

BASIN GOVERNANCE

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A Review of Organizational and Institutional
Capacities to Plan, Manage and Control
Water Resource Problems in Major River Basins

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Preface

This report is the result of three workshop sessions and communications in between. It was made possible by a small grant from the Office of Water Research and Technology (OWRT) under the Water Resources Research Act of 1964. Social scientists need this kind of interaction, perhaps more than the natural and physical scientists who enjoy a longer history of dealing with natural resource problems. The considerable diversity of experience, concepts, methodology, assumptions, attitudes, and the like in this group of sociologists, economists and political scientists led to both strains and rewards from the process. We hope this report shows more of the rewards than the strains. As the final section suggests, we thought enough of the result to urge OWRT to consider continuing the process under their emerging approach to inter-regional research coordination.

Credit for stimulating this review of the application of social science to water resource problems, as well as others like it, should go to the Universities Council on Water Resources. The UCOWR Committee on Education and Research in the Social and Behavioral Sciences, currently chaired by Edgar Michalson of the University of Idaho, saw the need for this review. With the encouragement of then OWRT Director, Warren Hall, committee members Wade Andrews and Harold Capener agreed to serve as workshop organizers. David Allee agreed to draft the problem statement that evolved from the workshops. Utah State University's Institute for Social Science Research on Natural Resources provided administrative support.

Introduction

We begin where so many others have in considering this topic (eg., Schad, 1967), recognizing two facts. First, the river basin is a natural system representing physical, biological and social interdependencies which offer opportunities for improved resource management to a world that is structured along other geographic and organizational lines. Second, there has been a national strategy of evolving coordinative arrangements along interagency, intergovernmental and river basin lines. Our history goes back to the 1930's with the National Resources Planning Board, to the several predecessors of the present Water Resources Council, to TVA, the basin interagency committees, to the various interstate compact commissions and the present Title II planning commissions. Beside basin and national groups for coordination of water resources, the nation has also experimented with interstate regionalism in other ways; the Appalachia Regional Commission and the related "5A" regional development commissions, Federal Regional Councils, and the border commissions with Canada and Mexico. (

An assessment of P.L. 89-80, the Water Resources Planning Act of 1965, against realistic criteria will show, we believe, a good but far from perfect arrangement in this most recent arrangement for basins. The Water Resources Council and the basin planning commissions provided in that act have performed the limited functions intended by the Congress and the President. There has been personal leadership, specifically Executive Directors Henry Caulfield, Don Maughan, and the current Director Warren Fairchild, and improved communication between the various national and state participants in the water resources development process. It has provided, at both the national and multi-state regional level, a place for the examination and study of problems whose resolution was not immediately apparent and where many points of view were needed. Coordination of planning has taken place. A focus for leadership review and response development has been provided.

At the same time compact commissions have developed for the Delaware, the Susquehanna, the Potomac, and Lake Tahoe. Each has followed quite different paths in using what appears to be a much richer assortment of authorities. Assessments to date have not come to definitive conclusions on the value of one organizational form over another (Hart, 1972, and NWC, 1972).

Clearly, these efforts should be continued and strengthened. We see no reason to deviate from this forty-year policy trend of experimentation in basin management.

What Have Been Our Expectations?

At least two elements of conventional wisdom have been important in what we have expected of the various forms of river basin organization that now cover virtually every part of the nation. First, the concept of the drainage basin as a unit of management has rested upon an image of hydrologic and other interdependencies. Water runs downhill. Actions upstream affect those who are downstream. Management that took these interdependencies into account would be more efficient, producing more from limited resources. (Martin, et. al., 1960; Eckstein and Krutilla, 1969)

But water is most ubiquitous in its role in society; where is the basin management role to end? Consider flood risk management and the location and construction decisions of those who might be tempted to live in that statistically ill-defined area -- the flood plain. For example, urbanization upstream clearly makes floods worse downstream. Or consider domestic water supply and liquid waste disposal. Or electric power, recreation, irrigation, navigation or the many parts of environmental quality, or the many ways water development is said to affect regional economic growth. To be held responsible for all of that approaches and often exceeds the charge to a general government.

The management role is limited conceptually by the extent to which actions in the name of all these purposes produce interactions important to the other actors in the basin. Thus basin management needn't imply assuming responsibility for doing everything but "simply" causing the interests of others to be taken into account by those who do act. It seems probable that even this charge was more than any of the institutions devised could perform, but that may not have diminished expectations of such performance.

A second element in what has been expected, then, hangs upon the observation that authority for all those many purposes to which water is put is now fragmented between many levels and units of general governments. Jurisdictions overlap. Responsibility is not clear. No one is in charge; thus the river basin organization is to be put in charge. This has been a standard form of analysis and prescription in public administration, at least since Woodrow Wilson articulated it in the late 1800's. We are beginning to see that it has uniformly either failed or been ignored (Ostrom, 1974).

