

Methods and Roles of Environmental Policy Studies

In 1951, Harold Lasswell noted that the term *policy science* meant “applied social and psychological science.” The term *policy analyst* meant “political scientist.” The term *policy* itself was “commonly used to designate the most important choices made either in organized or private life” (Lasswell, 1951). These definitions are still critical to our understanding of policy science.

The beginnings of policy science can be traced to the time of World War I, when the social, psychological, and other applied sciences contributed greatly to the conduct of war. Economists estimated the resources, manpower, and facilities required. Psychologists developed intelligence tests as a means of selecting individuals to perform particular tasks. The economists relied on mathematics and statistics while the psychologists used other quantitative methods. The emphasis on such methods reflected the view of many social scientists that they would gain greater acceptance the more closely their “tools” approximated those of the physical sciences. In the early 1920s, Charles E. Merriman, professor of political science at the University of Chicago, formed the Social Science Research Council, a group of scholars in political science, economics, sociology, and psychology, which stressed the importance of breaking down the barriers between scholars and enhancing the study of methods. In the preface to his book, *New Aspects of Politics*, Merriman sought “to suggest certain possibilities of approach to method, in the hope that others may take up the task and through reflection and experiment eventually introduce more intelligent

and scientific technique into the study and practice of government, and into popular attitudes toward the governing process" (Lasswell, 1951). Many similar groups formed during the period between the two wars.

Improvements in social science research methods resulted in increasing capacity to make primary observations and process data. During the period of the depression in the United States, policy science came into its own with the realization that government intervention was essential in order to address the issue of unemployment and to set in motion the forces of the free market. Until that time, "economic theory" had cautioned against drastic government action. World War II witnessed an increasing and more effective use of the skills of economists, psychologists, sociologists, and social psychologists (Lasswell, 1951). Although the groundwork for policy science was laid, the parameters of policy science had not yet been set.

The introduction and subsequent development of applied social science methods inevitably led to the question of how this new knowledge should be used. Lasswell stated that the resources of the expanding fields of social science should "be directed toward the basic conflicts in our civilization . . . by the application of scientific method to the study of personality and culture" (1951). He further noted the importance of selecting fundamental problems, the use of models, the clarification of goals, the need to maintain a global perspective, and the value of building institutions to foster the association between active policy makers and academicians (Lasswell, 1951).

Lasswell underscored the desirability of integrating "the intellectual life" and harmonizing science and practice. A "policy orientation," he argued, required an emphasis on process and on the intelligence needs of policy. Or, to put it another way, policy science includes: "(1) the methods by which the policy process is investigated; (2) the results of the study of policy; and (3) the findings of the disciplines making the most important contributions to the intelligence needs of the time" (Lasswell, 1951). Ultimately, this view of a "policy orientation" emerged as what we know as policy analysis.

APPROACHES TO POLICY STUDIES

Since Lasswell's early writings on policy science, the field has continued to evolve. Quade and Carter (1989) define policy analysis as "attempting to

bring modern science and technology to bear on society's problems . . . [by] search[ing] for feasible courses of action, generating information and marshaling evidence of the benefits and other consequences that would follow their adoption and implementation, in order to help the policy maker choose the most advantageous action." Operations research, systems analysis, and cost-benefit analysis are some of the methods often used to conduct policy analyses. However, the term *policy analysis* has a broader connotation than the analysis itself and generally encompasses the political and organizational difficulties associated with making policy decisions and then implementing them (Quade & Carter, 1989).

In general, the techniques of policy analysis emphasize a structured and systematic approach characterized by the need to: (1) define a problem and develop evaluative criteria; (2) generate policy options, forecast future requirements, and predict consequences; and (3) evaluate and rank alternative policy options (Carley, 1980).

Systems Analysis

In a narrow sense, systems analysis characterizes one approach used in policy analysis. In its broadest sense it can actually substitute for the broad definition of policy analysis offered above. To fully comprehend the scope of systems analysis, operations research must first be briefly examined.

