

CORNELL
AGRICULTURAL ECONOMICS
STAFF PAPER

RIVER BASIN MANAGEMENT

by David J. Allee

August 1986

No. 86-25

Department of Agricultural Economics
Cornell University Agricultural Experiment Station
New York State College of Agriculture and Life Sciences
A Statutory College of the State University
Cornell University, Ithaca, New York, 14853

It is the policy of Cornell University actively to support equality of educational and employment opportunity. No person shall be denied admission to any educational program or activity or be denied employment on the basis of any legally prohibited discrimination involving, but not limited to, such factors as race, color, creed, religion, national or ethnic origin, sex, age or handicap. The University is committed to the maintenance of affirmative action programs which will assure the continuation of such equality of opportunity.

River Basin Management¹

by David J. Allee
Professor of Resource Economics
Department of Agricultural Economics
Cornell University, Ithaca, NY 14853

Table of Contents

Abstract	1
Introduction - Wengert's Eras of Water Development	2
Further Interpretation of the Environmental Era	4
The Need for a Bargaining Arena	6
The Role for Planning	8
Different Politics for Different Policy Outputs	9
Water Runs Downhill and the Just Enough Principle	11
Broad Base of Support and Understanding	13
Importance of Information on System Behavior	13
Programming to Expand Management Capacity	15

Abstract

Institutional arrangements for watershed and basin management are diverse in form and pragmatic in approach. They come in many shapes and sizes. Over the years they have reflected the status of American federalism and do so today. In other words, we seem to be at a crossroads, ready to drop some aspects of our ideas about management and to add others. The imperative for a centralized authority to manage a large basin system was never very strongly held and is presently fading. But the idea provided a standard against which to test eclectic reality. It may be replaced, in function if not in form, by widespread capacity to interpret the system and evaluate the impacts of the actions of others. This improved capacity to identify community interest may be translated into more effective support for federal and state programs to deal with the coordination of water functions -- flood control, water supply, waste management, habitat enhancement, recreation, etc. -- and translated into support for the evolution of intra-local organizations to provide management capacity and local implementation of the federal programs.

¹A contribution to "The Assessment of the Role of the Social Sciences in Water Planning and Management," a project led by Duane D. Baumann of Southern Illinois University, supported by the National Science Foundation.

Most relevant for river basin management is the fact that coordinative or horizontal organizations are different than operating or vertical organizations, and those differences need more study and recognition. Expectations for basin management have been unreasonable because the two types have been confused. Likewise, the capabilities of local governments and their ability to federate in different configurations for different purposes need more study and recognition. The role for state and federal programs can then be clarified.

Introduction - Wengert's Eras of Water Development

River basins manage themselves, with a little help from their friends. These natural systems are integrated into the hydrologic cycle and provide mankind with a wide variety of benefits and burdens. Project by project, the mix in that variety of benefits and burdens has been changed. Sometimes system interrelatedness has been explicitly recognized, and often not. From the earliest use of government to manage water in the United States to the present day, there have been arguments presented for institutions to match the management needs of water systems. What are some of the central ideas? How have they evolved? What has been learned from trying to apply these ideas? What might be done next? What policies or program strategies seem to make sense and why?

Norman Wengert, in his thoughtful 1980 paper, reviews the history of the river basin as a focus for planning investment and public management. Beginning with Powell's Arid Lands report of 1879 and ending with Bea Holmes' 1979 history of water programs, he reviews a century of intellectual activity. Of this he chooses, quite accurately, Gilbert White's 1957 statement as the "pure" doctrine of river basin development, three basic ideas and two related concepts. Basic were the notions of the multiple-purpose storage project, the basin wide program and comprehensive regional development, combined as an ideal, less often in reality. Two related concepts were articulated land and water programs (e.g. irrigation, drainage, flood plain management, erosion control), and unified administration (e.g. TVA).

Wengert clarifies this history for us with the identification of three periods, begging the consideration of what the fourth era will and should be like. The first was the Preparatory Period from Powell's report to the New Deal when concepts of wide scope rationality were being developed and largely overrun by the urgency of immediate development.

The second might be called the Development Period when, between 1933 and 1965, goals for regional socio-economic development were added to multi-purpose, integrated planning. The politics of the period were still very much occupied with individual benefits from Federal investment -- flood plain protection, free navigation, irrigation water, and hydropower. Associated jobs and profits and still vague notions of secondary and indirect effects were slowly pushed into concepts of national efficiency, regional development economics, environmental quality and social well being. This gained fuller articulation in the Water Resources Planning Act of 1965, which called for a set of

uniformly organized basin planning commissions, a national coordinating council and a four objectives project evaluation system. These features were the intellectual offspring of TVA and the National Resources Planning Board.

Like most institutional adjustments, these features of the 1965 act were responsive to the past and came under great pressure from changes in national perceptions and priorities. Maximum development from a hydrologic and engineering point of view still drove the institutions, but fragmentation and disintegration of the basin concepts set in quickly. Investment continued in what might be called the Environmental Transition Period -- 1965 to date -- but it slowed in terms of traditional dam and channel work, expanding in waste water treatment works. Water quality as an objective grew, but almost wholly outside of the institutional arrangements for water resource development. Indeed, the hostility of environmentalists, the many Federal alternatives for contractors and regional developers, the growth of the wilderness program, the Vietnam distraction, refinement and wider understanding of evaluation tools in the budget process, and failure to evolve either a credible environment or social impact evaluation paradigm, all played a part in the demise of the 1964 Planning Act arrangements.