The result is an expectation of an horizontal organization that cuts across a great many of the other organizational compartments of society and is able to assert a central authority in dealings with all of them (Derthick, 1974). River basin organizations, in reality, have had to settle for something far less. Indeed, it may not be possible to find any that have been so unwise as to try to live up to these expectations of full rational system control.

Against more realistic standards of performance than these expectations they appear to have achieved a great deal. The facilitation of

communication between those who have an interest in a basin probably has improved efficiency. There has been some greater taking into account of the interests of others. The comprehensiveness part of the expectation has expressed itself in many file drawers of data and plans, if as yet little impact on the overall project decision process. In some cases such as the Tennessee Valley Authority a more specialized role has been successfully developed in a niche left between, or taken from, the territories of other agencies.

Basin organizations must be much like other agencies in many ways, but different in others. They have to identify the content areas in which they can develop a role and expertise. This, in turn, hinges on the development of client relationships and the identification of credit as roles are developed. Without clients and credit, claims on resources become lost in the competitive struggle of government. Alternative strategies for basin organizations have been characterized as the "grass roots," "governors," "compromise and moderation," or the "federal agencies" strategies depending on where and how they seek support (Ingram, 1973).

Strategies to acquire the political resources, linkages between private and public organizations and the individual actors that represent them can also be seen as a complex production system (Craine, 1971). These organizations respond to various incentives and jointly manage a set of production processes. Individual and group consumption of the outputs sets up another set of incentives or preferences whose articulation and expression is worked out in the way in which the public and private production organizations are linked to each other. But our theory and understanding of these linkages and the principles to be followed in evaluating them and prescribing for their change is rudimentary. The key may lie in a distinction between horizontal and vertical organizations.

A vertically structured organization normally has a specialized mandate, is vested with specific powers to carry out this mandate and those empowered to administer are inherently wary and protective about others presuming to encroach on their designated territory. (A vertical structured organization fundamentally proceeds from a mandated power base approach.)

A horizontal structured organization also has a mandate of purpose, is vested with certain privileges and the relative success of its mission lies in the quality of its relationships with the other organizations with which it must deal. (A horizontal structured organization fundamentally proceeds from an influence or persuasion approach toward cooperation.)

A set of key questions in interorganizational relationships is the satisfactory resolution of content, clients and credits. Content is related to the specific mandate or purpose (*raison d'etre*); clients are a variable, flexible multi-shared group that can lay important claims on the organization; the credits are generally counted either in quantified terms, i.e., numbers, frequencies, percentages, comparisons, or in

qualitative terms, i.e., expressions of satisfaction, lessening of conflict, visual effects, elements of safety or protection.

The rationale for organizational structure in River Basins is to carry out mandates, pursue goals and otherwise bring solutions to public problems or issues. The very nature of public issues such as flood control, stream levels, municipal water supplies, sewage effluent, industrial waste, irrigation, recreation, monitoring, patrolling, and policing are such that they tend to lie in horizontal patterns across our social systems. The typical organizational approach, however, is to create a vertically structured unit to deal with specific or combinations of issues. Very often the amount of intersect the vertical organization can bring to the horizontal problem is too limited for adequate resolution.

The dynamic set of structural relationships, their patterns, alternatives and predictable outcomes in terms of capacities to cope with the problems and issues should constitute a main focus of study for an interdisciplinary social science group interested in basin governance.

Much of the available theory and analysis would seem to be in the context of the vertical organization. The need for a theory of horizontal organizations is probably a phenomenon of growing system size and complexity. The horizontal organization has other organizations as clients -- most of them vertical in form. It probably draws much of its strength, i.e., ability to influence others, from its service to other horizontal organizations, i.e., general governments. Credit may have to be earned both in terms of output modification and preference articulation, as well as a recognition that a role of facilitation of consent building has been carried out successfully. A key may be in how credits of this kind can be identified and legitimized among those actors who must price consent building, i.e., elected and appointed public officials and others in that small group that make things happen in public life.

Related Causes of Dissatisfaction in Basin Management

Plans are the focus of Title II Commissions under the Water Resources Planning Act of 1965, but basin plans seem almost unrelated to the politics of consent building for projects (Allée and Ingram, 1972). But decision rules are changing and roles that were once impossible for basin organizations may seem quite possible. An articulation of some of the possibly related causes of current dissatisfaction with river basin management may assist in identifying the scope of the task ahead.

Changing Decision Rules

The basic politics of water resource development has been in the distributive arena. Public water programs have been seen more as providing benefits for all and costs to none than as redistributive or regulatory to borrow Lowi's three-way classification (Lowi, 1964). The

charge to the agencies has been to design projects and programs so that those who might see themselves as disadvantaged are compensated, eventually if not immediately. Redistributive elements; i.e., taking from those who shouldn't have it and giving to the deserving, or regulatory elements of the programs where again costs are more obvious, has been emphasized less. But the old decision rules are changing; the old political mix is changing. As one old timer in the water game put it, "... water ... is in galloping disarray. When, if ever ... it ... is put in working order, it is going to be quite different from what it was." With the rise of the Environmental Protection Agency and Housing and Urban Development, the Small Business Administration and Economic Development Administration, this is well underway at the federal level.

