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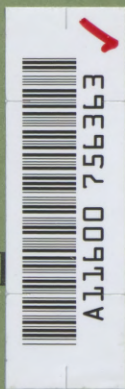
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HEARINGS

BEFORE THE

COMMITTEE ON WATER RESOURCES

OF THE

COMMITTEE ON

ENVIRONMENT AND PUBLIC WORKS

UNITED STATES SENATE

NINETY-SIXTH CONGRESS

FIRST SESSION

PART 5—APPENDIX

PRIORITY SETTING FOR WATER RESOURCES PROJECTS
AND PROGRAMS

A REPORT
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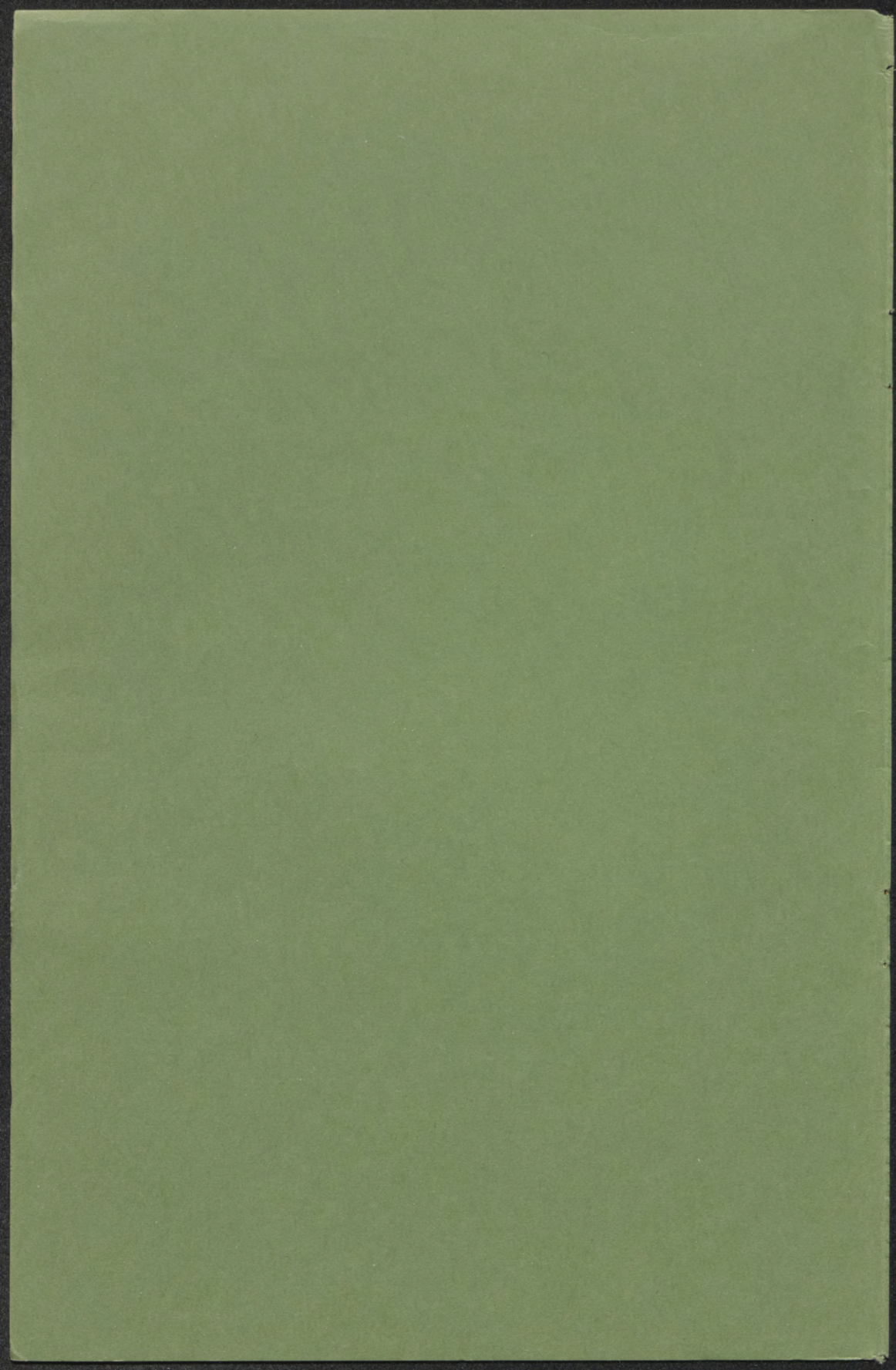
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WATER RESOURCES DEVELOPMENT ACT OF 1979

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OF THE
COMMITTEE ON
ENVIRONMENT AND PUBLIC WORKS
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WASHINGTON : 1980

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PRIORITY SETTING FOR WATER RESOURCES PROJECTS AND PROGRAMS

By

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June 1979

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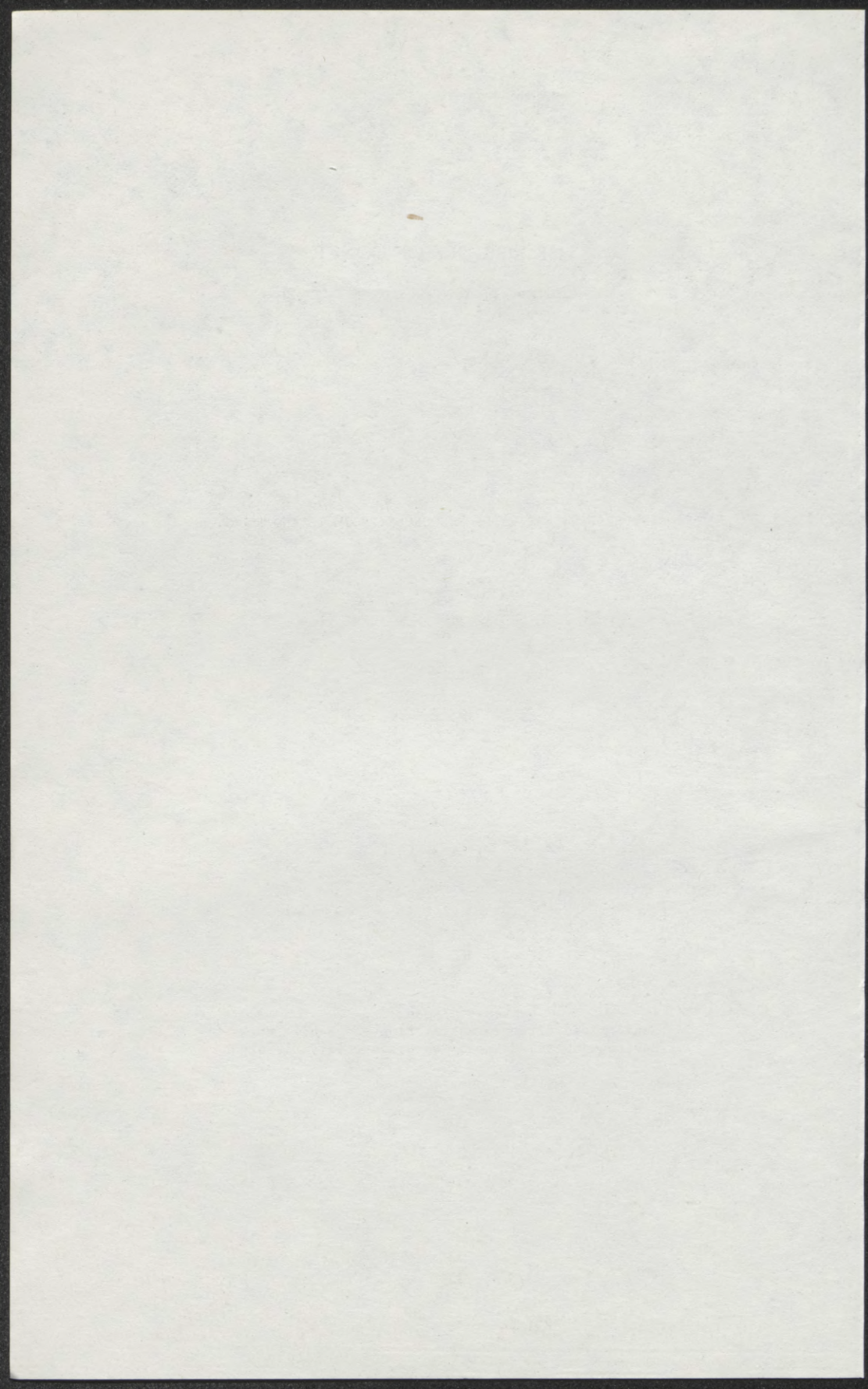


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SUMMARY

In view of limited fiscal resources, expanding environmental pressures and escalating energy problems, Federal initiatives in water resources should be those whose outputs maximize benefits to the Nation. This implies the need for a priority-determining mechanism which can operate at national, regional, State and local levels. This issue, deserving of Congressional attention, raises many questions which require answers if the current decisionmaking process is to give way to one based on a more balanced view of: the importance of water resources development and management to the achievement of national objectives; and the allocation of limited fiscal and other resources to those water programs and projects which will have the greatest payoff to society.

This study reviews current prioritization processes at the several levels of government and sets forth alternative priority-setting strategies which could be implemented to achieve a better national and regional focus.

Present Position of the Federal Agencies

There is great variability in the extent and nature of prioritization processes used by the Federal water resources agencies. Except for the Corps of Engineers, most internal rankings have been on the basis of individual project merits or purposes rather than on the basis of river basin or regional considerations. For the most part, inclusion of water projects in agency budget proposals depends only upon satisfying the criteria set forth in the Principles and Standards for Planning Water and Related Land Resources.

State and Local Government Prioritization

Information on quantitative prioritization procedures used by State agencies is very limited. Presently only a few States employ such techniques. In reality, most State priorities result from Federal agency proposals for projects and Congressional authorizations and appropriations.

Regional Considerations

Natural hydrologic systems are not confined to State boundaries and this has fostered many regional and river basin approaches to water resources planning and development. That regional entities might be influential in prioritization processes is borne out by the efforts of River Basin Commissions (RBC's) to take a basin-wide approach to evaluating the importance of water resources projects and programs. The combined influence of the governors of several States could also be an important force in influencing Congressional actions on water resources development.

Use of five year financial plans for river basins or regions combined with area-wide budgeting techniques might facilitate a new focus on regional mechanisms for priority setting giving Congress the opportunity to consider packages that would be easier to ratify. If comprehensive basin planning processes can identify

projects which have strong regional support, these can be displayed to show their relationship to regional goals and thus facilitate priority setting in a broader framework.

The Water Resources Council (WRC) has supported expenditures well over \$100 million for water resources planning but the plans produced have not been used to any great extent by the States, the Administration or Congress to facilitate program implementation decisions. There is no evidence that similar activities by the RBC's have been any more successful although they are in the process of developing new prioritization procedures. In 1978, however, the WRC issued a positive policy statement requiring that:

A statement shall be included with the annual budget submission of each member agency to the Office of Management and Budget which (1) certifies that the agency budget submission is consistent with the appropriate regional water resource management plan(s). ...