Based upon the post-1964 history, it is tempting to suggest that the future of the river basin management concept depends upon political and institutional integration of water quality management with water quality and other environmental objectives (Lord, 1971). This may happen in response to new initiatives at the local level which have these objectives as their focus (Harrison, 1981). Water policy has always had local roots -- the problems continue to be so very site specific. But can the local incentives to integrate bring together the long separated public health/environmental network and the public works/water management network?

There are several approaches we can use to think about how institutional evolution comes about. One is the social movement notion, with the elements of reform built into a coherent ideology developed by its advocates as a basis for achieving a better society. The environmental movement is an example. A second combines interest group theory and economic determinism to argue that benefits and costs to groups can provide the incentive to achieve or discourage reform. Further, once reform has been accomplished, resources must be found to sustain an institution and they again come from continuous support fueled by net benefits (Anderson and Hill, 1977).

These two notions can be combined into a dynamic model of reform. Note that many issues have benefits and costs quite unequally divided between large and small groups. Usually it is a large group with not much at stake per individual facing a small group with a lot at stake per individual. Then a reform movement will mobilize. The large diffused group will call for reforms on ideological grounds. But implementation of a legislative response finds the interest of a diffused group has waned but the smaller, more particular interest group

is still there, ready to provide its support for implementation that tilts in its favor. Thus, seeds for a new reform cycle are sown.

Further Interpretation of the Environmental Era

Perhaps the policy process and intergovernmental dynamics will become a little clearer if we supplement Wengert's evaluation of the period 1964 to date. Water quality programs have now gone through an evolution with some striking parallels to water quantity programs. Clearly, investment in sewers and treatment facilities, either through appropriations or tax benefits, have been important. Regulation, however, has been the more obvious tool -- e.g. the EPA National (and State) Pollution Discharge Elimination System (NPDES) permits or the Corps' "404" dredge and spoil permits. Keep in mind that EPA's legislation has kept states and local governments involved in the process. The states carry most of the EPA enforcement and review burden. While the involvement and process are different, local governments hold the initiator role for public treatment projects. Local governments have been the significant clients for the developmental agencies (the Corps, BuRec, SCS, and TVA) over the years and with the recent pressure for greater local cost sharing and innovative financing, the strength of the local role in hither-to Federal water development has increased. Of at least equal significance is the fact that Federal and related State environmental programs are now constrained much like most public programs. Even more to the point, whether a developmental project or a permit to protect the environment, local inter-interest bargaining is now the character of the politics involved. This should have important implications for the evolution of management institutions at all levels -- federal inter-agency; the large, usually inter-state river basin; and the inter-local or watershed scale.

The Advisory Commission on Intergovernmental Relations (ACIR) has provided useful frameworks and insights into such questions. In a 1981 report, they characterize the pre-1969 Earth Day period for water and air pollution policy, as well as solid and toxic wastes, as dominated by incremental adjustments. Congressional response to recognition of a problem was to call for research and then for modest inducements for states and localities to solve the problems themselves. Funds were then substantially increased, but a direct federal role -- already well articulated in flood control, navigation, water based recreation and irrigation supply -- was restrained by a sense of state and local responsibility.

The post-Earth Day period is characterized by ACIR as one of "speculative augmentation". With an unusual outpouring of public opinion, Congress was encouraged to respond in non-incremental ways. Air quality standards could be set to force the development of technology that was not in hand. Superfund site cleanup could be called for when "how", "how much" and "how clean" were not known or even knowable at the time. Traditional restraints to policy making, however, were not long in coming. The recent initiatives in groundwater protection illustrate the change. Only modest proposals to strengthen

state programs are surfacing. Congress is uncertain as to whether to proceed with a federal initiative on standard setting or on classification, but probably not both as would have been more consistent with the legislative history in the '70's.

ACIR identifies two types of inter-governmental conflict at the end of the period of speculative augmentation. First, state and local programs felt restrained from achieving more attainable goals while conflict proceeded over less attainable zero discharge or non-degradation goals. Second, conflict with urban economic revitalization became pronounced. Meanwhile, the Congressional reviews of the programs were noting that growth of local government capacity to operate and maintain the sophisticated treatment plants inspired by the liberal federal capital subsidies had not kept up with what the consultants and the agency reviewers wanted to build. Environmental policy makers and implementers are being forced to deal more realistically and cooperatively with those they would regulate.

Note how this may leave the water quality process in a parallel position with water development. After a similar flirtation with less-attainable goals, the nation may be ready to go back to local specifications of needs with federal objectives limited to response to spillovers, either negative or positive. Environmental protection consistent with economic revitalization, and economic strategies consistent with environmental goals have become the product. Frequently, these are the result of more careful analysis, and certainly the result of more effective bargaining. But for this to happen with any stability and reasonable use of scarce decision capacity, institutions must continue to be adapted to the need. Management capacity must be considered more explicitly.