Local support for traditional projects is uncertain. The old clients aren't as strong and often divided. The "natural" supportive groups have many other claims for their attention, other ways to "do good" for the community. Water development as a vehicle for growth, indeed, growth itself, is now questioned at the local level.

The test of agreement at each stage of a water project is harder to come by, more and more often allowing the project to be deferred (Ingram, 1973). The environmental movement has provided participants who do not share the positive orientation to the means of water development held by the other participants. This shows itself in the actions of state and federal agencies and elected officials at every level who before went along with proposals for development. Mutual accommodation has been harder to achieve because there is less of a common interest in achieving a successful negotiation among all the participants. Mutual non-interference has been possible in fewer and fewer cases because environmental issues generate a national public.

New guidelines for fairness and equity must be developed along lines that re-establish confidence in open decision making. For example, the new "Principles and Standards" for project planning and evaluation being implemented by the Water Resources Council are in response to sentiment that the old approaches were unfair to environmental interests. The old benefit to cost ratio is under pressure in its role of saying "no" or "yes" and helping build consent. Likewise, cost-sharing rules that show a willingness to carry the burden that others have before are not enough to win consent. Opponents are being heard more often when they argue benefits are too much greater than the costs born by those benefited.

The efficiency and efficacy of the traditional water development means (dams and channels) are being questioned. But most of the agencies in the "water game" appear to be more specialized by the means of solving problems than by the problems themselves. Dams and channel work have become the legitimate federal approaches to flood management, hydro-power, water supply and irrigation, etc. Changing ownership rights in the flood plain (eg., zoning or easements), rescheduling of discretionary power use, limiting leaks and low valued uses of municipal water, and encouraging the development of water conserving crop varieties and farm practices, are all feasible, partial alternatives to dams and

channel work. They have very different environmental consequences than dams and channels but have been looked upon as someone else's job, and thus too often not seriously considered. The undermining of confidence and thus of consent which this has produced should be obvious. But these are not easy solutions to implement.

New approaches to water resource management to achieve the traditional developmental objectives, the traditional means sought will require new participants and new bargaining arenas. In almost every case they involve even wider consent building than old means. Different agency capacities are being developed. Old boundary maintenance rules must change. Skill and status shifts are involved. Is there a role for horizontal organizations to assist vertical organizations in this change process? It has been observed before that bureaucracies have a difficult time adjusting to a new environment without strong external stimuli. Can basin organizations provide such stimuli, or must they be a part of the reinforcement process for established agency goals, procedures and programs.

Water Quality is Different

Just as a recognition of new means to achieve old purposes has put pressure on the system for change, so also has a recognition of new purposes. Water quality has a new priority.

Water quality degradation has become more obvious. Likewise, costs of its correction are apparent. Its politics, like water development, no longer fit the distributive model alone. A real infusion of grant funds through the states came about at about the same time as there was real support for a meaningful regulatory approach. But more to the point here, this water quality approach grew up largely outside of the framework of the traditional federal water agencies and the basin organizations that had grown around them. After years of minor participation in basin planning, indeed, in any planning beyond facilities and stream classification, the quite autonomous water quality "chapter" of the water "fraternity" is now launched on what is at least a well funded regional planning effort of its own. Following a tradition that stresses working through state agencies with basin and urban regions are the focus for such planning. Will our expectations for comprehensive basin management receive yet another blow, or will there be a greater measure of success in relating water quality management and water development?

This is not to say that the water development agencies have not had an interest in water quality. Low flow augmentation has fit their interests very well. The Corps of Engineers almost developed a lasting alliance with the Public Health Service and thus commitment to water quality management in the Ohio River studies in the 1940's. More recently, it has sought a planning role emphasizing land disposal -- a technique largely ignored by the state-oriented water quality network. And in some current studies it is explicitly linking water quality and water supply. The Soil Conservation Service points to erosion control as a water quality measure. Salinity control is finally getting some

attention from irrigation developers. Thermal problems of power generation are getting more attention. And much of this has come from the recent recognition of the need to accommodate environmental interests rather than from any opportunity to court their support.

Society is Changing

Surely, part of this change and part of the prescription for modification comes out of the increasing complexity of social organization that has accompanied urbanization and industrialization of society. The role of the agency and its technical staff are changing as the communities in which we live become more fragmented, and less cohesive. The planner cannot expect to have social values prescribed for him, leaving him only the role of the value-free technician. The planner is more and more forced to seek out value and preference signals. With only a very small portion of society willing to participate in the process, recruitment of support and discovery and accommodation of opposition becomes difficult. The evidence suggests that opposition is easier to come by than support.