Congressional Selection Process

Congress is disposed to building projects in response to political demands. Water projects usually distribute benefits directly to Congressional constituencies while indirectly allocating costs. Thus, the political rewards for bringing home a project are easily accounted for while the costs are diluted through funding mechanisms. Congressional prioritization then is strongly flavored by the desire to accommodate constituencies. This is not always compatible with building either the best or most needed projects.

The fragmentation in Congressional assessment of water projects is directly linked to the way individual Congressmen perceive the issues. Historically, each legislator has set his priorities mostly out of concern for his constituency. Water projects have strong local implications and

getting Federal authorizations and funding for these is politically advantageous to legislators. Congressional committees have thus been organized to reflect the interests of the constituencies served and Congressmen have resisted changes which would make committees less accessible to these interests.

A change in Congressional practice to deal more directly with river basin plans might be achieved through joint hearings on comprehensive river basin plans by concerned committees and informal cooperation and incremental changes in jurisdiction.

A mechanism which could increase regional or river basin planning impacts on Congressional project selection processes would be a nationwide, joint State and regional prioritization strategy. RBC's or suitable counterparts could act as coordinators. The success of this effort would depend, however, upon a greatly strengthened State role coupled with an extension of the process beyond the scope of the present Title II Commissions. In addition, new authorizing legislation providing appropriate authorities to insure implementation of this joint priority-setting process in terms of Congressional decisions would also be needed.

Executive Role in New Water Project and Program Selections

The Office of Management and Budget (OMB), representing the President's position, reviews agency recommendations for new water projects and programs. Agency recommendations not conforming to OMB's interpretation of the Administration's views are opposed. Based on OMB views as well as those of other policy officials of the Executive

Office of the President and the agency heads themselves, the President decides which water projects he will recommend to Congress for funding.

In his June 6, 1978 message on water policy, President Carter stressed the need to apply specific measures in selecting water projects for inclusion in the Federal budget. Criteria were prescribed to guide Presidential decisions on annual funding of water projects and on authorization and appropriation bills, including the selection of new planning and construction starts.

Factors Impacting on Prioritization Processes

Various factors can play an influential role in prioritizing water resources projects. Significant ones include: the severity of water problems, type of project outputs, financing and cost sharing, the nature of planning processes, local interest, density of population and extent of unemployment.

Alternative Prioritization Strategies

Many strategies can be used to set priorities for water resources projects. All of them require some form of filtering and they all share the political reality of not satisfying everyone.

Status Quo -- The current approach to water project selection remains primarily one of project-by-project consideration. Most water projects have been initiated at the local level by those desiring Federal funds for their own areas and by the Federal agencies responsible for building them.

National Merit -- The principal mechanism for prioritization by national merit is the benefit/cost ratio or variations thereof. The Corps of Engineers has enumerated three alternative procedures. These are: (1) ranking projects nationally by benefit/cost ratio; (2) arranging projects nationally in an order reflecting a discounting of specific project purposes or benefits; and (3) listing projects by Division Engineer priority within regions and then arriving at a national ranking subjectively.

Regional Allocation -- Another option for setting water project priorities is to establish geographic budget allocations. In this case, an initial determination must be made concerning the budget a region should receive over time. After regional allocations are set, tradeoffs between projects within a region can be made in agency field offices or by political representatives in the area. Benefit/cost analyses can be used to guide these decisions.

The budget analysis system developed and implemented by the Corps in the late 1960's typifies the process. Designed to produce information on the water resource needs of various regions and the

incomes of their inhabitants, it could be used with other factors to guide decisions on regional budget allocations.

After an initial regional budget allocation is made, a five-year program of water resources projects is formulated based on benefit/cost analyses and agency recommendations reflecting local interest and professional judgment.

Project Purpose -- In this approach the President, the Congress or a department head recommends a specific amount for municipal water supply, hydroelectric generation, navigation, etc. Congress appropriates funds for these categories and sets rules for selecting projects within them. An insight to how the allocation should be made among the various proposals can be gained from studies of the comparative returns of different kinds of projects. Combining this information with an assessment of the anticipated future demands for a specific purpose would yield a determination of its relative importance over a selected time horizon.

Once the initial allocation to a purpose is made, the choice of projects can be arrived at through the political system, benefit/cost analyses or some other ranking mechanism.

Revenue Sharing -- Water resources development could be financed through general revenue sharing. A lump sum earmarked for resource

and environmental programs, for example, could enable a State to play a principal role in water project decisions. A general revenue sharing system would permit States to evaluate the tradeoffs between developing water, building highways or implementing or extending other programs. Using this approach, water projects of Federal agencies would not be pursued by State officials simply because Federal funding was available for that purpose. The burden of prioritization would be thrust upon the States who would have to face up to political and other problems inherent in any prioritization scheme. The general revenue sharing approach would also impose, at the State level, the problem of not only prioritizing water projects but evaluating their priority relative to that of other approaches to achieving State objectives.

Block Grants -- A correlary to the concept of revenue sharing for resource and environmental programs would be to establish block grants for water resources management and development. This would put the States in the position of executing water management programs now carried out by Federal agencies. The net result might be a choice of better projects rather than merely a selection of those for which Federal authority exists or funds can be obtained.

River Basin Planning -- The comprehensive river basin planning program being conducted under the direction of the inter-agency

Water Resources Council and the regional River Basin Commissions provides still another option for setting water project priorities. This approach is similar to a Planning, Programming, Budgeting (PPB) system in that it considers a network of projects over a period of years. The purpose is to develop estimates of needs and set priorities. The program is carried out on a cooperative basis by Federal water agencies and their State counterparts.

The comprehensive planning effort could provide information for budget allocations to river basins in the same manner as the regional allocation approach cited previously.

Public Law 89-80 states that the River Basin Commissions shall "recommend long-range schedules of priorities for the collection and analysis of basic data and for investigation, planning, and constructions of projects." To date, however, the comprehensive planning effort has not been effective in establishing priorities. One problem is that it is difficult for an inter-agency group to be unbiased towards its projects. The outcome has been more of a shopping list of projects than a plan of action based on "hard" priorities. Further, the recommended program is often large relative to budget levels and tends to include something for all agencies. Another deficiency is the lack of national coverage of the River Basin Commissions.

State Allocation -- States can also be used as the primary geographic area for distributing water project funds and setting priorities. Such an approach is consistent with President Carter's intent of having the State's play a more dominant role in water resources development and management.

Senate bill S. 1241, the "National Water Resources Policy and Development Act of 1979" would do just that. The Water Resources Council would be the coordinating and, in some cases, the decision-making body. The bill would also require that the States hold public hearings as they develop annual lists of water project priorities. A sum of \$4 billion would be annually allocated to States for building water projects. The allocation formula would distribute funds to States based half on population and half on land area. States or local interests would also be required to put up 25 percent of a project's costs.

The allocation formula takes subjectivity out of the process but overlooks the severity of water problems and water needs as a part of its determining mechanism. This could be a serious shortcoming. The criteria used by the Corps in setting their regional allocations might be the basis for a modification of the formula. In addition, a provision for revising the State allocations on some time interval such as five years would be worth considering. The needs of the State's will not remain fixed over time.

For any State-oriented prioritization system to be effectively implemented, creditable priority setting procedures will have to be developed or adopted by the States.

Multilevel Allocations -- Like water, water resources problems are not uniformly distributed across the Nation. A critical water issue in North Dakota might not be exhibited elsewhere. On the other hand, water quality degradation is a national problem. This suggests that a procedure for developing and coordinating priorities on national, regional and State levels is needed. S. 1241 addresses this issue and provides for, or alludes to, all levels of prioritization. It further supports the notion that some allocation of funds should be made on a similar basis. The national prioritization called for by the bill does not seem to be coordinated with State and regional prioritizations, however, and some linkage is needed. In addition, the bill does not provide guidance on criteria for setting the several levels of priority.

An approach which might be taken to coordinate the priority-setting process could begin at the State level with these entities determining the seniority ranking of their individual needs. This prioritization could then be subjected to a regional forum of States and appropriate Federal agencies, such as the RBC's. A regional or river basin schedule for projects could then be used to designate "special regional projects." In concert with the regional coordinating bodies, the Water Resources Council, using regional prioritization reports and other information such as that contained in its National Assessment, could establish national priorities. Success in this effort would require a more dominant State role and the appropriate

authorities to complete the job. Criteria for priority-setting could be established at the national, regional and State levels by the WRC; RBC's or appropriate counterparts working with the States; and the States respectively.

Closing Note

An optimal prioritization process would likely include the elements of many of the specific processes previously discussed. Some aspects deserving attention are:

- the need to include the budget authorities of all major construction agencies including EPA.
- coordination of planning and budgeting processes so that they can be subdivided into similar categories. i.e.. construction, operation and maintenance, etc.
- provision for regional (river basin, State, etc.) and project purpose budget tradeoffs.
- use of the WRC's National Assessment and the comprehensive river basin studies as guides for identification of critical water problems and needs.
- development of effective communication links among national, regional and State and local prioritization systems.
- provision of a consistent technical prioritization mechanism which can adequately guide the political decisions which will have to be made
- incorporation of a planning horizon such as five years.

INTRODUCTION

Historically, the selection of water resources projects has taken place in the political arena -- the result of bargaining. Companion program development and funding have stemmed from special interest group pressures, Congressional wishes, crisis situations and prevailing societal attitudes. Further, programs and projects related to similar issues are often implemented with little or no coordination and with scant attention given to their importance in the "grand scheme of things."

In view of limited fiscal resources, expanding environmental pressures and escalating energy problems, Federal initiatives in water resources should be those whose outputs maximize benefits to the Nation. Implied is the need for a priority-determining mechanism which can operate at national, regional, and State and local levels. This issue, which deserves Congressional attention, raises many questions requiring answers if the current decision-making process is to give way to one based on a more balanced view of: (1) the importance of water resources development and management to the achievement of national objectives; and (2) the allocation of limited fiscal and other resources to those water programs and projects which will yield the greatest pay-off to society.

It is the purpose of this study to review current prioritization processes at the several levels of government, to set forth alternative priority-setting strategies which could be implemented to achieve a better national and regional focus and to explore the processes by which those alternatives might be activated.

FEDERAL AGENCY APPROACH TO PRIORITIZATION

There is considerable variability in the extent and nature of prioritization processes used by the Federal water resources agencies in developing their programs. Except for the Corps of Engineers, most internal rankings have been on the basis of individual project merits or purposes rather than on the basis of river basin or regional considerations. For the most part, inclusion of water projects in agency budget proposals only depends upon satisfying the criteria set forth in the Principles and Standards (P&S) for Planning Water and Related Land Resources.