What happened to the water development ideal of river basin management? In addition to the points made by Wengert listed above, consider the results of another political scientist, Helen Ingram. Not long after Earth Day, Ingram published her American Water Resources Association award winning paper that reported on the changing decision rules in the politics of water development (1972). This was confirmed in research she and I completed for the National Water Commission (Allee and Ingram, 1972).

Five rules governed traditional project selection: local support; agreement also at the various veto points in the system; mutual accommodation and mutual non-interference between major decision makers; plus fairness and equity taken together and expressed in the acceptance of evaluation ($B/c \geq 1$); and cost sharing rules. Consistent with Wengert, environmentalists and other new participants that didn't feel the need to accommodate the other players were forcing different perspectives and behavior. Project features were not always enough to exchange for support from those who might previously have been left out. Basin and project planning, even with multiple objective evaluation procedures, were not up to the task of accommodating the new participants with the old.

With the advent of the Reagan administration, the ease with which the 1964 Water Resources Planning Act was gutted suggests a result very similar to the ACIR conclusion about environmental programs where concern about urban revitalization and the blocking of attainable environmental goals had set the stage for a backlash. Environmentalists in the Carter administration, plus the usual interest by the budget professionals, enhanced the rigor of benefit-cost analysis while reinforcing the general disinterest in settling on an evaluation framework for environmental, social and regional development objectives. Also, the concept of a comprehensive coordinated joint plan (CCJP) was advanced as the basis for a policy of more consistent federal actions. Studies had shown quite varied interpretation of the federal interest and wide differences in cost sharing by purposes, among other sources of diversity. National objectives were pressed as guidelines for formulation of agency plans rather than local problem solving within national constraints (Lord, 1981). The WRC and the RBCs shifted away from the roles of facilitating interagency and state-federal communication. Policy initiatives were pressed not only for consistency but also for water conservation and new steps for project review. These were viewed among state key informants interviewed in the AWRA study (Dworsky, et al., 1982) not as fostering accommodation but as a means to impose environmentalist positions. The result was a gradual withdrawal of support by state and local interests. No one was left to resist the demise of the WRC and RBCs.

Project development was left to more direct bargaining. For almost the last two decades, no new large projects were authorized. While not as receptive to the concerns of the environmentalists, ideological and budget concerns in the Reagan period have strengthened a move to greater non-federal cost sharing. This among other changes has increased the strength of the states in the development process. The environmental impact statement is still there and environmental activities at local and national levels is as strong, perhaps stronger - - but the need to bargain is being re-asserted. While the water quality agencies must bargain with economic interest and live with many attainable results, the water development agencies must bargain with the environmental interests and accept programming that puts less emphasis on the cherished dams and channel work, and more on management. Changing the management of existing dams, even modest steps toward conservation are evident. As Lord (1982) points out, demand management should be increasing in acceptance, particularly if it is recognized that waste treatment is a form of demand rather than supply management.

The Need for a Bargaining Arena

What do we know about bargaining and where it fits into river basin management? First, we need to dispose of two concepts, unified administration and the rational analytic model expressing national interests.

It is easy to forget that our federal system was created to divide power, to frustrate the concentration of authority and to preserve some measure of multiple access and multiple veto points. And the nature of

water resources is such that more, not fewer, organizations can be expected to be involved. The purposes water management serves are highly local in benefit and idiosyncratic or site specific in technical terms. Also, it is too ubiquitous, too much a part of too many activities to be efficiently assigned to any one organization. It is inherently a carrier of inter-governmental, inter-agency, inter-interest concerns. There are several times more local inter-related water agencies than there are general local governments; 100,000 or so. At the state level, there are 500 or so. At the level of sub-agencies recognized by separate budgeting reviews, there are over 30 important federal entities, many with quite separable and independent field units, perhaps over 100 federal decision centers on the executive side alone.

Some students argue that there are many advantages in having a wide variation in the size and orientation of the independent players in the water game (Ostrum and Ostrum, 1977). Note that at least since the late 1880s, there have been calls for consolidation that have largely gone unheeded. Indeed, the growth in numbers of public entities is impressive. They must be doing something right. Most calls for consolidation stress supply-side efficiency, and ignore the demand or preference expressing side of the process. Serious studies of such efficiency have found it illusive, if not absent altogether. Indeed, the dis-economies of size in production and demand discovery are just as significant as the economies. Groupings of governments and agencies are common and attempt to follow the size and logic of the systems being managed, and the interests involved. Flexibility in dealing with multiple boundaries is one advantage for many actors. This is not a well studied aspect of governance, and even less well understood is the demand side -- the specifications of preferences, how they are discovered and reflected in a multiple jurisdiction setting.

One argument for a variety of actors at many levels is that it facilitates the expression of differences in tastes and willingness to pay for different mixes of public services. Clearly, while we argue about levels, we seem to agree that minimum standards of service are important, civil rights are to be defined and protected, and participation of the disadvantaged is to be sustained. Indeed, the essence of river basin management may be to insure that various stake holders have evenhanded access to the decision making process. Interests not well represented now, unable to commit resources to sustained participation in the long process to get projects, play an efficient and often effective waiting game. Wait until late in the process, then object. This is rational especially if you doubt that the game has much chance to help you and a good chance that it will hurt your interests. Basin managers may play their best part in facilitating unilateral accommodation to head off such disruptions if they can.