Community cohesion has declined and we are learning to deal with more conflict. There is no longer a choice to "involve the public." And efforts to enlist support after the solution is in hand will help mobilize the easier to mobilize opposition. Thus planning and consent building may have to go more hand in hand than in the past. But agencies tied to particular solutions may not have the flexibility to perform alone the kind of conflict management, consent building function required.

Colonial Problems

Another source of dissatisfaction with the basin as a unit of management as currently exercised may exist in the emerging colonial aspects of resource development. The fight over the dam in a rural area to give flood protection to the downstream city is a long standing version of upstream, downstream conflict. Basin organizations have long had to address that problem.

But many times the city and its hinterland are not in the same basin. With energy development as a growing focus for water, importing pollution and exporting clean power will become more of a conflict issue. Basin entities, to be viable and approach expectations, may have to become a focus for the bargaining on such issues. To be fully creditable to the activists involved in the bargaining they may have to facilitate representation of interests that would otherwise be less well represented.

Conflict resolution may be an important function for basin organizations in the future and an area of dissatisfaction now. Typically, interests that are not well represented in the day-to-day processes of consent building have limited resources for participation in proportion

to their overall stake (Olson, 1974). A rational strategy is for them to wait until late in the process and then attack a proposal with as much appeal to broadly held values as possible. The proponents are caught with many prior commitments made and little scope for accommodation. A tricky problem presents itself for the basin organization if it is to be helpful. To be successful in longer term consent building it will have to complicate early phases of the process by representing those who won't represent themselves. This is sure to raise the ire of those naturally involved early on in the process, yet their long run interests may require such intervention.

Some Implications

Water does indeed run down hill. Besides the physical interdependencies that can easily translate themselves into market values or comparable proxy values, the basin is increasingly recognized as an ecologically significant unit and important to many of the protections of more intangible values. But basin governance appears not to have provided as wide a focus for resolving interest conflict and management problems as some expectations suggest. Economic and social systems are not well reflected by drainage basins and it is these interests that fuel water decisions.

In reality, the river basin is a natural unit for a set of secondary interests. The major focus of the interests to be accommodated turn toward the general governments and any strengthening of basin management must recognize that re-establishing a sense of equilibrium in water can only come about with inter-interest accommodations ratified if not worked out at the general governmental level.

For basin arrangements to satisfy current causes of dissatisfaction and to respond to problems clearly on the horizon it may be necessary for them to be clearer extensions of the general governmental structure. Given the greater interest by the Congress than the President in water politics, for example, basin organization may require greater links to the functions of that branch than in the past. Likewise, should we expect the recent growth of interest and capacity of the states in various functional areas including water to require stronger links to governors and legislators? Are these some of the "new" clients?

What Should a Basin Institution Provide?

All characteristics that might be listed are less interesting than those that provide a tailoring to the kind of pluralism of our political system and yet do the job inherent in the natural basin unit. It includes a re-examination of representation, how to internalize the externalities of individual actions; information capacity including the identification of stakes, building consent by facilitating accommodation and projecting new images of what could be. Broadening choice to find consent seems to be a major strategy. Reconciling local and regional interests appear to be a key element. It implies new content, new actors and clients, new credit, indeed, a new "water game."

Interest Representation and Articulation

Representation of interests in an organization, ideally, should be related to the stake which those groups have in the actions likely to be taken by that organization. Such representation can be formal, with such devices as seats on a board of directors or quite informal, simply recognizing that the group in question has the capability to protect itself through normal political processes. It is quite well established that not all interests are in fact able to represent themselves in equitable proportion to their stake in the decisions made to provide public goods and services which once provided are more or less equally available to all.

Large groups whose interest is diffused over many members, especially if that interest is intangible, conjectural and in the future, are at a disadvantage. Small groups of individuals with a high immediate, tangible stake identify their mutual interest and are more likely to form a cohesive effective group (Olson, 1974). For these and other reasons, the professional composition of planning staffs, evaluation procedures and other mechanisms to express the public interest such as facilitation of participation by politically disadvantaged groups is of interest. In many cases it is not possible to adequately quantify a particular value, eg., wilderness or social disruption. But it should be possible to judge whether or not those who seek to represent those values had reasonable representation in the decision process.

River basin management is very much a question of dealing with "The Tragedy of the Commons" (Hardin, 1968 and Ostrom, 1974). Common property, public goods and externality problems are inherent in the water system. The unique role for basin managers is "internalizing the externalities" of individual action whether by private persons, firms, local governments or public agencies subject to tunnel vision in the basin game. But in many cases agencies with other jurisdictional areas are also concerned. The basin organization needs the capacity and the will to identify where society is better served by taking into account the basin transmitted impact on others of individual action. Changing the incentives facing these other actors by offering cost sharing, by facilitating the participation of the affected interests, by review and permit processes, and the like, are the tools available to the basin organization. Identifying the stake that others have in the use of these tools is an important element in interest representation.