U.S. Bureau of Reclamation

The U.S. Bureau of Reclamation (BR) does not have a formal prioritization process for new water project construction starts. If projects meet the criteria set forth in the P&S, they are included in the Bureau's budget request. A prioritization scheme for evaluating energy development proposals has been developed, however, and could be extended to water resources projects.^{13/14/} The approach uses 12 weighted evaluation factors and according to one water expert, the BR system ... "has been extensively used and is presently being considered by the Corps of Engineers for their national study of low head dam electric power generation."^{8/}

Tennessee Valley Authority

The Tennessee Valley Authority (TVA) has not developed a methodology to rank water resources projects.^{15/}

Soil Conservation Service

Within the Soil Conservation Service (SCS) primary responsibility for the selection of program elements rests with local districts.^{16/} SCS assigns a priority based upon State recommendations, a review of river basin studies, and consultation with other Federal agencies. There is currently a large backlog of projects and their implementation (thus prioritization) is based mostly on local sponsors being ready with their share of funds. Projects meeting the requirements of the P&S are usually built without regard to their relative merits.

Corps of Engineers

The Corps of Engineers (CE) does not have a strict numerical system for project ranking but it does address the issue and has done more in terms of formal prioritization than other construction agencies.

In the late 1960's, the Corps designed a five-year regional allocation program for developing the Nation's water resources.^{12/18/}

This program consisted of civil works projects to be initiated over a five year span. It was to be updated annually, providing the basis for the yearly budget selection of new construction and planning starts. Two basic decisions are required to formulate the five-year program. They are:

- the total cost of the civil works five-year program, and
- the allocation of funds available for civil works among the Corps' major regions. 18/

The budgeting system is based on the assumption that the above decisions should be made prior to the selection of new construction starts and prior to determination of the level of funding of continuing construction projects (see Appendix A for additional details).

The regional allocation criteria considered by the CE in formulating their five-year program are as follows:

Regional water needs -- Regions having the highest level of projected water resource needs receive the most funds.

Federal income taxes paid -- Regions paying the greatest amount in Federal income taxes receive the greatest amount of funds.

Population -- Regions having the greatest number of people receive the greatest amount of funds.

Population and per capita income -- For two regions having the same population, the one having the lower per capita income receives the greater amount of funds.

Efficiency -- Regions having the projects with the highest benefit/cost ratio receive the most money.

If population, per capita personal income, water resource problems and local attitudes relative to water resources development were the same in all regions there would be little to commend the regional allocation process. The high degree of variability among the Nation's regions supports the merits of such an exercise, however. Regional analysis is also appropriate when various grant programs such as those for water resources, highways, and economic development are in competition and may be substituted to achieve regional objectives.

The Corps notes that the use of regional allocations implies only a relative and not an absolute commitment to regions; that is, no suggestion whatever is made of the amount of money that should be allocated to the civil works programs as a whole, nor is there any implication that the Federal Government owes a particular region some specific amount of funds.

The Corps multi-year civil works investment program requires a simultaneous examination of all projects in each region for a five year period. If a more attractive project is available in four years relative to one ready in the budget year -- and if budgetary conditions preclude the selection of both projects -- the more attractive project in the more distant year is chosen over the less desirable project available in the current year. According to the CE, it is this property of the multi-year program -- the selection of budget year starts only after the projects available for the next five years have been analyzed -- which makes it a potentially powerful management tool.

Several alternative ways of formulating a multi-year civil works program have also been considered by the Corps. These alternatives are all based on a "national order of merit" ranking of available projects. The ranking mechanism is the benefit/cost ratio or variations thereof.

Since implementation of the CE five-year regional allocation program, the President has announced his project selection criteria and other events have occurred to modify the original prioritization process. The concepts are still used but there has been a shift back from regional allocations to the more traditional project by project

evaluation. This change has resulted primarily from: (1) the mandate in the President's June 6, 1978 water policy message to evaluate water resources projects on the basis of new or modified criteria;^{9/} (2) a decrease in the number and total cost of available new construction starts, making regional allocations less meaningful (some regions have few if any new CE starts proposed for a given year), and (3) the practical aspect of considering OMB's selection criteria which are geared to priority-setting on a National basis which emphasizes such water development purposes as M&I water supply and urban flood control.

The Corps, according to current budget guidance established by the Administration (1979), is programming on the basis of a total commitment of \$500,000,000 per year for new construction starts (a \$2.5 billion five-year program). There is an attempt to select projects in regions that have not had recent regional allocations but the available project mix does not always permit this. More time appears to be devoted now than in the past to the review of individual project merits and the consideration of environmental factors. Prioritization by purpose rather than by regions seems to be the rule.

Environmental Protection Agency

There is an established procedure for awarding construction funds. In order to qualify for an EPA construction grant

an applicant must be a public entity authorized to dispose of municipal or industrial, sewage or some other type of waste. In addition, the applicant must be authorized to design, plan, finance, construct, operate and maintain sewage treatment works. The types of projects eligible for P.L. 92-500 grants are:

- those sewage treatment plants which provide a minimum of secondary treatment;
- interceptor and outfall sewers;
- sewage collection systems including pumping stations, but the prospective community must have been founded prior to October 18, 1972;
- combined sewer overflow control systems which include the reduction, treatment, storage, separation or disposal of wastewaters.

Up to 75 percent of a project's costs can be financed by a construction grant. Projects falling under the first two categories above are given priority by EPA and States because they are deemed most critical.^{20/}

Each State receives yearly funding and it is the individual State which has the responsibility to rank projects. In setting

priorities, each State must consider the degree of pollution problems, the inhabitants affected in a community, the need for maintaining high quality waters, national priorities and additional factors a State acknowledges as important to address.

Further, any project judged entitled to a grant must be certified by its home State as having priority over other projects and a State's priority list is subject to a public hearing. If a high priority project has been selected to commence but the local agencies involved are not financially or technically ready, a lower priority project may be selected providing that the community in question has the necessary funds to go ahead.

Prioritization in water quality management is much more a judgmental issue than it is in assigning construction grants. Tough water quality assessment standards are set by States and they are based on the severity of the problem. Furthermore, a State decides if action is warranted. A State-EPA agreement is formulated designing a strategy for water

quality protection. Prioritization occurs at the State level only, with EPA having the oversight responsibility to review and criticize.

STATE AND LOCAL PRIORITY SETTING

There has been considerable argument that the role of the States in formulating water resources programs should be strengthened. Although water projects vary in their areal impact, they are all located within some State boundary and thus convey benefits and/or adverse consequences at that level. It is reasonable, therefore, that State and local public officials and legislators should have a greater voice in assessing the desirability of a particular project and in influencing the decision that is finally made.

Most States have developed some capability for water resources planning, either through their own initiatives or as a result of grant funds provided by the Water Resources Planning Act of 1965 (P.L. 89-80). As a result, they are more competently prepared to participate in setting priorities for water resources projects and for cooperating with Federal agencies in the design of useful water resources programs. State acceptance of water project proposals is no longer automatic, there appears to be a more sincere attempt to place water projects in their proper perspective relative to State goals.

Opponents of a larger State role argue that many States still lack the technical expertise to make competent project evaluations. There is also the belief that interstate battles over water resources projects would inhibit comprehensive river basin development. It has been pointed out, however, that competition among States on water matters has decreased and States have developed cooperative relations by working together in basin compacts, River Basin Commissions and in basin planning efforts. Other opponents of greater State involvement cite the more unstable political attitudes of Governors relative to those of the Congress and Federal agencies and the concern that States might be less prone to pursue environmental interests. Finally, many State water resources officials still feel that their interests are served best by the current Congressional authorization-appropriation system.

According to water specialists Allee and Ingram:

"[the] strongest barrier to a larger State role, the insistence of Congress upon maintaining control over the selection of projects to be authorized and constructed, is weaker today than ever before. The traditional Congressional involvement is increasingly troublesome and unrewarding. If Congress could continue to

get credit for providing some overall support for water development, hold an informal path to influencing projects as with SCS today, and yet extract itself from formal individual project choices, it might welcome the change." 1/

Increased responsibility of the States in determining water project and program priorities could be achieved by front-end cost sharing as set forth in the President's Water Policy Initiatives. This would encourage the States to carefully evaluate the merits of water projects and to select those for backing that clearly produced significant benefits. Another approach would be to shift the administration of water development programs to the States through block grants for water resources development or through resource and environmental revenue sharing programs.

Information on prioritization procedures used by State agencies is limited. According to one authority, North Carolina may be the only State or at least one of a very few known to utilize such procedures. 8/ For the most part, the priorities are determined by the Federal agencies and the Congress as they propose and support projects within individual States. The National Water Commission has placed the traditional State role in perspective.

States have legal authority under the 1944 Flood Control Act [P.L. 534] to review all Corps and Bureau projects. Where a State's interest can be perceived and the State is united behind a project, it can, of course, inform its congressional delegation. But the States are, by and large, too far removed from the authorization process to wield great influence. Interest varies from State-to-State. Sustained interest on the part of State officials comes only, as a rule, when State officials see water as a key to economic development. Water projects planned and substantially financed by Federal money tend to be looked on as Federal largesse. There is reluctance on the part of State officials to look critically on them when they cannot be exchanged for more needed programs, and there is no mechanism whereby a water project might be traded for Federal help on a highway, airport, or schools. 3/

North Carolina's prioritization procedure is based on the weighted sum of factors technique developed by Professor Ortolano 17/ of Stanford University. To use this approach, planning objectives such as economic development must be defined in terms of their components (factors). Environmental quality might be characterized by factors such as fisheries, open space, wetlands, etc. The relevant objectives are described in terms of these and the ranking criterion is the maximization of the weighted sum of the factors.

North Carolina's ranking system employs a priorities matrix listing individual water projects on the vertical axis and objective components and their weights on the horizontal axis. 8/

The sums of the products of component weights and project component ratings are ordered resulting in numeric priorities for the water resources projects considered. These are grouped into high, medium and low categories for further evaluation by decisionmakers.

Component weights are assigned by citizen advisory groups as an expression of their social preferences for the various components of a single or mixed objective. For example, in considering an environmental quality objective, a weight of 10 for wild and scenic rivers and 5 for wetlands indicates that the social preference for the former is twice that of the latter. In a mixed objective of environmental quality and economic development, if flood control is weighted as 10, both wild and scenic rivers and flood control would be equal in importance relative to public interest.

Proponents claim that the weighted sum of the factors technique is a sound conceptual approach to project ranking even though it has not yet been demonstrated in practice.^{8/} In an assessment of the procedure, Howells of North Carolina State University said:

...Its Achilles heel is the limited information base available for both planning and prioritization ... The primary initial spinoff may well be to focus attention on the dearth of information available for planning purposes. ^{8/}

REGIONAL CONSIDERATIONS

Natural hydrologic systems are not confined to State boundaries and this has fostered many regional and river basin approaches to water resources planning and development. That regional entities might be influential in prioritization processes is borne out by the efforts of River Basin Commissions to take a basin-wide approach to evaluating the importance of water resources projects and programs. The combined influence of the governors of several States could also be an important force in influencing Congressional actions. Use of five year financial plans for river basins or regions combined with regional budgeting techniques could facilitate a new focus on regional mechanisms for priority setting and give Congress the opportunity to consider packages that would be easier to ratify. If comprehensive basin planning processes can identify projects which have strong regional support, there will be opportunities to display these projects in ways that provide more relevant information about their relationship to various regional goals and to permit priority setting in a broader framework. The Appalachian Water Plan, which was designed to complement other Appalachian Regional Commission development efforts, is an example.

