6

Rethinking the Choice of Methods for Policy Analysis

The theories discussed in Chapter 5 suggest three overlapping sets of methods for conducting environmental policy studies: analytical methods, rhetorical methods, and process methods. We examine each in turn, relating them to the six examples of effective environmental policy studies discussed in Chapter 3. In light of this examination, we then turn once again to Congressman Randolph's concern about the continued use of chlorinated organic compounds.

ANALYTICAL METHODS

Analytical methods usually involve a *systematic, scientific approach to the development of policy options.* Examples include cost–benefit analyses, risk assessments, gaming simulation, and linear and dynamic modeling. More often than not, using analytical methods in environmental policy studies involves a heavy reliance on the rational approaches to policy studies outlined in Chapter 5—particularly systems analysis. Although our review of the topic in Chapter 5 might lead the reader to believe that purely analytical policy methods have fallen out of favor, these techniques have in fact been successfully employed in studies such as *Lead in Gasoline* and the *Delaney Paradox.* Indeed, there are situations in which purely analytical methods present the only practical approach. Moreover, Arrow et al. (1996) argue that cost–benefit analysis should be incorporated into every policy

analysis involving environmental, health, and safety questions tied to modification or adoption of regulations.

When an analyst opts to use an analytical approach to developing policy options, there are several factors that determine the effectiveness of the ensuing environmental policy study. First, as seemingly straightforward as analytical methods appear to be, values inevitably influence the outcome of the analysis and must be handled carefully. Rein (1976) refers to these values as "frames," and posits that "[i]nformation and data can never be understood in isolation from the context of ideas which give them meaning." In other words, information and data are not value-neutral. A study may be valid and consistent in terms of internal criteria, but still may be opposed by those whose interests it affects. The crucial point, argues Rein, is that questions of interpretation rather than matters of fact often shape policy debates. Claims of causality underlying a policy issue are often unclear and open to competing interpretations. The data and information used in an environmental policy study will, therefore, have a critical influence on the results. Different sets of data, all equally valid, employed in the same analytical way can nevertheless produce results that vary considerably. Eberstadt (1995) illustrates this phenomenon by examining a number of different public policy studies (and resulting policy decisions) to demonstrate how using different parameters and different sets of data (emphasizing alternative causal factors) yield starkly contrasting results.

Second, each analytical method rests on assumptions and values that must be understood prior to its use in a policy study. A risk assessment, for example, usually assumes that risks below a certain threshold will be acceptable. In a cost–benefit analysis, although costs are usually quantifiable, benefits often are not. Certain assumptions must be made about what the benefits are and how they are to be quantified. Hendrickson, Lave, and McMichael (1995) illustrate this point quite nicely in their analysis of the recycling program in Pittsburgh, Pennsylvania, discussed in Chapter 4. Perceived benefits from the recycling program included income generation, resource conservation, and environmental benefits in general. However, upon deeper analysis, Hendrickson, Lave, & McMichael (1995) demonstrated that disposing of recyclables was actually more expensive than dumping in a landfill and required a disproportionate amount of resources to collect recyclables. Far from benefiting the environment, the recycling program appeared to cause more harm to the environment. Apart from these quantifiable benefits, the authors were unable to evaluate fac-

tors like social benefits and other similar intangibles, clearly demonstrating some of the barriers to employing cost–benefit analysis.

Third, the assumptions and values discussed must be made explicit at the outset of the study. Although opponents may argue the validity of particular assumptions and values, stating them "up front" lends credibility to a study. For example, if risk assessment is involved, the analyst should specify at the outset the level below which risks will be deemed acceptable, and study results should indicate whether the risks were in fact below that level. Similarly, credibility depends on whether benefits are identified at the outset of a study in which cost–benefit analysis is used.

Finally, analysts should share all their data and results with others in the field and across disciplines. This enhances the credibility of their work and encourages future studies by opening up causal connections or avenues previously unexplored to independent scrutiny. This is particularly important in the environmental field, where interactions among various disciplines are hard to maintain.

The ways in which these approaches to handling methodological difficulties can enhance the effectiveness of analytical policy studies are evident in both *Lead in Gasoline* and the *Delaney Paradox.*

Lead in Gasoline

As we discussed in Chapter 3, the *Lead in Gasoline* study relied on cost–benefit analysis. At the outset, Environmental Protection Agency (EPA) analysts were able to identify a clear benefit associated with reducing lead: The reduction of human lead intake reduced the incidence of high blood pressure. Once this benefit was identified and quantified, it could be tied to the cost of reducing lead levels in gasoline. The results were staggering. The significance and credibility of the "benefit" were identified as the primary factors leading to the adoption of regulations lowering lead levels in gasoline.