Information Capability and Providing a New Bargaining Arena

Information capability is central to the basin task. While it is true that few public decisions are made following a comprehensive planning approach (Lindblom, 1959 and Lindblom and Braybrooke, 1970), it is also likely that those charged with taking the comprehensive point of view can have a positive effect on other actors in this fragmented, incrementalist world. At least they can offer up as an element in public debate images of what the future might be like. Even the failure to do so effectively when so charged would serve to legitimize others

in doing so. Likewise, by providing a bargaining arena that takes the posture of considering all alternatives and all effects, the comprehensive agency may facilitate consent building in situations where otherwise action would be stymied.

Vertical organizations must follow incremental decision patterns. Seeking consent of the many participants in the decision process, forces the consideration of only those proposals that differ as little as possible from those approved in the past. Large changes threaten more uncertainty of consequences and provide more opportunity for conflict. Conflict has a very high opportunity cost in decision capacity and is thus avoided. But horizontal basin organizations should be different with their mandate to intersect with the many vertical elements in a problem area, with their opportunity to facilitate change, and need to rely on persuasion and facilitation. Helping the vertical organizations acquire the resources to produce different outputs, by mobilizing and otherwise utilizing the support of those whose preferences have not been well served, by facilitating the accommodation of interests injured by change, are these viable strategies for effective basin management? If they are it would seem that very different information requirements exist than the technical, physical, and biological specifications sometimes developed.

Rationality in decision making is an elusive goal but would seem to be able to serve the interests of a basin organization if broadly defined. Rationality is too often taken to mean ignoring the political elements of decision making. Surely an important focus for identifying more effective behavior is to seek means of more explicitly inserting political variables into rational methodology. In other words, representation of interests would be made in guidelines for analytics as well as in the participant mix. But to be effective in providing representation in both may be associated with capacity to process stakes and maintain creditability with those whose stakes are being considered. For this staff capacity must include expertise recognized as relevant by the interests. Likewise, it may require participation in some of the analytical and technical roles. And it seems most likely that the basin organization will have to play a role in allocating resources to the other participants.

The following incremental changes to be considered illustrate some of these notions.

Some Incremental Changes to be Considered

The multi-state region -- a basin or a group of basins -- has long been an obvious unit of analysis -- but what about its potential as a management and administrative unit? The arrangements called for in the Water Resources Planning Act of 1965 (especially the Title II commissions and the Title III grant funds), more recently the Susquehanna Compact, the Water Quality Agreement with Canada and the new look of the International Joint Commission are just some examples of a long line of actions that test the potential of the basin. In general, those close to the process by which projects are approved and funded find it difficult

to see where basin arrangements make much difference. But changes in the project consent building process, as we have noted, may suggest that basin arrangements should be given -- indeed may take -- a more significant role.

Those who see a stake in individual projects -- whether negative or positive -- often behave with little apparent sense of responsibility for the whole systems involved. Bit by bit, more system understanding may enter our debates if we indeed can find ways to link the bargaining arena more closely to the limits of the systems involved. Improving interest access, bargaining capacity, availability of multiple purpose projects that take full advantage of the full array of means and address a wider range of objectives should lead to more effective collective solutions to our water problems.

Thus, one of the questions to be raised in considering planning objectives and cost sharing, at very least, is "who is to do what?" Can we realistically specify what ought to be done without considering the question of who is to do it? Plans with an emphasis on whatever shakes out of the new environmental quality, regional development and social wellbeing accounts of the proposed multiple objective planning may be able to employ a basin role to enhance effectiveness in consent building. Cost sharing that gives a basin orientation to implementing these national objectives may be a way out of the dilemma of direct project funding for these objectives, perhaps encouraging more systematic evaluation and verification of the quid pro quo for the federal dollars involved.

New Roles for Basin Planning

Environmental and other indirect impacts, however imperfect our methodology, are now an accepted part of formal project evaluation. Just to meet Environmental Impact Statement requirements it is necessary to open the analysis of the project to critiques from those interested in such values. Formal multiple objective evaluation procedures proposed by the Water Resources Council may be modified as a result of current reviews. But it is unlikely that some of the elements that are new to the evaluation, such as in some elements of the social wellbeing account, will be lost.

And regional development is no longer the avoidable, simple issue it once was. At least since Pennsylvania objected to Ohio Congressman Mike Kerwin's proposal to link the Ohio River with Lake Erie, some inter-regional impacts have had political interest. As important is the ambivalence that now exists in many parts of the country about whether regional development is even desirable. Indeed, Oregon's experience seems to say a posture of avoiding development is a good way to attract it. And of course there is still strong interest in dealing with disadvantaged groups who often have a particular geographic distribution -- Indians, Appalachia, rural development. Also water projects now have many other federal programs that compete for local activist support, and that frequently are seen as less conflict producing.