The original mandate to the RBC's included prioritizing the inventory of unfunded water projects in their regions. Initial attempts to implement this function produced little apparent impact

on either the Office of Management and Budget or the Congress. Unless the RBC's are to have a direct impact on project selection, the exercises they are engaging in will be of little value. The WRC's current policy on consistency does require that projects be reviewed in the context of basin plans but the extent to which this will influence decisions on project authorizations remains to be seen.

Because of the obvious advantages of treating river basins as units and the potential strength which might be gained in organizing State participation through regional arrangements, there could be merit in funding State and local participation through Appalachian type commissions, RBC's or their counterparts. Instead of direct revenue sharing or grant-in-aid funds for project support, these regional organizations could administer water resources development programs.

Unfortunately, most river basin plans have either included recommendations for action that far exceed the likely rate of investment or duck priority setting entirely. If Congressional authorizations and appropriations are to be guided by river basin planning, the character of that planning will have to be changed to accommodate political realities and downplay agency bids for expanded programs. The impact of basin planning processes on

Congressional decisionmaking has been limited although this could be modified. On this issue Allee and Ingram stated the following:

...Greater achievements for basin planning have been limited because the genesis of Congressional consideration of projects is still in initiatives emanating from localities, and projects are pushed through Congress primarily because of evidence of unified, energetic local backing and the active sponsorship of individual Congressmen... Federal water agencies do not provide a broad enough bargaining arena by themselves. State and local governmental officials can provide this. Basin planning must represent what State and local government officials and groups within the basin can agree upon, so that 'left out' interests will not regularly resort to Congress and argue to overturn plans. Earlier Congressional involvement and broader public participation in planning is necessary. Basin plans must be financially realistic if Congress is to follow them. It is not politically viable in the present day Congress to fund basin development several times the current rate of investment.

Regardless of changes in basin commissions and support for State participation, inter-agency comprehensive basin planning must stop being a one-time affair. The idea that the plan can be developed in a single effort is thoroughly discredited and politically unrealistic. Regional basin planning with constant reevaluation of proposals to meet shifts in social values, problem understanding and the availability of technical options is essential for viable political participation. 1/

U.S. Water Resources Council

The Water Resources Planning Act of 1965 (P.L. 89-80) assigned a planning review function to WRC which has implications for priority setting. The Law states:

SEC. 104. Upon receipt of a plan or revision thereof from any river basin commission under the provisions of section 204(3) of this Act, the Council shall review the plan or revision with special regard to --

(1) the efficacy of such plan or revision in achieving optimum use of the water and related land resources in the area involved;

(2) the effect of the plan on the achievement of other programs for the development of agricultural, urban, energy, industrial, recreational, fish and wildlife, and other resources of the entire Nation; and

(3) the contributions which such plan or revision will make in obtaining the Nation's economic and social goals.

Based on such review the Council shall --

(a) formulate such recommendations as it deems desirable in the national interest; and

(b) transmit its recommendations, together with the plan or revision of the river basin commission and the views, comments, and recommendations with respect to such plan or revision submitted by any Federal agency, Governor, interstate commission, or United States section of an international commission, to the President for his review and transmittal to the Congress with his recommendations in regard to authorization of Federal projects.

Although WRC has supported expenditures well over \$100 million for water resources planning through regional Comprehensive Coordinated Joint Plans (CCJPs), Level B (Basin) Plans, and special studies, the plans produced have not been used to any great extent by the States, the Administration or Congress to facilitate program implementation decisions. Major criticisms according to the WRC (Council of Members meeting, Dec. 5, 1977) are:

- (1) plans tend to be a collection of projects and programs rather than an articulated statement of management policies and strategies;
- (2) plans do not adequately provide for integrated management of water quality and water quantity and ground and surface waters;
- (3) plans focus primarily on the long-term rather than providing guidance for near- and intermediate term actions; and
- (4) no requirement exists that insures Federal management actions are consistent with comprehensive plans.

To provide a positive mechanism whereby the planning process could be used to guide water resources priority setting, the WRC issued Policy Statement Number 4 on May 24, 1978:

A statement shall be included with the annual budget submission of each member agency to the Office of Management and Budget which (1) certifies that the

agency budget submission is consistent with the appropriate regional water resource management plan(s), or (2) provides reasons satisfactory to the President such as statutory requirements or overriding national priorities or constraints, such as application of Principles and Standards, for those exceptions where the budget submission is inconsistent with the appropriate plan(s). 4/

This policy represents a Council commitment to have its plans directly considered as decision documents for States, the Congress and the Federal agencies. The consistency certification does not carry the force of the law, however, and is therefore still subject to disregard and/or political circumvention.

River Basin Commissions

The River Basin Commissions were established under the authority of P.L. 89-80. They serve as coordinators of Federal, State, interstate, local and non-governmental plans for the development and management of water and related land resources within their river basins.

Section 201 of P.L. 89-80 states in part that RBC's shall "recommend a long-range schedule of priorities for the collection and analysis of basic data and for investigation, planning and construction of projects..." The purpose of the priorities programs is to develop, by consensus, a set of regional priorities to provide guidance for the President, Congress, State Legislatures, and Federal, State and local agencies during the scheduling, funding and conduct of such programs within the basin.

The RBC's have been conducting prioritization programs each year since 1974. According to the Missouri River Basin Commission,

Use of the Commission's regional priorities has increased each year since the program began. Many of the programs documented in past year's reports have advanced toward or through implementation, at least partially as a result of their endorsement as a regional priority by the Missouri River Basin Commission.

The prioritization procedures used by the six RBC's have some variances but there is a move underway to develop a consistent methodology. The approach taken by the Missouri River Basin (MRBC) serves as an example.

The Missouri River Basin Commission (MRBC) at its fifth meeting July 11-12, 1973, adopted by consensus Policy Statement C, "Criteria and Procedures for Declaration of Priorities and Development of Commission Program." This statement provides the applied authority and contains the MRBC's basic procedure for carrying out its priority activities. The following excerpts from MRBC's Fourth Annual Report outline the procedures followed:

An MRBC standing committee on 'Study Selection and Programs' was established originally by the Commission Chairman. MRBC at its third regular meeting February 7-8, 1973, adopted by consensus a motion that expanded the responsibilities and duties of the Committee to include project and program selection and priorities. Currently, the designation is the Priorities Committee.

The prioritizing process is intended to show the priorities for water and related land resource studies, research, data collection, and implementation of projects or programs within the Missouri River Basin. First, each State is to address its needs and priorities annually by category and from a State viewpoint. However, there is need also to apply to the aggregate of these proposals consideration for their relative urgency basinwide. Thus, in fulfilling its mandate by the Missouri River Basin Commission, the Committee is to review and analyze the state proposals annually and develop basinwide priorities using an approved set of criteria. The results are an MRBC-recommended set of Basin priorities from the regional viewpoint.

While the Priorities Committee receives proposals primarily from each of the 10 Basin States, submissions may originate through other channels such

as inputs from special purpose organizations, the MRBC staff, or others. The proposals and recommended basinwide priorities of the Committee may be adjusted or supplemented by the Missouri River Basin Commission. Final approval, publication, and distribution of the annual report on Basin priorities is the responsibility of the Commission.

Except as noted previously, in this year's effort for the fiscal period 1979-1981 and for the fiscal year 1978 where applicable, the Commission has addressed the following six categories for which proposals were submitted by the States and where both State and regional priorities were established: (1) Basic Data Collection, (2) Planning-Related Research, (3) Special Studies, (4) Regional or River Basin Planning, (5) Implementation (Feasibility Grade) Studies, and (6) Implementation (Structural and Non-structural) Programs or Projects. Because of basic differences in nature of the six categories, an individually adopted description and justification format was used in providing information for each State proposal. While similar, the criteria and formats for each category were designed to provide the information necessary for Committee consideration and evaluation of each proposal in terms of.... applicable parameters... 5/

While there has been some evidence of improved prioritization mechanics by the RBC's, their efforts have not significantly impacted Congressional or other decisionmaking processes. Currently, the RBC's are considering a uniform prioritization process which classifies water resources projects into three categories: highest priority, high priority and priority. This system still tends to skirt the issues and is further weakened by the lack of authority the RBC's have to enforce their decisions.

CONGRESSIONAL SELECTION PROCESS

Water resources projects sent by the major construction agencies to Congress for authorization are referred to the appropriate House and Senate Committees for review. Projects which have social merit and political support are generally received with favor. Although economic efficiency is an important criterion in the selection process, strong political support at the State and local levels is essential for positive action. For example, the Polecat Bench Project (Wyoming) was authorized (1976) because of its rural development and social well being merits even though it did not pass the economic efficiency test.^{7/} The trend by Congressional Committees in recent years has been to submit project packages for authorization, making it more difficult for the President to reject their proposals.

Congress is disposed to building projects in response to political demands for them. Water projects usually distribute benefits directly to Congressional constituencies while indirectly allocating costs. Thus, the political rewards for bringing home a project are easily accounted for while the costs are diluted through funding mechanisms. Congressional prioritization then is strongly flavored by the desire to accommodate constituencies. This is not always compatible with building either the best or most needed projects within a region.

Once a project has been authorized, funds must be appropriated if it is to reach fruition. Appropriations committees generally use the same selection criteria as authorizing committees. Projects already under construction are usually given priority as are multi-purpose over single purpose projects. Allee and Ingram note that:

- (1) The Appropriations Subcommittees have to be pushed into a new start. As a Senate staff man remarked, 'The Appropriations Committee is not interested in an authorized project which has not been asked for.' Who asks is important in the Subcommittee's decision. The leadership is more influential in getting what it wants than the run-of-the-mill Congressman or Senator.
- (2) A new start must represent some sort of geographical balance.
- (3) A new start is more likely if the project appears to be an emergency situation.
- (4) A project is more likely to be funded in a ... region where the agency has excess capacity.
- (5) A new start is more likely to be funded if the project is a small one with a modest immediate expenditure. Congressional Appropriations Subcommittees are very sensitive to the overall cost of the bundle of projects they recommend for funding. Adding big projects tends to push the total above what Committee members identify as comfortable. In the Senate Appropriations Subcommittee, the chairman, the chief staff man, and perhaps a ranking member or so get together before the mark up where new starts are distributed and set some outside limit of what the Committee will add above what OMB and the House Appropriations Committee recommend.