The *Delaney Paradox*

The *Delaney Paradox* study employed risk assessment methods that examined pesticide levels in raw and processed foods. Acceptable levels of risk were identified at the outset, lending credibility to the resulting policy recommendation that a consistent negligible risk standard be adopted for

pesticides in both raw and processed foods. Additionally, analysts subjected the findings and conclusions of the study to a broad peer review process and ultimately incorporated much of the resulting feedback into the final report. The credibility of the study in the eyes of Congress and the Clinton administration was clear. This led to the statutory adoption of a uniform negligible risk standard for pesticide levels in raw and processed foods.

RHETORICAL METHODS

Rhetorical methods represent another approach to conducting environmental policy studies. Rhetorical methods involve *persuasion, advocacy,* and *consensus building.* Although rhetorical approaches emphasize persuasion, analytical methods also play a role in providing convincing evidence to support policy recommendations. Rhetorical methods are most appropriate when a study concerns broad changes in policy direction or when many stakeholders will ultimately feel the impact of proposed changes in policy. Examples of rhetorical methods include risk communication and meta–policy analyses such as those used in the *Reducing Risk* study.

Because rhetorical approaches focus on persuasion, it is important that policy analysts incorporate the following techniques into their analyses. First, analysts should put together data in a convincing fashion. To accomplish this, analysts must first identify the primary audience of their study—those who need to be persuaded. Obviously, decision makers constitute one such audience. However, when the audience is much larger and composed primarily of lay people, the use of risk communication strategies such as public disclosure, educating the media and the public about the issues, and maintaining a channel for communication by interested stakeholders, is important. When this is the case, Morgan et al. (1992) argue that it is imperative that data be presented in such a way that lay individuals can understand them and use them to make rational decisions. Morgan et al. suggest that this can be accomplished with a four-step process:

1. Elicit people's beliefs, both accurate and inaccurate about a hazard.
2. Ascertain the prevalence of these beliefs.
3. Develop communications, based on the information gathered in the first two steps, to inform people of what they need to know to make informed decisions.
4. Test the effectiveness of the communications strategy adopted.

When the prospective audience is an executive agency, different strategies of persuasion will often make more sense. Williams (1987), a policy analyst at the Rand Corporation, notes that when using rhetorical approaches to policy analysis, it is imperative to know your audience, and to recognize that facts don't speak for themselves and that timing is everything.

Second, the study should be organized to appeal to commonly held democratic values. If such values are only implied, decision makers may not make the connection between the study results and the underlying values they represent. By making these values explicit, a study is more likely to persuade decision makers to take action. Additionally, explicit reference to democratically held values is particularly relevant to environmental policy studies where issues often defy attempts at quantification and the "economically most efficient" solution may not be the fairest (Susskind & Cruikshank, 1987).

Third, analysts should illustrate their arguments with actual cases. Forester (1993) argues that the use of practice-based stories can assist analysts in conducting policy studies. Similarly, stories of actual cases can be incorporated into a presentation of findings to demonstrate the practical reality of a particular argument. The cases selected can be "success stories" chosen to bolster a particular policy recommendation, or cases that illustrate the gravity of an issue, highlighting the need to take action.

Finally, analysts should build on the work of well-respected experts. Often, the impact of recommendations will be based not so much on what the analyst says, but on who supports them. The critical consideration here is trust. Especially in environmental policy studies, data are often complex and difficult to understand. Additionally, as Rein (1976) points out, data frequently lend themselves to alternative interpretations. The decision maker may ultimately be unable or unwilling to completely trust the arguments presented in the analysis. However, the decision maker may be more willing to trust recognized and well-respected experts who make the same arguments or lend their support to study results and recommendations. Relying on well-respected experts to conduct or review study results represents one more approach to enhancing the persuasiveness and thus the effectiveness of a policy study.

A good example of an effective environmental policy study that benefited from use of rhetorical methods is the *Reducing Risk* study discussed in Chapter 3.

Reducing Risk

The *Reducing Risk* analysis undertook a daunting task—to generate recommendations concerning prioritizing environmental efforts at the EPA. The scope of the study (referred to as a meta–policy analysis) was broad and its recommendations implicated all of EPA, as well as other agencies, states, and individuals. A rhetorical method was called for in order to persuade EPA that policy recommendations aimed at reconciling conflicting agency mandates were important. The study argued that equal attention should be paid to ecological and human health risks. The study employed over 60 EPA Science Advisory Board (SAB) members and more than 250 experts to bolster its findings.

