REPORT BY THE

Comptroller General

OF THE UNITED STATES

Ways To Resolve Critical Water Resources Issues Facing The Nation

In this report GAO discusses ways to deal with problems in

--authorizing and appropriating funds for water resources projects,

--making benefit/cost analysis more reliable,

--promoting better water management and conservation,

--managing ground water supplies,

--developing a national dam safety program,

--resolving urban water supply issues, and

--reevaluating the 160-acre limitation on land eligible to receive water from Federal projects.

This report was prepared at the request of Senator Pete V. Domenici, Ranking Minority Member, Subcommittee on Water Resources, Senate Committee on Environment and Public Works.

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APRIL 27, 1979

COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON, D.C. 20548

B-114885

The Honorable Pete V. Domenici
Ranking Minority Member
Subcommittee on Water Resources
Committee on Environment and
Public Works
United States Senate

sen 06402

Dear Mr. Domenici:

As you requested on February 8, 1979, we are reporting, on the basis of our work over the last 5 years, on ways to deal with the most important water resource issues facing the Nation. Also, as arranged with your office, we have included our observations on those portions of the December 6, 1977, task force reports, prepared for the President's Water Resource Policy Study, concerning options for increasing State and local control over water resources projects through methods such as block grants. This arrangement was necessary because our work over the last 5 years has not directly dealt with this issue, which is of interest to you.

At the request of your office, we did not take the time to obtain written agency comments. The issues covered in the report, however, were discussed with appropriate agency officials and written comments were received when our prior reports were prepared. Where necessary we have updated the issues identified in our prior reports to reflect the agency and congressional actions that subsequently have taken place.

As further arranged with your office, unless you publicly announce its contents earlier, we plan no further distribution of this report until 7 days from the date of the report. At that time we will send copies of this report to appropriate Senate and House Committees; the Director, Office of Management and Budget; and the heads of departments and agencies directly involved. We will make copies available to interested organizations as appropriate and to others upon request.

Sincerely yours,

Comptroller General
of the United States

COMPTROLLER GENERAL'S REPORT

WAYS TO RESOLVE CRITICAL WATER RESOURCES ISSUES FACING THE NATION

D I G E S T

What are the primary, unresolved water resources issues facing the Nation and how should they be dealt with? GAO sought answers to these questions by reviewing its work from the last 5 years.

MAJOR UNRESOLVED WATER RESOURCE ISSUES

GAO's prior reports describe many issues which remain unresolved. For example:

--Corps of Engineers flood control projects take an average of about 26 years from initial authorization to the start of construction: about 12 years for planning and design and 14 years for project review and approval and funding decisions. If these projects were completed faster, flood hazards would be lessened, inflationary effects on project costs would be reduced, and other project benefits would be available sooner. (See p. 7.)

--Problems with the practices and procedures for calculating benefit/cost ratios used in evaluating water resources projects costing billions of dollars persist despite a continuing awareness of the need to improve the system. A change is needed to make sure that more objective and impartial benefit/cost ratios are developed. (See p. 14.)

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control the Congress wishes to exert over these projects. Three alternatives GAO identified would quicken construction but would lessen congressional controls, thereby giving more authority and responsibility to the Corps. (See p. 7.) On the other hand, another alternative would increase congressional control without further increasing the time between authorization and construction. (See p. 10.)

--Alternatives involving Federal organizations also are available to make benefit/cost analysis more reliable. Essentially the choices are between establishing an independent review function in either the Water Resources Council or the Office of Management and Budget (see p. 15), establishing a new independent review board in either the executive or legislative branches (see p. 16), or creating a new independent agency for benefit/cost analysis (see p. 18).

On other issues, basic data must be developed and policy questions resolved before alternatives for dealing with them can be identified. GAO restates prior recommendations and suggestions for obtaining the necessary answers as they pertain to

--the Federal role in promoting better agri- agricultural water management and conservation (see p. 19),

--ways to solve ground water problems (see p. 21), and

--the proper Federal role in a national dam safety program (see p. 23).

GAO also suggests alternatives for stricter enforcement of the 160-acre limitation or a liberalization of the law coupled with the removal of water subsidies, depending on whether the Congress wants to use the 160-acre limitation to encourage the establishment of family-size farms. (See p. 34.)

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CHAPTER 1

INTRODUCTION

On February 8, 1979, the Ranking Minority Member of the Subcommittee on Water Resources, Senate Committee on Environment and Public Works, requested that we identify, on the basis of our work over the last 5 years, the most important, unresolved water resources issues. 1/ We were asked to update these issues based on agency and congressional actions that subsequently have taken place and to suggest ways for dealing with these open issues.

Six areas were singled out by the requestor as being of particular interest. (See app. I.) These six areas and others identified on the basis of our prior reports are discussed in this report. In addition, the following information on (1) water resources overview, (2) the Federal role, and (3) the President's water policy actions has been extracted from a recent report 2/ to put the issues discussed into proper perspective.

WATER RESOURCES OVERVIEW

While the United States has an abundant water supply, the geographical distribution and availability of its water resources often does not match needs and demands. This condition, magnified by the Nation's continuing population growth and industrial development, has led to water shortages and increased competition for the limited supply. Also, new national priorities have emerged. Satisfying energy and food and fiber needs; changing land use policies; and preserving and enhancing environmental, aesthetic, and recreational values place new demands on our Nation's water resources.

The Water Resources Council's Second National Water Assessment predicts that the increase in annual freshwater consumptive requirements by the year 2000 will further compound water supply problems. These problems will

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1/ For this report the term water resources issues has been defined by the requestor's office to include water supply and demand issues, but not water quality issues.

2/ "Water Resources and the Nation's Water Supply: Issues and Concerns" (CED-79-69, April 13, 1979).

include shortages resulting from poor distribution of supplies, instream-offstream conflicts, competition among offstream users, ground water overdrafts, quality degradation of both surface and ground water supplies, and institutional conflicts that inhibit a unified approach to water management.

Federal, State, and local governments as well as the private sector must share the responsibilities for solving the existing and projected future water problems. With shared responsibilities; integrated and comprehensive water resources planning, management, and development; and compromises between competing uses and interests, the Nation can find ways to more efficiently and effectively manage its water resources to best satisfy future economic, environmental, and social goals.

THE FEDERAL ROLE

Managing the Nation's available water resources is, to a considerable extent, a State responsibility. State and local governments have an immediate and utilitarian interest in water resources management because their well-being, as that of the Nation, depends upon the availability of water resources of adequate quality and quantity.

The Water Supply Act of 1958 (Public Law 85-500) declared it to be a congressional policy to recognize the primary responsibilities of the States and local interests in developing water supplies for domestic and industrial purposes and that the Federal Government should participate and cooperate with State and local interests in developing water supplies in connection with constructing Federal water resources projects. Federal projects for developing and using water resources are seldom initiated without strong State support and generally not undertaken in opposition to State desires.

The Federal concerns over natural resources, environment, and the economic and social well-being of the people have led to many acts of Congress which clearly indicate that the Federal Government may participate to some degree in all aspects of water resources planning, management, and development. In response to such Federal concerns, the Congress has established varying degrees of Federal interest in such areas as hydroelectric power, irrigation, water supply, flood control, navigation, outdoor recreation, and fish and wildlife preservation and enhancement. The degree of Federal participation is generally limited to that

required to achieve national objectives in an optimal manner and varies from a maximum participation in planning activities to minimum participation in operation and maintenance activities.

The Federal role in water resources planning basically stems from the Water Resources Planning Act of 1965 (Public Law 89-80). The act was designed to encourage conservation, development, and use of the Nation's water and related land resources on a comprehensive and coordinated basis by Federal, State, and local governments and private enterprise. The act also established the Water Resources Council, provided for establishing river basin commissions, and authorized financial assistance to States for comprehensive water and related land resources planning. The river basin commissions were designed to be planning/coordinating entities where representatives of States and Federal agencies could coordinate activities and jointly develop river basin or regional plans for water and related land resources.

The Federal Government, by ownership of much of the land in the West; by its responsibilities over Indian lands; by constructing and operating water resources projects; and by its various loan, grant and technical assistance programs to municipalities, rural communities, and farmers, has both a direct and indirect role in allocating water among competing uses, conserving and efficiently using water supplies; and promoting water research and technology to increase the useable water supply.