Operations research (OR) is a tool that helps management determine its policies and actions scientifically. Stated in a more pragmatic way, it is the use of "scientific methods to help decision makers get the most out of available resources" by manipulating them more effectively (Quade & Carter, 1989). OR traces its origins to World War II, when it was first employed in the defense arena to handle complex problems involving large systems composed of men, machines, and other resources. Today it is used widely in business and industrial arenas (Quade & Carter, 1989).

Utilizing OR, analysts develop a simplified mathematical model of a complex system and then add estimates of risk and chance in an attempt to predict and compare the outcomes of several alternative decisions or strategies. Unlike some areas of science, where the models are often based on a well-understood and confirmed body of scientific knowledge, the OR analyst is frequently challenged by "systems" for which no established theory exists. To construct a model, the OR analyst organizes numerical inputs based on intuition (and limited practical experience). As experience with the relevant system increases or when data from experimentation

become available, the analyst modifies or even completely discards earlier models (Quade & Carter, 1989).

OR is best at addressing "efficiency problems." Systems analysis more generally applies to the task of making an "optimal choice." Where OR was frequently used to address relatively simple problems where the decision makers had clear objectives in mind, systems analysis was applied to more complex problems involving unclear policy objectives. Systems analysis is thus often employed for the selection of an appropriate mix of goals and frequently takes forecasts of future economic factors into account (Quade & Carter, 1989).

Systems analysis thus takes OR one step further; it not only collects and analyzes quantitative data, it also addresses the question of what then to do with them. Quade and Carter (1989) describe the process of systems analysis as including: (1) objectives, (2) alternatives, (3) impacts, (4) criteria, and (5) models.

Objectives specify what the decision maker hopes to achieve. Frequently, objectives will not be clearly stated and the analyst will have to investigate and broker agreement on policy objectives. Where there is more than one decision maker (as in a legislative body), the analyst may have to infer objectives from written documents or published statements. Once objectives are established, the analyst must then identify alternatives by which the objectives can be achieved.

The alternatives considered are not necessarily obvious substitutes for each other, nor do they necessarily involve the same specific functions. Some alternatives may only emerge after a first round of analysis is conducted, posing new alternatives to consider. After identifying alternatives, the analyst must then address the likely consequences of each.

Impacts are often cast as costs (negative factors) and benefits (positive factors). Costs and benefits may sometimes overlap (as when a cost to one decision maker may be a benefit to another). When addressing impacts, the analyst must also consider distant consequences, which may not directly affect the attainment of the objectives but may be of particular concern to a key decision maker.

Criteria are rules or standards the analyst uses to rank alternatives in terms of how well they achieve the objectives. Thus, criteria connect objectives, alternatives, and impacts.

Models are at the heart of systems analysis. Models are used to predict the consequences of a particular alternative. When building a model, the analyst must test for consistency the logic of assumptions about operations, and use

data from the world-at-large to evaluate the strength of hypothesized relationships. In this manner, model-building can enhance understanding of a situation even before the consequences of particular alternatives are evaluated using the model (Quade & Carter, 1989).

The five elements of a systems analysis described above are woven together to form an analytic process with five phases (Quade & Carter, 1989):

1. *Formulation*—clarifying and constraining the problem and determining the objectives
2. *Search*—identifying, designing, and screening alternatives
3. *Forecasting*—predicting the future environment or operational context
4. *Modeling*—building and using models to determine impacts
5. *Synthesis*—comparing and ranking alternatives

Often, this process needs to be performed several times before a “best” alternative can be identified.

Figure 5-1 illustrates how the systems analysis methodology outlined above fits into public policy analysis more generally.