The point is that project benefit-cost analysis has major weaknesses from both a political and technical level that might be corrected somewhat through the participation of an analytical group at the regional level. When analysis is done, project-by-project, there are many things that seem to suffer. The cumulative effects of a series of projects is harder to establish and usually ignored. Reaping the technical advantages of hydrologically linking projects becomes difficult -- especially between projects of different agencies. More difficult is the linking of water programs to other development actions. The show case character of the few projects where this was done in the Appalachian water plan make that point. Perhaps they would do better in a second plan. But even the evaluation of environmental, social and economic system effects is difficult. Also to be considered is the tendency for "ad hocery," i.e., consideration of cost and output effects, beyond the most basic, only when it is to the advantage of the moment.

But perhaps the greatest need that might be served by stronger regional arrangements is the interaction between the technical and political aspects of system evaluation. Individual water agencies simply are hard pressed to develop the expertise to perform creditable environmental and social analysis or even analysis of the indirect economic effects. Part of the problem is that they, as specialized organizations, find it difficult to attain the perspective to see the inter-relations between water projects and other public actions or even between water projects themselves if they cross agency lines. Part of the problem is that with the increased potential for conflict in water projects, it is rational to start more planning studies and put less into each; yet evaluation of environmental, social and regional systems is most demanding of analytical capacity, calling for more resources, not less. Part of the problem is that we have not yet developed highly accepted measurement and evaluation methodology to show good cause and effect between projects and all the called for aspects of environmental, social and regional development systems, at least not comparable to that which is used in the engineering and national economic evaluation. The result is that the agency -- seen as an advocate for its proposal -- suffers from general suspicion of its analytics.

A basin agency with capacity to evaluate projects at the system level could at least critique and finally bless the analytics of the agencies. But if the scale economies of system analysis in environmental, social and regional development are as great as they seem at this time it may be advantageous for the basin agency to actually do some of the project analysis and provide formulation guidelines for project plans. It should be remembered, however, that what is needed is not just more analytical competence judged by the experts, but also linkage to political capacity as judged by those affected by the projects. It is here that the interaction of cost sharing and analytical role is important.

Restructuring Horizontal Organizations

The existing Water Resources Council may need to be restructured somewhat to give a broader representation and to more effectively participate in the budget process. This might be recognized by placing

more agencies under the effective coordination of the Water Resources Council. Coverage by the "Principles and Standards" for planning and evaluation is a case in point. To date only a small part of the federal investment is covered. Coordination of agency basin planning budgets and schedules is another.

Perhaps the organization of the Title II basin planning commissions suggests several alternatives for the structure of the Council itself. Note that the federal chairman personally oversees much of the basin commission staff activity. His only duty is commission chairman and thus he avoids the existing suspicion at the federal level that the Council may favor the agency headed by the Chairman.

Note also that the Title II Commission is made up of federal agencies as well as state representatives. In a planning context this should have advantages. But in other roles the general governmental representation of the typical compact commission may be preferable. Should overlapping arrangements be recognized now as worthwhile to meet different needs? For example, should existing Compact Commissions be authorized to form the nucleus of a Title II Commission? The same people could wear different hats, calling meetings of different representatives depending upon whether they were meeting as a Title II commission or a compact commission.

At the regional level, consideration also should be given to improving the access and participation of localities, citizen groups, metropolitan areas and other regional entities such as those for urban planning, regional development and coastal zone management.

Congressional committees prior to reviewing the authority, guidelines, and appropriation for individual water programs should direct the basin commissions to prepare reports and offer testimony on priorities from the basin point of view. An independent chairman of the Water Resources Council, more formal recognition of the coordinative role of the Assistant Secretaries in the several departments, and expanded emphasis on the participation by the Governors of the states could go far towards identifying a commission as an independent viewpoint and a focus for coordination.

Budgeting at the Regional Level

Perhaps the most important decision network is that associated with structuring and agreeing upon public budgets. Most general governments are under pressure to change the process by which priorities are set and needs evaluated. In most cases the pressure is to find ways to make more meaningful comparisons, if not between every objective and means, at least within larger categories than is presently possible with the highly fragmented approach of most budgeting processes. (Wildavsky, 1974) In proposals for such reforms enhancing the role of the region could make procedural and political sense. On the one hand, the region may be a level where tradeoffs can be more accurately identified and related to the problems of interdependency and jointness. On the other hand,

it may also be easier to identify the balance and accommodation needed to assure support. The result could be much more effective use of public funds.

