

Improving Ecosystem Governance: Lessons from Watershed Management Programs in the United States

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Author's Background:

Mark T. Imperial has a Ph.D. in Public Affairs from Indiana University. He has been researching coastal and water quality management programs in the United States for over a decade. These include watershed management efforts in the Great Lakes, Chesapeake Bay, National Estuary Program (NEP), Special Area Management (SAM) Plans, Lake Tahoe, and some state watershed partnership programs that utilize an ecosystem-based approach to varying degrees. Of particular interest is the analysis of institutional arrangements and network processes used to develop and implement these programs. His research is published in journals such as *Coastal Management*, *Ocean and Coastal Management*, *Environmental Management*, and the *Natural Resources Journal*. The National Academy of Public Administration also published a report entitled *Environmental Governance in Watersheds: The Importance of Collaboration to Institutional Performance*. He has also worked for Rhode Island's coastal zone management program and as a consultant assisting in the development of local coastal and water quality management programs. The presentation provides an overview of one ecosystem-based program, the National Estuary Program (NEP), and draws on the U.S. experience with watershed management to draw lessons for practitioners seeking to make ecosystem management operational.

Applying the CPD's 12 Principles and 5 Operational Guidelines

The Convention on Biological Diversity's (CPD's) twelve principles and five operational guidelines have some applicability to watershed management programs in the United States, although they were not used to guide these efforts. Watershed programs generally recognize that management objectives are a matter of societal choice and decision making is often decentralized to the lowest possible level. This lets decisionmakers identify and define problems in terms of their local contextual conditions. Most programs rely on either joint decision making or use advisory committees to synthesize public input and involve relevant societal sectors and scientific disciplines. However, decisionmakers often fail to make a concerted effort to consider the effects of their activities on adjacent watersheds.

Watershed management programs often focus on conserving ecosystem structure and functions while managing within these limits. However, this can be difficult to achieve. Most watershed efforts also recognize the importance of the economic context within which decision making occurs. However, there is less focus on minimizing market distortions and internalizing the costs and benefits within a given ecosystem.

The efforts tend to be information intensive and emphasize scientific research (applied and basic) during both planning and implementation. Problems occur when the science fails to provide the information decisionmakers need when they need it. There is also a tendency for participants in

the decision-making process to think that science will tell them the answer or make decision for them – this is rarely the case. No matter how much information is generated, decision making almost always occurs under conditions of uncertainty. Moreover, you often know enough about problems to begin taking action while research is being conducted.

Scale is always an issue because watersheds are nested within watersheds. Watersheds studied have ranged from about 30 square miles to literally 1,000s of square miles. What is clear is that the scale should match the problem and that all problems are not “watershed problems” because they are better addressed at other scales (e.g., national, state, county, local government). Time lags are an important issue. Politically, the pressure is often on demonstrating results quickly and there is a tendency to implement what might be called “random acts of environmental kindness.” Policymakers fund visible projects to respond to problems but they are too limited in scope, scale, magnitude, or duration to make a difference in the underlying problem. Successful programs recognize that implementation occurs over long time periods and adopt specific performance measures as well as monitoring and reporting processes that encourage a systematic approach to problem solving. Performance measures can then be modified based on implementation and new scientific research. This adaptation process appears to be easier than continually developing new plans as changes occur.

Were Adaptive Management Practices Used to Learn About the Structure and Function of Ecosystems?

The use of adaptive management practices is somewhat limited and there appear to be some practical constraints on its use when it comes to addressing some water quality problems. For example, there are limits to our understanding how ecologic systems function. It is often difficult to disaggregate the effects of various federal, state, and local programs on specific problems. There can be long time lags between management interventions and observed effects. It is also common to find that practitioners are reluctant to revise policies and plans that take years to develop. Many politicians are also reluctant to take the risks implied by the adaptive management approach.

It is common to find that implementation uses a trial and error, learn-by-doing approach. When viewed over time, there is often clear evidence of policy-oriented learning. Thus, adaptive management can be thought of as a management philosophy – one that embraces organizational change, innovation, and learning. It is also common to find that the adoption of performance measures and reporting processes encourage these learning processes. However, accountability mechanisms can be a “two-edged” sword. On the one hand, they provide incentives for joint action. Monitoring processes also create peer pressure at the political, professional, and individual level. Conversely, there is a constant tension between organizational autonomy and accountability. Too much emphasis on accountability can create disincentives for joint action and excessive transaction costs.

What Can be Learned From the U.S. Experience About Making the Ecosystem Approach Operational?

Much can be learned from the U.S. experience in watershed management over the past several decades. First, context matters. Watershed management is invariably influenced by factors such as the physical, political, socioeconomic, and institutional environment. Local culture and situational histories (e.g., previous watershed efforts, history of conflicts, etc.) also influence watershed programs. Second, leadership is critical at all stages of the process to initiate, maintain, and expand cooperative processes. Third, it is important to “nest” science in the decision making process. Science is typically most influential in identifying problems, framing options, and evaluating progress but it rarely tells decisionmakers what to do.