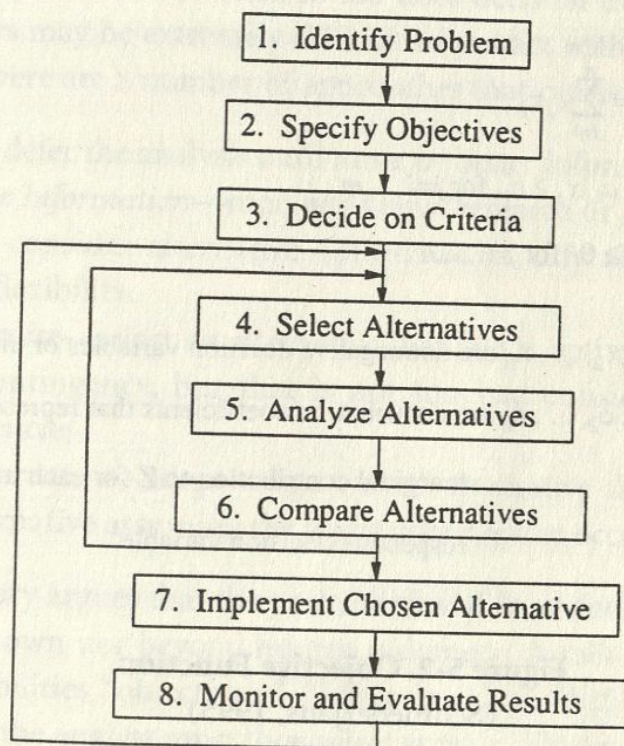


Figure 5-1. Steps in a Public Policy Analysis.
(Walker & Fisher, 1994).

Steps 2 through 6 clearly involve systems analysis. Public policy analysis must include problem identification and objective setting (steps 1 and 2) as well as implementation (step 7) and monitoring and evaluation (step 8). The feedback loops illustrate the iterative nature of the process. In addition, these feedback loops indicate that as the process progresses, analysts, their sponsors, and those likely to be affected learn from previous work. Decision makers for whom the work is being done are also influenced by pressure from interested constituents, and from still other decision makers who may see their domain adversely affected by what they anticipate as the likely impact of certain policy alternatives. Hence objectives and alternatives change, and constraints are introduced and removed. This is one of the major reasons why systems analysis must be a repetitive process (Find-eisen & Quade, 1985).

Many models have been developed to compare and rank alternatives (step 6). Often the relative merits of alternatives are described in terms of one, or at most a few, indicators (index value, figure of merit, or objective function). For example, an objective function is a type of linear program (LP) model that seeks to maximize a limited set of objectives, or Z function. The objective function may be stated as shown in Figure 5-2.

$$\text{Minimize: } Z = \sum_{j=1}^n c_j x_j$$

$$\text{Subject to: } \sum_{j=1}^n a_{i,j} x_j \geq b_i, \text{ for } i=1, \dots, m$$

$$x_j \geq 0 \text{ for } j=1, \dots, n$$

Where: x_1, x_2, \dots, x_n are nonnegative decision variables or unknowns; and c_1, c_2, \dots, c_n are contribution coefficients that represent the marginal contribution to Z for each unit of their respective decision variable.

Figure 5-2. Objective Function.
(Schniederjans, 1995).

The objective function is subject to a set of m constraints. Each constraint that makes up an LP model is a separate function, called a functional. These functionals may be viewed as individual objectives or goals to be attained. In effect, the b_i are a set of objectives or goals that must be satisfied in order for a solution to be feasible. Also, optimization of the objective function is secondary to finding a feasible solution set of the x_j that will satisfy all of the constraints in a model. In addition, LP models are implicitly based on several other assumptions, including the certainty assumption: all parameters, a_{ij} , b_i , and c_j must be known with certainty (Schniederjans, 1995).