- (6) The position of the Office of Management and Budget carries some weight in the choices made by Congressional Appropriations Subcommittees. It helps a project to be included in the budget when new starts are distributed. If opposition surfaces against a budgeted project, though, it may well be taken out. 'Add-ons' are fairly common.
- (7) Increased funding levels including new starts depend upon the degree of support committee members perceive within Congress for water development projects. Members get this sense from the number of letters and statements from Congressmen. 1/

Since the beginnings of the environmental movement in the 1960's, the support base for water resource development at the local level has been slowly changing. Many water development advocates have found an increased number of other public programs that offer easier-to-come-by or more attractive rewards. This has resulted in a shift in the pool of potential local supporters, if not a reduction. In view of this, there is the need to question whether changes in project selection mechanisms in the Congress, the Executive Branch and at State and regional levels might not be in order.

One possibility is that Congress might extract itself from some of the detailed decisionmaking in water resources and approach the subject more programmatically. To do this, a mechanism would be needed which would let Congress get credit for construction activity but relieve it of working out the fine points of projects

and their timing. The program developed would have to be one that Congress could endorse comfortably, however.

There is evidence that when projects are small, non-controversial and require a minor commitment of Federal funds, Congress is willing to let Federal agencies make decisions. This has been the case for small projects sponsored by SCS, CE, and BR. For example, Congress has delegated considerable authority over the selection of specific projects to the SCS. In general, where project costs are less than one million dollars, the SCS State Conservationist can approve them and if funds are available, initiate the projects immediately. Larger SCS projects receive greater Congressional attention, but are not subjected to the project by project authorization and funding processes used on large BR or CE projects. In this case it is the program that is examined.

It might be possible to extend the practice of giving greater selection authority to the agencies while involving the Congress in a more comprehensive review of river basin or regional plans and capital budgets. Both Congress and the agencies would have to reach agreement on ground rules to make this work, however. It would also be necessary to assess the policy consequences of such a move. Support for water projects is usually generated at the local level and Congressional interest is tied to this constituency. If this relationship is disturbed by a more programmatic

approach, Congressional backing might not be as intense and the result could be less Federal support for water development. On the other hand, delays in authorizations and appropriations would probably be reduced by such a mechanism. In addition, Congress could be freed of the burden of many detailed project reviews and could use the time made available to more carefully set priorities and assess the merits of major programs and projects.

Another aspect of Congressional prioritization and selection of water projects deserving attention is that Congress does not deal with river basins or regions in making decisions. Regardless of the coordination which the construction agencies achieve in river basin planning, projects forwarded to Congress are categorized by lead agency and then assigned to the appropriate Congressional committees for consideration. Congress has ^{1/} never really reorganized to handle water in a unified fashion.

The fragmentation in Congressional assessment of water projects is directly linked to the way individual Congressmen perceive the issues. Historically, each legislator has set his priorities mostly out of concern for his constituency. Water projects have strong local implications and getting Federal authorizations and funding for these is politically advantageous to legislators. Congressional committees have been organized to reflect varying features of the constituencies served and as a result, Congressmen

have resisted changes which would make committees less accessible to their principal interests.

A change in Congressional practice to deal more directly with river basin plans could be achieved through informal means and incremental changes in jurisdiction. Joint hearings could also be held on comprehensive river basin plans by concerned committees. Allee and Ingram in an analysis of this subject stated the following:

In face of the declining Congressional interest in water, the Congressional leaders who still have a stake in the field have something to gain by presenting a unified stance, and appealing to a 'rational river basin plan' as justification for their recommendations. The backing for river basin planning and authorizations could be strengthened by joint hearings leading to multiple authorizations in various committees of a basin package containing more than just water projects. Environmental concerns such as parks, recreation areas, wildlife habitats and wild rivers should be included and authorized simultaneously. This would make river basin plans truly comprehensive and broaden congressional support.

A mechanism which could increase regional or river basin planning impacts on Congressional project selection processes would be a nationwide, joint State and regional prioritization strategy. RBC's or suitable counterparts could act as coordinators. The success of this effort would depend, however, upon a greatly strengthened State role coupled with an extension of the process beyond the scope of the present Title II Commissions. In addition, new authorizing legislation providing appropriate authorities to insure implementation of this joint priority-setting process in terms of Congressional Congressional decisions would also be needed.

Presently, basin organizations have not developed plans against which agency proposals are rigorously tested for suitability and rejected or approved. Such a mechanism would be needed if regional considerations are to be adequately reflected in priority setting. Unless the Congress and the States agree, however, to this type of approach, it will not come about.

EXECUTIVE ROLE IN PROJECT AND PROGRAM SELECTION

OMB reviews projects and programs that water agencies recommend be included in the President's Budget. Agency recommendation not conforming to OMB's interpretation of the Administration's views are opposed although the President has the final word on selection. Allee and Ingram summarized the criteria used by OMB in its decisionmaking process:

- (1) The benefit-cost ratio is of consequence to OMB. One representative of the OMB stated that much more than a unity benefit-cost ratio was a pre-requisite for acceptance.
- (2) The size of the budget commitment represented by the project is influential in OMB choice. The initial impact upon next year's budget is important, but important also are the long-term impacts upon future budgets. Projects take a number of years to complete, and once a project is started, it is often expensive to stretch out the construction period by reduced funding. OMB is conscious of how much each project will cost spread over a number of years.
- (3) The purpose of a project may be important in its selection. OMB is accused and some Budget officials admit that there is a bias against irrigation projects of the Bureau of Reclamation and preference for projects with municipal and industrial benefits.
- (4) Repayment arrangements may be important. Where local areas demonstrate in a visible way their intention to reap substantial shares of construction costs, OMB may favor the project in its selection.
- (5) The political support which a project may represent for the President is a criteria few OMB officials will speak of but none will deny. Where a project is badly needed by a Congressman or Senator of the President's party who faces an uncertain Congressional election campaign, OMB will have the matter called to its attention. 1/

Once the water agencies' budgets are prepared, they are sent by the President to Congress for its review and decision on appropriations.

In his June 6, 1978 message on water policy the President stressed the need to apply specific measures in selecting water projects for inclusion in the Federal budget. Criteria were prescribed to guide Presidential decisions on annual funding of water projects and authorization and appropriation bills, including the selection of new planning and construction starts. They were:

- Projects should have net national economic benefits unless there are environmental benefits which clearly compensate for any economic deficit.
- Projects should have widely distributed benefits.
- Projects should stress water conservation and appropriate non-structural measures.
- Projects should have no significant safety problems involving design, construction or operation.
- There should be evidence of active public support including support by State and local officials.
- Projects will be given expedited consideration where State governments assume a share of costs over and above existing cost sharing.
- There should be no significant international or intergovernmental problems.
- Where vendible outputs are involved preference should be given to projects which provide for greater recovery of Federal and State costs, consistent with project purposes.
- The project's problem assessment, environmental impact, costs and benefits should be based on up-to-date conditions.
- Projects should comply with all relevant environment statutes.
- Funding for mitigation of fish and wildlife damages should be provided concurrently and proportionately with construction funding. 9/

These criteria are essentially a reinforcement of the evaluation aspects of the P&S combined with more explicit considerations of safety, cost sharing, and enforcement of environmental statutes. The provision for giving preference to projects where States provide more than the required level of cost sharing has merit when considered from the Federal point of view, but could place poorer States at a disadvantage when competing for project funding.

Finally, Executive Orders 12113 and 12141 dated January 4, and June 5, 1979 respectively, directed WRC to ensure that an impartial technical review is performed on pre-authorization reports or proposals and pre-construction plans for Federal and Federally-assisted water and related land resources projects and programs. If the Orders are implemented (currently delayed due to Congressional consideration), it will be mandatory for agencies to submit plans and reports on projects to WRC for review. This submission must be at least 90 days before documents are forwarded to OMB to support authorization or funding requests for the next fiscal year. Reports submitted to OMB must be accompanied by a statement of the findings by WRC and transmittal to Congress must include a statement of the advice received from OMB.

While agency water projects, proposals or plans needing Congressional authorization or appropriations will still require OMB clearance, WRC will evaluate a project's technical compliance with required planning procedures. OMB will accept WRC's technical report and not duplicate its work. This constitutes a significant change in OMB's role.

FACTORS IMPACTING ON PRIORITIZATION PROCESSES

Many factors can play an influential role in prioritizing water resources projects. Important ones include: the severity of water problems, financing and cost sharing, the nature of planning processes, local interest, population density, and extent of unemployment. Several of these are summarized herein.

Severity of Water Problems

A focal point for prioritizing water resources projects is the identification of water resources problems and the determination of their severity. If water projects and programs are to be meaningful to more than a few enthusiastic proponents, they should address national, regional and State and local problems. The level at which the significance of an issue is attacked will depend upon the relative expansiveness of the problem, that is, whether it is nationwide, confined to a region or river basin or to a single locality. The WRC's National Assessment and Continuing Assessment and Appraisal Programs could serve to identify water resource problems, classify their severity and determine their relative scope.

A system for determining national priorities based on the cataloging of water resources problems was proposed by water resources consultant Bromley in a study for WRC.^{2/} His scheme for arriving at priorities involves two steps. The first is

to classify identified water and related land resources (W&RLR) problems by scope of interest: is it a national problem, or is it in the national interest to resolve it? The second step is to classify the problem based upon the appropriate governmental jurisdiction to address it.

Figure 1 shows Bromley's classification scheme in which there are eight possible groupings, four representing problems in which there is a national interest and four in which there is no national interest. After this classification is made, the problems are scaled on the basis of the impact of not solving them. Bromley's suggested ranking scheme for these effects includes three categories: (1) effects on human life; (2) economic effects; and (3) resource-related effects.^{2/} A scale of 1-3 (denoting low, medium and high effects), is used to characterize the relative importance of not solving the problem on each of the three categories.

