIgh | Bay-Delta Finance Plan (2004) proposed that SWP/CVP fund 15% of levee costs. | Similar to Bay-Delta Financing Plan user fee proposed in 2005, which identified levee financing as one component. |
| State Water Project (SWP)/Central Valley Project (CVP) water conveyance lease; i.e., transmission capacity pricing | To be determined, e.g., could use FERC-based pricing model | HIgh | Channel basin lease akin to gas pipeline pricing. Could be priced at WaterFix cost net of "leakage." | Legal basis similar to Tideland Oil & Gas Lease. Structured as contractual relationship rather than intergovernmental. |
| **Public benefits financing tools** | | | | |
| General Fund | Separable costs / remaining benefits | High | High | Recent funding has been displaced by bonds. |
| General/revenue bonds | Separable costs / remaining benefits | High | High | Episodic issuances, usually tied to a broad range of issues. |
| Federal financing | Separable costs / remaining benefits | High | High | Funding reductions in recent years; USACE ruled many levees ineligible indefinitely in 2012 |

## Evaluation Steps

We highlight some key considerations here for the mechanisms that passed the feasibility screen. As described in Chapter 8, those mechanisms will require a more detailed analysis to determine whether and how they could be implemented.

***Institutional Feasibility.*** Table 7-2A begins by listing the candidate mechanism and the type of entity that would use the mechanism. If the entity already exists, this eases implementation. If a new entity must be assigned or created, this adds a barrier. If no previous institutional and governance model exists for this new entity, then we deemed the mechanism infeasible. For four of the mechanisms, if they were to be implemented, existing agencies would likely be assigned new revenue collection responsibilities, but each already collects fees or similar types. Collecting a Delta Flood Protection Fee would be a new activity for the Delta Stewardship Council (not within its current statutory authority). Since the Flood Protection Fee is modeled on the Rural Fire Protection Fee that is collected by CalFIRE,[62] we deemed this to have an institutional precedent.

***Legal Feasibility.*** Columns 2 through 6 of Table 7-2A describe the key statutes, constitutional provisions, and voting requirements applicable to each mechanism. In most cases, these mechanisms are subject to either Proposition 218 or 26, but the water conveyance lease fee falls outside of specific constitutional limits on cost allocation and governance, which eases institutional barriers. The waterway lease has several precedents, including leases to marinas in the Delta for using space in the channels. The State Lands Commission has already asserted its ownership of the channel bottoms.[63] None of the other mechanisms are prohibited by legal provisions.

The next three columns list the mechanism approval requirements, to highlight the relative ease of or obstacles to such approval. An initial consideration is whether it goes through a governing entity or to the electorate—the eight surviving mechanisms all rely on approval of a board or the Legislature. None of these appear to face insurmountable barriers to approval.

[62] California Public Resources Code Sections 4210-4228.

[63] Public Resources Code Section 6501.

The next consideration is whether adoption of a mechanism can be challenged; only for assessments, under Proposition 218, can property owners protest and initiate a popular vote. The others can be enacted by the governing entities without direct challenge.

Finally, the question of whether benefits must exceed assigned cost responsibility is addressed. Benefit-cost and cost responsibility analysis requirements can be an obstacle to feasibility, insofar as they require significant additional analysis and associated expense. In the case of assessments, only special benefits beyond general benefits can be assessed and cost responsibility must be assigned in proportion to those special benefits. However, this requirement already exists, so should not be a significant additional barrier. The fees require that responsibility be assigned in proportion to costs incurred, but without the additional benefit test. Public funds face none of these tests in statute, but may in practice as agencies often perform benefit-cost analyses as part of decision making.

***Cost Responsibility and Limits.*** Table 7-2B addresses criteria related to fiscal and political viability. The table begins with the cost responsibility allocation method dictated in statute. This provision illustrates the disparity in cost allocation methods and indicates the reason for revenue shortfalls that may cause deviations from the beneficiary-pays principle. For example, cost allocation for assessments are done on a benefits-based method (or alternative justifiable expenditures) as described earlier in Chapter 6. As pointed out in Chapter 6, benefits-based differs from the SCRB method used by the State for many projects, including Special Projects. The legally-directed method leads to the estimates of revenue capacity and potential for new revenues.

Table 7-2B then includes is a qualitative ranking of the capacity to generate a significant share of total revenues. In screening the 50 proposed mechanisms, if any had low revenue capacity, then it could not have any other significant barriers, such as high collection costs, to be viable. All of the surviving mechanisms are considered to provide medium or high revenue capacities.

The subsequent step is a qualitative appraisal of the potential additional revenues from the mechanism. We note that assessments are an existing mechanism, consequently, they are unlikely to add more revenue. However, they will continue to be a cornerstone of a full

portfolio of financial mechanisms. Several of the new mechanisms could increase revenues because they bring in new beneficiaries to the pool. In the case of the Delta Flood Protection Fee, moving from one cost allocation method under assessments to another under the fee results in increased revenues, due to disparities in allocations based on benefits versus costs.

***Stakeholder and Political Support:*** The final criterion is the potential feasibility and prospects for successful implementation given stakeholder and political support. Table 7-2B lists practical aspects of implementing each measure such as whether it is the current practice, if other models exist, and notes certain unique features. None of the mechanisms shown have fatal flaws that can be clearly identified or that stakeholders raised. (That is not to say that stakeholders will not resist any of these proposed new mechanisms.)

# CHAPTER 8 OBSERVATIONS AND FINDINGS

This Study characterized the challenges associated with implementing a beneficiary-pays-based approach to funding Delta levees. The analysis demonstrated that the *existing* approach to paying for Delta levee work can effectively recover associated costs from most—but not all—beneficiaries in rough proportion to the benefits and/or costs of providing flood risk reduction and protecting California's interests (such as supporting the State's economy and ecosystem restoration). The existing approach relies primarily on:

- Reclamation districts, which cumulatively cover most of the Delta, that assess Delta property owners based on their proportionate share of flood risk reduction benefits; and
- State and federal funding that reflects the general public benefits of all flood risk reduction, as authorized by various California and federal statutes. Because California relies mainly on General Obligation bonds, funding for levee work has been episodic. Funding varies with the provisions in each bond act.

However, existing mechanisms fall short. They do not generate revenues from beneficiaries that receive significant private benefits and that are located primarily outside of the Delta—namely, water exporters and linear infrastructure owners and users. Moving forward with the beneficiary-pays principle would require collecting revenues from these two groups of beneficiaries, as well as from landowners in the Delta and the general public. Pursuing this policy choice would necessitate implementing *new* financing mechanisms. In addition, the current approach to funding levees lacks revenue stability and reliability, which should motivate further exploration of potential financing strategies to increase the level of certainty of levee funding.

This chapter describes the findings from the evaluation of potential financial mechanisms based on applying the various evaluation criteria within the five archetypes. It describes the financial mechanisms determined to be the most feasible to apply to the main categories of levee beneficiaries. It also offers some observations about the challenges of consistently allocating costs to Delta beneficiaries, and describes how a beneficiary-pays approach could be applied to Delta levees.

## General Observations and Findings

We arrived at a series of observation and findings over the course of this Study that appear to be broadly applicable across all of the mechanisms reviewed. Some findings derive from testing various cost allocation schemes within the archetypes. Other findings arose from in-depth examination of particular financial mechanisms. We have used these general observations and findings as part of screening mechanisms for feasibility.

1. The current financing system does not collect funds from all beneficiaries in proportion to the benefits conferred and tends to obscure those relationships to costs.
2. The complete set of benefits and beneficiaries from Delta levees includes *many entities and individuals that reside outside of the Delta*. In some settings, the sum of the benefits to those outside of the Delta exceed the benefits to in-Delta parties. This implies that no single "stand alone" mechanism will be applicable in all situations.
3. Assessment districts, such as reclamation districts, use property-based assessments to pay for levee improvements. California law constrains the use of property-based assessments, and limits their application to only those beneficiaries that own property within the district. Therefore, by definition *assessment districts cannot and will not reach the full array of Delta levee beneficiaries*.
4. A *Delta-wide assessment district is likely infeasible* for two reasons:
    a. It cannot capture revenues from all beneficiaries of flood protection in the Delta because many of them do not control significant taxable property to be assessed in the Delta;[64] and
    b. It would face significant legal and political hurdles to cross jurisdictional boundaries such as counties and special districts in order to apply to all property owners in the Delta. Most importantly, the benefits vary significantly across geography and beneficiaries, making assignment of cost responsibility so complex that it would likely violate state law. The San Francisco Bay Restoration

[64] A different type of Delta-wide financing agency may be feasible, such as to administer and collect a Delta Flood Protection Fee, and that is discussed further below, but it would not rely on assessments for its funding.