River basin managers do not and will not be able to manage by command. There is no foreseeable way to provide this kind of authority. Ingram in 1973 addressed the issue of political viability of regional water institutions. Her analysis has been confirmed in the events of the last decade. She observed that regional entities are made up of the existing political actors with only minor rearrangement of their resources and interactions. Factors that influence power and viability

are the extent of regional consciousness (i.e. perceived stake), the motivations of the public entrepreneurs who put the arrangement in place, and the values and preferences of individuals in other key water related activities. It may simply formalize an existing "old boy" network or do little more than such an informal device could do. Strategies available to build viability include grassroots involvement, alliances between political figures, and developing alliances with federal agencies. Resources have to come from somewhere, and some kind of exchange must be worked out to obtain those resources.

If there are clear rewards from unified basin management, they should provide an incentive to attract support. When pressures on the resource build up, opportunities for new benefits or cost savings will appear. Will these be seized to the benefit of a basin management organization? There are other claimants and other ways a result can be bargained out.

Indeed, inter-agency, inter-interest coordination, i.e. river basin management, may be a risky business for those who are asked to make it work. They have to help potential participants protect their stakes. This facilitates bargaining, accommodation, and agreement. It runs the risk of a potential loser doing an "end run" to one of the participatory general governments. Indeed, this is commonplace. Fence mending is constant and occasionally not possible. Conflict, budget troubles, reorganizations and issue shifts may be endemic.

Coordination entities have to respect the many sizes, shapes and orientations of the other players in the water game they facilitate. Planning can only be a bargaining process. Plans must represent agreements freely arrived at and usually ratified by the general governments involved. There is no workable alternative view.

The Role for Planning

This is not to suggest that there is no place in the system for rational analysis -- the attempt to apply full consideration of alternatives and consequences to water problems, selecting alternatives on the basis of objective criteria. Such analysis is a potentially powerful safeguard for public welfare providing a modest check on raids of the treasury, and a means to test the use of values that continue the status quo. The economist's version of such analysis emphasizes the use of the potential optimum -- if the winners can bribe the losers from their winnings to accept the change, then it is an efficient action. Planners can't stop there -- if compensation is not paid, there may not be agreement or if those who are highly advantaged do not pay a fair share there may not be agreement. Decisions in our system depend upon agreement at many veto points in the process. At each veto point, the legitimacy of the evaluation is subject to question. Further in the evaluation process, the many values involved will not all be accepted as legitimate to leave to the analyst. This too, is part of the process of interest accommodation.

When I accept the methodology for weighing my concerns in your evaluation process, I have accepted a great deal. I have ratified your legitimacy. Of course, of even greater importance than my acquiescence is whether others accept the way you treat my concerns. Until this is the case for environmental values, disadvantaged groups and in a parallel way for highly advantaged groups, many rational techniques will be of limited effectiveness. The twenty year paucity of new authorizations for the water development projects is testimony to this process.

In addition to these problems are the arguments of those who advocate adaptive planning, i.e. planning is to facilitate accommodation. It cannot know the "best" answer in the sense that others will agree to what that best answer is. Shabman (1984) cites three concerns that undercut the hope that a specialized planning process and thus, a specialized organization to carry it out will be possible. First, we don't understand the physical and biological interdependencies well enough, much less the social and economic interdependencies that follow the natural system. Second, these uncertainties plus the security drawn from small changes from the status quo, plus limited authority to consider all alternatives, constrain the feasible set of alternatives. Third, fragmentation of decision authority forces bargaining.

The point is that comprehensive planning while sharply constrained in its applicability is nonetheless expected as a part of the process, and provides coordinators/basin managers with a modicum of influence on the process that they would not have otherwise. It provides a cloak of professionalism and objectivity, and potential information useful in identifying the stakes of those not well represented, and in the design of more equitable and thus more stable plans. To pretend that the agreed upon plan is or must be the one that passes all the rational tests undermines credibility and must be avoided.

Equally to the point here is an earlier study by Lord (1979) that led to another AWRA award for an outstanding article. He notes that planning deals best with conflict due to differences in information and differences in stake. Planners can make sure tht everyone has the same information. Planners can facilitate bargaining between groups that have different stakes in the policy. But planners deal less well with differences in values about what is good and bad. While information and stake changes can affect public values, the process is so slow and difficult that in practical terms only the adjudicatory and coercive powers of government can be used to bring resolution, if one is to be had. Of course, no resolution is a common outcome. As Lord notes, Lowi's system for classification of politics based on the output of the process provides useful insights here.

Different Politics for Different Policy Outputs

Lowi (1966), in a seminal concept, argues that three kinds of products from public decisions are the result of three very different politics, i.e. the types of groups that interact, the way they interact,

including the use of coercion, and the way information and other exchanges are conducted, particularly in the perception of cost. Distributive politics is most familiar to people in water project allocation. Little perception of cost suggests little need for coercion. Ingram's decision roles above spell out the rest. Many local and small support groups, with little else in common, lobby for the rewards of government. Conflict is apt to be in the form of either bargaining the content of the project and thus threatening to have it differ because that decision system is not able to handle much conflict, or it is in terms of seeking reform of the rules of the system.