Decision Theory

Decision theory developed as an approach to working with uncertainties in the context of an analysis. Specifically, decision theory involves the selection of an optimal alternative based upon contingent probabilities—likelihoods that events will occur and will influence the benefits or the costs associated with various policy alternatives (Raiffa, 1968; Nagel, 1984). In the same way that systems analysis represented a leap forward as compared with operations research, so too does decision theory, even though future factors may be extremely difficult to predict with accuracy. In these situations, there are a number of approaches that can be used:

- *Delay*—defer the analysis until more or better information is available.
- *Purchase Information*—fund additional research or data collection.
- *Hedge*—consider alternative options or modify alternatives to give greater flexibility.
- *Compromise*—select an alternative that is not optimal given the most likely contingency, but that is not too bad considering alternative contingencies.
- *Be Conservative*—adopt a “max–min” alternative that represents the best alternative assuming the worst contingency occurs.

Decision theory argues that the probabilities of these future factors are not entirely unknown nor beyond human judgment. It calls for the analyst to assign probabilities “objectively” (Schwartz et al., 1985). After assigning probabilities, the analyst must then select appropriate evaluation criteria to evaluate the alternatives (e.g., cost–benefit analysis of expected values).

The principal advantage of decision theory rests with the fact that it permits the consideration of compromise actions (alternatives) that are neither absolutely optimal nor efficient. Moreover, because of its statistical underpinnings, decision theory accommodates formulations involving repeated designs of models or experiments (Raiffa, 1968).

Institutional Rational Choice Theory

Institutional rational choice theory is a complex concept that rests on the idea that the institutional context of a decision maker is a critical element in setting objectives and in recommending or selecting particular policy options. Rational choice theory is not a method of policy analysis but a theory for selecting and recommending policy alternatives which themselves are a result of a policy analysis.

In a simple model of choice, if alternative A_1 results in outcome O_1 while alternative A_2 results in outcome O_2 , and O_1 is more desirable than O_2 , rational choice theory dictates that A_1 should be chosen over A_2 . The selection of a policy alternative is thus value laden—requiring the determination of which outcome is more valuable and why. However, the simple rational choice model only works when there is a single decision maker, the outcome can be predicted with certainty, and the resulting consequences are immediate (because the value of the outcome will change over time) (Dunn, 1994).

When there are many decision makers, as in a legislative body, individual legislators exercise their own values in selecting a policy alternative. When alternatives can be consistently ranked—based on one or more attributes—the situation is referred to in rational choice theory as being transitive. However, when there are many decision makers with differing or conflicting objectives, the situation is called intransitive. The intransitive situation requires moving beyond the simple choice model to what is called the complex choice model. Just because a situation is intransitive does not mean that a rational choice cannot be made. In a complex, intransitive situation there are a number of rational grounds for supporting a particular policy:

- *Technical rationality*—reasoned choices that compare alternatives with respect to their ability to promote effective solutions
- *Economic rationality*—reasoned choices that compare alternatives with respect to their efficient solutions

- *Legal rationality*—reasoned choices that compare alternatives based on their conformity to established rules and precedents
- *Social rationality*—reasoned choices that compare alternatives based on their ability to maintain or improve social institutions
- *Substantive rationality*—reasoned choices that compare alternatives based on all of these forms of situational rationality (Dunn, 1994).

Often, policy alternatives can be justified on a multirational basis. Rational choice theory attempts to explain how and why policy options are ultimately selected.

Institutional rational choice theory takes this process one step further by recognizing that decision makers operate within their institutional contexts, which in turn affect the choices made. The role of institutions is presented by Vickers as twofold: Institutions or organizations are entities that can be studied themselves; individual decision makers play institutional roles (1995). Vickers further distinguishes the choices a decision maker must make in the context of market choice (i.e., an individual chooses for himself) or political choice (i.e., an individual chooses for many).