Authority considered and then rejected a region-wide assessment district approach for this reason.

5. No *single financial mechanism can meet the requirements of a beneficiary-pays approach* to address the full range of beneficiaries and financing needs. Consequently, a portfolio of mechanisms will be needed. However, *no existing agency* has the full governance capacity or authority to guide and administer *the full range of finance mechanisms that may be needed.*

6. In most settings illustrated by the archetypes employed in this Study, *the majority of benefits accrue and costs would consequently be allocated either to public beneficiaries for ecosystem restoration purposes or statewide economic benefits*, and/or *to infrastructure owners and water exporters outside of the Delta*. The exceptions are urban developments in the Secondary Zone, where higher property values generate greater benefits from substantial flood risk reduction investments relative to outside interests.

7. State funding for levees, over the last four decades, has shifted from the State General Fund to bond funds, which are episodic or erratic, and will be exhausted within the next decade. Further, the State has not developed an equitable policy for allocating funding for levees.[65]

8. Importantly, state and federal law and accompanying guidelines yield inconsistent results on levee financing methods.[66] As one example, in specific settings with large State interests (e.g., extensive publicly-owned habitat within a reclamation district), local land owners may not be able to pay their cost share allocated through the State's method due to these conflicts, as explained in Appendix B. The separable-cost / remaining-benefits allocation method used by the State, for example, may not arrive at the same answer as the benefits-based method required by Proposition 218 to be used by reclamation districts. These constraints arise before considering other fiscal

[65] See Appendix G for a description of current and historic financing.

[66] See Appendix B on cost allocation issues.

measures such as revenue capacity, relative tax burdens, and debt capacity. For several reasons, described below, conflicting cost allocation requirements can lead to total revenue shortfalls or surpluses. This Study does not address the additional issue of solving this ability to pay conundrum, but we raise this for further consideration by stakeholders and decision makers.

a. As described in Chapter 6, the use of different cost allocation methods while using a portfolio of financial mechanisms can lead to significant discrepancies between the revenue allocated under the beneficiary-pays approach and the total revenues required to meet costs. For RDs represented in the archetypes, this could lead to a shortfall in required revenues. Where significant revenues would come from user fees, the opposite could happen, with revenues significantly exceeding costs. However, in this latter case, these excess revenues could be used to offset the costs attributed to agricultural property owners for higher levels of flood protection than probably needed for agricultural operations.

b. Where publicly-owned acreage is a significant portion of total acreage within a reclamation district, and if the public beneficiaries do not pay for flood protection through assessments, then the assessments for the remaining land owners would need to be larger than the allocations under a strict benefits-based cost allocation method.[67] For example, if 50% of the acreage is in publicly-owned habitat, and therefore exempt from assessment, then the assessment for the remaining land owners would need to double to cover the expenses not paid for by the habitat owners.

[67] This is issue is legally complex and unresolved. While reclamation districts are authorized to assess public property under Water Code Section 51200, case law has yielded contradictory results. ""There is, however, an implied exemption from such assessments in favor of publicly owned property provided the property is devoted to a public use (City of Inglewood v. Los Angeles County, 207 Cal. 697), but not otherwise. City of San Diego v. Linda Vista Irrigation District, supra; Conley v. Hawley, 2 Cal.2d 23." See Board of Equalization, State Constitution Article XII, http://www.boe.ca.gov/lawguides/property/current/ptlg/ccp/art-XIII-all.html#3. Also, Reclamation District 17 recently lost a case, now on appeal, to assess the Manteca School District.

c. In certain settings illustrated in the archetypes, it appears that higher flood risk reduction may be economically justified for seismic risk, but the associated cost share attributable to agriculture is likely to be burdensome. One solution in this scenario may be to limit agriculture's cost-share to what it would be for levees constructed to the Bulletin 192-82 / PL84-99 standards. However, this would require significant project costs to be allocated to beneficiaries outside of the Delta. Determining whether this would be an appropriate use of State funds. is beyond the scope of this Study, but we raise the issue here and suggest that it be addressed in a subsequent analysis.

9. Although it is not the intent of this Study to determine the relative merits of levee investments, the cost allocation methods required that we calculate benefit-cost ratios for investments in each of the five archetypes. We found that in most of the archetypes, the benefit-cost analysis (BCA) ratios appear to justify further investment in flood protection, with the following conditions:

    a. For agriculturally-dominated islands and tracts, benefits exceed costs when meeting Bulletin 192-82 / PL84-99 standards, but not necessarily for higher levels of flood risk reduction. This outcome suggests that for these settings, other benefits would need to be identified to justify greater investments to protect against seismic failure or sea-level rise.

    b. For islands encompassing infrastructure or conveyance corridors, the BCA ratios are large—even for the high cost scenarios. This suggests that enhanced flood protection is economically justified in these situations.

    c. For islands with small or urban communities, whether or not the island already has sufficient protection significantly influences the BCA ratio. For small communities, the archetype BCA ratio is similar to that found by the USACE in its 2014 report which could not justify federal spending on these levees.[68] For tracts

[68] U.S. Army Corps of Engineers, "Appendix B: Economics for Delta Islands and Levees Feasibility Study, California," Sacramento District, Water Resources Branch, Economics Risk Analysis Section, April 2014. Note, however, that this conclusion applied only to the costs of proactively managing flood risk through levee improvements. The USACE report includes inundation repair costs

in the Secondary Zone with significant urban development, the BCA ratios appear to be consistently high, implying that the economic benefits clearly justify investment in flood risk reduction.

10. The analysis and the findings presented here do not include investment strategies to respond to potential sea-level rise. We also do not address seismic risk, though we certainly acknowledge the importance of addressing that set of issues. That analysis will have to await proposed strategies before financing alternatives can be determined.

## Preferred Feasible Financial Mechanisms for Further Investigation

The following mechanisms are identified as candidates for more in depth analysis and discussion among stakeholders. These are organized by the beneficiaries' groups that are targeted for revenue collection. The project team envisions these mechanisms would be implemented as portfolios; no single mechanism can reach all of the beneficiaries of Delta levees in a manner that reflects the proportion of benefits received. For this reason, the candidate financing mechanisms are organized so as to cover the entire range of beneficiaries with multiple mechanisms. Again, we emphasize that this discussion is prospective; we are not recommending immediate implementation of these measures.

### Delta Property Owners

Beneficiaries that are assessed under existing law within existing reclamation districts include: residential, commercial and agricultural properties within those districts (but excluding public safety beneficiaries, i.e., reduced mortality), and privately-owned infrastructure located in the district. These groups benefit from reduced flood damage risk to their property which is fixed on the specific island or tract. Public agencies that own lands within reclamation districts—including federal agencies, school districts, and State agencies—are included in this group of beneficiaries, although for various reasons they do not pay assessments as discussed previously. This group excludes beneficiaries who do not own or rent property within an

as an upper bound on at least a portion of the benefits as an alternative cost. We have not compared the benefits in this archetype against the inundation repair costs to determine if after-the-fact compensation by FEMA is economically justified.

existing district—see subsequent sections on General Public Beneficiaries and Infrastructure Owners & Users for mechanisms that would apply to such beneficiaries.

Local reclamation districts should continue to be the primary entities responsible for collecting revenues from local property owners who benefit from in-Delta activities and purposes, e.g., farming behind levees or owning property in local communities. Given the benefits accruing to out-of-Delta activities and purposes, further analysis is needed to determine whether linear infrastructure owners with property in those reclamation districts would pay sufficient amounts under a beneficiary-pays system. The out-of-Delta benefits to this group of infrastructure owners could be covered by an alternative mechanism, such as the Delta Flood Protection Fee, discussed below.

Where islands are dominated by agricultural uses, agricultural operators would be responsible for a quarter to half of costs using a beneficiary-pays approach applied in the archetypes. The cost shares between landowners and public beneficiaries would be roughly comparable with the current shares specified by statute and DWR guidelines for non-project levees in the subventions and special projects programs, and with current reclamation districts' revenue shares.[69]

**Local assessment district**—Assessments are imposed and collected by a local agency, such as a city, county or special district (including reclamation districts), under a process governed by Water Code Sections 50000 et seq, Proposition 218, and associated case law. The governing board of the local agency must approve the assessment by a majority vote. Proposition 218 allows for a protest vote by local voters, whose vote is weighted by prospective financial obligations. Assessments are already in effect, so are unlikely to generate significant new revenues.