The study, in fact, persuaded EPA to alter its long-term risk reduction strategy and to reorganize appropriately.

PROCESS METHODS

Process methods represent a third approach to environmental policy studies. Process methods involve *public participation* and *consensus building among affected stakeholding interests.* At times, such participation may be purely advisory, while at other times, participants may form a partnership with analysts in developing study results (Susskind & Field, 1996). They also involve situations that call for analyses across more than one discipline. Process methods bridge the gap between the differing opinions of interested parties as well as the contributions of different disciplines. While rhetorical approaches target situations where the study will affect large numbers of stakeholders, process methods are particularly useful in situations involving smaller numbers of individuals or a more easily defined region. Good examples of process methods include public participation and interdisciplinary collaboration.

The *Alternative Agricultural Research and Commercialization (AARC)* and *Spotted Owl* studies illustrate how process methods can be effectively used in environmental policy studies.

AARC

Fischer (1993a) demonstrates how the joint participation of experts and stakeholders can be effectively employed in a study of an environmental

policy problem that generally has no ideal solutions, such as the siting of a waste treatment facility. The *AARC* study demonstrates that if stakeholder representatives are incorporated in a collaborative study, they are more likely to accept the technical basis for the eventual decision, even though they may still disapprove of it. *AARC* task force members included representatives of industry, the public sector, and academia. Although the study was noticeably short on scientific support, the process employed helped to identify many of the roadblocks to commercialization of new agricultural products and processes. Such a result would probably not have been possible if interested parties had not been included in the analysis. The study ultimately resulted in legislation that established the *AARC*. Perhaps because of the direct involvement of so many interests, the *AARC* has successfully operated for over a decade as envisioned by the study participants.

Spotted Owl

The problems addressed in the *Spotted Owl* study could have been addressed as nothing more than a tradeoff between ecological protection (owls) and economic growth (jobs). However, the strength of the study was that it adopted an interdisciplinary perspective, redefining the critical question as one of ecosystem management. In this way, analysts not only addressed the issue of owl preservation, but also the related topics of information gathering and analysis, watershed restoration, and prescribed burning. The process methods employed by the analysts thus facilitated the synthesis of information from a wide range of disciplines. This powerful form of interdisciplinary analysis allowed the analysts to present fourteen separate policy options, each characterized by data viewed as accurate, from which Congress could choose.

PUTTING IT ALL TOGETHER: THE ISSUE OF CHLORINATED ORGANIC COMPOUNDS REVISITED

The three sets of methods discussed here—analytical, rhetorical, and process methods—provide a convenient framework for thinking about how to approach tough environmental policy questions. All of the factors

discussed in earlier chapters will come into play in deciding on a method or combination of methods to employ, which uses to target, and what organizational strategy to rely on in carrying out an environmental policy study.

If we shift back to the concerns of Congressman Randolph—the environmental and human health risks posed by the continued use of chlorinated organic compounds, we can see the way that each of the three sets of methods might come into play. As Congressman Randolph pointed out, many different groups have conducted studies concerning the various aspects of the chlorinated organic compound issue. The sponsors of these studies are diverse and include environmental groups, health groups, industrial and trade groups, and government advisory bodies. The issue has been addressed at the national, regional, and state level. And not unexpectedly, the results and recommendations of these studies have been in conflict with each other.

There are a number of factors that Congressman Randolph must weigh when deciding which method to pursue. Any of the three approaches or a combination could result in a credible and effective environmental policy study.

First, he must be politically circumspect. Given a politically charged climate, he should be focused on generating the highest possible degree of legitimacy. As we discussed in Chapter 2, it is not difficult to find and hire a consultant to produce a report along the lines you desire. Whether decision makers pay attention to the results of such a study, however, will hinge in large part on the degree of legitimacy the study achieves. Because there are already so many published studies concerning the continued use of chlorinated organic compounds, only a new study with an extraordinarily high degree of legitimacy will influence decision makers. In addition, timing is crucial. A study that arrives after decision makers have formulated and announced their positions will have little or no impact. Thus, the selection of a method or set of methods that requires coordination with various stakeholders before recommendations can be formulated may not be appropriate when a decision must be reached quickly. Finally, fiscal constraints and organizational constraints can also shift the preference for one approach over another. Optimizing these factors and others should result in the selection of a method or approach by the analysts considering the needs of the sponsor and nature of the study and will hopefully produce an effective environmental policy analysis.