Fourth, you need to work at a scale appropriate for the problem you are addressing. It is also important to remember that increasing the scale is likely to expand the set of problems, which in turn expands the number of affected stakeholders. It is also likely that stakeholder interests will become increasingly heterogeneous. As a result, it can increase the transaction costs of decision-making processes. A solution to these problems is to utilize nested institutional arrangements. For example, you can have a program focused on setting watershed goals with separate programs focused on specific problems or subwatersheds.

Finally, it is important to have a well-managed decision making process that minimizes transaction costs. It is critical during the early stages of an ecosystem management effort to decide on who will be involved, what issues will be addressed, what will get decided, how decisions will be made (decision rules), and what impact decisions will have (binding, advisory, etc.). These rules must then be institutionalized. It is also important to establish decision-making and interactive processes that produce trust and improve relationships between individuals and organizations.

How Do You Improve Ecosystem Governance and Build New Institutions?

Since all ecosystems are “managed” by a wide range of institutions, the challenge for practitioners is finding ways to enhance governance in a world of shared power where the capacity for solving complex problems is widely dispersed and few organizations have the power to accomplish their missions by acting alone. Accordingly, when viewed from an institutional perspective, you improve ecosystem governance by building, enhancing, expanding, or changing interorganizational networks. It also requires altering, changing, or improving how decisions are made both within and across organizations to improve policy integration and enhance interorganizational coordination.

These activities are likely to occur at the operational, policy making, and institutional level. Activities at the operational level involve government service delivery and individual or collective actions that improve environmental conditions directly or indirectly. Common activities focus on improving environmental conditions (e.g., habitat restoration project), educating decisionmakers or the general public, and improving monitoring and enforcement.

These activities are often influenced by activities at the policy making or institutional level. Policy making activities perform a steering function by improving communication and information flow, coordinating actions, and integrating policies that advance shared goals. Activities typically focus on knowledge sharing (e.g., joint research projects, shared databases, etc.); resource sharing, and developing shared policies and norms. Successful programs not only establish meaningful interactions, but they also find ways to make relationships endure by institutionalizing shared policies and norms in existing institutions or by establishing new network organizations that commit members to activities at the policy making or operational level.

While environmental improvements are the rationale driving the creation of watershed efforts, they generate other forms of public value at the individual, organizational, network, and societal levels. It is common to find that they improve job satisfaction and motivation for some individuals. They stimulate learning, adaptation, and change within and across organizations. They develop problem-solving capacity in organizations and networks. Improved trust, personal relationships, and organizational interactions create social capital while volunteerism and stakeholder involvement produce civic engagement.

What Is Needed to Implement Ecosystem Management and What Are the Potential Obstacles?

Much has been learned about what is needed to implement ecosystem management. While implementation activities vary by watershed, it is common to find that initial implementation efforts are slower than expected – thus, some inertia has to be overcome. One of several patterns is commonly observed. Implementation activities begin to increase in scope as participants gain experience, learn how to work together, and successes attract new resources and participants. This is called the bandwagon effect. Other efforts never achieve this threshold effect but manage to maintain a sustained ability to implement projects over a long period of time. Less successful efforts gradually decline as enthusiasm and resources diminish and participants are unable to find ways to overcome their differences or find productive ways to work together. This suggests that practitioners should gradually scale up implementation efforts to facilitate learning. They should initially address issues where there is strong support, build on early successes, and begin addressing other issues and problems. It is also important to enlarge the “shadow of the future” so there is a compelling reason for continued interaction to maintain relationships and trust.

There are also common obstacles that practitioners confront. The first is the disposition and skills of implementers. Some staff and organizations dislike working together or participating in network processes. They may also lack the skills needed to participate or are unable to effectively manage network processes. Second, there are often incentives to engage in strategic behavior that exacerbates transaction costs (e.g., shirking, social loafing, corruption, etc.). For example, it is common to find individuals and organizations trying to protect their “turf.” Competing programmatic priorities and conflicting budgetary or statutory obligations can also make it difficult for organizations to cooperate.

Finally, adequate resources are typically a necessary but not a sufficient condition for effective implementation. It takes resources such as time, money, equipment, staff, technical expertise,

and legal authority to get things done. When resources are distributed among different organizations, it can create complementary relationships and incentives for joint action. Slack resources are also important. If partners can contribute nothing more than staff to attend meetings, then it is unlikely that much will be accomplished. It is also important that there is some stability in funding levels to allow participants to plan and budget with confidence. However, a problem arises when there is heavy reliance on external funding sources to implement watershed programs and a funding agency's priorities drive implementation rather than watershed priorities. This is particularly problematic when a funding agency's priorities change frequently because it becomes difficult to enact the long term, systematic approach to problem solving necessary to address watershed problems effectively.