Proposition 218's cost allocation requirements limit the amount of revenue that can be collected. Only special benefits can be included in the assessment; "general" benefits must be paid from general taxes. Costs must be reasonably related to special benefits conferred upon

[69] Based on the cost-share formulas discussed previously, and the State Controller's Office data on special districts previously referenced.

parcels by a levee project. The cost allocation method used must be either benefits-based or alternative justifiable expenditures.[70]

This local assessment district mechanism does not reach beneficiaries that are not local property owners. Consequently, only local property owners pay for the local share of state-sponsored projects (such as DWR's subventions and special projects programs), as well as the entirety of any other levee work costs. Because public roads and school districts are statutorily exempt from assessment, other mechanisms are needed to collect contributions from these agencies under a beneficiary-pays approach. Continued dependence on local assessments could become problematic if state funds are significantly reduced and/or if the need arises for substantially greater revenues.

### General Public Beneficiaries

Broadly speaking, public benefits are defined as those that cannot be assigned explicitly to individuals or entities. Beneficiaries cannot be easily excluded from enjoying those benefits, nor can they be charged a price or an entry fee to enjoy them. The classic example of a public benefit is the enjoyment of a sunset—no one can sell tickets to the event. Beneficiaries who would contribute the most through the mechanisms described below are public safety (i.e., reduced mortality), the local and state economy, the ecosystem, recreational users, and indirectly, government agencies. Other beneficiaries who might be paying other fees and charges, such as Delta farmers and upstream and in-Delta dischargers, , also would contribute but in very small proportion to their individual benefits.

Delta levees provide significant statewide public benefits by maintaining, and protecting habitat, by ensuring the continued existence of the Delta as a place, and by protecting the ripple effects of regional economic activity on the state economy.[71] The economic ripple effects arise from preventing disruptions to the State's economic activity, and from the Delta's role as a

[70] See Appendix B that describes cost allocation methods.

[71] These benefits are delineated Appendix D. Estimated benefits of terrestrial habitat protection can be found in Section 3.5 of DLIS Technical Memorandum 3.1, available at http://deltacouncil.ca.gov/docs/delta-levee-investment-strategy/dlis-peer-review-tm31 . The DLIS Peer Review panel describes the broader economic impacts outside of the Delta in James Mitchell, et al, "Methodology and Scientific Basis to Support the Delta Levee Investment Strategy," Report of the Independent Science Panel Review to the Delta Science Program, July 2, 2015.

hub for water, energy, and transportation infrastructure networks. Financial contributions reflecting these benefits, which generally accrue to all residents of the State, are best collected through general taxes, and by use of the General Fund (and ideally federal appropriations as well) to pay for levee work.

The financial mechanisms that target the general public beneficiaries derive revenues from general taxes. Consequently, *all* beneficiaries will contribute to these mechanisms. However, the general public would pay the largest share, even if the revenues collected may not be proportionate to cost responsibility for individuals.

For some private beneficiary groups, such as recreationists or telecommunications infrastructure, either the amounts of additional revenue generated by imposing new fees on these groups are likely to be very small or the linkage of benefits sufficiently tenuous that it is not worthwhile to pursue new mechanisms to collect from these beneficiaries. This particularly applies to upstream beneficiaries such as stormwater and flood control agencies, hydropower operators, and groundwater users in regions receiving water exports. Transaction costs (i.e., design, implementation, collection) would be too high to justify adopting specific mechanisms to recover costs from these beneficiaries. When allocating cost responsibility under a beneficiary-pays approach, it would make sense to consolidate these beneficiaries into the general public beneficiaries' category as a "next best" solution.

**General Fund**: This mechanism is a transfer to the local management agencies (LMAs) from the State General Fund, just as the State makes direct contributions to school districts or counties for ongoing operations on a continuing basis. Cost allocation most likely would rely on the method currently used for state contributions, the separable costs / remaining benefits approach. Revenue capacity and generation potential are high given that the funds come from the entire state economy.

Over the last 15 years or so, general obligation bonds, starting with Proposition 40 in 2002 and continuing through Proposition 1 approved in in 2014, have replaced the General Fund as a source of levee funding (see more on general obligation bonds below).

To secure ongoing general fund support, the Legislature could make a continuous appropriation for the Delta levees subventions and special projects programs. This would require a majority vote of the Legislature and could be done in the annual Budget Act.

**General or revenue bonds**: As described above, recently the State has relied on periodic bond acts to authorize funding for levee work. Recent bond acts have been issued with little predictive regularity, and have been directed at a broad range of issues, of which flood control is one small element. Even Propositions 84 and 1E in 2006 with $4.8 billion focused on flood control in response to Hurricane Katrina,[72] required another $1.4 billion in other infrastructure investment to "sweeten the pot."[73] As a consequence, funding for flood protection has been contingent on either impending disaster or public support for other issues such as water supply, water quality, and open space preservation.

DWR currently administers the bond funds available for levee work, though in future bond acts the Delta Protection Commission, Central Valley Flood Protection Board or Delta Stewardship Council could be designated as an administering state agency. Unless qualified under the initiative process, placing a bond act on the statewide ballot requires a majority vote of the California Legislature. All general obligation bonds must be approved by a majority vote of the electorate.

Cost allocation most likely would rely on the same method used for General Fund allocations—the separable costs / remaining benefits method. Revenue capacity and generation potential are high given that the funds come from the entire state economy.

**Federal financing**: This mechanism is a transfer to either the State or the LMAs through the State General Fund. The approved projects must pass a benefit-cost test per USACE guidance.[74] Federal funding reflects the broad national public interest in the Delta, including *public safety, the national economy, the ecosystem, recreational users, and indirectly, federal government*

[72] For flood protection allocations, see CNRA, "Proposition 1E Overview," http://bondaccountability.resources.ca.gov/p1e.aspx, retrieved December 1, 2016.

[73] CDWR, "Infrastructure Bonds of 2006 (Prop 1E / Prop 84)," http://www.water.ca.gov/sbe/about/ibonds.cfm, retrieved December 1, 2016.

[74] U.S. Army Corps of Engineers, "Principles and Guidelines," Retrieved June 9, 2016, http://planning.usace.army.mil/toolbox/guidance.cfm?Id=269&Option=Principles%20and%20Guidelines, 2016.

*agency beneficiaries*. Other beneficiaries, such as Delta farmers, who might be paying other levies and charges also would contribute but in very small proportion to their individual benefits.

Federal funding is currently available only for eligible project levees (currently only a few miles of levee on Twitchell Island in the Delta primary zone), and approved projects must pass a benefit-cost test per USACE guidelines.[75] *Federal funding for flood protection in the Delta has completely waned in recent years as the USACE has not found that benefits exceed costs (as defined by the USACE) for most projects (as explained in Chapter 1, and as USACE has deemed most project levees to be non-compliant with PL 84-99 program requirements).* To obtain federal funding for non-project levees would require new federal legislation enacted through a majority (or a Senate cloture) vote in the U.S. Congress.

Under federal funding, costs would be allocated based on the same separable costs / remaining benefits method used by the State. Revenue capacity and generation potential are high given that the funds come from the entire national economy.

### Water Users and Exporters

Both in-Delta and out-of-Delta water users benefit from Delta levees, although according to the DLIS study, most of the consumptive water use occurs outside of the Delta. Based on the archetypes analysis in this study, neither of these water user groups pay for levees in proportion to the benefits derived.

A conveyance channel is a channel in which a significant amount of water from upstream reservoirs flows through to the projects water pumps.[76] The State owns all rights to lands not designated for private or agency ownership and the State Lands Commission leases use of those lands for various purposes including for marinas in the Delta.[77] As most of the Delta has been

[75] See discussion of historic financing in Appendix G and cost allocation methods in Appendix D.

[76] The State Water Contractors have asserted in a complaint filing that in-Delta water users are unlawfully diverting SWP water. See State Water Contractors, "Public Water Agencies Seek Action to Protect Stored State Water Project Supplies from Unlawful Diversions: Diversions in the Delta Reduce Water for Environment, Water Quality," Press Release, http://www.swc.org/files/swc-release_swrcb-complaint_6-16-15_13158.pdf, June 16, 2015. Delta water users have disputed this assertion.