Federal water-related programs are found in 26 agencies within 8 departments and 10 independent agencies and commissions. The agencies have different missions and clientele, and various ways for financing their programs.

Federal water and water-related programs are funded by many different appropriations. For example, the public works appropriations for fiscal year 1978 provided about $3.4 billion to the Corps of Engineers (Civil Functions) and the Bureau of Reclamation for constructing, rehabilitating, and operating and maintaining water resources projects. Agricultural appropriations for fiscal year 1978 included $229 million for conservation operations, $250 million for rural water and waste disposal grants, and $750 million for water and sewer facility loans.

THE PRESIDENT'S WATER POLICY ACTIONS

Recognizing the Nation's water resources problems, the President's Environmental Message of May 23, 1977, directed the Office of Management and Budget, the Council on Environmental Quality, and the Water Resources Council "to conduct in consultation with the Congress and the public, a review of the present Federal water policy." He further stated that "* * * we need comprehensive reform of water resources policy, with water conservation as its cornerstone."

Water resource policy task forces were established to study

--revision of water resources planning and evaluating criteria and procedures,

--cost sharing,

--policy considerations and alternatives relative to institution and institutional arrangements,

--water conservation,

--water quality,

--research, and

--reserved water rights.

In July and August 1977, hearings were held in major metropolitan areas. Considerable adverse reaction was voiced, especially from water interests in the western States. Consequently, the Senate passed a resolution, S. Res. 284 (October 1977), expressing its concern about possible interference with the traditional State role in water allocation actions and the need for consulting with the Congress.

On June 6, 1978, the President announced his water policy message and sent to the Congress water policy initiatives designed to:

--Improve planning and efficient management of Federal water resources programs to prevent waste and to permit necessary water projects which are cost effective, safe, and environmentally sound to move forward expeditiously.

--Provide a new, national emphasis on water conservation.

--Enhance Federal/State cooperation and State water resources planning.

--Increase attention to environmental quality.

The President's water policy initiatives call for enhanced Federal/State cooperation and propose grant programs to help States plan for their water needs. It also creates a task force with State, local, and Federal officials to examine water-related problems and to deepen the Federal/State partnership in water resources policy and planning. Also, the policy initiatives emphasize nonstructural measures to reduce flood damages, raise the issue of Federal assistance for the deteriorating water systems in the East, and call for the States to participate in the financing of Federal water projects. The water policy initiatives, as well as the increasing concerns over the adequacy of the Nation's water supply to meet future demands, may lead to legislative and administrative policy changes which could materially affect the respective roles of Federal, State, and local governments in water resources planning, management, and development.

The President concluded his water policy message by saying:

> "These initiatives establish the goals and the framework for water policy reform. They do so without impinging on the rights of States and by calling for a closer partnership among the Federal, State, county, city, and other local levels of government. I want to work with the Congress, State, and local governments and the public to implement this policy. Together we can protect and manage our Nation's water resources, putting water to use for society's benefit, preserving our rivers and streams for future generations of Americans, and averting critical water shortages in the future through adequate supply, conservation and wise planning."

On July 12, 1978, the President issued directives for all agencies to take certain actions to implement his policy initiatives.

In a November 1978 report, 1/ we concluded that the President's water policy initiatives were a progressive attempt to bring about a much needed reform in current water resources development practices, but some initiatives did not go far enough and other areas needing reform were not addressed. Ways to resolve the critical water resources issues identified in our November 1978 report and other issues identified from our work over the last 5 years are discussed further in the following chapters.

SCOPE OF REVIEW

We identified the most important water supply and demand issues facing the Nation and ways to deal with these issues based on our work over the last 5 years. A list of the reports we used in making this review is included as appendix II.

As arranged with the requestor's office, we have included our observations on those portions of the December 6, 1977, task force reports, prepared for the President's Water Resource Policy Study, concerning options for increasing State and local control over water resources projects through methods such as block grants. This arrangement was necessary because our work over the last 5 years has not directly dealt with this issue, which is of interest to the requestor.

1/ "Review of the President's June 6, 1978, Water Policy Message" (CED-79-2, Nov. 6, 1978).

CHAPTER 2

ALTERNATIVES FOR IMPROVING THE AUTHORIZATION AND APPROPRIATION PROCESS FOR WATER RESOURCES PROJECTS

In two of our recent reviews, we were directed to look at ways for improving the authorization and appropriation process for water resources projects. In a September 1978 report 1/ we examined whether Corps of Engineers flood control projects could be completed faster through legislative and managerial changes. In a July 1978 report, 2/ we determined whether Corps and Bureau of Reclamation water resources projects could be better controlled by congressional authorizing committees without impeding project progress. In both reports we identified alternatives which had many advantages over the current authorization and appropriation process. Implementing any of these alternatives, however, depends largely on the amount of control the Congress wishes to exert over water resources projects.

ALTERNATIVES WHICH WOULD QUICKEN THE CONSTRUCTION OF WATER RESOURCES PROJECTS, BUT WHICH WOULD LESSEN CONGRESSIONAL CONTROLS

In September 1978 we reported that the average time being taken to complete Corps of Engineers flood control projects was very long and had been increasing in recent years. If these projects were completed faster, flood hazards would be lessened, inflationary effects on project costs would be reduced, and other project benefits would be available sooner.

We found that for 77 projects for which the Corps completed survey investigation or design phases during fiscal years 1975, 1976, and 1977, it had taken an average of 26 years after initial authorization before construction of authorized flood control projects were started. During this period, only 12 years were used for actual planning and design; various reviews and appropriation actions took

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1/ "Corps of Engineers Flood Control Projects Could Be Completed Faster Through Legislative and Managerial Changes" (CED-78-179, Sept. 22, 1978).

2/ "Improved Project Authorizations and Agency Practices Can Increase Congressional Control of Water Resources Projects" (CED-78-123, July 11, 1978).

most of the remaining time. Approval of proposed projects and decisions on funding priorities by the executive and legislative bodies are required under the current process. Although we agree with these controls, we also believe there is cause for concern when these processes consume more time than the actual planning and design phases. In our opinion, 26 years is an unreasonably long time for a project to be in the planning and design phases. Implementing other recommendations in our report could possibly shorten the time by several years, but the projects still would require an unreasonably long time to complete.

Alternatives to the current process which could greatly reduce the time between authorization and construction are available. These alternatives are similar to those currently used to authorize and fund other Federal projects--such as Navy shipbuilding and conversion, urban mass transportation activities, and Forest Service construction activities. Each of these alternatives, however, would weaken the congressional control over the water resources projects undertaken by the Corps.

Corps-initiated surveys with a single authorization and appropriation for design and construction

Under this alternative, the Congress would provide the Corps with an annually replenishable survey fund. The Corps could then initiate and carry out flood control survey work without congressional authorization, but within the limits allowed by the fund. Design and construction of projects would require congressional authorization and would be fully funded by a single appropriation.

This alternative severely curtails the ability of the Congress to determine which projects will be surveyed; the Congress would also only review the Corps solution to a flooding problem once. This alternative, however, does have several advantages. It could reduce preconstruction time by 6.6 years or more, totally eliminating the time spent waiting for survey funds after the initial survey authorization. In addition, full funding of the project's advanced engineering and design and construction provides the Corps with an incentive to proceed through the final design and construction stages as speedily as possible in order to negate the impact of inflation. Instead of funding only the initial advanced engineering and design for a project, the full level of funding needed to complete advanced engineering and design and construction could be authorized in the same action. However, because full

funding requires a reasonably accurate estimate of cost, it probably would be necessary to complete the survey phase before requesting funds. There are so many unknowns when a survey is begun that developing such a reliable estimate of the project cost would be extremely difficult--if not impossible.

Another aspect of the full funding concept is the likelihood of fewer projects being authorized at one time. This would depend on prevailing funding constraints.

The executive branch recently requested full funding of water resources projects rather than endorsing the incremental funding system traditionally used by the Congress. The President's 1979 budget proposed a comprehensive application of the full funding concept asking for full funding of all new major procurement and major construction projects.

Combine the authorization and funding steps within the existing process

Under the existing process, after the survey is authorized it is not funded for the first time until an average of 5 years later; in those instances where segments of the survey receive specific appropriations, an average of 6.6 years was required. Similarily, advanced engineering and design work is authorized and then initially funded about 2.8 years later. If the authorization and funding steps for each of these phases were combined, the funding wait interval (which totals 9.4 years) would be eliminated. This represents about a 36-percent reduction in the lifespan of current projects. Congressional control over which projects are authorized and funded would be maintained.