For example, most programs are now balanced by region within quite narrow agency lines. Each agency tries to have a program in every state about comparable to the political significance of that state. But some agency programs are more important to some regions than others. Allowing more imbalance by agency in exchange for more balance over the whole water program should allow for greater efficiency and perhaps easier agreement. But this suggests a mechanism for accomplishment that has the trust and confidence of the agencies and the Congress.

Also seeing a single program broken into regional components has some potential for increasing program effectiveness. It is commonplace to point out that broad national budget components are relatively fixed from year to year. Yet there is a tendency to treat individual projects as if they posed no opportunity cost in the budget. Perhaps regionalization of programs would suggest that sizing a project at \$16 million, where an \$8 million solution was almost as good a problem solution, was doing the region out of a second project.

The Corps now prepares a five year budget by region; should the other agencies do likewise? Shouldn't all planning budgets be put on a regional basis as well as construction? Isn't regional monitoring and assessment of EQ, RD and SWB factors closely akin to the planning input? The Water Resources Council should continue to shift the concept for level B planning toward greater usefulness at the project level -- shorter time horizon, more issue and conflict orientation. Congress has heard from basin groups regularly -- but perhaps it should ask them to play a more obvious role in their budget process. Of course, giving basin commissions a cost-sharing role and providing for expanded input into the EQ, RED and SWB aspects of project planning, as well as funding, would put them into the budget process. At very least, representatives of basin arrangements should comment on the size and shape of both the construction and planning budgets in their region. It would have to be established and recognized that they represented a point of view independent of the President's and thus were not subject to clearance by the Office of Management and Budget. Emphasizing the state representation involved could do this.

Cost-Sharing at the Regional Level

Alternative channels for federal aid, as complements to existing arrangements for direct project fiscal participation, should be considered. It is doubtful that direct shares can be reduced otherwise. But of more significance indirect cost sharing through clearer labelling of the funds could be used to more precisely key assistance to specific national objectives -- for example, the economic development of disadvantaged regions and minority groups, enhancement or mitigation of environmental values. And it could be viewed as a way to induce or make more effective participation in the decision process of particular groups of points

of view, those that have access to the channels chosen. Revenue sharing as an alternative place for water funds, as usually proposed, suggests that local and state governments know what society needs and just lack fiscal resources. State capacity (and willingness) to deal with water problems is certainly a candidate for further enhancement through cost sharing. But a case can be made that even with state and national objectives, much less at local levels, incentives and interest representation are not identical with the public interest and that grants that provide for specific objectives can be a desirable tool in the hands of representatives of a federal point of view in water resources. Also for various reasons, some that will be explored shortly, the multi-state region is a channel for complementary federal aid funds that should be considered carefully.

The success of the Appalachia Regional Commission suggests that in at least one case where governors succeeded in gaining access to complementary funding they provided a measure of political viability and vitality to the regional institution involved. An important part of the ARC program is cost sharing which is supplemental to that available from other federal sources, on a project by project basis. The ARC model cannot be pushed too far. For example, none of the similar so-called "5A" interstate commissions has shown the same program and budget strength. Nonetheless, it should suggest a closer look at basins as channels for water cost sharing.

Some other opportunities include the following:

Border problems. Special authority would be needed for the Great Lakes Basin Commission to cooperatively plan with Canada under arrangements and guidelines developed by the State Department and appropriate Canadian authorities in cooperation with the International Joint Commission. Similar arrangements for other border watersheds should be considered.

Integration of quality and quantity planning. Clearer and sharper guidelines from the Congress may be needed for the coordination of measures for quality management with quantity management specific to the Environmental Protection Agency and "Section 208" planning as well as in connection with basin-wide water resources planning generally.

Linking research and planning. While they are separate functions whose independence must be preserved, nonetheless closer coordination at least at the basin level between planning and research has been shown to be fruitful by recent cooperation between the commissions and the State institutes created under Title I of the Water Resources Research Act of 1964, sister legislation to P.L. 89-80.

While the basin has had limited political significance, it remains the unit for common property problems. The basin defines the system within which externalities are transmitted and within which some of the public good aspects must be managed. Note that much of the substance in the four objectives approach to planning and evaluation originally proposed by the Water Resources Council are aspects of these "Tragedy of the Commons" elements.

To sum up, the challenge is to provide principles that will lead to procedures for matching evaluation to the systems involved, reflecting and shoring-up the weakness of benefit-cost analysis at the project level. There probably are economies and program advantages in dealing with the extra local effects of projects in a unit separate from the several agencies; there may also be some advantages in achieving systematic evaluation. The monitoring and assessment function of some basin arrangements gives them a start on the process. "Independent" review groups need a political base somewhere and the governors are one place to turn -- the states should be pressed for more political accountability in the water field. Linking some cost-sharing to the evaluation of extra local effects of the projects seems to make sense if they are in fact to be well represented in project formulation. Stressing the implementability of non-traditional project means through cost-sharing reform may offer as much potential for improved performance as any other item discussed.