[77] Public Resources Code Section 6501.

developed with levees, very little remains as "natural" water courses. In addition, a natural watercourse would flow in the natural direction; conveyance from the reservoirs to the export pumps has changed the direction of the flow, changing the natural water course.

In those parts of the Delta where leveed channels are part of the fresh water conveyance corridor or islands provide a salinity barrier, agricultural and municipal water exporters receive significant benefits from levees. Water deliveries through SWP and CVP infrastructure in the Delta rely on the Delta levee system to convey water through Delta channels, to protect the projects' pumping infrastructure, and to act as a barrier against seawater intrusion into the Delta, which protects water quality. Flooding of Delta islands, particularly those near SWP and CVP pumps and in the western Delta, has the potential to increase salinity to levels unsuitable for agricultural and municipal use, which could disrupt water deliveries through the Delta.

Flood protection benefits to water users located outside of the Delta take the form of *avoided* economic damages and/or *avoided* overdrafting of groundwater supplies. Depending on the duration of disruption and the availability of alternative water supplies, levee breeches can disrupt water exports, which can have impacts outside of the Delta (damaged crops, reduced municipal supplies, and overdrafting of groundwater supplies). Both hydrologic modeling[78] and real-world events such as the Jones Tract levee failure in 2004 indicate that the benefits of avoiding expected economic losses outside the Delta are large relative to the benefits to Delta island residents.

Water exporters do not currently pay directly to maintain Delta levees. Because water exporters generally do not own property within reclamation districts, they do not make direct payments into the State's various funding mechanisms. Their customers (who are the actual beneficiaries, not the agencies conveying the water because they do not have an independent economic stake) make the same contributions as the rest of the general public through state and federal funding. Under a beneficiary-pays approach, mechanisms other than assessment districts would be needed to collect the requisite revenues from water exporters and their

[78] The project team estimated economic losses by reviewing Delta Levee Investment Strategy (DLIS) modeling results and testing cases in the archetypes using DWR's Delta Emergency Planning Tool. Further modeling is required to substantiate these estimates, but the results to date have been consistent in direction and magnitude.

customers. *The magnitude of the potential benefits should be further evaluated with specific analysis of the different ways that levees affect water quality and exports before determining the amount of any levy, fee, or charge for an alternative mechanism*.

In-Delta water users and dischargers also benefit because they use the water moving through the channels to either irrigate crops or consume for municipal purposes, or to receive excess seepage, floodwaters or wastewater discharges. These benefits are separate from the flood protection provided by the levees. For example, a dry-land farmer growing wheat has levees protecting that acreage but is not drawing water. As another example, an in-Delta water agency may be withdrawing water for use on lands and in buildings situated above the flood plain. An important step in the implementation phase will be disentangling the flood and water-use benefits, and determining if it is feasible and/or desirable to charge these beneficiaries separately from existing assessments.

Upstream dischargers and flood management agencies also benefit from the use of Delta levees, which receive their flood flows and stormwater discharges. As discussed previously, measuring their benefits through impacts on Delta levees may be too difficult to justify imposing a water-use fee.

To test the relative levels of benefits and potential cost allocations among beneficiaries, we used an archetype representing the fresh-water conveyance corridor, which includes the set of islands leading to Clifton Court Forebay and ultimately to the California Aqueduct and the Delta Mendota Canal. Generally, the other beneficiaries on these islands (and those in the western Delta that provide salinity barrier benefits) are either agricultural operations or habitat maintained by public agencies or non-profits. Based on this preliminary analysis, the cost share for water exporters is greater than 50 percent using the costs of alternatives to improving water supply reliability (derived from the Bay-Delta Conservation Plan) to represent the alternative justifiable expenditure [79] and assuming even small flood events with losses less than 10,000 acre-feet per incident.[80] A significant breach, such as that which occurred at Jones Tract

[79] See Appendix D.

[80] Estimated using the Delta Emergency Planning Tool as described in Appendix D.

in 2004, could result in a loss in excess of 100,000 acre-feet or more, with larger commensurate economic losses.[81] Assuming a loss of water supply of this magnitude greatly increases the exporters' benefit share to more than 80 percent within the archetype.

**Delta water user fee**: This fee would reflect benefits received by *in-Delta water users, water exporters, and upstream dischargers*. To capture these benefits, all significant users of Delta water could be charged a fee based on the amount of water diverted from or discharged into Delta waters. The user fee would be for general use of Delta waters. This would be consistent with SWRCB practice to charge diverters in specified situations.[82] The fee revenues would be disbursed to the islands and tracts where levees benefit water conveyance. Revenue could be distributed to DWR for disbursal, similar to the Special Projects and Subventions programs, or could be distributed directly to the appropriate RDs. The amount of the fee would depend on the outcome of the cost allocation process, which is beyond the scope of this Study, and should be determined in an implementation study.

The fee would be based on diversions. We can envision two administration scenarios. In one option, would be administered by the State Water Resources Control Board which regulates diversions. Alternatively, if the mechanism is a broader Delta water user fee that also includes various types of dischargers, then administration might be carried out by the Delta Stewardship Council which is charged with managing resource use in the Delta through the *Delta Plan*. The State Legislature would establish the fee through a majority vote. Imposing the fee may require amendments to the Federal and State water project contracts.

A Delta water user fee would be subject to the requirements of Proposition 26. The charge must be reasonably related to the underlying costs of providing the service, so cost allocation would be done using either the proportionate use of facilities or the alternative justifiable expenditures method. The fee mostly likely would be limited to metered withdrawals, and like

[81] Measuring those benefits from flood protection of the water supply are based on the methodology described in Appendix D. Supply losses are valued at about $600 per acre-foot based on analysis conducted for the Bay-Delta Conservation Plan as discussed in that appendix.

[82] SWRCB, "Fiscal Year 2016-17 Fee Schedule Summary," Water Lease Annual Fee and Water Least Application, http://www.waterboards.ca.gov/waterrights/water_issues/programs/fees/docs/fy1617_finalfeeschedulesummary.pdf, retrieved December 1, 2016.

recently-imposed SWRCB diversion fees, would be applied only to diversions above a minimum threshold to avoid undue transactions costs for both the affected parties and the administering agency.

This mechanism is similar to the user fee proposed in the Bay-Delta Financing Plan in 2004, which identified levee financing as one component.[83] The 2004 Plan proposed that SWP/CVP fund 15% of levee costs throughout the Delta, but did not target specific islands that provide these benefits.

### *State Water Project (SWP)/Central Valley Project (CVP) Water Conveyance Fee or Charge*

The beneficiaries subject to this levy or rate would be *water exporters*. The conveyance fee is for moving water through the Delta from the Sacramento River watershed to the Clifton Court Forebay. A conveyance fee would be for providing the passage of water from project reservoirs to the California Aqueduct and North Bay Aqueduct, just as a natural gas pipeline charges for conveying gas from wells to a city-gate. The fee or charge would be imposed only for certain channels deemed important to conveyance; it would not be Delta-wide. The channels important to conveyance would be identified through empirical analysis. The fees or charges likely would vary among channels.

This water conveyance fee or charge can take one of two forms, a user fee or a lease payment, which differ in their legal basis and institutional treatment. Creation of either the user fee or the lease payment would require a majority vote of the State Legislature. The Federal and State Water Project contracts would also likely need to be amended. The revenue capacity and generating potential could be large, given the economic value associated with water exports.

#### Export Conveyance Fee

A user fee is simply a state-imposed charge for the use of a resource without specific linkage to how resources relate to each other. The State may not be explicitly claiming a property right to resource and the State is not establishing a contractual relationship with the user of the resource.

[83] California Bay-Delta Authority, "CALFED Bay-Delta Program Finance Plan," December 2004.

A user fee could be administered by the Delta Protection Commission, DWR which currently administers the State Water Project, or the SWRCB which regulates diversions. As a user fee, it would be subject to Proposition 26. Cost allocation would be based on the cost of service, per Proposition 26, rather than on relative benefits.

### Export Conveyance Lease Payment

A lease payment is a rental payment specified in a contractual agreement—a lease—for use of a resource. In this case, the resource is the Delta channels and the supporting levee. Both the SWP and CVP have reservoirs upstream and the California Aqueduct/Delta Mendota Canal downstream, for which they have paid, but they have not directly invested in the infrastructure in the middle, namely the Delta channel levees. The current situation is analogous to a natural gas utility buying gas from various wells in Texas or Alberta and delivering that gas through its distribution system in California, but not paying the pipeline owners, which are separate corporations that ship the gas to California.