Bargaining out the local project is more akin to regulatory politics. Groups representing gainers and representing losers confront each other. Government, within the context of a set of regulations, mediates between the two. The regulators have to protect the losers but must also get along with the gainers. Resources for the regulators can come from accommodating either. Indeed, the often perceived capture of regulators by those regulated is an interesting part of the phenomenon. It speaks to the problem that those protected by regulations often have difficulty adequately representing themselves in the process. Their interests are so diffused that it makes it difficult to get organized. For example, fish and wildlife interests often see the development agencies siding with irrigators, developers, and others who have an immediate, and very motivating stake in actions that would reduce habitat.

This access is usually much better at the federal level, and they don't seem to appreciate the greater losses that would be suffered if the development agency weren't there to bargain for mitigation by offering a subsidy for the development. Fish and wildlife interests certainly could lobby for more changes to enhance the potential for the federal role in mitigation and enhancement through the development agencies.

Rule changing politics -- called redistributive politics by Lowi -- calls for substantial use of coercion but it is different than forcing mitigation or acceptance of permit terms. It is power at the system change level. Now losses and gains are more conjectural and diffused, often expressed in symbolic terms. Groups involved are national in scope. Opinion leaders and ideologies of particular classes or professions carry more weight when they are strategically located as staff and participants in the reform process.

The ideology of professional water planners was spawned by sympathy for John Wesley Powell in his conflict with the irrigation boomers, only partly stifled by the way the program of reclamation and Army Corps actually was developed, and changed again by TVA and the Natural Resources Planning Board. Comprehensive planning and the Unified River Basin concept were expressed in the Water Resources Planning Act of 1965 because they were the right way to do the job. This analysis is based upon interviews with some of the people involved; Henry Caulfield, for example. It is consistent with Wengert (1981). The only traditional interest group or redistributive politics aspect of

the 1965 act was Title III, which provided planning grants to the states. They were an outgrowth of the reaction of the state agency members of the water planning fraternity to earlier proposals to give federal representatives more complete control of the Title II River Basin Planning Commissions.

Water Runs Downhill and the Just Enough Principle

"Water runs downhill" is a phrase that reminds us of the basic principle in water management. We are managing a system that has a local focus and constituency. The physical and economic character of the spillovers transmitted by that system are the essence of management and provide both the rewards and the limits for coordination. Because the rewards of coordination and management are inherently shared with others, for example neighboring jurisdictions, the agencies and units of government involved can be expected to underinvest in the costs of coordination. It takes time and commitment, money and sacrifice to take into account the interests of others. Thus, resources to do coordination have to be found in extraordinary ways, such as coming from or stimulated by the Federal Government, for example. An ideologically based reform movement, such as that which led to the 1965 Water Resources Planning Act, is necessary. But the stake that others have in the spillovers from agency and local government decisions also set limits on the extent that people have to have "their hands in each others' pockets".

Thus, the "water runs downhill" principle has to be joined by the "just enough" principle to judge the proper involvement of one state with another, inter-agency coordination, inter-interest bargaining and the like. The participants have to have a stake and work under the expectation that they can and will return home with acceptable results. No one with good access to the veto points can be excluded. Communication to those veto points must be adequate. That is what we should be striving for when we consider the proper linkages of natural resource development and the environment, of water quality and water quality management, water resource development and related land, fish and wildlife coordination, planning assistance funds, and even cost-sharing rules. This is the essence of managing the commons.

These are more modest goals than are often held up for basin management, yet the discussion of this paper to this point suggests they are quite ambitious enough. Perhaps they are still unattainable. The rest of the paper suggests three topics that just might be the keys to attaining these goals. They follow from the character of the political economy outlined above, particularly when related to the Congressional processes involved. First, broaden the base of support and understanding; second, continue to improve the information on system behavior; and third, mount more programs to expand management capacity, especially at the inter-local level. All of these relate to the role of state and local governments in representing the interests of their constituents.

This should be clarified with a little reflection on how inter-agency, inter-governmental coordination takes place in the absence of institutional arrangements to facilitate it. When the Water Resource Council and the River Basin Commission were displaced by the Reagan Administration in 1981, it became apparent in our interviews of the participants that what might be termed the alternative ombudsman role was most sorely missed.

What can a group of local officials concerned about the potential effect or lost opportunity effect of a project do? Their congressmen and senators must be approached, and it will involve several. As is likely, inconsistent information from several agencies, state and federal, must be evaluated in an atmosphere not use to dealing at a technical level. The power to urge a compromise will be there but probably not the capacity for facilitation. The broker role on the local issues involved will be incomplete. Sometimes this more technical ombudsman role is effectively carried out by state staff or consultants, but rarely is there enough time and money.

Presidential staff at the inter-agency level, for example at OMB or other parts of the White House, could perform this role but usually do not because the incentives are rarely sufficient. Likewise, state agency staff may be supplemented from the governor's office or the state legislature.