ENHANCING THE INTERPLAY OF THEORY AND PRACTICE

In previous sections, we discussed the various theories of public policy analysis as well as the methods that can enhance the effectiveness of environmental policy studies. In this section, we focus on the interaction of knowledge and learning in environmental policy, the importance of science in environmental policy making, and what the future might hold in terms of new theories and methods for environmental policy analyses.

Knowledge and Learning in Environmental Policy Making

We have discussed how knowledge relates to power (Wildavsky, 1987), how knowledge is disseminated, and how information and data, depending on the perspective they are viewed from, often affect the outcome of policy analyses (Rein, 1976). Environmental policy analysis frequently calls for the interaction of many interested parties, for example, government agencies and decision makers (wishing to redirect public processes in a particular direction), stakeholders (those affected by any policy decision), other interested groups, and those who are involved in implementing selected policies. Environmental policy analysis and policy making increasingly involve collective action (Loeber, 1996). Loeber argues that because "analysis in practice does not provide a neutral, unbiased and impartial input into (political) decision making, it is relevant to consider the impact of the activity of analysis itself on the policy process." Sabatier and Jenkins-Smith (1993) use the term *policy-oriented learning* to describe the concept of considering changes over time regarding the distribution of policy knowledge and policy positions of the various groups involved in the policy analysis and policy-making process. Consequently, the role of analytical debate in policy-oriented learning is essentially characterized by the way analysis is employed (Loeber, 1996).

Loeber notes that an effective way to attack the collective action problem in environmental policy analysis is to (1) include the perspectives of the various actors in the policy-making process in the policy analysis itself, and (2) select an approach to analysis that is interactive and interpretive in character. Many of these approaches have been discussed in Chapter 5 (e.g., participatory policy analysis and critical theory). Loeber continues that in order to make collective action work, new information

must be systematically made available to all of the individuals involved in the policy analysis. This allows the various actors to reflect on each others' points of view and underlying assumptions.

One type of policy-oriented learning occurs in professional and open forums. A professional forum, much like an epistemic community, consists of participants who have a common basis for assessing analytical claims. The drawbacks of professional forums include: (1) the forum may represent only a small cluster of actors interested in particular environmental problems; and (2) the screening of forum participants can effectively eliminate those with opposing policy viewpoints. Open forums, on the other hand, consist of participants who do not share a common analytical basis. While they are more representative, open forums (1) are more likely to find themselves caught up in analytical conflicts, and (2) often do not provide a basis for achieving consensus on contentious policy issues (Sabatier & Jenkins-Smith, 1993). However, open forums can enhance learning among the various participants and lead to questioning of tacit assumptions or belief systems (Loeber, 1996). In fact, both types of forums can work—in real time as well as in cyberspace—as long as they are facilitated effectively by professional "neutrals"(Susskind, McKearnan, & Thomas-Larmer, 1999), operate under clear and appropriate ground rules, and build on a basis of shared technical analysis (Ozawa, 1991).

Although the present trend in environmental policy analysis appears to be toward collective action, we must not forget or neglect the importance of science in environmental policy analysis.

Role of Science and Technical Knowledge

Policy issues with complex scientific and technical ramifications naturally require scientific and technical input for effective policy analysis and wise policy formulation. Most environmental policy issues arise in complex economic, social, political, scientific, and technical contexts. Consequently, effective integration of these contexts in defining problems, identifying and evaluating policy alternatives, and arriving at policy options is essential. Brown (1993, p. 10) has suggested that

> *[S]cience has been particularly effective at influencing policy debate when it is overtly linked to widely shared subjective values. Over the past 25 years, the remarkable success of the environmental movement in influencing national priorities has been due largely to the popularity of an*

ethical or spiritual position [of preserving and protecting the environment] bolstered by scientific expertise.

Integrating scientific and technical considerations in policy analysis and formulation poses many problems. The very nature of scientific inquiry—focusing on understanding fundamental mechanisms of physical, biological, and social systems; experimentation, data collection, and analysis; generating new knowledge and then making a credible scientific case—dictates a considerable investment in time. Results are hardly ever conclusive, as there are always some uncertainties. More research alone to resolve uncertainties is rarely helpful. Indeed, as Brown (1993) suggests, "the search for greater accuracy in science may lead to greater controversy in politics. Few would argue that dioxin is highly toxic; the exact degree and nature of the toxicity, however, is subject to endless debate." Additional research related to the effects of dioxin has not minimized the controversy.