Basic Requirements for Interdisciplinary Research in River Basin Management

The dynamics of interorganizational relationships in river basin management can be compared in their complexity to the dynamics of the hydrology of a river basin. The sponsorship of hydrological research proceeds on the correct assumption that the work needs to be supported until the dynamic relationships are well understood and can be modeled. The notion of assembling a technical team to begin the hydrological investigation and funding the project for one year or three years does not occur to sponsors because it is understood that the nature of the problem is one that has to be pursued in necessary sequential stages from beginning to end.

A similar set of assumptions and philosophy is required on the part of research sponsors if the dynamic nature of interorganizational relationships in river basins is to be delineated, understood and policy recommendations derived applicable to size, scale, regional or interregional units.

A FIRST REQUIREMENT OF SOCIAL SCIENCE SPONSORED RESEARCH IS NOT TO FUND A PROJECT FOR ONE TO THREE YEARS -- BUT TO SUPPORT AN INTERDISCIPLINARY TEAM OF TALENTED RESEARCHERS UNTIL THEY TOO HAVE MOVED THROUGH THE SEQUENTIAL STAGES OF THE PROBLEM FROM BEGINNING TO END.

A COROLLARY REQUIREMENT IS THE ESTABLISHMENT OF AN INTERREGIONAL RESEARCH ADMINISTRATION GRANT OVER A FLEXIBLE TIME PERIOD TO ENABLE A RESEARCH TEAM TO CONFER AND COALESCE AROUND THE SEQUENTIAL RESEARCH PROBLEMS OF RIVER BASIN ORGANIZATION AND MANAGEMENT. IN OTHER WORDS, THE INITIAL HARDWARE INVESTMENTS FOR THE SOCIAL SCIENCE TEAM WILL BE THE TRAVEL RESEARCH PLANNING AND CONFERENCING BUDGET.

A sparse availability of social science researchers committed to the study of water resource management problems presents a difficult problem of assembling an interdisciplinary team. Such a team has been

assembled together for the past six years or more. The geographical dispersion represents staff from Penn State and Cornell in the Northeast, Utah State, Brigham Young University and Colorado State in the Rocky Mountain region and Santa Barbara in California. The disciplines represented are political science, resource economics, and within Rural Sociology emphasis on social and complex organizations, community and regional analysis and environmental management. The team basically consists of around 10 members.

An interdisciplinary research team brings a greater capacity to address a wider range of variables in the administration and management of a river basin system. Because of this it is feasible to plan for the research to be developed in a series of sequential phases and with special divisions of labor.

For example, the kind of information rudimentary in inventorying and mapping river basin management organization in a macro-organization and interorganization sense would answer the following kinds of questions:

1. What is the domain of river basin management in general?
 - a. What services, or content, or outcomes?
 - b. Who for?
 - c. Who has stakes in the outcomes?
2. What are the domains of agencies/organizations in the basin?
 - a. How is the general domain of river basin management divided, specialized, allocated?
 - b. What:
 - (1) overlaps?
 - (2) conflicts?
 - (3) gaps?
 - (c. An additional step would be to consider expertise, capacity, etc., to carry out the activities required by the domain.)
3. What activities (planning, decisions, etc.) are carried out to serve the domains?
 - a. What activities need to be carried out to serve the domains?
4. How do the domains and activities get added back into an integrated whole?
5. What are the salient issues in the foregoing that people in government would be anxious to have information about, and act on?

Such a national inventory and mapping of river basin management organization would develop both formal and real versions of these domains. Domains include the services provided and population served. Statutory, official descriptions and actual, operating situations obviously are often quite different, but both are needed as a basis for further research.

A SECOND REQUIREMENT FOR O.W.R.T. TO FACILITATE THIS INTERREGIONAL RESEARCH WOULD CONSIST OF SUPPORT FOR THE SEQUENTIALLY PHASED PORTIONS OF THE RESEARCH WHICH WOULD BE SPECIFIED BY THE RESEARCH TEAM IN SEQUENTIAL PERIODS OF TIME.

Minimums and maximums of funding for the administrative grant can be specified as well as for each sequential phase to satisfy budgeting procedures. The total project administration could be handled through one university water resource center, ie., Penn State, Cornell or Utah State, or could be divided between or among them.

In sum, the first commitment to the interregional research, then, may only require the administrative grant plus the sponsorship of "state of the arts" review of the number and types of river basin organization structures. Parallel to the overall review there would be initiated two case studies of small to medium sized basins as a means of identifying the reality features of major issues, problems and dimensions of inter-organizational relations in basin management. Following the case studies on smaller units and the opportunity to test out theoretical assumptions and methodological approaches -- the design for studying large basin systems would constitute a second major phase. Comparative analysis between systems could be a third phase and policy implications for overall system management, while no doubt available throughout, would comprise the major emphasis of a final phase.

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