Kiser and Ostrom (1982) describe five factors that help to explain an individual's behavior within an institutional structure:

- The decision maker
- The community affected by independent decision making
- Events
- Institutional arrangements
- The decision situation in which individuals make choices

By focusing on each element above, public policy theorists attempt to explain actions in terms of both individual decision makers and aggregated decisions. In this sense, institutional rational decision theory examines not only the individual values that a rational decision maker relies on to select among policy alternatives, but also incorporates the reality of institutional forces that shape the process of selection.

Policy Analysis Within the Political Context

The previous sections of this chapter have documented the rise of policy science and examined various approaches to policy analyses. In this section we delve further into the political role that policy analysis has played.

Wildavsky (1987) examines policy analysis from the standpoint of advocacy and then explores the importance of problem identification, knowledge, and citizens in the process. He begins by framing policy analysis as a change in patterns of social interaction:

Policy analysis, as I conceive it, is about change in patterns of social interaction. How does change happen? By joining planning to politics, social interaction gives analysis a historical outlook made up of the past pattern of agreements, including agreements to disagree until next time. From the organized actors, the constituent elements of this interaction, analysis gets its abiding interest in incentives to alter their behavior. And planning helps analysis bring intelligence to interaction, by rationalizing movement to a different pattern that may lead to improved future outcomes. (Wildavsky, 1987, p. 139)

Policy analysis is composed of both intelligence and social interaction. If analysis were purely intellectual, analysts would take center stage. Likewise, if policy analysis were totally interactive, there would be no need for analysts. Wildavsky's view of policy analysis is actually a hybrid of intellect and interaction that uses intelligence to help guide social interaction. By defining rationality in policy analysis as being both retrospective (objectives absent in the present are retrospectively rationalized) and prospective (as discussed earlier), Wildavsky argues that planning and politics do not differ with respect to reason.

Wildavsky's view of policy problem identification and definition also represents the evolution of the field. Previously, a set of fundamental policy problems were identified and analyzed within the constraints imposed by the notion in social science theory that individual choice is controlled by thoughts and values that are passively received from the surrounding culture. Wildavsky disagreed with the notion that culture was "a fixed set of logical pigeonholes." Instead, just as "problems are man-made, so is culture." Because life is not merely a matter of producing given values, but an exploration of the field of values itself, creativity then can be thought of as the conceptualization of new problems. Just as scientists view prohibitions (constraints) as challenges to be met, tested, and perhaps invalidated or overcome, policy analysts should view constraints not merely as obstacles but opportunities that challenge the analyst to determine how they can be overcome (Wildavsky, 1987).

In an attempt to characterize the most fundamental interactions between policy analysis and politics and to explore how analytic integrity can be combined with political efficacy, Wildavsky examined the role of knowledge and power within the context of a "self-evaluating organization." Such an ideal organization would be one that continually monitors its own activities so that it can determine not only how well it meets its objectives, but whether the objectives ought to be changed. Unfortunately, such self-evaluating organizations are hard to find. Instead, evaluation remains, if it occurs at all, as a minor element in administrative organizations. Knowledge can play an important role in a self-evaluating administrative organization, particularly in those where the pursuit of evaluative results has an important role to play in policy setting. Without power, knowledge is difficult to obtain. Organizations may have to change their goals as a condition for receiving information. Knowledge can be used to enhance power, which in turn can result in an increased ability to obtain additional knowledge. Wildavsky concludes that organizations must balance the need for knowledge with the exercise of power so that knowledge and power reinforce rather than undermine one another.

Finally, Wildavsky addresses the role of citizens in public policy making. Citizen participation as a discrete element in the policy-making process has been a neglected topic, although the peripheral importance of citizenship has been examined in great detail. Wildavsky posits that "[b]y helping make what citizens learn in their daily lives part of what they need to know, analysis can improve both citizenship and public policy." Clearly, citizens cannot hope to fully participate in every public policy decision made by government. However, by specializing in issues about which individuals have a special interest, they sometimes can have an impact on public policy. Effectiveness as an "issue specialist" must be buttressed by a learning process through which a would-be specialist selects an issue, gathers information, shares information with other individuals with similar interests, and then acts. Although specialists may initially be motivated by self-interest, their interaction with others can enhance mutual interests by pointing out what others prefer and are willing to give up. Such a learning process can lead to changes in relationships among participants.