The State owns the channels in the Delta. The levees are owned by the RDs in general (although there is a mix of ownership). Since the State Lands Commission manages state lands; it could also administer a Delta channel lease payment.[84] The legal basis for this lease would be the same as that for the existing Tideland Oil & Gas Lease administered by the State Lands Commission.[85] Similar examples include Delta marinas, which currently pay leasing fees to the Commission for use of their docks and berths, and Diablo Canyon Power Plant, which pays for a tidelands lease for its cooling structure. As with leases to Delta marinas, power plant cooling systems and oil producing tidelands, the lease would be for use of the channel bottoms up to the State's property line, as defined in statute. A lease payment for use of the Delta channels would be structured as contractual relationship rather than an intergovernmental transfer.

As a lease payment for the use of government property, the Proposition 26 restrictions on fees would not apply. Instead, property-use rates would be tied to fair market value. Lease price

[84] "The lands under the Commission's jurisdiction are primarily sovereign (the beds of tidal and navigable waters acquired at statehood in 1850) and school lands (lands granted by the United States to California in 1853 to support the public school system)." See SLC, "Frequently Asked Questions," http://www.slc.ca.gov/About/FAQs.html, retrieved September 8, 2016. See also SLC, "Land Classifications," http://www.slc.ca.gov/Info/Land_Class.html, retrieved September 8, 2016.

[85] See for example, SLC, "Leases and Permits," http://www.slc.ca.gov/Leases-Permits/Leases-Permits.html.

could be determined using several methods, with some examples listed in the cost allocation section of the report, or using natural gas utility pricing models such as the one in common use at the Federal Energy Regulatory Commission (FERC). [86] State Lands also has its pricing models for leases. Pricing models would be part and parcel of the next phase of negotiating and choosing which mechanisms are part of the financing portfolio.

### Infrastructure Owners and Users

Owners of essential infrastructure (e.g., pipelines, railroads and highways) are beneficiaries from levees on certain stretches in the Delta. Owners and end users of these physical infrastructure assets benefit from Delta flood protection in the form of service reliability and avoided infrastructure downtime. The loss of product or service revenues is potentially of greater financial consequence to infrastructure owners than the direct loss of the physical infrastructure; only the latter value is recognized in property valuation assessments used as the basis of property-based levies and charges. Because these facilities typically span several islands and tracts, the full benefits may not be fully reflected in the benefits-based assessments administered by local reclamation districts.

On the other hand, ownership and regulation of these facilities varies, so that each type of infrastructure would require a different user fee under a beneficiary-pays approach. Additional challenges to imposing comparable fees across different forms of linear infrastructure (e.g., electricity transmission lines, natural gas pipelines, roads, and railroads) include creating commensurate metrics (e.g., is a mile of railroad equal to a mile of transmission?) and coordinating fees across multiple jurisdictions. California Public Utilities Commission and Caltrans would be candidates to the implement such fees; however, we are skeptical of the feasibility of pursuing such a complex portfolio of mechanisms when the prospect for additional revenue generation potential is relatively small given that most of these entities already pay assessments to the RDs.

For publicly-owned facilities such as highways, the added challenge of collecting fees from millions of individual users suggests that these beneficiaries may need to be covered by

[86] This cost allocation method is not described directly in Appendix B because it is such a narrow application, but it is considered a cost-based method by FERC.

additional State funding. For transmission lines and pipelines, further research is needed to examine the additional revenue potential from a user fee compared to the revenues collected from assessments, as well as to evaluate the transaction costs of developing and administering such a fee.

Based on the archetype analysis, in parts of the Delta with significant linear infrastructure such as pipelines, highways and railroads, user fees on infrastructure could generate one-half to three-fourths of the total costs of levee projects. Applying property-based assessments in that same jurisdiction instead would reduce the infrastructure owner's cost share to about two-fifths. A user fee would generate about three-quarters more revenues from infrastructure owners than an assessment.

**Delta Flood Protection Fee**: One potential solution to capturing linear infrastructure beneficiaries could be to impose a Delta Flood Protection Fee. This prospective mechanism would be a State-administered property-based charge that would apply to a broader set of beneficiaries including *property owners in local Delta communities, all Delta water users and exporters, and infrastructure owners*. The basis for the fee could depend on the beneficiary type – landowners' fees could be based on acreage, while water users' fees could be based on pumping capacity.. A Flood Protection Fee would be implemented in a manner akin to the existing State Responsibility Area Fire Protection Fee.[87] *Most importantly, an equitable approach would suggest that property owners' payments of assessments or other water user fees would be deducted from the Delta Flood Protection Fee*, as is done with the Fire Prevention Fee.[88] Consequently, local property owners would be exempt; similarly, if a water user fee is implemented, then in-Delta water diverters and water exporters also would be largely exempted from paying the flood protection fee. The agency that could administer such a fee has not been determined, but it probably would have an equivalent role to CalFire in addressing

[87] The State Responsibility Area (SRA) Fire Prevention Fee was enacted by Assembly Bill X1 29 in July 2011 after several destructive wildfires. The law approved the new annual Fire Prevention Fee, which applies to all habitable structures within the SRA. The fee is charged to property owners in the rural foothills that are considered to be particularly vulnerable to wildfires, but often do not have sufficient local resources to fight these fires effectively. The fee currently is $152.33 per habitable structure. See "About the Fire Prevention Fee," http://www.firepreventionfee.org/

[88] The exemption is implemented in the Fire Prevention Fee as a fixed amount per structure. The Delta Flood Protection Fee could use a more precise method that differentiates between individual contributions.

flood protection in the Delta. One possibility might be the Delta Stewardship Council or the Central Valley Flood Protection Board, depending on jurisdictional limits.

As with the Fire Prevention Fee, this mechanism would require new state legislation adopted by either a majority or two-thirds vote, depending on outcome of ongoing litigation related to the Fire Prevention Fee.[89] A Flood Protection Fee could be subject to a protest by property owners, as provided by Proposition 218, depending on how the fee was adopted by the Legislature.

The Delta Flood Protection Fee could be assessed on a structure or parcel basis. Cost allocation most likely would follow the cost-based method mandated by Proposition 26. The Flood Protection Fee would generate moderate additional revenue, based on the experience to date with the Fire Prevention Fee.

Adoption of a Delta Flood Protection Fee may require the same strong motivation that drove the fire prevention fee after recent fires. Recent enactment of the Fire Prevention Fee and the adoption of the San Francisco Bay Restoration Authority parcel tax in June 2016 demonstrate the political feasibility of these types of parcel taxes.

## Summary of the Mechanisms and Targeted Beneficiaries

Table 8-1 summarizes the preferred set of feasible financing mechanisms that resulted from our screening process. The table indicates which beneficiaries would be paying the levy or charge under each mechanism.

- An “X” highlighted in pink indicates that a mechanism is directly applicable to that beneficiary group and could feasibly collect funds in a proportionate manner to cost responsibility.
- An “AB” highlighted in aqua indicates that a feasible mechanism is directly applicable to that beneficiary group, but that it may be too administratively burdensome to collect fees from that specific group; due to the transaction costs of implementing the mechanisms and collecting the revenues likely being too high to justify adopting such a

[89] See http://firetaxprotest.org/.

mechanism for these beneficiaries.[90] Instead, cost responsibility for these groups would be allocated to the general public funds.

- The grey-highlighted squares indicate that under the public benefits financing mechanisms, all beneficiaries would pay some amount due to the broad revenue base of those mechanisms but that amount is not proportionate to the beneficiary-pays principle; and
- The green-highlighted cells with a "%" indicate the beneficiaries targeted with general tax mechanisms that would pay a large share relative to their realized benefits, but that the revenues collected may not be proportionate to cost responsibility for specific individuals due to the issues surrounding public goods discussed earlier in this report.

[90] The rationale for the rejection of these mechanisms is discussed further in Appendix F.