This process, however, eliminates the traditional separation of project authorization and project funding between the Public Works Committees and the Appropriation Committees. A modification is possible, in which the Appropriation Committees each year appropriate funds to two annually replenishable funds (one for surveys and one for advanced engineering and design) to be used on projects approved by the authorizing committees.

Authorize and fund survey and advanced engineering and design work under a single congressional action

Besides eliminating the funding wait intervals totaling 9.4 years (as explained above), another 0.9 year would be

eliminated under this alternative. The 0.9 year represents the interval in the existing system between survey completion and the authorization of advanced engineering and design. Thus, about 10.3 years in the lifespan of a feasible project is eliminated under this alternative. Congressional control over which projects are initially authorized is maintained. A possible disadvantage under this concept is that the Corps would need the authority to decide whether a project merits advanced engineering and design and ultimate construction. Another disadvantage is that the Congress may decide not to authorize project construction after advanced engineering and design is completed. Subsequently, resources expended for the survey and advanced engineering and design would be of no value or, should project construction eventually be authorized, of only marginal value since much of the work may then have to be updated.

ALTERNATIVE FOR INCREASING CONGRESSIONAL CONTROL OVER WATER RESOURCES PROJECTS WITHOUT FURTHER INCREASING THE TIME REQUIRED BETWEEN AUTHORIZATION AND CONSTRUCTION

If the Congress believes that the current controls over water resources projects should be retained or improved, then an alternative we reported on in July 1978 would seem more appropriate. In that review we found that the Congress was expecting to use two separate authorization methods to control the development and funding of water resources projects--the two-phase authorization for the Corps of Engineers and an authorization ceiling for the Bureau of Reclamation. Although each provides some benefits to the Congress, neither is adequate by itself to provide effective control over planning and developing the projects.

For example, a two-phase authorization for Corps projects was adopted in 1974 to give the Congress increased control over the design of water resources projects and the changes which occur during the project planning. This was to be accomplished by providing the Congress with a second look at a project during the planning phase and before authorization of construction. In practice, however, no Corps projects had been through the two-phase process because of delays by the Secretary of the Army and the Office of Management and Budget in reviewing Corps planning documents. Additional delays are possible because the Corps and the Congress disagree on the detailed work which should be

accomplished in developing the documentation to be submitted to the Congress for the construction authorization.

The authorization ceiling used by the Congress in authorizing Bureau of Reclamation water resources projects provides a number of benefits in that it (1) serves as an early indicator of problems, (2) limits Federal expenditures, and (3) controls the nature and scope of the projects. These benefits can be achieved without seriously affecting engineering flexibility.

Generally, Bureau projects are authorized with flexible authorization ceilings which increase with inflation. The ceiling applies to very small projects as well as those costing several hundred million dollars. Even though the authorization ceiling is established at the time construction is authorized, the details of the project may not have been clearly defined.

Legislation authorizing the construction of Bureau projects generally includes a provision which states:

> "There is hereby authorized to be appropriated for construction of the (name) the sum of $xx,xxx,xxx (month, year prices), plus or minus such amounts, if any, as may be justified by reason of ordinary fluctuations in construction costs as indicated by engineering cost indexes applicable to the type of construction involved herein."

The phrase "plus or minus such amounts" permits inflation to raise the authorization ceiling.

For example, if the original authorization was $100 million in January 1974 prices, the authorization ceiling could automatically increase annually with inflation. A 10-percent increase in construction prices during 1974 would change the January 1975 ceiling to $110 million. A 5-percent rate of inflation during 1975 would further increase the January 1976 ceiling to $115.5 million.

If noninflationary factors escalate project costs above the Bureau ceiling, generally two options are available:

--Restructure the project to reduce costs without substantially reducing the projects' benefits.

--Return to the Congress for reauthorization before actual appropriations exceed the ceiling.

Despite its advantages, there are some basic problems in the way the ceiling is currently being identified and established. A major problem is that the ceiling is sometimes established so early in the planning process that adequate cost and design data is often not available. As a result, many projects will require reauthorization.

Although we made several recommendations in our July 1978 report which would improve both the Bureau and Corps authorization methods, we believe the Congress could increase its control of the development and cost of water resources projects by adopting a single approach which incorporates the best features of both methods. Under this concept the initial authorization would permit planning and general design, such as that which occurs during the Corps phase II and the Bureau's Definite Plan Report.

The second authorization would permit project construction and would include an authorization ceiling. Because construction would be authorized after general design, the authorization would be based on more accurate and reliable cost and engineering data, and the authorization ceiling would be a more realistic indicator of the total cost of the project. Because better data would be available, fewer post-authorization changes and fewer reauthorizations should be required.

We believe this alternative would enable the Congress to achieve better control without materially affecting agency workloads or program activities. Agency planning could proceed uninterrupted by efforts to obtain the second authorization if feature designs could be developed during the time the agencies sought the second authorization.

We recognize, however, that this alternative will change the way the legislative committees have historically interacted with these agencies and will require the establishment of procedures to assure effective implementation. Consequently, we are not advocating that this alternative would be appropriate for every project. We suggest that the Congress establish criteria as to the size and scope of those projects subject to this alternative.

An intergovernmental task force, established by law (Public Law 95-46) to study the Bureau's San Luis Unit of the Central Valley Project in California, has also recommended a two-phase authorization for Bureau projects. The

first authorization would permit the preparation of a detailed project plan, and the second would authorize the final project and construction. This recommendation is similar to ours.

CHAPTER 3

WAYS FOR MAKING BENEFIT/COST ANALYSES MORE RELIABLE

Benefit/cost analysis is a vital tool used by both the executive and legislative branches in making decisions on water resources projects costing billions of dollars. Projects are seldom authorized unless their estimated benefits exceed their estimated costs.

In an August 1978 report, 1/ we concluded that problems with the practices and procedures used to calculate benefit/cost ratios continue to exist despite a continuing awareness over the years of the need to improve the system. Although these problems can be attributed to many different causes, we believe that a major contributing factor has been the influences from Federal, State, and local levels, as well as the self-interest of the agencies preparing the analysis. A change is needed in the system to insure that more objective and impartial benefit/cost ratios are developed.

We made a number of recommendations in our August 1978 report which, if properly implemented, should help the agencies provide more accurate, uniform, benefit/cost analysis. Even if our recommendations are carried out, however, benefit/cost analysis will continue to be subject to outside influence unless the system is changed.

Several alternatives are available for achieving more objective and reliable benefit/cost analysis. One approach would be to establish a focal point within the existing organizational structure and strengthen the role of the Office of Management and Budget or the Water Resources Council. A second approach which has been considered by various studies over the years would be to establish an independent group to either prepare or review benefit/cost analysis. Selecting the most desirable alternative would depend upon the cost, complexity of the new system, range of responsibilities, degree of changes and independence desired, and the wishes of the Congress.

1/ "An Overview of Benefit-Cost Analysis for Water Resources Projects--Improvements Still Needed" (CED-78-127, Aug. 7, 1978).

OBTAINING INDEPENDENCE WITHOUT CHANGING ORGANIZATIONAL STRUCTURE IS DIFFICULT, BUT IMPROVEMENTS ARE POSSIBLE

Because subjective judgement is a critical part of water resources project benefit/cost analysis, independence is important for a reliable economic analysis. Since most Federal agencies are part of the executive branch and are funded by the legislative branch, it is difficult to establish a review agency or board which is completely independent of both branches. However, changes could be made within the existing organizational structure which may provide for more objective, impartial benefit/cost analysis reviews.

Water Resources Council

The President also realizes the need for greater independence and has implemented a change. In his June 6, 1978, national water policy message, he stated that (1) more consistent, uniform benefit/cost analysis is needed and (2) independent reviews should be performed to insure that consistent and uniform analyses are actually prepared. He added that he was creating, by Executive order 1/ a project review function within the Council to insure that impartial reviews would be conducted. Although this change should result in more consistent, uniform benefit/cost analysis, we do not believe it would provide the independence needed to correct the problem, primarily because the Council is not independent. The Council includes the Secretaries of the Departments under which the water resources agencies are located and is chaired by the Secretary of the Interior. The Bureau of Reclamation, a major water resources agency, is under the Department of the Interior.