While the goal of science is objectivity, the goal of policy formulation is to study all sides of an issue, build consensus, and formulate a policy that is acceptable given what is known and not known. These goals at times may seem to be at odds. What role can scientific and technical knowledge play in policy formulation and how should scientific information be conveyed to affect policy?

Scientific research can help anticipate potential problems that may result from selecting certain policy choices. Under conditions of uncertainty, scientific and technical input can help devise contingent policy options that permit action even if the future is not clear. Policy makers and the scientific and technical community can work together to design incremental, adaptive policies that can move toward prescribed goals along multiple and evolving pathways (Brown, 1993). Unfortunately, too much technical information is conveyed to the public and policy makers in ways that are not "user friendly." It is natural for scientific and technical personnel to want to be precise, accurate, and comprehensive. But complicated, voluminous, and untimely technical information often becomes incomprehensible, irrelevant, and marginally useful if no effort is made to present it properly. Thus, scientific information has to be conveyed in a user-friendly and timely manner.

Because there are enormous scientific and technical ramifications of each environmental policy choice, it is prudent to involve those technically competent in the examination of policy options. Such partnerships often

lead to what we have already noted—"joint fact-finding" (Ozawa, 1991). This mode of collective inquiry works best when all the stakeholding parties play a role in selecting a single set of technical advisers, specify the research protocol together, and use the services of a neutral interlocutor (Susskind, McKearnan, & Thomas-Larmer, 1999).

Policy Studies Can Often Raise More Questions

In previous chapters we have discussed the role of problem definition in environmental policy analysis and the need to define the problem in helpful ways. However, no matter how much effort is put into problem definition, the analysis itself will often raise more questions that need to be addressed. This is not necessarily a bad thing. Many environmental issues are quite complex. Causal connections and interactions are often poorly understood. As groups dig more deeply into an issue, and learning occurs, new questions are sure to arise.

New problems or questions can be handled in two ways. Some methods of analysis can incorporate refinements in problem definition. In the *Spotted Owl* study, for example, the analysts redefined the issue as one of ecosystem management, supplanting the narrower conception of jobs versus owls. Second, new issues raised can be addressed in subsequent policy analyses.

When the environmental issues are narrow, as in the *Spotted Owl* study, it may be possible to successfully adopt a wider problem definition. When an issue is quite complex, it may be necessary to tackle pieces of the problem in a creative manner. This approach was adopted in the *Reducing Risk* study where the SAB committee was divided into three subcommittees—Ecology and Welfare, Human Health, and Strategic Options—each of which issued a report that was then included in the main report as appendices. The resulting meta-policy approach facilitated analysis of three different policy issues on an individual basis at the outset, while addressing new issues raised at the later integration stage.

There Is Still Great Room for Progress

The problems and complexities associated with environmental policy management often seem daunting. In this book we have illustrated six effective environmental policy studies. However, there are countless other

environmental policy efforts that have not been nearly as successful and indeed can be considered failures. Rubin, Lave, & Morgan (1992) illustrate the failure of the $500 million, decade-long National Acid Precipitation Assessment Program (NAPAP) to effect changes in the Clean Air Act in 1990. This well-funded, lengthy study, although producing a lot of "good" science, was not prepared in time for decision makers to use it in drafting the new Clean Air Act. Additionally, the information contained in its twenty-seven technical reports and three-volume integrated assessment was not presented in a manner that could be easily understood by the decision makers. The results of the NAPAP study highlight the institutional and organizational obstacles facing acceptance and implementation of study results.

The *Complex Cleanup* study highlights these obstacles as well. The Office of Technology Assessment (OTA) began the study by evaluating what was known about the contamination and public health problems at nuclear weapons facilities as well as the remediation technologies available to address them. However, the analysis and subsequent report instead focused on institutional changes that were needed. The study documented that the Department of Energy (DOE) did not have a process in place to collect information about public health impacts, lacked adequate public participation, and lost public credibility because of these practices and past behaviors. OTA concluded that the current institutional structure at DOE precluded making the proposed changes. In much the same way, Rubin, Lave, & Morgan (1992) conclude that organizational barriers precluded the NAPAP study from being an effective effort to address the complex issue of acid rain.