The challenge is to convert what appears as a negative sum game to a positive sum game. When limited to the water field, the bargaining is limited enough. When restricted to either water development or water quality alone, bargaining is even more constrained. Increasing pressure on the resource should open more and more opportunities to work together to produce more.

The more leaders and activists understand these opportunities, the more they should support the institutions that can deliver them. Information on system behavior from whatever sources, the more credible the better, should lead to this understanding of opportunities. Management capacity at state and local levels should increase the ability to recognize the gains and carry out many of the activities needed for more sophisticated management. Many of the powers and duties needed for water demand management (supply or waste disposal), aquifer protection, or flood plain management, are held at the local level. For federal agencies to play a more successful role, it would seem that they must be a part of wider, more complex agreements that cannot be implemented alone. The process of arriving at such agreements is to complement, not substitute, the basic congressional representative function. The information that Congress needs most is that a bargain has been struck, that what has been agreed to will work technically with a minimum of surprises and it has the acquiescence, if not full support, of all the groups involved.

Broad Base of Support and Understanding

We need a continuing process that discovers public preferences and applies the everchanging understanding of water problems. This is probably best tied to a forum for inter-interest bargaining that can receive varying delegations of authority from our general governments and can refer agreements for ratification -- and then help remake them as new perceptions arise. Continuous knowledge generation and bargaining takes resources, and resources require support and understanding.

Support is the commitment of a critical share of the "gladiators" in our society -- those who are always participating in some public decision process. Most of those likely to meet this definition are probably make up a percent or two of the adult population spread over all issues (Milbrath, 1985).

Understanding is required by a critical share of the "spectators" -- the two-thirds or so of society that pay some attention and particularly that tenth or less that are potential recruits to the gladiator ranks. It beats watching television. These are most approachable at the local level where stakes and chances of successful participation are most apparent. Also, costs of participation are lower and it is more fun. Albany and Washington scare a lot of people -- even gladiators.

Organizations such as the Water Resources Association of the Delaware River Basin play a key role in both support and understanding. They have special potential in the recruiting and training of gladiators. It is this factor that gives the Delaware more capacity for basin governance than perhaps any other.

Importance of Information on System Behavior

If we can't be concerned with concentrating authority in a basin entity but instead have to accept the process of facilitating bargaining, then the understanding of the role of system information becomes more important. Little research is available to elucidate what works and what doesn't. Some ideas can be spelled out for further testing.

Economists note that the persistence of spillovers whose value exceeds the cost of correction indicate market failure. This can be a result of a public as well as a private failure to take into account effects on those not a full party to the transaction. Such failures are a basic part of environmental and natural resource problems.

Hardin's seminal Tragedy of the Commons was not more and certainly no less than the problem of spillovers and high cost of exclusion from a common property resource or a public good. These are boundary problems. State assertion of primacy in planning does not change the fact that most basins are inter-state in character. This is true at the large

basin regional level and still true at the 100+ level of regions for basin organization. Most of the 105 water resources regions identified by the Water Resources Council and U.S. Geological Survey involve territory in two, three, or four states. Thus, the reality is that there will be two to three hundred sub-state regions where state actions will be evaluated for impact on a neighbor. Might management be more effective if the state created an entity that was able to deal with internalizing the adverse and beneficial effects within that area? Then, bargaining out a result with the adjoining area under a federal structure for that purpose could proceed. In other words, we should visualize a process very much involving local governments, states as their representatives in inter-state matters, with federal agencies facilitating both the development of management capacity at the inter-local and inter-state levels.

If this sounds unique, it is only because we are not used to thinking in these terms. The American Water Resources Association project on Unified River Basin Management found repeated examples of this kind of development, even though there is no current federal policy endorsing it or actively facilitating it.

Sheer (1982) reports on the work of the Interstate Commission on the Potomac River Basin as an honest broker in helping municipalities increase the effective capacity of water supply in the basin simply through cooperation. The key to that success was credible understanding of the behavior of the natural system and its manmade components. Partly as a result of Sheer's evangelical fervor, other commissions, the Corps, and the Bureau of Reclamation have also attempted to play similar roles.

The Corps and Bureau of course provide system support information in many inter-state settings. Creel (1981) reports on the Savannah River Basin outlining a history and prospect that rivals the more famous TVA.

The initiative can come from the local level, too. Bickel (1982) reports on the overdraft and salt water intrusion on the Oxnard Plain in southern California. An inter-local water supply district with this understanding of the system is now negotiating for federal assistance from the Bureau of Reclamation.

Similarly, Kaynor and Berger (1982) conclude that a fairly effective regionalization of water supply takes place in response to need and growth in New England. Study is warranted of the physical system and the needs of those served by it, but of lower priority is concern for any special forms of organization or institutional constraints.

May, et al. (1982) reports on the resistance to uniformly organized regional waste treatment systems stressed during the 60s and 70s. The Clean Water Act of 1977 formalized the shift to smaller, more local systems. The gains from resisting the standardized, not site specific policy were spelled out. Lower costs and greater effectiveness were the result.