## Table 8-1 Identified Feasible Financing Mechanisms Matched to Beneficiaries

| MECHANISMS | Property-related | Assessment district | Delta Flood Prevention Fee | User Fees | Delta water user fee / AF | SWP/CVP Water Conveyance Fee | Water conveyance "capacity" pricing | Public benefits financing tools | General Fund | General/revenue bonds | Federal financing |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **BENEFICIARIES** | | | | | | | | | | | |
| **Community Beneficiaries** | | | | | | | | | | | |
| Delta Resident Personal Safety | | | AB | | | | | | % | % | % |
| Delta Commercial & Residential Property Owners | | X | X | | | | | | | | |
| Delta Public Facilities | | X | X | | | | | | | | |
| Delta Schools | | | | | | | | | | | |
| Local Economy | | | | | | | | | % | % | % |
| **Agricultural Water Users** | | | | | | | | | | | |
| In-Delta Ag Operators | | X | X | | X | | | | | | |
| Out of Delta Ag Water Users | | | X | | X | X | X | | | | |
| **Municipal Water Users** | | | | | | | | | | | |
| In-Delta Muni. Water Users | | X | X | | X | | | | | | |
| Out of Delta Muni. Water Users | | | X | | X | X | X | | | | |
| **Infrastructure Owners and End Users** | | | | | | | | | | | |
| EBMUD | | X | X | | | | | | | | |
| Oil and Gas Companies | | X | X | | | | | | | | |
| Power plant Owners | | X | X | | | | | | | | |
| Electricity Infrastructure Owners | | X | X | | | | | | | | |
| Telecommunications Companies | | X | X | | | | | | | | |
| Railroad Companies | | X | X | | | | | | | | |
| State Highway Users | | | X | | | | | | | | |
| Ports | | | X | | | | | | | | |
| **Upstream Dischargers** | | | | | | | | | | | |
| Wastewater Dischargers | | | | | AB | | | | | | |
| Stormwater Dischargers | | | | | AB | | | | | | |
| Hydropower owners | | | | | | | | | AB | AB | AB |
| **General Public** | | | | | | | | | | | |
| Public concerned for ecosystem | | | | | | | | | % | % | % |
| Commercial /recreational fishers | | | | | | | | | AB | AB | AB |
| Recreation participants | | | | | | | | | AB | AB | AB |
| Delta as Place beneficiaries | | | | | | | | | % | % | % |
| **State and Local Government** | | | | | | | | | | | |
| State Government | | | | | | | | | % | % | % |
| Local Government | | | | | | | | | % | % | % |
| Special Districts | | | | | | | | | % | % | % |
| **State Economy** | | | | | | | | | | | |
| Ripple Effect | | | | | | | | | % | % | % |

# CHAPTER 9 FLOOD MANAGEMENT FUNDING: IMPLEMENTATION ISSUES

Other efforts[91] have documented the major issues and challenges to implementing a long-term funding strategy for flood risk reduction, not only in the Delta, but throughout the State. Recent studies—DWR's *Water Plan*, the *Central Valley Flood Protection Plan*, and DWR's *California's Flood Future Report*—identified the statewide need for more than $50 billion to complete flood management improvements and projects. However, these studies have not delved into the details of how to finance these investments or how to maintain what already exists.

This Feasibility Study demonstrates that no single financing mechanism is likely to generate sufficient revenues to pay for the Delta's flood risk management needs consistent with the beneficiary-pays principle. It also illustrates the complex challenges of developing revenue-raising approaches within California's existing web of legal and regulatory constraints on fees, taxes, and assessments.

These conclusions echo the statewide flood management concerns found in DWR's "Flood Management Resource Management Strategy" (RMS) for the 2013 Water Plan, which concluded that there are four main challenges to improving flood management in California. We refer to these as "RMS Issues," and discuss our findings in relation to those issues below:

## RMS Issue 1: Inadequate and Unstable Funding and Incentives

The RMS discussion of this issue anticipated the findings of this Feasibility Study—"current funding for flood management is inadequate and unreliable because it is dependent upon agency user fees, assessments, bond funding, and earmarking."[92] The RMS also notes the constraints of Propositions 13 and 218 on local agencies, and that assessments cannot reach beneficiaries outside of the geographic boundaries of an assessment district—both of these significant findings were addressed in this Study. In particular, the RMS asserts that floods that

91 See California Bay-Delta Authority, "CALFED Bay-Delta Finance Plan," January 2005, and Public Policy Institute of California, "Paying for Water," March 2014.

92 DWR, California Water Plan Update 2013, Vol. 3, Chapter 4, pp.4-28. Available at http://www.water.ca.gov/waterplan/topics/rms/index.cfm

disrupt water supplies can trigger significant statewide economic losses,[93] reinforcing this Study's findings that out-of-Delta beneficiaries receive significant benefits from Delta levees in the form of reduced risks of flood-related supply disruptions.

## RMS Issue 2: Inadequate Data/Information and Inconsistent Tools

The RMS calls for improving the quantity, quality, and accessibility of data related to flood risk, floodplain mapping, hydrologic information, flood infrastructure integrity, ecosystem mapping, flood forecasting, flood readiness, and climate change. The RMS notes that California lacks a consistent methodology to assess flood risk and measure associated project benefits; different methods used across the State to assess flood risk yield inconsistent results. And some types of benefits are difficult to quantify, such as related ecosystem restoration, which can lead to under-valuation.

Again, the RMS foreshadowed the findings of this Feasibility Study. Although data was not readily available to conduct a Delta-wide analysis of benefits to all beneficiaries, the study team was able to estimate relative benefits using constructed examples, or "archetypes" which provided a framework for allocating costs to beneficiaries. The study also revealed the inconsistent results caused by the different mandatory cost allocation methods associated with various funding sources (federal, state, and local), and the challenges of implementing a beneficiary-pays approach given existing legal constraints. However, the archetypes also demonstrated that it is possible to quantify most of the significant benefits and use a portfolio of financial mechanisms to collect revenues from the various beneficiaries in proportion to their level of benefit.

93 "These flood management projects include maintenance projects and other identified actions. The Flood Future Report also indicated the need for substantial additional funding to complete flood risk assessments throughout the State, and to conduct flood management improvements based on those assessments. Therefore, the total estimated capital investment needed for flood management projects could easily top $100 billion (California Department of Water Resources 2013). These estimates do not include the broader regional economic impacts or ripple effects of flooding, such as the costs resulting from rerouting traffic and closing businesses, and from compromised services of water and wastewater treatment plants, as well as critical facilities such as hospitals. These losses of function have a wider impact that can range from regional to statewide, nationwide, or even international. For example, if flood damages disrupted the delivery of water for a significant amount of time, the economic impacts would be substantial, with the effects reaching far beyond California. Specifically, if water supply were disrupted in the Delta, impacts would affect not only agricultural production, but also commercial businesses in the San Francisco Bay Area and Southern California." (DWR 2013 Water Plan Update, Flood Management RMS, page 4-26.)

## RMS Issue 3: Inadequate Public and Policy-maker Awareness

The RMS stated that policy-makers and the public have varying levels of understanding about the risks and consequences of flooding. According to the RMS, lack of awareness and understanding can increase risks to people and property and make it difficult to achieve sustainable, long-term planning and investment that supports flood management.

Several projects are underway that will help educate the public and policy-makers about flood risk and needed investments in flood risk reduction. Concurrently with this Study, the Delta Stewardship Council undertook the Delta Levee Investment Strategy (DLIS) to identify state investment priorities for the Delta.[94] The DLIS created a decision-support tool that uses a variety of risk measurements to identify tracts and islands that are most critical to state interests: protecting lives and property, ensuring a reliable water supply, protecting and enhancing the environment, and protecting the unique values of the Delta. In addition, the 2017 update of the *Central Valley Flood Protection Plan* is underway, which also describes flood risks and identifies priorities for investments in flood management. Discussions are underway among the staffs of the Delta Protection Commission, Delta Stewardship Council, and the Central Valley Flood Protection Board (CVFPB) to determine how to integrate their study results, determine next steps, and convey that information to the public and decision-makers in a coordinated fashion.

## RMS Issue 4: Complex and Fragmented Governance Structure Impeding Agency Alignment and Systems Approach

According to the RMS, more than 1,300 agencies share the responsibility for flood management in California. Each of these agencies has "unique objectives, authorities, roles, responsibilities, and jurisdictions. The fragmentation of flood management responsibilities results in poor agency alignment, which in turn results in projects that are narrowly focused, missed opportunities for integration and funding maximization, and projects with unintended negative impacts on downstream or upstream communities and the ecosystem. Another consequence of improper agency alignment is inconsistent regulatory requirements, permitting processes, and enforcement practices."[95] That observation aptly describes conditions in the Delta, with

94 As directed by Water Code Section 85306.

95 DWR, California Water Plan Update 2013, Vol. 3, Chapter 4, Flood Management, pp 4-30 to 4-31.

more than 80 reclamation and flood control districts, as well as several federal, state, and local agencies with interests in flood management.