After the W&RLR problems have been classified by the scope of their national interest, the implications for different levels of government identified, and they have been scored on the severity of the effects of not solving them, Bromley suggests that they be ranked in two directions. The first is on scope of interest and the second is on effects of not solving. The need for this two-directional ranking scheme is described in the following manner:

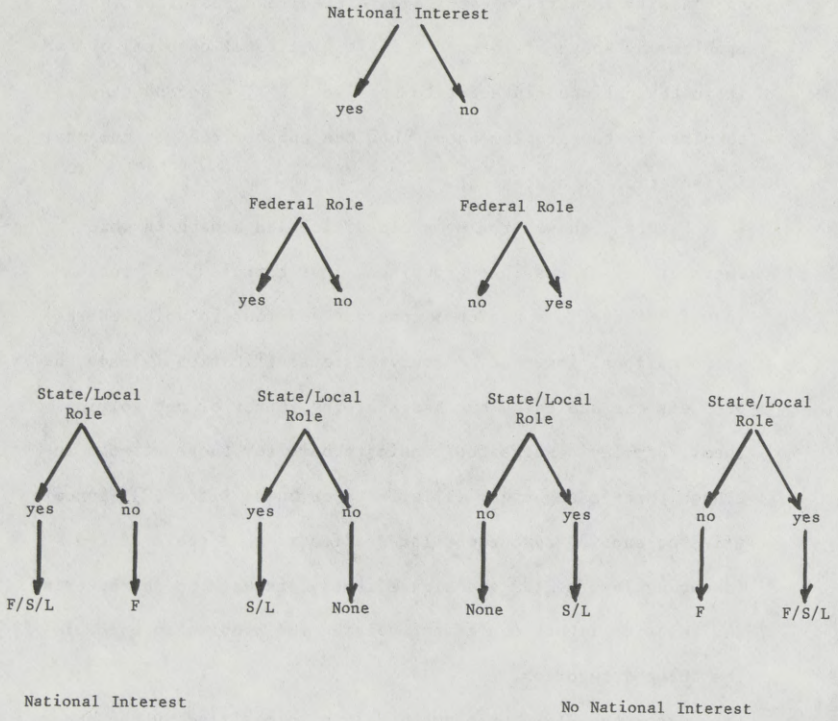


FIGURE 1.--BROMLEY'S CLASSIFICATION SCHEME FOR W&RLR PROBLEMS

Our definition of what is currently in the national interest evolves from the presence of certain legislative or executive actions which have identified certain W&RLR problems as national in scope. An example of this is the water quality area; 10-15 years ago this would not have surfaced as an area of great national interest. The same reasoning holds for the public sector implications. The second ranking scheme may result in the identification of certain very serious W&RLR problems (in terms of the effects of not solving them) which are not yet recognized as of national interest, and for which there is no clear direction to the Federal government for leadership. Throughout it should be recognized that once the proper level of public-sector involvement has been identified, there is still the matter of deciding on the proper form of public sector involvement; that is, as facilitator, as inducer, or as enforcer. 2/

This problem oriented ranking process is designed to be carried out by region or area.

The matter of problem definition may present some difficulties due to possible differences between Federal and local or regional points of view. Federal views are often influenced by the specific focus of the major water project construction agencies. On the other hand, local perceptions of problems might be very narrow in terms of regional needs, and problem solutions suggested at this level could result in benefits to a few while missing a broader

opportunity to impact on more widely distributed regional issues. A mechanism to reconcile disparate perspectives is needed.

The ranking scheme devised by Bromley could facilitate the political process for addressing high priority problems. If, for example, the effects -- in economic terms -- of not solving a given problem are identified in the process as several times as great as the effects of not solving another severe problem, then this information could provide considerable insight into which problems deserve the most attention. According to Bromley, this requires that the

...ranking be clearly labeled as not one of priorities, but as a ranking of significant problems...To call them priorities connotes that one should start with [number one] on the list. To call them problems implies that the first one is judged by the technical experts to be of greatest severity. If the political process results in the second or next worst problem being attacked first, the [ranking agency] has not lost face, nor has it invaded the political arena (unduly). It can merely be said that there were other factors which led the political process to choose to solve problem X before solving problem E. 2/

Water Resources Planning

Water resources planning can be an effective prioritization tool. According to the National Water Commission (NWC), strategic planning as a budget function

...is concerned with specifying objectives, choosing among alternative programs to achieve those objectives, and then allocating resources among the programs. Strategic planning brings into the budgetary process those decisions about program objectives, specifications, and levels of funding which are taken as given in financial and management control functions. 3/

By grouping budget data into regional sectors, the relationship between Federal spending with priorities set in regional development plans can be obtained. The planning process is in itself a form of prioritization mechanism. The development of carefully prepared alternative plans provides a comparison mechanism for identifying tradeoffs and evaluating their consequences.

Financing and Cost Sharing

The willingness and ability of project proponents to bear its costs is a significant priority impacting factor. Thus, cost sharing and financing policies can be highly influential in decision processes. A basic premise of the President's water policy is that increased non-Federal cost sharing and revised financing arrangements will allow

States to participate more actively in project decisions.

Other related priority impacting features of the water policy are:

- Projects will be given expedited consideration where State governments assume a share of costs over and above existing cost-sharing.
- Where vendible outputs are involved preference should be given to projects which provide for greater recovery of Federal and State costs, consistent with project purposes.

Local Interest

Historically, strong local interest has been a pre-requisite for water project development. Many problems are identified at this level and the political influence wielded by local proponents is likely to continue to influence construction decisions. The form this influence takes could be directed away from the individual project focus of the past, however, to impact more directly on State, regional and national planning-prioritizing processes.

ALTERNATIVE PRIORITIZATION STRATEGIES

There are numerous strategies that can be used to prioritize water resources projects. All of them require some form of filtering and they all share the political reality of not being able to satisfy everyone.

Status Quo

The current approach to water project selection remains primarily one of project by project consideration. Most water projects have been initiated at the local level by those desiring to attract Federal funds to their areas and by the Federal agencies responsible for building them.

According to the NWC,

Congressional politics and behavior lend themselves to particularized and fragmented decisionmaking in project authorizations. When an individual Representative or Senator perceives a local stake in the authorization of a project or project survey, he can often command considerable resources in producing congressional action. Mutual respect for a colleague's constituency affairs and his acknowledged superior insight into what may be best for his district or State inhibit congressional resistance at this stage. With the aid of tacit rules of mutual non-interference and accommodation, Congressmen have ordinarily been able to obtain authorization for local projects wherever there is substantial local support for them. 3/

It seems clear, however, that traditional decisionmaking processes are undergoing some change. Broad public support for water projects is less guaranteed to legislators today and environmental issues have made water projects increasingly less attractive as constituency pleasing devices. This suggests that the time may be right for the implementation of more reasoned prioritization systems.

National Merit

The principal mechanism for prioritization by national merit is the benefit/cost ratio or variations thereof. The Corps of Engineers has enumerated three alternative procedures. These are: (1) ranking projects nationally by benefit/cost ratio; (2) listing projects nationally in an order reflecting a discounting of specific project purposes or benefits; and (3) ranking projects by a Division Engineer priority system within regions and then arrive at a national ranking subjectively.^{18/}

Ranking by benefit/cost ratio -- in this alternative, all projects are listed in descending order of benefit/cost ratio. Projects are then selected for funding from the top down until a budget constraint is reached. The advantages of this approach are its simplicity and tendency to maximize national income. Total

reliance on the benefit/cost ratio has disadvantages, however; among them are the failure to consider objectives which cannot be quantified, and the indifference to the geographic distribution of civil works investments which results from this approach.

Ranking by discounting -- this alternative consists of the modification of a list of projects ranked by benefit/cost ratios by eliminating projects having benefits considered to be of low priority or by assigning a reduced value to these benefits, thereby decreasing the benefit/cost ratios of affected projects. Reasons why one may wish to consider discounting on a national basis are that:

- some civil works project purposes may be considered inconsistent with national economic efficiency;
- the benefits attributed to some project purposes, even though consistent with efficiency, are nevertheless inflated; or
- the investment of Federal funds for some project purposes, even though encouraged by legislative actions of the President and the Congress, has low priority because the "Federal interest" in these purposes is limited. 18/

The appeal of this option is flexibility; it is not completely tied to the benefit/cost ratio. The main disadvantage is the

difficulty to determine, in other than arbitrary fashion, which project purposes should be de-emphasized. A difficulty here is that the relevance of various project purposes is not uniform throughout the nation. This approach, like that of strict benefit/cost ranking, does not permit regional considerations to be made.

Ranking by division engineer priority -- This approach is limited to CE projects.^{18/} It includes more subjectivity than either of the other national order of merit options. The Corps describes this process as consisting of two steps: ranking projects within each region according to the priority assigned by the Division Engineer, based on a consideration of project benefit/cost ratios and other quantifiable and non-quantifiable attributes; and setting priorities on a national basis. The chief advantage of this approach, according to the Corps, is the reliance on the judgment of the Division Engineer. Others might see this as a disadvantage, however.

A difficulty with this approach is that agreement on any unique set of national project priorities is very difficult since priorities vary according to the bias of each decision-maker. For example, if there were 20 regions, which project of top regional priority should be ranked first nationally and so on?

Regional Allocation

An attractive option for setting new water project priorities is to establish geographic budget allocations. In this case, an initial determination must be made concerning the budget a region should receive over time. According to an economist at Michigan State University, a principal task is to "...get some idea on the magnitude of the net returns to water investment in the various regions -- ideas strong enough to serve as a base for decisions on regional allocations, yet not requiring project analyses of all possible projects."^{11/} After regional allocations are set, tradeoffs between projects within a region can be made by agency analysts or by political representatives in the area. Benefit/cost analyses can be used to guide these.

The budget analysis system implemented by the Corps in the late 1960's typifies the process. Designed to produce information on the water resource needs of various regions and the incomes of their inhabitants, it could be used with other factors to guide decisions on regional budget allocations.

After an initial regional budget allocation is made, a five-year program of new water resources projects is formulated based on benefit/cost studies and agency recommendations reflecting local interest and professional judgment.

If regional budget allocations are held constant for a period of years, agencies and others influencing them might be encouraged to consider tradeoffs over time. The project-by-project practice, in contrast, encourages agencies to push for projects which are ready to be built even if these are judged to be less desirable than other projects which will be ready for construction in a few years.

The concept of regional budget allocations was also addressed and supported by the NWC. They said:

...The Commission has found little evidence that long-range water resource planning efforts affect the allocation of funds and resources among geographic regions in such a way as to take inter-regional needs and conditions into account.

The Commission believes that the 20 major regions used by the Water Resources Council should be incorporated into the water resource budgeting process so that the relative needs and priorities for regions are related one to another. In this connection, the Commission shares the concern expressed recently by the Joint Economic Committee about the scarcity of regional data in the Federal budget:... 3/

'The current budget document provides no information on the regional impacts of Federal spending. Without such, the Congress is seriously hindered in developing consistent national policy for regional objectives.

Moreover, because program expenditures are not broken down regionally, the priorities of localities and regions cannot influence the mix of Federal appropriations. Insofar as many Federal budgets -- including those for hospital construction, pollution control, and highways, for example -- are decided nationally the choice offered the locality or region is a take-the-gift-or-leave-it choice. The region is given no chance to say: 'Highway project x is of relatively low priority to us, while hospital project y is far more important.' Consequently, the ability of the Federal Government to respond to the need of localities and regions, as the people there see these needs, is decreased. Substantial gains would result from the formation of a regional breakdown for major portions of the budget.' 19/

Not everyone is totally enthusiastic about regional prioritization, however. The Interstate Conference on Water Problems in a 1979 questionnaire addressed to its members relative to water policy issues stated the following:

The value of establishing regional priorities has often been questioned. At times, states are reluctant to contribute to a list of regional priorities because they feel a higher priority can be achieved by dealing directly with their congressional delegation. Then too, Congress at times has not been greatly enthused by priority lists because of reducing their decisionmaking role.

Finally, as has already been pointed out, the CE has found that the number of proposed new construction starts in some regions is

currently so limited that a meaningful regional allocation process is difficult to maintain. This comment relates only to Corps projects, however.