Most analyses of public policy assume the continuance of social and political relationships. Usually, changes sought do not constitute a complete rejection of the past. This is not to say that radical change cannot occur, because it can be the result of an accumulation of more modest changes. An enhanced role for citizens will not necessarily alter the conservative na-

ture of public policy. The more policy issues and areas of a policy analysis that citizens are invited to participate in, however, the less likely they may be to participate in any. Wildavsky concludes that citizens as analysts will probably not alter the magnitude of change, but instead will certainly affect the quality of change (1987).

NEW THEORIES: POST-POSITIVIST PARTICIPATORY APPROACHES TO POLICY ANALYSIS

Wildavsky's early commentary on the need to increase social interaction in public policy analysis heralded what, a decade later, is called the post-positivist response to rationality in policy analysis. In general, post-positivism in the policy context consists of "value-critical" analysis coupled with an emphasis on participation and dialogue. The post-positivist movement sprang from the sense that policy studies were overly technical, perpetuated a fact-value dichotomy, presented precise numerical analysis when it was often inappropriate, and emphasized statistics that were themselves perceived to be easily manipulated by government agencies. Additionally, policy studies of this sort were used to confirm or oppose positions that had already been decided, were usually completed after the fact, and were plagued with inadequate performance (DeLeon, 1994a). The post-positivist response takes two forms. The first is to call for more participatory analysis while the second involves a reliance on critical theory. These new forms of analysis emphasize the importance of values within the context of discourse.

Participatory Policy Analysis

Frequently, those likely to be the most affected by new or revised policies are not consulted. Likewise, policy analysts are usually quite distant from the ultimate "targets" of their work. This state of affairs, as pointed out by DeLeon (1994a), is often the reason for the failure of many policy initiatives. To combat these tendencies, DeLeon and others suggest the antidote of participatory policy analysis.

Participatory policy analysis advocates and seeks out public opinion through a reliance on polling. The analyst randomly selects, educates, and listens to a selection of citizens and then tallies their views in such a way

that they can be incorporated into the analysis. Policy polling, as envisioned by DeLeon, differs from other types of opinion polls in that the participants in policy polling serve as an actual decision making forum (like a legislature) whereas in most deliberative policy polls, participants function in an advisory role in terms of the suggestions they provide policy makers. To maximize the impact of public participation and to ensure that the views tallied represent the actual views and values of the affected citizenry, participatory policy analysis is consciously designed to incorporate the views of carefully selected, informed participants rather than reactively incorporate the views of self-selected elites or established interest groups (DeLeon, 1994a).

Participatory policy analysis poses several challenges, such as how to recruit participants, how to educate them once selected, and how to manage the entire process within the short time frame of most policy analyses. These are daunting problems. Few efforts have been made to actually use these techniques on a national level. DeLeon concludes that participatory policy analysis, emphasizing policy polling, is a way to identify and reach out to targeted stakeholders (as opposed to the general population).

Participatory Expertise

Fischer (1993a) has examined the interactions between policy analysts and those affected by policy decisions. Unlike the commentators cited above, Fischer has moved the debate from the purely theoretical to practical terms.

He initially characterizes the relationship between analysts and those who are affected by policy as a professional relationship much as in law and medicine with the analyst as the professional/practitioner and those affected by a policy decision as the client. The analyst as professional is then cast as a mediator between interest groups and political representatives. This "superior-subordinate" relationship presumes that analysts conduct policy studies autonomously, and clients passively accept the results. Such a relationship inevitably leads to an assumption of "value-neutrality," precisely the concept that engenders the concern of post-positivists. Fischer's formulation of participatory policy analysis as "participatory expertise" is one way to deal with this concern.