Office of Management and Budget

The Office of Management and Budget's review function could be strengthened to provide for more stringent reviews. The Office reviews selected benefit/cost analysis reports of the water resources agencies. At the time of our review, however, the Office's Water Resources Branch was staffed with only six people and did not attempt to review

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1/ Executive Order 12113 was signed on January 4, 1979. Its purpose is to provide for an independent water project review function within the Water Resources Council. The review process was scheduled to begin April 1, 1979.

the reports for consistency among the agencies. The Office reviews the reports to determine their relationship to the President's program and also raises questions concerning any analysis which seems faulty or incorrect.

Increasing the Office's review role and responsibility should provide for more independent reviews. This approach may not provide complete independence, however, because of the Office's commitment to carrying out the President's budgetary policies.

GREATER INDEPENDENCE COULD BE ACHIEVED BY CHANGING THE ORGANIZATIONAL STRUCTURE

Among the changes that could be considered to provide greater independence in water resources project review and analysis is an independent review board or an independent agency for computing the benefit/cost analysis. Each change offers certain advantages and disadvantages.

Independent review board

To perform unbiased reviews and make independent decisions, a review board must be immune from undue outside influences. Although difficult, outside influence can be reduced by several different methods.

One approach for reducing outside influence would be to structure the board as an independent agency but insulate it from political pressures by having executive officers' appointments which extend beyond congressional or presidential terms and which cannot be easily terminated. This agency could be placed either within the executive or legislative branches.

For example, two bills--H.R. 10004 and H.R. 8060--introduced during the 95th Congress would have established an Independent Water Project Review Board in the executive branch to advise the President and the Congress. No action was taken on the bills which were referred to the Subcommittee on Water and Power, House Committee on Interior and Insular Affairs.

The two bills would have provided for some autonomy by establishing a board consisting of nine members appointed by the President with the advice and consent of the Senate. After initial appointments following establishment of the Board, all members would serve 3-year terms. Members would not serve consecutive terms. No more than five of the nine members would be of the same political party.

The bills also provided that the Board would be responsible for the following functions and duties to insure that accurate, unbiased analysis was developed and presented.

--Establish a system for the detailed evaluation of proposed water resources construction projects.

--Establish coordination among all applicable Federal agencies to promptly notify the Board of proposed projects.

--Conduct extensive evaluations of (1) proposed water resources construction projects before construction funds are appropriated by the Congress and (2) other water resources construction projects at the request of the President, five Members of Congress, or the Director of the Office of Water Management (as also established by these bills) after a majority vote of the full board determines that such an evaluation or re-evaluation of such projects is necessary.

--Provide an opportunity for comment by all interested persons.

--Recommend to the Congress and the President whether or not to construct proposed projects.

--Testify with respect to their evaluations.

--Periodically review the effectiveness of applicable Federal agencies.

--Inform the Congress of undue pressure exerted on the Board or its members and recommend to Congress further legislation to insure the Board's independence.

Although an independent review board should result in more accurate, well developed benefit/cost analysis, additional funding and personnel would be required. Total additional costs would depend on the number of Board members, the Board's actual role, and scope of review responsibilities. The Presidential task force's November 11, 1977, draft report prepared for the Water Resource Policy Study estimated that the review board procedure for expensive or controversial proposals would cost between $100,000 and $500,000 for each project. The congressional bills make no

estimate, but stated that sums as necessary to carry out the provisions of the subject title would be authorized for appropriation. The addition of another review level could also contribute further delays to an already long process.

Locating the review board within the legislative branch may provide additional balance and independence because the benefit/cost analyses are prepared by agencies within the executive branch.

Independent agency for benefit/cost analysis

Another approach to providing better benefit/cost analysis would be to establish an independent agency to perform the analysis for all agencies' water resources projects. (Independence could be established through an approach similar to that mentioned above.) This method would separate the project analysis and recommendation functions from the construction agencies and reduce the self-interest of the agency making the analysis. Since this new agency would analyze all water resources projects, jurisdictional problems would be eliminated.

Although this approach would not provide for an independent review of project analysis it should provide for a more unbiased initial analysis.

Water resources projects are so complex that highly skilled professionals are needed for proper analysis. Since many of these skilled individuals work for water resources agencies, the individuals currently providing analysis work for these agencies could be transferred to the proposed new agency. The new agency could, therefore, be established primarily through reorganization rather than through substantial increases in Federal personnel or funding. The total additional cost would depend on the reorganizational change as opposed to adding a new layer of analysts.

CHAPTER 4

NEED TO BETTER DEFINE THE FEDERAL ROLE IN PROMOTING BETTER WATER MANAGEMENT AND CONSERVATION, IN SOLVING GROUND WATER PROBLEMS, AND IN IMPLEMENTING A NATIONAL DAM SAFETY PROGRAM

On several issues covered in our prior reports, we concluded that certain basic data needed to be developed and certain policy questions needed to be resolved before options for dealing with the issues could be identified. Three such issues involved the appropriate Federal role in (1) promoting better water management and conservation, (2) solving ground water problems, and (3) implementing a national dam safety program.

THE FEDERAL ROLE IN PROMOTING BETTER AGRICULTURAL WATER MANAGEMENT AND CONSERVATION IS UNDER STUDY

The greatest potential, as well as the greatest need, for better water management and conservation is in the irrigated areas of the West. Crop irrigation accounts for over 80 percent of water consumption, most of which occurs in the arid and semiarid West.

Irrigation is a relatively inefficient water use, since under present practices less than half the water delivered for irrigation is actually consumed by the crops. The remainder, which is excess to crop needs, may be absorbed by weeds, may oversaturate the lands (causing drainage problems), or may return to the supply system either in the ground water aquifers or at a downstream location, degraded in quality by minerals, fertilizers, sediment, and pesticides. These return flows may be used downstream for additional irrigation. In some cases, however, the water may return where it does not benefit potential users located between the point of diversion and the point of return, or it may require substantial additional amounts of energy to pump the water back to the surface.

Some techniques which could lead to productivity increases, are lining of water conveyance and distribution systems; more exact timing of water deliveries; avoiding overdeliveries; and using water savings methods, such as drip and sprinkler irrigation systems. Other measures

include suppressing reservoir evaporation, controlling unwanted vegetation (which consumes considerable water), and increasing yields without additional water through better crop varieties and fertilizers. Some techniques which could be effective, but are sensitive issues, are water-pricing policies which are a disincentive to excessive use, such as (1) charging progressively higher rates as greater quantities of water are used and (2) eliminating or reducing Federal subsidies to recipients of irrigation water from Federal projects.

In two reports, issued in June 1976 1/ and September 1977, 2/ we identified many problems with implementing improved agricultural water management and conservation practices, and we made recommendations to the Secretaries of the Interior and Agriculture and the Administrator of the Environmental Protection Agency which, if properly implemented, should (1) determine the extent and causes of overirrigation, (2) identify ways to improve inefficient irrigation delivery systems, and (3) determine the role the Government should play in solving the related problems. These agencies have established a task force to deal with these matters and they plan to issue a final report by May 1979.

Presumably, the task force's report, if it accomplishes its goals, will have a substantial effect on the President's water policy initiatives concerning Federal programs for promoting agricultural water conservation. In an October 1978 report, 3/ we concluded, however, that a June 1978 draft report by the task force's technical work group contains information on the overall significance of the irrigation efficiency problems, but does not adequately address the basic causes and applicable Federal role.

1/ "Better Federal Coordination Needed To Promote More Efficient Farm Irrigation" (RED-76-116, June 22, 1976).

2/ "More and Better Uses Could Be Made of Billions of Gallons of Water by Improving Irrigation Delivery Systems (CED-77-117, Sept. 2, 1977).

3/ "Better Water Management and Conservation Possible--But Constraints Need to Be Overcome" (CED-79-1, Oct. 31, 1978).

POLICY QUESTIONS NEED ANSWERING BEFORE WAYS TO SOLVE GROUND WATER PROBLEMS CAN BE IDENTIFIED

Many places across the Nation are using ground water from an aquifer faster than the water is replenished. To a lesser extent, soil subsidence (lowering of the land surface resulting from reduced ground water) and saltwater intrusion into fresh ground water aquifers are also occurring. Presently, ground water supplies about 20 percent of all fresh water used in the United States. The estimated storage capacity of aquifers is nearly 20 times the combined volume of all the Nation's rivers, ponds, and other surface water. Although the ground water supply in the 48 continguous States is plentiful, little more than one-quarter of it--equivalent to about 10 years annual precipitation--is available for use because it cannot be extracted with present techniques.