Environmental policy theorists and analysts are currently considering various strategies for addressing these complex institutional and organizational obstacles. One area of current research involves the use of integrated policy assessments, a policy analysis framework akin to a meta–policy analysis, where complex issues with large degrees of uncertainty can be addressed in a systematic, meaningful manner. Rubin et al. (1992) note that one of the primary reasons NAPAP failed to influence new clean air legislation was that there was no serious effort made to define policy related research priorities. If this had been done, it might have aided in setting appropriate research priorities and timetables. Integrated assessments offer an effective means of establishing a mechanism for reviewing the results of research and reevaluating research priorities. Integrated policy assessments seek to (1) survey the current state of knowledge concerning an issue under discussion, (2) reach scientifically informed judgments concerning what is known and not known as well as key uncertainties,

and (3) ascertain where new research might aid the policy process most effectively. Integrated policy assessments thus form a bridge between the scientific and policy communities (Rubin, Lave, & Morgan, 1992).

To be credible, such assessments should be conducted simultaneously by several groups of researchers. One assessment should be conducted by a nongovernmental organization such as a university or a nonprofit research organization. A second, parallel assessment should be conducted in-house by the government. Dowlatabadi (1995) summarizes and describes three families of current integrated assessment models as follows:

- Cost-effectiveness framing (e.g., DGEM and MARKAL)
- Cost-impact framing (e.g., IMAGE)
- Cost–benefit framing (e.g., CETA and PAGE)

Dowlatabadi and Morgan (1993) argue that integrated policy assessment is essential to tackling complex, long-term environmental issues. Using such models to address research priorities can help overcome many of the institutional and organizational barriers to effective environmental policy analysis.

"Backward mapping" can be used to assess an implementing agency's organizational capability to pursue a policy option and to produce the desired result (Lynn, 1987). Backward mapping includes:

- Describing the problem behavior at the lowest level of implementation
- Determining the ability of the implementing organization to affect this target behavior
- Determining the resources the implementing organization will require in order to bring about the desired change in the target behavior
- Describing the policy that will produce these required resources

Although backward mapping may be useful to identify situations where the organization may not be capable of implementing a selected policy alternative, it offers few tools for modifying institutional and organizational structures to effectuate policy implementation.

The use of alternative policy instruments may provide a viable option for achieving policy goals (McDonnell & Elmore, 1987). Alternative policy instruments include:

- *Mandates*—rules that govern the actions of individuals and agencies and are intended to produce compliance

- *Inducements*—the transfer of money to individuals or agencies in return for certain types of actions
- *Capacity-building*—the transfer of money for the purpose of investment in material, intellectual, or human resources
- *System-changing*—the transfer of official authority among individuals and agencies.

Of the various alternative policy instruments presented, system-changing goes farthest toward hurdling the barriers posed by institutional and organizational obstacles.

Another approach to addressing institutional problems in environmental management was presented earlier when we discussed Wildavsky's "self-evaluating" organization. Wildavsky (1987) examines the role of knowledge and power within the construct of a model of a self-evaluating organization. Such an ideal organization would be one that continually monitored its own activities to determine not only how well it is meeting its objectives, but whether the objectives need to be changed. In Wildavsky's view, a self-evaluating organization uses its institutional or organizational structure to overcome many of the barriers identified above. The barriers to creating a self-evaluating organization include the mindset of the individuals in an organization and their "loyalty" to established clientele and ways of working, the tension between different programs within an organization, the tendency to disregard policy choices that appear ineffective (as opposed to analyzing why they were ineffective), and the resources (time and money) required to support evaluation. Wildavsky proposes that forward-thinking individuals within an organization who possess a willingness to critically evaluate current objectives and clientele in light of the future, however uncertain, can be a powerful engine for overcoming traditional institutional barriers. When needed, program managers can shift resources among projects instead of making absolute judgments as to which are better at a particular time. Program managers can also focus on why certain policy efforts are failing and what can be done to correct such failures. To accomplish such objectives requires a radical change in institutional thinking. Once organizational actors recognize the need for experimentation, select and gather relevant information for evaluation, and establish a basis of trust both within the organization as well as with external actors, the self-evaluating or learning organization will be much closer to becoming reality.

CONCLUDING REMARKS

Policy science continues to evolve. There is certainly room for progress. Theoretical approaches to environmental policy study need to be improved so that they better address the technical, economic, political, and cultural context in which policy is made. In practice, environmental policy studies confront institutional obstacles that we need to better understand. Finally, bridging the gap between theory and practice with respect to environmental policy making will require a set of highly trained policy analysts who understand both the uses and the organizational context of environmental policy studies.