Participatory expertise shifts the practitioner-client relationship to more of a collaborative relationship. In this new "client-centered" relationship,

dialogue plays a crucial role. Fischer (1993a) outlines four factors essential to this client-centered relationship:

- Joint efforts of citizens and experts
- Spirit of inquiry and sharing of data
- Opportunity to influence each other
- Freedom to discontinue the relationship

Although many may view this approach as a messy, multimethod approach, Fischer responds by noting that this type of policy analysis is best suited to situations where the problem consists of a mix of technical and social problems, that the approach is really the scientific method made more time consuming, and that participatory expertise may hold the key to solving specific types of complex problems, namely those that pose challenges with no solutions or only temporary or imperfect solutions. One such example would be the problem faced by decision makers trying to site hazardous waste disposal facilities.

Hazardous waste disposal facility siting has often been approached by using formal assessments of risk to allay the "irrational" fears (not in my backyard [NIMBY] syndrome) of those most affected by such decisions. This approach has been largely unsuccessful and has led to a virtual stalemate in the siting of new waste disposal facilities. However, a different approach was used in Alberta, Canada (Swan Hills—opened September 11, 1987) to address opposition to the siting of a hazardous waste incinerator. Public participation was incorporated into the analysis from the outset. Stakeholders were given funds to hire their own experts and consultants, and meetings were held to discuss the proposed plan and its consequences (Paehlke & Torgerson, 1992). In other words, emphasis was placed on joint fact finding and consensus building. Once the siting of the incinerator was agreed to, meetings and seminars were held to educate the community. A local committee played an oversight function by reviewing the facility's monthly monitoring report. As the committee members gained expertise, the oversight function evolved into an enhanced deliberative relationship.

This example suggests that participatory policy analysis can be effective as an approach to dealing with a specific class or type of policy problem. Also, it is critical to note that technical expertise was not compromised in the name of an enhanced democratic process. Instead, collaborative negotiation and consensus building helped provide a solution to a particular environmental policy problem (Susskind & Laws, 1994).

Critical Theory

An alternative response to the post-positivist criticism of scientific policy analysis is critical theory. Critical theory posits that there are many perspectives that can and should be taken into account in any policy analysis; the scientific approach is just one of these. In addition, critical theory asserts that a fundamental asymmetry of knowledge and communicative styles is the basic reason for the failure of many policy analyses to lead to policy changes, and that institutional changes are required to enhance communication by challenging the natural conservatism of institutions (DeLeon, 1994a).

Forester develops a critical theory approach focusing on the use of practitioner stories to enhance communication and provide alternative perspectives to the problems addressed in policy analysis (Forester, 1993). The time demands placed on analysts frequently allow little time for systematic experimentation. Through practitioner stories, policy analysts can increase their experience regarding problems and conflicts in the world in which they work. In a practical setting, practitioner stories allow policy analysts to find out what has worked. This can provide a more informal basis for professionals to make judgments on what is valuable and significant.

Analogizing the telling of stories among practitioners to the telling of stories between friends, Forester notes that: (1) friends usually relate appropriate stories that bring knowledge, empathy, thoughtfulness, and insight to bear on a particular situation; (2) friends relate stories that use new words which in turn allow us to learn about our own insights, cares, and constraints in new ways; (3) friends do not usually offer cure-alls or technical fixes; (4) friends help us deliberate; and (5) friends present stories to us that are full of experience and passion, which prompt us not only to see consequences, but also to recognize "the demands, the vulnerabilities and precarious virtues required of a politically attentive, participatory professional practice" (Forester, 1993). In this sense, practitioner stories—as with stories between friends—help the analyst not only to focus and recognize views and judgments already maintained, but to see alternative perspectives and possibilities.