The ground water problem is particularly acute in the high plains region of western Texas/eastern New Mexico. The fast-dwindling and increasingly expensive 1/ supply of ground water, with no other local water source identified, may soon cause profound economic and social consequences. Similar problems are developing in the ground water aquifer which extends from the high plains region to as far north as the Platte River in Nebraska.

Ground water management, when it exists, aims to regulate ground water withdrawals and use of the water. In the Western States, emphasis has been on administering and protecting surface and ground water rights rather than the use of the water. More intensive ground water management generally occurs only after a locality has been faced with problems such as declining ground water levels, soil subsidence, or saltwater entering the fresh water. State water rights have the effect of preventing more intensive management. Federal, State, and local officials said that optimal water management would include using and managing surface and ground water as a unit.

In ground water management, the aquifer or aquifer system must be described in detail, and the quantity and quality of the water supply must be continuously monitored. The U.S. Geological Survey has provided much of this type of

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1/ As ground water is depleted, it is necessary to dig deeper wells. The cost of pumping water increases significantly as the well gets deeper.

data to managers through its Federal/State cooperative program; however, more data is needed. State and local officials say that because of tight State and local budgets, the Government will have to develop the needed data if it is to be provided.

We discussed the issues described above in a report issued in June 1977. 1/ We raised the following questions about ground water management, conservation, and use:

--Should the Government take a more active role in ground water management? If so, what should its role be and what agency or agencies should be responsible?

--Should future construction of Federal water resource projects depend on whether the States show that their laws provide for integrating surface and ground water rights?

--How crucial is an inventory of water rights to proper management of ground water? Should the Government be responsible for inventorying these rights?

--Should the Government systematically identify areas with ground water problems to assign priorities for Federal assistance in obtaining ground water data?

--Should there be a national water policy requiring all Federal agencies involved in water planning or construction activities to require use and management of surface and ground waters as a unit? If so, how should such policy be implemented?

--Should water be transferred from one river basin to another to reduce ground water pumping or to recharge aquifers?

--Is enough being done to identify and prevent the intrusion of saltwater into ground water?

1/ "Ground Water: An Overview" (CED-77-69, June 21, 1977).

--Should (or can) Federal programs be devised which provide incentives to decrease dependence on irrigation in water-short areas? How important is irrigation to the national economy? Is it feasible to compensate for decreased farm production in such areas by increased farm production in areas not requiring irrigation?

The President's water policy message did not resolve these matters, nor did it establish a mechanism for their eventual solution. We believe these questions involve basic policy and warrant consideration by the Congress and study by the Federal and State agencies responsible for planning and administering water programs before ways to solve ground water problems can be identified.

SOME KEY ISSUES MUST BE RESOLVED BEFORE THE PROPER FEDERAL ROLE IN A NATIONAL DAM SAFETY PROGRAM CAN BE DETERMINED

In March 1979 we reported 1/ that recently the Federal Government has taken major steps toward addressing dam safety and alleviating the threat that unsafe dams pose throughout the United States. While much progress has been made to increase the safety of dams, some key issues remain unresolved.

The Corps of Engineers is spending about $100 million to inspect non-Federal dams in a major step toward compliance with the 1972 National Dam Inspection Act. The Corps inspected about 1,800 non-Federal dams during 1978, found deficiencies in many of those considered potentially most hazardous because of location, and recommended remedial measures to States and dam owners. The Corps program, although limited to inspecting 9,000 of the 43,500 dams in 4 years, is an important move toward developing a national safety program for non-Federal dams.

For Federal dams, an independent panel of dam safety experts, Federal agencies involved in dam safety, and an ad hoc Federal committee developed guidelines to help coordinate

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1/ "Improving the Safety Of Our Nation's Dams--Progress and Issues" (CED-79-30, Mar. 8, 1979).

Federal agencies' dam safety efforts. As of February 1, 1979, all parties were reconsidering ways to make these guidelines more specific.

While some safety improvements for Federal dams are still in process, the key safety issues to be resolved at this time concern non-Federal dams. Increasing the safety of these dams depends on dam owners' cooperation and States willingness to continue efforts begun by the Corps non-Federal dam inspection program. Success will not come easy because:

--Many dam owners lack the financial resources, willingness, or understanding to take remedial measures recommended in Corps inspection reports. We reviewed some inspection reports in five States and found that dam owners in these cases took only limited actions to implement the recommendations.

--States do not have legislative authority, funds, or trained personnel to conduct their own comprehensive programs. Our study of five selected States showed that, although some States have improved their programs in certain respects, many of the improvements, such as hiring additional personnel and providing training, depend on Corps financing and may not continue when the Corps program ends in 1981.

The Federal Government is not responsible for State or dam owner actions to improve safety programs or make necessary repairs, but it can influence those actions and determine their adequacy to afford an acceptable level of protection from the risks of dam failures.

We recommended that the Secretary of the Army direct the Corps of Engineers to:

--Collect, analyze, and report to the Congress information necessary for judging the appropriate long-term Federal role in non-Federal dam safety. (The Corps is already collecting some of that information for purposes of reporting to the President on the first year inspections. Ways are readily available to obtain the additional information for the Congress.)

--Monitor, on a continuing basis, State and dam owner actions to increase non-Federal dam safety. (Corps monitoring would reinforce the need for States and dam owners to take action on inspection report recommendations, help the Corps collect data for defining the appropriate Federal role, and have other benefits for increasing non-Federal dam safety.)

We also recommended that the Congress direct the Corps to:

--Propose, as soon as possible but before its non-Federal inspection program ends in 1981, legislation defining an appropriate long-term Federal role in non-Federal dam safety. (Collecting the data and monitoring the actions mentioned above would put the Corps in a position to propose such legislation.)

These steps would be a logical extension of the Corps non-Federal dam inspection program and would provide a method to gather timely, reliable information which the Congress urgently needs to consider a national dam safety program and the Federal role in such a program. Corps officials indicated that the executive branch has not yet decided whether a report with dam safety proposals will be made to the Congress.

CHAPTER 5

URBAN WATER SUPPLY PROBLEMS AND CONSERVATION ALTERNATIVES

In two recent reviews, we made an overall assessment of the Nation's urban water supply problems and we identified some water conservation alternatives for dealing with these problems. Essentially, we observed that:

--The risk of water shortages in urban areas exists nationwide. In many urban areas, use already approaches or exceeds the dependable yield of the water supply system. In addition to quantity problems, some areas have water quality problems or inadequate water supply distribution systems. With increased urbanization and demand for water, the constraints on assuring an adequate water supply could intensify.

--Diverse measures are available to increase water supplies, reduce demand, and manage existing supplies more efficiently. However, all of these measures are not appropriate in all locations. Conservation and demand reduction programs can lessen or postpone the need to develop additional supplies, but they will not preclude the need entirely.

--The Federal Government should take the lead in obtaining, evaluating, and disseminating information on conservation techniques, including the establishment of a clearinghouse for such information. Federal agencies should encourage water conservation techniques in programs they administer.

Some of the conservation alternatives we identified were incorporated into the President's water policy initiatives. The conservation clearinghouse alternative, however, has been deferred until after final decisions are made on the implementation of the President's initiatives.

WATER SUPPLY PROBLEMS FACED BY URBAN AREAS

Urban areas face a variety of problems which, individually and collectively, limit the amount of water available for water supply, interfere with the delivery of an adequate

water supply to the ultimate user, and pose obstacles to implementing programs to meet future needs. 1/

Municipal systems rely on surface sources of water--rivers, lakes and streams--for the bulk of their supply. Problems with surface sources include:

--Some cannot be relied on to provide a uniform streamflow throughout the year.

--Some are already fully allocated and cannot accommodate increased demand without changes to existing allocation.

--Streamflows are declining in some surface water bodies.

In addition to these problems, there are requirements to maintain instream flows at certain levels for water quality, fish and wildlife protection, and other purposes. This may limit the amount of water that can be withdrawn for water supply.