Although this Feasibility Study does not address Delta governance issues, any effort to move forward with developing new fees or funding strategies should include critical Delta stakeholders: the reclamation districts, flood districts, Delta water agencies, cities and counties, as well as state and federal agencies. Whether investigating a Delta water user fee or a Flood Protection Fee, the jurisdictional challenges will need to be examined in more detail. Any subsequent work on beneficiary-pays-based funding for flood management will require strong coordination among regulatory, land use, flood management, financial, and other entities. Ultimately, one or more agencies will need to be authorized to develop and collect any new levies or charges, and to disburse those funds.

# CHAPTER 10 RECOMMENDATIONS

This Study evaluated the feasibility of several financial mechanisms that would move towards a beneficiary-pays-based system for funding Delta levees. The next step should be to study the details of the candidate fees, and determine how they could be implemented. The implementation study should be conducted as a collaborative effort, which is further described below.

**Figure 10-1 Steps in Overall Fiscal Policy Development**


The implementation study should generate principles for integrating existing funding sources and new financial mechanisms, as well as detailed descriptions of how to implement a beneficiary-pays-based approach to financing levee work. These descriptions would be the basis for the third step—negotiations aimed at generating agreement on a set of policy and legislative changes necessary to authorize and implement the beneficiary-pays approach. These changes might include:

- A legislative statement of policy and intent, and adoption of a similar policy statement by the California Natural Resources Agency; and
- A strategy for resolving conflicts between transparent and equitable cost allocation approaches and the cost allocation required by constitutionally imposed limits on fees and assessments (legislation will likely be needed).

Throughout the implementation study, the results of current policy efforts (the Delta Levee Investment Strategy and the Central Valley Flood Protection Plan) should be incorporated into the beneficiary-pays framework. This will ensure that the development of financing mechanisms aligns with priorities for levee improvements.

The implementation study should follow these guidelines:

1. The four State agencies that have statutory flood management, land use, or regulatory authority in the Delta related to flood protection—DWR, Delta Protection Commission, Delta Stewardship Council, and the Central Valley Flood Protection Board—should establish a collaborative process to further develop the candidate financial mechanisms and move toward a "beneficiary-pays" based approach to paying for levee work. These

agencies should be in agreement on the levee work needed, how it is prioritized, and how to pay for it (see discussion under "Additional Considerations," below).

2. The study should include a core group of participants, with representatives of the following organizations or stakeholder groups:
    - California Natural Resources Agency;
    - Delta property owners;
    - Water exporters;
    - Reclamation Districts;
    - Owners of linear infrastructure (railroads, EBMUD aqueduct, etc.);
    - Caltrans;
    - Fish, wildlife, and habitat interests (public and private owners of habitat lands);
    - State Lands Commission.
3. The implementation study should be structured as a collaborative fact-finding process that explicitly identifies the benefits and beneficiaries of Delta levees, including property owners, water supply, habitat, infrastructure owners, and public benefits. The process should be built on explicit assumptions, jointly developed data sets and methods, and pooled expertise. The process should include a clear statement of the intended distribution of results and links to implementation.
    - **Participants**: Participants should bring relevant expertise to the process. They should demonstrate past experience in reaching agreements with diverse parties, and commit to a constructive approach to deliberation and mutual gains bargaining. The aim is to create broad based agreements that can provide the foundation for implementation.
    - **Outputs:** The study should spell out the operational details of the candidate financial mechanisms (user fee, lease fee, Flood Protection Fee) in more detail. Key questions to address include:
        - What are the strategies to comply with legal requirements and constraints (i.e., information needed, nexus tests, benefit-cost analysis, cost allocation, voter and/or legislative approvals, etc.)?
        - What entity or entities would establish and collect the fees, and distribute the funds?
        - How would each fee be calculated and apportioned to beneficiaries? The study should include:
            a. Developing standard methods for calculating benefits, and articulate principles for such standards, such the type of data to be used; and

b. Developing cost allocation methods for each mechanism and recommending how to reconcile conflicts with cost allocations required by existing law.

4. The implementation study should include periodic briefings to policy-makers and outreach and engagement with the broader public to share interim results and gauge political feasibility of implementation.

## Additional Considerations

Some observers may suggest that the development of a beneficiary-pays-based finance approach cannot reasonably precede a determination of the amount of money needed, the types of improvements, and the time frame. In addition, some stakeholders have consistently mentioned the pressing need to address the effects of sea-level rise, continued subsidence, and seismic risk (the "3 S's")—all of which would bear on these key questions. We recommend that before convening an implementation study, the proposed convening agencies–Delta Protection Commission, DWR, Delta Stewardship Council, and the Central Valley Flood Protection Board—should jointly deliberate and reach agreement as to how to address these questions and establish the scope of the implementation study.

Efforts are underway to develop credible estimates as to how much funding is needed. For example, as part of the *Central Valley Flood Protection Plan 2017 Update*, DWR and the CVFPB are investigating the total costs of improving *project* levees[96] within the *State Plan of Flood Control*[97] to state-preferred protection levels.[98] Local maintaining agencies (LMAs) were extensively consulted during this investigation to ensure a comprehensive analysis of levee improvement needs. Many have provided five-year projections of expected work and funding requirements to DWR, but there is no comprehensive Delta-wide plan for levee improvements.

96 Project levees are defined in Water Code Section 9110, as "any levee that is part of the facilities of the State Plan of Flood Control." The State has committed to operating and maintaining these levees to federal standards; roughly one-third of Delta levees are project levees.

97 Within the Resolution adopting the 2012 CVFPP, the CVFPB requested staff launch efforts to work with locals on Regional Flood Management Planning to estimate costs of improving levees and to study the maintenance, repair, and rehabilitation of existing flood management facilities, vs construction of new facilities. While some materials are available now, final reports will be posted in December 2016 at : http://www.water.ca.gov/cvfmp/publications.cfm

98 In 2016, the evaluation of total costs for O&M of project levees in the Central Valley was estimated based on regional variation. Surveys of the LMAs indicated that non-urban LMAs spend $11,400 per mile in the Sacramento River, and $5,000 per mile in the San Joaquin River region. After considering what should be spent to keep the levees maintained, DWR estimated that the Lower Sacramento River/Delta North should spend $46,000/levee mile annually, while spending in the Lower San Joaquin River/Delta South should be $33,000/levee mile. The questionnaires indicated that the levee districts were spending what they could collect rather than what they need. (Source: Final OMRRR Technical Memo http://www.water.ca.gov/cvfmp/docs/OMRRR_TM_May2016.pdf ).

## Additional Issues in Implementing Beneficiary-Pays

In addition to the challenges of identifying the complete range of beneficiaries and selecting an allocation method, other issues will arise in developing a beneficiary-pays approach to paying for Delta levees. These issues are outside the scope of this feasibility study and will need to be addressed in a more detailed implementation analysis:

- **Establish agreement on baseline value and incremental benefit from additional flood protection projects.** Where beneficiaries and/or stakeholders do not agree on how to characterize the benefit of a project, and no objective test is available to resolve the disagreement, the analytic team should develop a range of cost allocation examples that incorporates differing views. Such scenarios can inform policymakers about the range of potential benefits and associated costs to beneficiaries.

  For example, beneficiaries often hold different views on acceptable flood risk and the need for improved flood protection, as well as the baseline (point in time) by which to measure the benefits of a project. A farmer may view current flood protection as sufficient, while a developer of a new housing project may want a higher level. There may be no objective test to resolve this disagreement; various projects and cost allocations should be considered to illustrate the financial impacts of the different views.

- **Include only beneficiaries above a specified threshold.** If a beneficiary group receives very small benefits from a flood protection program or levee project, it can be removed from the cost allocation for that program or project. Any implementation studies should document the determination of incidental beneficiary, however. For example, hydropower users could be expected to receive some benefit from improved downstream flood protection because it relieves them of some flood control storage obligation. However, the expected benefits to this group are very small relative to total program benefits, and highly uncertain. They could therefore be classified an incidental beneficiary and not allocated any costs for a specific project.