Finally, the sub-state management entity has gained attention. Nebraska, Florida, Ohio, Alaska, and Arizona are examples of where they are successfully underway with quite different functional mixes. New York is an example of a state that has flirted with them, but has not adopted them above the county level (Coy, 1981, Dworsky and Wilkerson, 1982, Fisher, 1982, Feaster, 1982, Ingram and Weschler, 1982).

A final point on the importance of understanding system behavior concerns the inter-state stresses that will be placed on the system if the trend to greater facilitation of vendability of water rights continues (Anderson, 1983). Upset at what is seen as wasteful and unfair development of water usually for irrigation in the West, advocates of what has been called Economism (Sheehan, 1986), urge more privatization of water. Vendability means that third party concerns must be credibly protected. For example, rights to return flow from irrigation are protected in western appropriative rights systems as well as eastern riparian systems. While states can evolve procedures to assure transferability within the state, will it work so smoothly at the inter-state level? Perhaps the courts will provide some impetus for inter-state coordination on this or related grounds much as they did on an intra-state basis for groundwater in Arizona.

Programming to Expand Management Capacity

If the politics of project formulation, project allocation and program development are as different as Lowi suggests, doesn't it seem reasonable that the business of inter-agency, inter-interest coordination is equally different at different levels? It has been a preoccupation of much of the literature to concentrate on the national and large river basin region and then to jump to the project level. More attention needs to be given to the sub-state region as discussed above -- i.e. the inter-local level within a state that is probably a part of a larger inter-state system. Note that recent court actions have made wetlands a part of navigable waters and thus, of national interest. Coastal waters, boundary waters and water associated with public lands have always provided a role to assume that national agencies will continue to play a major role in management. The next question here is whether they should also take responsibility for the evolution of more management capacity among their partners in the federal management partnership. Local governments gain their authority and some of their management resources from the states. Thus, capacity building means working with and through the state agencies. Water quality programs have developed more sophistication in this approach than development agencies, but much room remains for improvement.

The regional coordination activity, whether done by an inter-state compact commission, an informal inter-agency coordinating committee, or a lead federal agency, will need to influence some individual project formulation. By the nature of its position, it will probably be largely involved in the project allocation process. It will at least perform mediation roles, insuring a level of due process for the various interests involved. Rather than face-to-face negotiation, they will be

involved in accommodations of broad policies in the various jurisdictions. Project review will often be the vehicle for this process, but the emphasis will be facilitating the allocation of projects between groups of recipients. Less often will they enter into the debate over how programs should be restructured. National level coordination entities would, as you might expect, more regularly find themselves providing information in support of program development.

The sub-state management region, on the other hand, is characterized by more opportunities for combining direct operations with the coordinative function. Florida's two major regional management districts started as and continue to be "local" sponsors for U.S. Corps of Engineers flood control projects. They are now involved in the full spectrum of flood control activities except waste water management. The Miami Conservancy District, the flagship of the Ohio fleet, started in flood control before the national programs were implemented. They have expanded into recreation and regional sewage treatment. Operating entities often develop the staff capacity to perform the important function of interpreting the behavior of the system whose management they share. Obviously, their stakes as an operator can get in the way of providing an acceptable bargaining forum. A council of governments or some other device may be needed to bring interests together. This seems especially true in the case of metropolitan supply agencies such as Denver, New York City, or the Twin Cities in Minnesota.

National water programs could be much more effective in assisting the evolution of sub-state regional management capacity. Many of the potential inter-local participants have been or will be their clients. Project development and regulatory program administration does automatically produce some greater management capacity in some of the aspects needed. For example, system behavior will be more widely understood as these are bargained out. Complimentary capacity development must be sought out. Flood plain management, including voluntary relocation, can be added to flood control projects. Contamination prevention programs can be added to toxic clean up efforts. Irrigation scheduling capability can be added to supply system renovations.

Elsewhere, I have helped argue that the federal role in the federal system (North, Dworsky and Allee, 1982) called for research and development, assessment, technical assistance inter-agency cooperation, financing and funding, plus standard setting. If I were to advocate any one organizing principle to cut through these roles, it would be management capacity building.

The reviews of the "208" water quality planning program may be instructive in how national efforts to impact local capacity can be improved. One of the 208 goals was the evolution of regional capacity to integrate various efforts to protect water quality. Non-point pollution seemed to offer significant opportunities for local land use control arrangements and the like to be used to improve water quality. The mechanics of rational analytic planning and debates over nationally determined technical criteria inhibited the process. Also, a perception

that didn't help was that planning was being done after the two major control systems were essentially in place (Spiegel and MacArthur, 1981).

Ertel (1982) provides such a review. She concludes that pre-existing political credibility for the 208 sponsoring agency was a key to success. Technical capacity and strong internal administration were also present. Many of the newer, less experienced entities will have used the 208 process to develop similar capacity that can be built upon in future planning and management. One wonders what might have been achieved if there had been less emphasis on the plan and more emphasis on institutional evolution.

Future research on water resource program evolution and development should be built around the evaluation and understanding of the capacity to make decisions, particularly at the inter-local level. Literature is beginning to emerge that is particularly relevant (Honadle, 1981, and Honadle and Howitt, 1985). I have taken a first cut at applying some of the concepts to institutional arrangements for groundwater protection (Allee, 1986). Such prospects for further contributions by the social sciences to the water resources public policy field are exciting.