About 30 percent of all municipal water supplies come from underground aquifers. Currently, ground water is being used faster than it is being replaced nationwide. Overdrafting is most serious in the West but also occurs in sections of the East, Midwest, and South. Besides the loss of a valuable resource, overdrafting of ground water reserves can result in (1) reduced surface water streamflows, (2) increased energy costs to pump water from lower levels, (3) saltwater intrusion into freshwater supplies, and (4) land subsidence.

According to the Water Resources Council, increased urbanization will increase water quality problems. Pollution may render a source of water unusable or make treating it more expensive. Surface water pollution comes from municipal and industrial waste discharges and from other sources, such as runoff from urbanized, agricultural, and mining areas. The Environmental Protection Agency administers programs that require the cleanup of municipal and industrial discharges. Some progress has been made but a great deal remains to be done.

1/ This will be the subject of a report on urban water problems that we expect to issue in May 1979.

Ground water pollution has been recognized in practically all of the Nation's 21 water regions. Saltwater intrusion and improper disposal of wastes on land are major factors. The Environmental Protection Agency reported in 1973 that saltwater intrusion problems were widespread and had affected both coastal and inland ground water aquifers. With respect to waste disposal on land, we reported in June 1978 1/ that in some heavily populated areas past practices had contaminated ground water to the point of threatening public health. This threat will continue since, according to the Environmental Protection Agency, 14,000 of 20,000 municipal disposal sites do not comply with established standards.

After a source of water has been developed, the water must be brought to where it is needed and distributed to the ultimate users. In some areas, growth and resulting increases in water usage have created the need for significant expansions in the capacity of urban water distribution systems. In other cities, some of the pipes in the system may be 100 years old. Where replacement and maintenance have been deferred, costly rehabilitation projects may be necessary to reduce leakage and water main breaks. It is believed that some cities are losing up to half of the water put into their distribution systems.

International and interstate water treaties and compacts, as well as State water laws, affect the amount of water available to particular States and the ways that water may be used. Resolving questions involving Indian water rights and Federal reserved water rights may also reduce the amount of water available for urban users in the western States. Environmental and other opposition to developing water resources, especially major projects involving interbasin transfers, can delay or kill projects needed to assure an adequate water supply.

APPROACHES TO SOLVING URBAN WATER SUPPLY PROBLEMS

No single, permanent solution to the water problems facing urban areas exists. Some methods of increasing water supplies are still in the experimental stages. Others, such as desalination and wastewater reuse, are feasible, but health, environmental, and economic considerations have

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1/ "Waste Disposal Practices--A Threat To Health and the Nation's Water Supply" (CED-78-120, June 16, 1978).

precluded their adoption on a broader scale. Conservation-related programs can reduce the demand for water but probably will not eliminate the need to develop new sources.

The urban areas we visited varied considerably in terms of how much additional water they needed by the year 2000, how they planned to provide those additional supplies, and the obstacles they faced in doing so. Some areas have adequate supplies nearby and only need to expand their intake, treatment, and distribution systems. Other areas must try to get water from locations outside of their river basins or will continue to overdraft ground water resources to meet their needs. In still other areas proposed solutions are still being examined and evaluated.

The cost of programs to assure an adequate water supply in the year 2000 varied greatly; in some areas it was estimated to be in the tens of millions of dollars while in other areas it was in the billions of dollars. In addition, some areas believed that they needed Federal assistance to implement their proposed solutions. Other areas believed that adequate financial capability existed locally.

As part of his water policy initiatives, the President directed that an intergovernmental water policy task force be formed to continue examining key water issues. The task force held its first meeting on December 12, 1978, and identified urban water supply as a subject of major concern. As a result, a subcommittee on urban water supply was formed to inventory existing Federal programs which have the potential for assisting in construction or rehabilitation of urban water systems and to evaluate the institutional and financial problems surrounding municipal water supply and distribution. Preliminary work in these areas is underway.

WATER CONSERVATION ALTERNATIVES AND THE CLEARINGHOUSE ISSUE

In April 1978 we reported 1/ that various Federal programs offer numerous opportunities for encouraging municipal

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1/ "Municipal and Industrial Water Conservation--The Federal Government Could Do More" (CED-78-66, Apr. 3, 1978).

and industrial water conservation. For instance, Federal agencies (1) provide funds for water resources planning to assure efficient water use, (2) construct dams and reservoirs to increase the supply in various sections of the country, (3) construct and operate public buildings and military and civilian housing and finance housing programs where water conservation programs could be undertaken, and (4) provide grants to local entities for constructing wastewater treatment facilities, the size and cost of which could be reduced if conservation were practiced. We made the following recommendations to individual Federal agencies, each of which were similar to ones included in the President's water conservation initiatives:

--The Water Resources Council should (1) require that State and river basin water resources plans consider water conservation and (2) revise the "Principles and Standards for Planning Water and Related Land Resources" to include water conservation.

--The Bureau of Reclamation, Soil Conservation Service, and Corps of Engineers should require water-use plans from purchasers of water supply or storage space in reservoirs they construct.

--Require that water conservation devices be installed in new housing that the Government participates in.

--Require the General Services Administration to use water-saving devices in designing, constructing, leasing, operating, and maintaining Federal office buildings.

--Use water-saving devices in the construction and operation of military facilities by the Department of Defense and hospitals by the Veterans Administration.

Our April 1978 report also describes several techniques, such as domestic water saving devices, metering, pricing, leakage control, water pressure control, education campaigns, and industrial conservation. We concluded that a major constraint to implementing these techniques was a lack of knowledge about their effectiveness. We found that although these techniques generally are believed to free additional water supplies; prevent or delay construction of costly water supply and treatment facilities; and decrease the amount of energy needed for pumping, treating, and heating water--their effectiveness had not been thoroughly evaluated. In addition, no centralized data bank or

clearinghouse on water conservation exists, and such a clearinghouse could be useful in providing water conservation information.

We recommended that the Chairman, Water Resources Council, take the lead in establishing an interagency task force of Federal and non-Federal water resources agencies. Its purpose would include developing Federal objectives and policies and plans for a clearinghouse on water conservation practices for municipal and industrial water supplies. Although the Council's Director generally agreed with our recommendation, he said that no action would be taken until after final decisions are made on all the President's water conservation initiatives. These decisions are expected to be completed on or about July 1979.

CHAPTER 6

ALTERNATIVES FOR REEVALUATING THE 160-ACRE LIMITATION ON LAND ELIGIBLE TO RECEIVE WATER FROM FEDERAL WATER RESOURCES PROJECTS

In November 1972 we reported 1/ to the Congress on the Bureau of Reclamation's efforts to implement the 160-acre limitation provision in the Central Valley Project in California. We concluded that reclamation law objectives were not being achieved and that questions existed concerning the practicality of limiting the use of water from Bureau projects to a landowner's 160 acres of irrigable land. We brought the issue to the Congress' attention suggesting alternatives for stricter enforcement of the law's provisions or liberalizing the law coupled with removing water subsidies--depending on whether or not the Congress wanted to use the 160-acre limitation provision to encourage the establishment of family size farms.

Over the years many bills have been introduced in the Congress to (1) improve the administration of the existing law, (2) increase acreage to which the law would apply, (3) reduce or eliminate water subsidies to farming operations in excess of the acreage limitation, (4) eliminate acreage limitations, or (5) combine some or all of the other alternatives; but none which would substantially change the 160-acre limitation provision have been enacted. In the 96th Congress there have already been 18 bills introduced for this purpose. Consequently, we believe that the alternatives we identified in 1972 can still be of interest in reevaluating the 160-acre limitation provision.

PROBLEMS IN IMPLEMENTING THE 160-ACRE LIMITATION

The Bureau of Reclamation, Department of the Interior, plans, constructs, and operates multipurpose water resources projects, primarily to provide irrigation water to arid and semiarid lands in the Western States. The Reclamation Act of 1902 limits to 160 acres the land on which any one owner

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1/ "Congress Should Reevaluate the 160-Acre Limitation on Land Eligible To Receive Water from Federal Water Resources Projects" (B-125045, Nov. 30, 1972).

is entitled to receive water from Federal water resources projects for irrigation purposes. Objectives of the limitation are

--to break up large, private landholdings to provide an opportunity for a maximum number of settlers on the land and to promote homebuilding,

--to spread the benefits of the subsidized irrigation program to the maximum number of people, and

--to promote the family size farm as a desirable form of rural life.