Project Purpose

Another approach to prioritization is by project purpose. OMB follows this approach in part as it reflects the Administration's preference for certain types of projects. Urban flood control, municipal and industrial water supply and hydroelectric power generation are some currently favored purposes.

In this approach, the President, the Congress or a department head recommends a specific amount for municipal water supply, hydroelectric generation, navigation, etc. Congress appropriates funds for these categories and sets rules for selecting projects within them. An insight to how the allocation should be made among the various proposals can be gained from studies of the comparative returns of different kinds of projects. Combining this information with an assessment of the anticipated future demands for a purpose, a determination of the relative importance to be attached to it over some time horizon can be made.

Once the initial allocation to a purpose is decided, the choice of projects can be arrived at through the political system, benefit/cost analyses or some other ranking mechanism. The system described here is an allocation system analogous to that previously described for regions. Variations of this approach are possible,

however, and project purposes are considered to varying degrees in most other prioritizing schemes. For example, the ranking by discounting procedure previously discussed weights certain purposes more favorably than others.

Revenue Sharing

Water resources development could be financed through general revenue sharing. A lump sum earmarked for resource and environmental programs, for example, could enable a State to play a principal role in water project decisions. A general revenue sharing system would permit States to evaluate the trade-offs between developing water, building highways or implementing or extending other programs. Using this approach, water projects of Federal agencies would not be pursued by State officials just because Federal funding was available for that purpose.

Allee and Ingram have observed that in a revenue sharing system, some water projects would be generated through State rather than Federal plans or construction agency initiatives.^{1/} They also note that "...Federal agencies would respond by courting state decisionmakers more assiduously than today and offering their services to produce investment packages that will be more responsive to groups at the State level."

Greater State involvement in project and program selection would permit more options to be explored, water related and

non-water related, for resolving critical State problems. The burden of prioritization would be thrust upon the States and they would have to face up to political and other problems inherent in any prioritization scheme. The general revenue sharing approach would also impose, at the State level, the problem of not only prioritizing water projects but in evaluating their priority relative to that of other approaches to achieving State objectives.

Block Grants

A correlary to the concept of revenue sharing with the States for resource and environmental programs would be block grants for water resources management and development. This would put the States in the position of executing water management programs now carried out by Federal agencies. The net result might be a choice of better projects rather than merely a selection of those for which Federal authority exists or funds can be obtained. Cost-sharing requirements could be imposed to reduce the bias toward capital-intensive structural solutions to water resources problems and to shift operation and maintenance burdens to State and local governments. Former chairman of the New England River Basin Commission Frank Gregg, in support of the concept of the block grant, said:

I'm arguing that the Federal government cannot devise either direct Federal action program authorities or categorical grant programs which are sufficiently responsive to the broad and constantly shifting needs of local and State governments in water and related land management. (Address to the 1977 Interstate Conference on Water Problems).

The use of block grants for water resources would not rule out Federal agency involvement in projects of interstate, regional, or nationwide interest. The water management grant program could be administered by one of the Federal water agencies. These could also act as engineering consultants to the States. As in the case of general revenue sharing, the prioritization burden would be shifted to the States.

Block grants have several attractive features. These include: greater flexibility, i.e. a wider choice of programs; the potential for cost sharing provisions to encourage more efficient use of funds; and shifting of prioritization processes to States, thereby minimizing Federal agency biases and tendencies to further their own programs.

Under one of the Department of Housing and Urban Development's block grant programs, the grants may be used to pay for various local services. They also provide for units of local government to contract with local agencies or nonprofit organizations to carry out part or all of their programs, and they can authorize cities the discretion to design their own programs and establish priorities conforming to statutory standards and program regulations.

Finally, some drawbacks to block grants are that they: add yet another layer while not necessarily eliminating Federal involvement; may be more of a financial burden to some States; and could reduce or eliminate other funds presently earmarked for water projects in the West.

River Basin Planning

The comprehensive river basin planning program being conducted under the direction of the inter-agency Water Resources Council and the regional River Basin Commissions provides still another option for setting water project priorities. This approach is similar to a planning, programming, budgeting system (PPB) in that it considers a network of projects over a period of years. The purpose is to develop estimates of needs and set priorities. The program is carried out on a cooperative basis by Federal water agencies and their State counterparts.

The comprehensive planning effort could provide information for budget allocations to river basins in the same manner as the regional allocation approach cited previously. It is a reconnaissance which generates adequate data for budget planning at the river basin level in terms of both regional and purpose priorities. A limiting factor on the process, as it now stands, is the lack of a mechanism for making inter-basin comparisons.

Public Law 89-80 states that the River Basin Commissions shall "recommend long-range schedules of priorities for the collection and analysis of basic data and for investigation, planning, and construction of projects." To date, however, the comprehensive planning effort has not been effective in establishing priorities. One problem is the difficulty an interagency group has divesting itself of bias towards its projects. The outcome has been more of a shopping list of projects than a plan of action based on "hard" priorities. Further, the recommended program is often large relative to budget levels and tends to include something for all agencies. Another deficiency is the lack of national coverage of the River Basin Commissions.

Through the years, many study groups and commissions have recommended river basins as the logical subdivision for a water resources development focus. In its 1950 report, the President's Water Resource Policy Commission said:

The financing of the nation's river basin programs should be set up on a long-range basis, with each annual budget request therefore subdivided by river basins. These budget requests, in turn, should be subdivided by projects, functions, and agencies. To obtain these results, Congress should direct all Federal agencies to submit their budget requests, insofar as they involve water resources, by river basins. The entire procedure should result in 6-year river basin capital investment programs and annual budgets, originating in the agencies, coordinated by the river basin commissions, and reviewed by the Board of Review for submission to the Bureau of the Budget. Congress should make an annual appropriation to each river basin commission for its activities. 10/

The National Water Commission in its 1973 report noted:

River basin and regional planning in the future may contribute more concretely to program and project authorization than it has in the past. Experience in river basin planning under the Water Resources Planning Act and other legislation to draw together Federal and State plans for resource development and land use may ultimately produce river basin or regional plans of tangible usefulness to Congress. 3/

They also recommended that:

Comprehensive river basin and regional development plans should be used as the basis for authorization and appropriation of funds for individual projects and programs within regions. The same geographic regions should be used as a basis for decision in both the water resources planning and in the budgeting processes -- the major water resource regions of the Nation used by the Water Resources Council in the National Assessments. 3/

The procedures for setting regional allocations and then assigning priorities within regions developed by the CE are directly transferrable to river basins.

State Allocation

States can also serve as the primary geographic areas for allocating water project funds and setting priorities. Such an approach is consistent with President Carter's intent of having the State's play a more dominant role in water resource development and management. 9/

The special character of the State role was also recognized by NWC. They said:

...Opportunities can be taken to make use of those State capabilities for resource planning that have

improved since enactment of the Water Resources Planning Act. Allowing projects to be generated out of State and regional planning efforts permits proposals initiated in localities to be decided at a governmental level close to the localities. The effects of a project upon population, income, employment, and the environment have their greatest incidence at the local level and State and local officials may be able to judge most accurately whether or not a project is desirable. 3/

Senate bill S. 1241, the "National Water Resources Policy and Development Act of 1979," would shift the selection of water projects from the Congress to the States. The Water Resources Council would be the coordinating and, in some cases, the decisionmaking body. The bill would also require that the States hold public hearings as they develop annual lists of water project priorities. A sum of \$4 billion would be annually allocated to States for building water projects. The allocation formula would distribute funds to States based half on population and half on land area. States or local interests would also be required to put up 25 percent of a project's cost.

The allocation formula takes subjectivity out of that process but overlooks the severity of water problems and needs as

a part of its determining mechanism. This could be a serious shortcoming. The criteria used by the Corps in setting their regional allocations might be the basis for a modification of the formula. In addition, a provision for revising the State allocations on some time interval such as five years would be worth considering. The needs of the State's will not remain constant over time.

Although incorporation of the severity of water problems in a prioritization formula would be highly desirable, this is easier said than done. It cannot be accommodated in the straight-forward fashion of population or land area. Human judgment is required and this, of course, lays open the potential for introducing personal biases, political pressures, etc. One scheme for addressing this problem is the establishment of an independent panel of nationally recognized water resources experts. They could periodically assign weighting factors to problems for each State. These factors could then be introduced into a prioritization formula along with population, land area and other quantifiable parameters. The best available data from the States, RBC's, WRC's national assessment and other sources could serve to guide the factor setting process.

For S. 1241 or any other State-oriented prioritization system to be effectively implemented, creditable priority setting procedures will have to be developed or adopted by the States. North Carolina's experience ^{8/} in this could serve as a data base.

The attraction the State-oriented system has that the regional or river basin systems do not have is the political strength and solidness with which a State would likely support its proposed programs as opposed to the more compromising situation which could often result when focusing

on a larger region. There would also be considerable political strength generated because under this system each State would get some share of the pie while in a regional system some States could easily be left out.

Multilevel Allocations

Like water, water resources problems are not uniformly distributed across the Nation. A critical water issue in North Dakota might not be exhibited elsewhere. On the other hand, water quality degradation is a national problem. This suggests that a procedure for developing and coordinating priorities on national, regional and State levels is needed. S. 1241 addresses this issue and provides for or alludes to all levels of prioritization. It further supports the notion that some allocation of funds should be made on a similar basis. The national prioritization called for by the bill does not seem to be coordinated with State and regional prioritizations, however, and some linkage is needed. In addition, the bill does not provide guidance on criteria for setting the several levels of priority.

An approach which might be taken to coordinate the priority-setting process could begin at the State level with these entities determining the seniority ranking of their individual needs. This prioritization could then be subjected to a regional forum of States and appropriate Federal agencies, such as the RBC's. A regional or river basin schedule for projects could then be used to designate "special regional projects." In concert with the regional coordinating bodies, the Water Resources Council, using regional prioritization reports and other information such as that contained in its National Assessment, could establish national priorities. Success in this

effort would require a more dominant State role and the appropriate authorities to complete the job. Criteria for priority-setting could be established at the national, regional and State levels by the WRC; RBC's or appropriate counterparts working with the States; and the States respectively.