Bibliography

- Advisory Commission on Intergovernmental Relations. 1981. Protecting the Environment: Politics, Pollution and Federal Policy. Washington, DC.
- Allee, David J. 1986. "Policy Issues in Groundwater Protection: Support for the Role of Local Government." Staff Paper No. 86-18, Department of Agricultural Economics, Cornell University, Ithaca, NY.
- _____, and Helen Ingram. 1972. Authorization and Appropriation Processes in Water Resources. Report to the National Water Commission, PB 212-40, NTIS. Springfield, VA.
- _____, Ronald M. North, and Leonard B. Dworsky (Eds). 1982. Unified River Basin Management - Stage II. American Water Resources Association. Minneapolis, MN.
- Anderson, Terry L. (Ed). 1983. Water Rights, Pacific Institute for Public Policy Research, San Francisco, CA.
- _____, and P.J. Hill. 1977. "From Free Grass to Fences: Transforming the Commons of the American West" in Garrett Hardin and John Baden, Managing the Commons, W.H. Freeman and Co., San Francisco, CA.
- Bickel, Gerald D. 1982. "Overdraft and Seawater Intrusion on the Oxnard Plain: A Water Management Strategy" in Allee, et al., pp. 251-260.
- Creel, Tilford C. 1981. "Savannah River Basin" in North, et al.
- Coy, L. Bennett. 1981. "Unified River Basin Management" in North, et al., pp. 284-292.
- Dworsky, Leonard B., David J. Allee, and Ronald M. North. 1982. United States Water Planning and Management Practices. Report to the U.S. Water Resources Council and Office of Water Research and Technology, U.S. Department of the Interior.
- Dworsky, R.F. and D.I. Wilkerson. 1982. "Substate Institutions in Alaska: Review and Evaluation" in Allee, et al., pp. 472-482.
- Ertel, Madge. "The 208 Experience: Enhancing Planning and Management Capacity at the Substate Level" in Allee, et al., pp. 494-498.
- Feasler, Donald R. 1982. "From Flood Control to Water Management" in Allee, et al., pp. 462-471.
- Fisher, Lloyd K. "A Critique of the Nebraska Natural Resource Districts" in Allee, et al., pp. 453-461.
- Honadle, Beth W. 1981. "Capacity Building (Management Improvement) for Local Government: An Annotated Bibliography." U.S. Department of

- Agriculture, Rural Development Research Report No. 28, Washington, DC.
- _____, and Arnold M. Howitt (Eds). 1986. Perspectives on Management Capacity Building. State University of New York Press, Albany, NY.
- Ingram, Helen. 1972 "The Changing Decision Rules in the Politics of Water Development." Water Resources Bulletin 8(6):1177-1187.
- _____. 1973. "The Political Viability of Regional Water Institutions." American Journal of Agricultural Economics 55(1):10-18.
- _____, and Louis Weschler. 1982. "Arizona Groundwater Reform: The Forces of Change" in Allee, et al., pp. 418-428.
- Kaynor, Edward R., and B.B. Berger. 1982. "Management of Water Supply in New England" in Allee, et al., pp. 261-272.
- Lord, William B. 1981. "Objectives and Constraints in Federal Water Resources Planning." Water Resources Bulletin 17(6):1060-1065.
- _____. 1982. "Unified River Basin Management in Retrospect and in Prospect" in Allee, et al., pp. 58-67.
- Lowi, T.J. 1966. "Distribution, Regulation, Redistribution: The Function of Government" in R.B. Ripley (ed), Public Policies and Their Politics. W.W. Norton and Co., New York, NY.
- May, Thomas G., D.A. Russo, and K.E. Schriter. 1982. "Sewers vs. Septic Tanks: Case Study of Planning for a Small Community" in Allee, et al., pp. 251-260.
- Milbrath, Lester. 1965. Political Participation. Rand McNally, Chicago, IL.
- North, Ronald M., Leonard B. Dworsky, and David J. Allee (Eds). 1982. Unified River Basin Management. American Water Resources Association, Minneapolis, MN.
- Ostrum, Vincent and Elinor Ostrum. 1977. "A Theory for Institutional Analysis of Common Pool Problems" in Garrett Hardin and John Baden. Managing the Commons. W.H. Freeman and Co., San Francisco, CA.
- Shabman, Leonard. 1984. "Emerging Concepts for the Conduct of State Water Resources Planning" Water Resources Bulletin 20(2):203-208.
- Sheehan, M.F. 1986. "Economism Democracy and Hazardous Wastes: Some Policy Consideration" in Sheldon Kamieniecki, et al., Controversies in Environmental Policy, State University of New York Press, Albany, NY.
- Sheer, Daniel P. 1982. "The Hope of a Basin Commission in Water Supply Management" in Allee, et al., pp. 301-315.

Spiegel, Stuart J., and Dwight A. MacArthur. 1982. "Conflict in Water Resources Management: Sections 201 and 208 Implementation" in North, et al., pp. 416-426.

Wengert, Norman. 1981. "A Critical Review of the River Basin as a Focus for Resources Planning, Development and Management" in North, et al., pp. 9-27.