The 160-acre reclamation law limitation has not prevented, in the Central Valley Project,

--large landowners and farm operators from benefiting under the subsidized irrigation program, and

--landowners and farm operators from retaining or acquiring large landholdings.

In 1972 we reported that, of the 502,499 acres receiving project water in seven irrigation districts, about 14 percent--71,645 acres--was owned and/or leased by the seven largest farm operators. The size of the individual farm operations ranged from 1,774 acres to 40,404 acres. These farm operators and landowners received project water on large holdings of land eligible to receive project water by leasing such land from the individual owners or by retaining or controlling such land by establishing corporations, partnerships, and trusts.

In 1978 the special task force on the San Luis Unit, created under Public Law 95-46, reported that farming operations in the Westlands Water District, the largest district in the Central Valley Project, were still considerably in excess of 160 acres. They reported that the average farming operation receiving water in Westlands in 1977 was 2,200 acres.

In another report issued in April 1976 1/ we concluded that the Federal subsidy applicable to the Westlands Water

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1/ Letter report to the Chairman, Senate Select Committee on Small Business, and to the Acting Chairman for the Westlands Hearings, Senate Committee on Interior and Insular Affairs (RED-76-98, Apr. 9, 1976).

District would be about $658 million on a simple-interest, present-value basis. Virtually all of the subsidy covers the estimated interest foregone on the Westlands distribution system's costs and that part of the main irrigation facility (San Luis Unit) applicable to Westlands. A small amount, estimated at $1 million, covers the repayment by power or municipal and industrial water users for part of the irrigation costs.

The impact of modern technology and techniques on farming raises a question as to the practicality of limiting the use of water from Bureau water resources projects. Several studies going back to 1964 questioned the practicality of a strict 160-acre limitation provision. Among the studies were (1) a 1964 Department of the Interior report entitled "Acreage Limitation Policy," which recommended that the Congress consider legislation which would authorize a method of equalizing the productive potential of various land classes; i.e., "a land-equivalency concept" and (2) a 1970 Public Land Law Review Commission report, which concluded that the changes which had taken place in the size of farms in the 17 Western States from about 1935 were not consistent with acreage limitation in the land laws.

REEVALUATION ALTERNATIVES

The Congress should reevaluate the provision of reclamation law limiting the use of water from Bureau-subsidized water resources projects to 160 acres of irrigable land of any one landowner. 1/

Should the Congress determine that restricting the availability of project water to 160 acres of land is still appropriate to encourage the establishment of family farms, it should enact legislation which would preclude large landowners and farm operators from benefiting under the subsidized irrigation program.

Such legislation could include:

--A requirement that the eligible water recipient must be the farm operator, as well as the owner, of the land and a definition of operator consistent with the concept of a family farmer.

1/ "Congress Should Reevaluate the 160-Acre Limitation on Land Eligible To Receive Water from Federal Water Resources Projects" (B-125045, Nov. 30, 1972).

--Limitations on future lease, trust, and other arrangements designed to insure continued operation of the land by a family farmer, but making reasonable arrangements for periods of physical or financial incapacitations, or other exceptions where warranted.

--A limitation on years before property can be resold at a higher price, designed to prevent speculation. 1/

Should the Congress determine that restricting use of project water to 160 acres is no longer appropriate to encourage the establishment of family size farms, it should enact legislation which would

--establish the area of irrigable land on a family farm eligible to receive Federal project water at subsidized rates,

--preclude landowners and farm operators from benefiting under the subsidized irrigation program by controlling numerous eligible tracts, and

--require the payment of the full cost of Federal project water used on farmlands of greater acreage than that established for family farms.

1/ "Appraisal Procedures and Solutions to Problems Involving the 160-Acre Limitation Provision of Reclamation Law" (RED-76-119, June 3, 1976).

CHAPTER 7

POLICY STUDY OPTIONS FOR INCREASING STATE AND LOCAL CONTROL AND RESPONSIBILITY FOR WATER RESOURCES AND OUR OBSERVATIONS

The December 6, 1977, task force reports, prepared for the President's Water Resource Policy Study, examined the roles of the State, local, and Federal governments in water resources planning, management, and development. They identified two options which would reverse the trend toward Federal predominance in water resources by increasing State and local control and responsibility.

Although we have done little work that deals directly with this issue, we question whether either option can be successful because

--comprehensive national water policy and priorities are lacking; therefore, national interests may not be adequately considered in making State and local decisions; and

--reliable data for decisionmaking is not always available.

It should be emphasized, however, that these obstacles to the policy study options exist within the current water resources mechanism. It is not known whether these obstacles would adversely affect the options more or less than they are adversely affecting on the existing water resources mechanism.

POLICY STUDY OPTIONS FOR INCREASING STATE AND LOCAL CONTROL AND RESPONSIBILITY

Before the last decade, the primary Federal role in water resources related to public works activities, such as flood control, navigation, irrigation and watershed activities. Federal involvement generally began in response to interstate needs, in cases where the financial commitments were beyond State or local capability, and to foster a related national objective such as western land settlement or soil and watershed conservation. Federal agencies, created to execute the programs, operated independently of any direct State control and were responsible for program and project implementation decisions. State and local

involvement in these decisions varied according to many factors, including the type of issue; the relationship between State, local and Federal officials; and the degree of non-Federal financial involvement.

States defined their own policies relating to general water quantity and quality management and developed laws and practices for allocating and using water. States also engaged in water resources planning and water-related project development. State activity in the water resources field varied according to the peculiar water conditions existing in each State.

Local governments had primary responsibility for local water supply and wastewater treatment and disposal. Planning efforts were generally of a localized nature and usually directed at a specific problem or circumstance.

In more recent times, a number of new Federal programs have emerged and the consequent increase in Federal involvement in water resource activities has been appreciable. Congressional actions, such as the Federal Water Pollution Control Act Amendments of 1972, the Coastal Zone Management Act, the Safe Drinking Water Act, the Water Resources Planning Act, the Clean Water Act of 1977, and flood plain management legislation, are examples where the Federal role either by design or in practice has been increased in relation to that of other governmental levels. State and local involvement in these programs is considered; however, the creation of new Federal programs increases Federal involvement in State and local activities and imposes additional requirements at those levels.

Give primary control and responsibility to the States

Under this option, States would have primary responsibility for decisions relating to planning, management, and development of water resources. Federal involvement would be reduced to (1) providing financial and technical assistance when requested by the States for intrastate problems and (2) providing a forum wherein interstate problems could be resolved. The Federal Government could maintain its role in planning and operating major interstate projects.

This option could be implemented in varying degrees depending on the number of functions to be delegated to the States. If the planning function were to be vested in the States, then funds currently expended or distributed by Federal agencies could be forwarded directly to States in

the form of block grants. Each State would have the option of pursuing the planning function either by itself, through regional entities such as basin commissions or by contracting with Federal agencies for specific areas of planning. The individual State plans would be comprehensive and coordinated with those of other States as necessary. Consistency and comprehensiveness could be monitored by a Federal entity created to disburse the funds and act as a liaison between the States and Federal agencies. This role would be fulfilled by a national entity such as the Water Resources Council or regional organizations.

A further step toward increased State involvement would be to allow States to set priorities and make decisions relating to Federal programs and projects. A given share of the Federal budget for water resources programs and projects could be allocated or credited to each State, which in turn would decide which programs and projects would be implemented and in what manner and order. Programs or projects implemented by choice of the State would have to be consistent with the State plan. States would have program implementation and operation options. Options would include State implementation and operation, private contractual arrangements, or the use of Federal agencies and expertise on a contract basis.

This option represents a substantial change from the existing State/Federal relationship in this area. Implementation would require extensive Federal legislation both in the general context of how Federal funds would be allocated--credited or granted to the States--and in the organic acts of Federal departments and agencies. The role of Federal agencies would be altered in direct relation to the degree to which the option was implemented but, the practical operations of the agencies would not be changed. Uncertainty would arise in forecasting State demands for Federal involvement in the planning and implementation functions. Establishing personnel levels and budgets would be difficult under these circumstances, but in time this problem could be minimized through advanced planning and commitments by the States relative to the desired future Federal involvement. This option's inherent uncertainties for the Federal water establishment may make it practicably attainable only through a long transition period in which the Federal capability is transferred to the State or private sector.