## Conclusion

This Study found that the current suite of financial mechanisms is insufficient to reach the complete set of Delta beneficiaries, and that new mechanisms need to be created to do so. These new mechanisms would collect revenue from those beneficiaries of Delta levees who do not currently pay in proportion to their benefits. This is particularly important in light of the condition of some Delta levees and chronic underfunding of levee work.

This Study presents the mechanisms determined to be most feasible to implement a beneficiary-pays-based approach to funding levee work. It does not recommend

implementation of any of the preferred mechanisms, rather, it identifies the issues which would need further analysis to move forward with implementation. Figure 10-1 below shows the current financing approach with the existing mechanisms as they apply to the main categories of beneficiaries. Figure 10-2 shows how a new financing strategy would add one or more fees to the current financing approach. Under this new strategy, more beneficiaries would contribute to paying for levee work or other flood risk reduction measures, increasing the fairness and reliability of funding in comparison to the current financing approach. Further quantitative analysis and deliberation among stakeholders will be needed to determine the most appropriate portfolio of mechanisms and how they should be implemented.

**Figure 10-1**

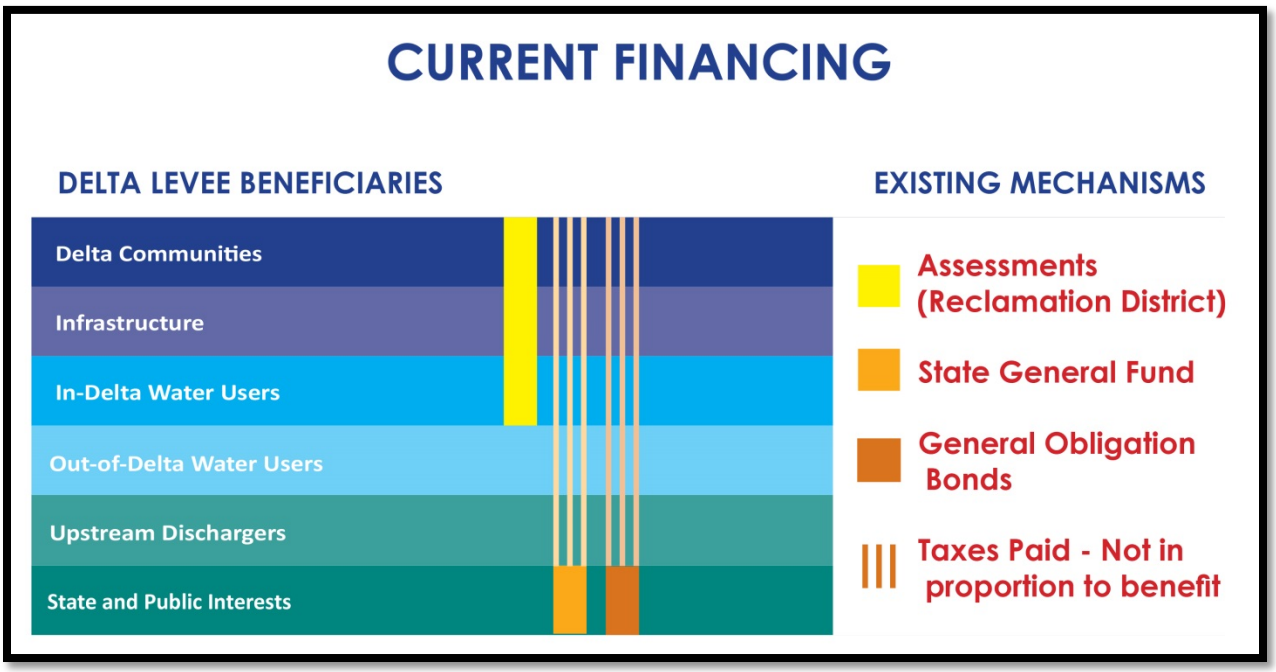
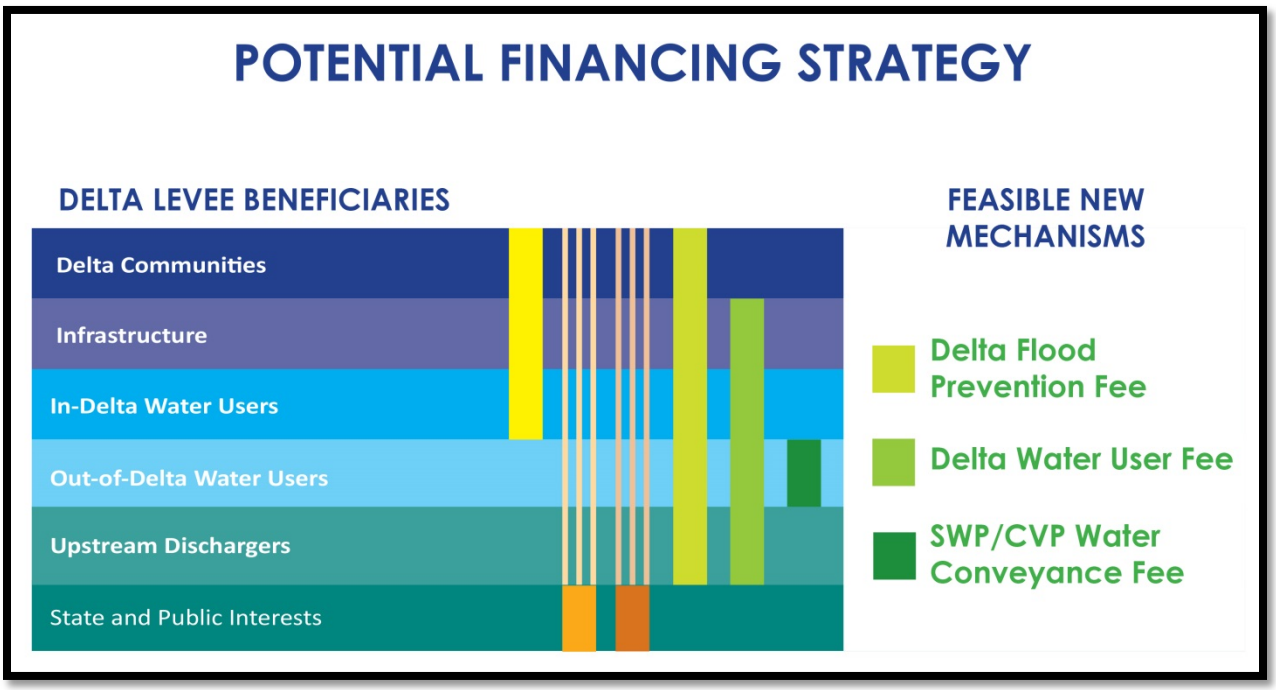



**Figure 10-2**




Under a beneficiary-pays approach, federal (where applicable), state, local and all other levee beneficiaries would pay for the share of flood protection costs that reflects their received benefits. Currently, only local landowners pay directly for levee improvements and maintenance by assessments or taxes paid on their property. Other beneficiaries of Delta levees are not explicitly recognized, and only pay indirectly for levee benefits to the extent that their

taxes contribute to the General Fund. To move to a beneficiary-pays approach, the State would need to estimate the different public and private benefits and collect fees or taxes from the beneficiaries where administratively feasible. As a result, some beneficiaries that currently receive private benefits but do not directly pay for levees could be required to pay. These include water suppliers and users, as well as owners and users of cross-Delta infrastructure.

There are many challenges to implementing such an approach, including identifying the beneficiaries, determining the economic values of their benefits, and finding the best set of financial mechanisms that can collect revenues. These we have addressed in this Study at a high level, sufficient to draw broad conclusions about feasibility. Additional challenges lie ahead if the State moves forward with this approach—these include determining the levee improvements needed and associated costs, the benefits derived from such improvements, the time frame of the investments and revenue stream needed to pay for those investments, and the appropriate government agencies to implement the various financial mechanisms.

Most observers agree that the current levee financing methods have several significant flaws, including insufficient and erratic funding. The overall benefit of moving to a beneficiary-pays-based approach for Delta levees would be a more reliable, equitable, and transparent system. Although the principle of "beneficiary-pays" has long been discussed as a basis for paying for water infrastructure, the State has not adopted policies or principles for an alternative to bond funding for Delta levees. Until now, the subject of funding for Delta levees has lacked a clear framing and explanation of the cost sharing issues in the context of beneficiary-pays. This Study helps advance the concept of a beneficiary-pays funding system by describing the problem more clearly, with a focus on legal constraints and cost allocation issues, and identifying feasible financial mechanisms for further study.