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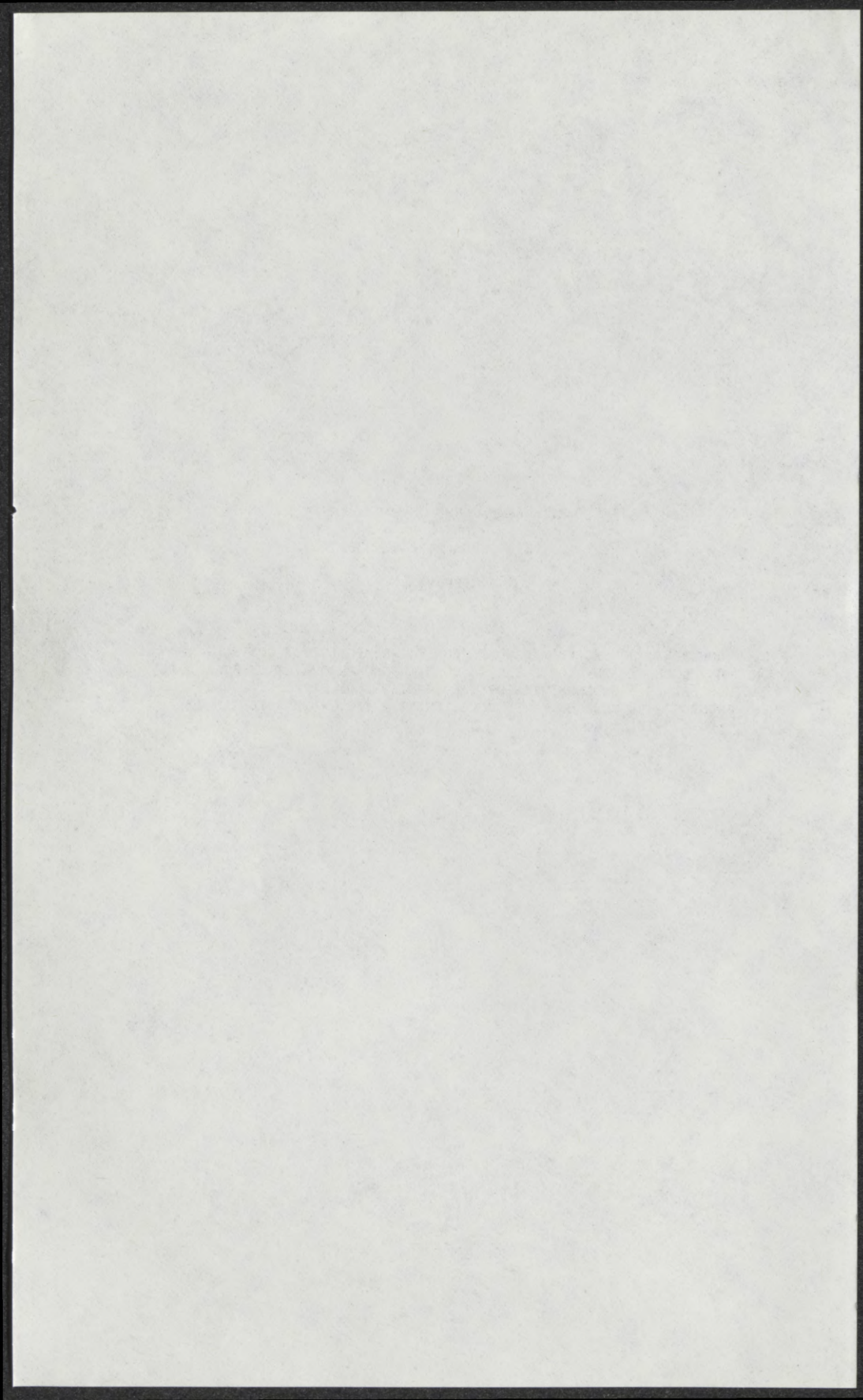
APPENDIX

U.S. ARMY CORPS OF ENGINEERS

CIVIL WORKS PPB FACT SHEET

FROM

U.S. CONGRESS, HOUSE, PUBLIC WORKS FOR WATER, POLLUTION CONTROL, AND
POWER DEVELOPMENT AND ATOMIC ENERGY COMMISSION APPROPRIATION BILL 1971
HEARINGS BEFORE A SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
91ST CONGRESS, 2D SESSION, U.S. GOVT. PRINT. OFF., WASHINGTON, D.C.,
1970, pp. 173-181.



ESTABLISHING PRIORITIES FOR THE CIVIL WORKS PROGRAM

Basic Decisions

The Department of the Army has a five-year program for the development of the nation's water resources. This program, consisting of civil works projects to be initiated over the next five years, is updated annually, and provides the basis for selection of budget year new construction and planning starts. Two basic decisions are required to formulate the five-year program and thus establish priorities for the civil works activities of the Army Corps of Engineers. The two decisions are:

- the level or total cost of the civil works five-year program, and
- the allocation of funds available for civil works among the 19 major regions of the nation.

The budgeting system used by the Corps of Engineers is based on the assumption that these two decisions should be made prior to the selection of individual budget year new construction starts and prior to determination of the level of funding of individual continuing construction projects. The system is designed to help those who bear the burden of responsibility to make these decisions. The budgeting system itself makes no decision. It organizes information necessary for decision.

Level of the Civil Works Program

During the five-year period FY 1966-70 the President and Congress started construction on civil works projects having a total Federal cost of \$2.9 billion. Should this same figure be used by the Army Corps of Engineers in planning a program for the next five-year period FY 1971-75?

Regional Allocation of Civil Works Funds

In making the \$2.9 billion commitment during the past five years, the President and Congress gave priority to certain regions over others. For example, as shown in table A, column (5), the Columbia-North Pacific region received the greatest amount of money for new

starts, 19 percent of the total, followed by the Ohio and California regions with 16 and 12 percent respectively. These are the priorities established by the President and Congress in the past, and the only question now is whether these same priorities, with Columbia-North Pacific region receiving twice as much for new construction starts as the Middle Atlantic region, should be used for planning the FY 1971-75 program.

Priorities established in terms of total cost of construction started in past years, as discussed above, are crucial; they not only set the upper limit on the total amount of funds to be spent in a particular region but also on that region's annual appropriation. The truth of this is demonstrated by table A, column (4). For example, the two regions -- Columbia-North Pacific and Ohio -- which received the greatest amount for new starts in the past also receive the greatest amount of annual funds.

Criteria for Regional Distribution of Funds

It is clear that as a result of actions taken by the President and Congress on the annual budget that certain regions receive more funds than do other regions. And this happens whether or not systematic analysis is used. Obviously there is a choice: either to be concerned about the distribution of funds before new start decisions are made or after they are made. If the choice is to be concerned about these decisions before they are made, there is a greater chance to assure equitable treatment of the people of each region. This -- and not spreading projects around "... so that somebody gets a little something" -- is the goal of regional allocation of the civil works budget, whether equitable treatment means a zero allocation or a 25 percent allocation to any particular region.

A number of criteria are available and have been considered to assure equitable treatment of regions. Each decision-maker who bears responsibility for the civil works program must decide for himself -- no computer is able to decide for him -- which criterion or combination of criteria best achieves this goal.

The regional allocation criteria considered by the Army Corps of Engineers in formulating the five-year civil works water resource program are as follows:

Regional water needs - Regions having the highest level of projected water resource needs receive the most funds.

Federal income taxes paid - Regions paying the greatest amount in Federal income taxes receive the greatest amount of funds.

Population - Regions having the greatest number of people receive the greatest amount of funds.

Population and per capita income - For two regions having the same population, the one having the lower per capita income receives the greater amount of funds.

Efficiency - Regions having the projects with the highest benefit/cost ratio receive the most money.

Table B shows regional allocations in percent based on each of the above criteria. In formulating the five-year civil works program, no single criterion was used for all regions. In stead, the regional allocations used are a value judgment based upon an assessment of the relevance of each criterion in each region. In this process the allocation based on regional water needs received emphasis.

TABLE A^{1/}

THE BUDGET FOR FISCAL YEAR 1971

Table R-4. PROGRAM DISTRIBUTION OF BUDGET AUTHORITY
DEPARTMENT OF DEFENSE—CIVIL: ARMY CORPS OF ENGINEERS
(in millions of dollars)

Program category	(1) 1969 actual	(2) 1970 estimate	(3) 1971 estimate	(4) ^{2/} 1969-71 percent of budget authority	(5) ^{3/} 1966-70 percent of budget authority
New England region.....	19.5	18.7	28.8	2	2
Middle Atlantic region.....	59.4	66.7	95.9	6	10
Gulf and South Atlantic region.....	94.6	98.6	122.3	9	9
Ohio region.....	149.7	147.1	188.1	13	16
Great Lakes region.....	37.7	38.1	44.7	3	1
Upper Mississippi region.....	76.3	60.4	80.0	6	7
Souis-Red-Rainy region.....	.9	1.1	1.4	.1	.1
Missouri River region.....	88.0	72.7	94.5	7	5
Arkansas-White-Red region.....	167.4	141.2	123.8	12	9
Lower Mississippi region.....	117.5	123.0	141.9	10	4
Rio Grande region.....	9.1	5.4	11.7	1	1
Texas Gulf region.....	43.1	40.5	58.4	4	4
Colorado region.....	1.7	2.5	5.5	.1	.1
Great Basin region.....	.1	.4	.8	.1	.1
California region.....	51.6	48.0	79.0	5	12
Columbia-North Pacific region.....	215.6	166.5	223.7	16	19
Alaska region.....	6.2	6.8	14.7	1	2
Hawaiian Islands region.....	.8	.8	1.6	.1	.1
Puerto Rico and Virgin Islands region.....	.5	.1	.3	.1	.1
General support.....	62.1	67.4	46.4	5	5
Total distributed to programs above.....	1,201.8	1,105.0	1,362.5	100	100
1969 reserve (Public Law 90-364).....	43.8	—43.8	—		
1970 budgetary reserve to be applied in 1971.....	—8.3	192.4	—92.4		
Offsetting proprietary receipts.....		—7.3	—7.5		
Total budget authority, Army Corps of Engineers, Civil.....	1,237.3	1,147.3	1,262.6		

* 0.5 percent or less.

^{1/} Exclusive of budgetary reserve for contract-deferral program.

NOTES

^{1/} This table has been excerpted from the Special Analyses to the 1971 budget, page 274. It has been modified by adding columns (4) and (5).

^{2/} This allocation in percent obtained by adding together budget authority for the years 1969, 1970, and 1971 and dividing the total for each region by the total for all regions.

^{3/} This allocation in percent obtained by adding together the total cost of projects initiated in the period FY 1966-70 and dividing the total for each region by the total for all regions.

TABLE B

ALTERNATIVE REGIONAL ALLOCATIONS

(in percent of total)

region	C R I T E R I O N				
	regional water needs (1)	federal income taxes paid (2)	population (3)	population & per capita income (4)	efficiency (5)
New England	1	8	5	4	7
Middle Atlantic	17	26	18	17	15
Gulf & South Atlantic	11	6	11	12	5
Ohio	10	8	10	10	7
Great Lakes	8	18	10	10	2
Upper Mississippi	4	7	10	9	10
Souris-Red-Rainy	*	*	*	*	*
Missouri River	3	4	4	4	12
Arkansas-White-Red	8	3	4	4	5
Lower Mississippi	7	1	3	4	4
Rio Grande	*	1	1	1	*
Texas Gulf	3	3	5	5	9
Colorado	2	1	1	2	1
Great Basin	1	*	1	1	*
California	11	10	11	10	4
Columbia-North Pacific	6	3	3	3	13
Alaska	7	*	*	*	3
Hawaiian Islands	*	*	*	*	*
Puerto Rico & Virgin Islands	*	*	1	2	2
The Nation	100	100	100	100	100

*0.5 percent or less