The major objection to this option would be its impact on the Federal water establishment and the potential for increased difficulties in attaining coordinated and comprehensive water planning and program implementation. A major positive factor would be its potential for better identifying and addressing State and local problems through consolidated decisionmaking.

Give primary control and responsibility to local government as coordinated through States

This option, like the first, could be implemented in varying degrees. The idea is to have water planning and program identification accomplished at the local level of government. Coordination would be through the State.

Local areas could be defined either by local, State or Federal action according to social, political, hydrologic, and other factors. Local units would be responsible for initiating planning and setting priorities for programs and projects much the same as the States would do under the first option. Federal funds would be allocated or granted to the local units through the States. The respective shares would be determined at the time the local units were designated and would be reviewed periodically.

This option would change the traditional Federal role to make it closer to local problems. The degree to which the Federal activities are directed and coordinated through the States would affect the amount of State support for this option. A system wherein Federal/local ties were strong and to the exclusion of the State government would further fragment decisionmaking and make comprehensive and coordinated action in a State even more difficult.

There are problems with this option which do not arise in the State-oriented alternative. One problem would arise in finding local governmental entities with jurisdiction over the area most desirable for hydrologic development. A second problem might arise in finding qualified personnel in sufficient numbers at the local level to accomplish what is intended. A third, and most serious problem, might arise if the local units were small and fragmented with various preferences concerning programs and projects. Instead of promoting efficiency and providing for locally identified needs, the result might be a mix of unrelated and irreconcilable programs and projects with coordination dependent on distant Federal oversite. Put another way, this approach may go too far in localizing perogatives and, accordingly, may be unmanageable.

LACK OF A COMPREHENSIVE NATIONAL WATER POLICY AND PRIORITIES MAKES IT DIFFICULT FOR NATIONAL INTERESTS TO BE ADEQUATELY CONSIDERED

Neither of the Policy Study options may ever be successful because comprehensive national water policy and priorities are lacking. Consequently, national interests may not be adequately considered in State and local decisions required under the options.

For example, we concluded in our November 1978 report 1/ that the President's water policy was a positive attempt, but some reforms did not go far enough and other areas needing reform were not addressed.

For instance, the water policy message briefly addressed some water quality aspects, but, in our opinion, failed to adequately emphasize the importance of water quality. We believe water quality and water quantity are interwoven and need to be considered together in the national water policy. The water policy message mentioned the need to improve the protection of instream flows and to evolve careful management of the Nation's precious ground water supplies, but these areas were mentioned only briefly. More consideration needs to be given to (1) the effects of waste disposal on water supply, (2) the quality of water needed for drinking, (3) the elimination and reduction of nonpoint sources of pollution, (4) the recycling and reuse of water from municipal and industrial sources, and (5) the interface of water quality and water supply management.

Another example involves our October 1977 report 2/ on the Water Resources Planning Act of 1965. We reported on problems in integrating regional plans and priorities with national priorities and goals. We described a history of unsuccessful attempts to develop guidelines for preparing and reviewing regional plans and priority reports. These guidelines have not yet been prepared.

1/ "Review of the President's June 6, 1978, Water Policy Message" (CED-79-2, Nov. 6, 1978).

2/ "Improvements Needed by the Water Resources Council and River Basin Commissions To Achieve the Objectives of the Water Resources Planning Act of 1965" (CED-78-1, Oct. 31, 1977).

UNRELIABLE DATA FOR DECISIONMAKING IS ANOTHER MAJOR OBSTACLE

Reliable information on which to base water resources decisions is lacking. In previous reports we pointed out that some information has not been developed and that in other instances the information available is inaccurate. Both these problems would appear to severely affect options for increasing State and local control and responsibility.

For example, we concluded in our June 1977 report 1/ that more data is needed to manage ground water effectively. State and local officials told us that because of tight State and local budgets, the Government will have to develop the needed data if it is to be provided.

In our March 1977 report, 2/ we concluded that substantial discrepancies existed between Federal and regional water data used in preparing the Second National Water Assessment. The Assessment is designed to identify future national and regional water needs and compare Federal and State regional views of such problems. This requires that both approaches use the same base year data.

When federally prepared data was compared with regional data, large discrepancies were discovered and regional agencies expressed concern over the reliability of the Federal data. Attempts to narrow these differences to a 10-percent variance were unsuccessful in many instances.

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It should be emphasized again that the obstacles discussed above exist within the existing water resources mechanism. It is not known whether these obstacles would adversely affect the Policy Study options more or less than they are adversely affecting the existing water resources mechanism.

1/ "Ground Water: An Overview" (CED-77-69, June 21, 1977).
2/ "Problems Affecting Usefulness of the National Water Assessment" (CED-77-50, Mar. 3, 1977).

APPENDIX I

United States Senate

COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
WASHINGTON, D.C. 20510

February 8, 1979

The Honorable Elmer B. Staats
Comptroller General
U.S. General Accounting Office
441 G Street, N.W.
Washington, D.C. 20548

Dear Mr. Staats:

Many critical problems involving the Nation's water resources will be considered by the Congress during the current session. Several bills already have been introduced, and more are expected. Consequently, I would like the assistance of your Office in identifying the most important water resources issues and ways to deal with them.

I would like a report which identifies the open issues based on your work over the last five years, including what agency and congressional actions have subsequently taken place. Where possible, I would like suggestions from GAO for dealing with these open issues.

I am particularly interested in open issues and any suggestions in the following areas: (1) alternatives for increasing state and local control, flexibility, and responsibility for water resources projects; (2) options for improving benefit-cost analyses on Federal water resources projects; (3) an assessment of the Nation's municipal water supply situation, including the potential for municipal and industrial water conservation; (4) an assessment of ground water supply problems; (5) the effectiveness of the Federal role in promoting more efficient water use; and (6) options for accelerating project development, both within the present system of specific project authorizations by Congress and the use of alternative approaches, such as loans or block grants.

To be of most use to myself and the Committee on Environment and Public Works, I would like to have your report on these matters by March 31, 1979. If you have any questions please contact Mr. Harold Brayman of the staff of the Committee.

Sincerely,

Pete V. Domenici
Ranking Minority Member
Subcommittee on Water Resources

LISTING OF OUR PRIOR REPORTS USED IN PREPARING THIS REPORT

Title	Reference number and date
"Water Resources and the Nation's Water Supply: Issues and Concerns"	CED-79-69, April 13, 1979
"Improving the Safety of Our Nation's Dams--Progress and Issues"	CED-79-30, March 8, 1979
"Review of the President's June 6, 1978, Water Policy Message"	CED-79-2, November 6, 1978
"Better Water Management and Conservation Possible--But Constraints Need To Be Overcome"	CED-79-1, October 31, 1978
"Corps of Engineers Flood Control Projects Could Be Completed Faster Through Legislative and Managerial Changes"	CED-78-179, September 22, 1978
"An Overview of Benefit-Cost Analysis for Water Resources Projects--Improvements Still Needed"	CED-78-127, August 7, 1978
"Improved Project Authorizations and Agency Practices Can Increase Congressional Control of Water Resources Projects"	CED-78-123, July 11, 1978
"Waste Disposal Practices--A Threat To Health and the Nation's Water Supply"	CED-78-120, June 16, 1978

"Municipal and Industrial Water Conservation--The Federal Government Could Do More"	CED-78-66, April 3, 1978
"Improvements Needed by the Water Resources Council and River Basin Commissions To Achieve the Objectives of the Water Resources Planning Act of 1965"	CED-78-1, October 31, 1977
"More and Better Uses Could Be Made of Billions of Gallons of Water by Improving Irrigation Delivery Systems"	CED-77-117, September 2, 1977
"Ground Water: An Overview"	CED-77-69, June 21, 1977
"Problems Affecting Usefulness of the National Water Assessment"	CED-77-50, March 23, 1977
"Better Federal Coordination Needed to Promote More Efficient Farm Irrigation"	RED-76-116, June 22, 1976
"Appraisal Procedures and Solutions To Problems Involving the 160-Acre Limitation Provision of Reclamation Law"	RED-76-119, June 3, 1976
Letter report to the Chairman, Senate Select Committee on Small Business and to the Acting Chairman for the Westlands Hearings, Senate Committee on Interior and Insular Affairs	RED-76-98, April 9, 1976
"Congress Should Reevaluate the 160-Acre Limitation on Land Eligible To Receive Water from Federal Water Resources Projects"	B-125045, November 30, 1972