Of course, practitioner stories do not provide rules for all situations, and the inherent "messiness" of such stories teaches the analyst that problems must be properly formulated before solutions will become clear. Forester's approach to telling practitioner stories is similar to the approach

used in this book of presenting examples of the effective use of environmental policy studies as a means of learning from past experience.

Forester's value critical approach actually addresses only the first two elements of critical theory: the advantages to taking many different perspectives into account when conducting policy studies, and bridging the gap between knowledge and communication. The third element—altering institutional structures to combat the natural conservatism of policy analysis—is not required in Forester's approach. As Wildavsky pointed out, citizen participation (improved communication) enhances the quality of change, not the quantity. Thus the third element is not crucial for the post-positivist approach to address the perceived limitations of the scientific approach to policy studies.

BEYOND PARTICIPATION—NETWORKS, COALITIONS, AND COMMUNITIES

Participatory theories of public policy analysis have recently given ground to still another array of approaches to better understanding public policy analysis. These three related concepts—policy networks, advocacy coalitions, and epistemic communities—recognize that public policy analysis and decision making are influenced by a wide constellation of actors who interact both formally and informally. All three involve attempts to describe these interactions and build theories around them.

Policy Networks

The concept of policy networks grows out of the realization that public policy analysis is affected by a variety of different actors. Bressers, O'Toole, and Richardson (1994) use the term *policy network* to denote "the large class of multi-actor [predominantly nongovernmental] arrangements of interdependencies in [the] varied phases of the policy process." Policy networks can also be thought of as specific structural arrangements in policy making (Kenis & Schneider, 1991). Thus, policy networks are defined by their structure as inter-organizational arrangements, as well as by their function in the formulation and implementation of policy (Marin & Mayntz, 1991).

Early formulations of policy network analysis described "iron triangles" that depicted the relationship between executive agencies, congressional

subcommittees, and interest groups in the public policy process. Later, the concept of policy networks was broadened to include other actors with indirect influence, thus leading to more loosely knit alliances (Dowding, 1995). Further research has focused on issue networks, specific policy networks that have developed around individual policy issues (Klijn, Koppenjan, & Termee, 1995).

Policy networks are described by their actors, linkages, and boundaries (Kenis & Schneider, 1991). Policy network analysis consists of sociological network analysis (primarily quantitative) and the other public policy analysis (mostly qualitative), and their integration (Marin & Mayntz, 1991).

Sociological networks can be viewed from two perspectives. The first concentrates on the structural aspects of the network itself and attempts to ascertain the relational characteristics among individual members by addressing the following factors (Dowding, 1995):

- Centrality
- Number of connections
- Inclusiveness
- Rules of interaction
- Embeddedness

The second concentrates on the actors themselves and Dowding (1995) characterizes them using:

- Knowledge and information
- Legitimacy
- Ability to influence (conditionally) other actors' incentive structure
- Ability to influence (unconditionally) other actors' incentive structure
- Reputation

The power of each actor is determined by the power of other actors in the network and their relationships. Similarly, the actors' relationships depend on their resources (Dowding, 1995). Dowding observes that sociological network analysis has been used to: (1) better define the relationship among actors within a given network and their individual characteristics as members of society; (2) study the relationship among actors' behaviors and a given network relationship; (3) study the relationship among the behavior of a group of actors and the network within which the group operates; and

(4) study the relationships among network configurations and the flow of information.

Policy network analysis attempts to take the work of sociological network analysis and superimpose it on the public policy domain. While most approaches to policy network analyses share a number of similar characteristics, they differ in important ways:

- Some focus on formal policy networks (Dowding, 1995) while others emphasize informal policy networks (Marin & Mayntz, 1991).
- Some focus on individual actors and their bargaining characteristics (Dowding, 1995) while others stress the actors' respective organizations and organizational identities (Bressers, O'Toole, & Richardson, 1994).
- Some focus on informal, decentralized, and horizontal relations in the policy process (Kenis & Schneider, 1991) while others emphasize the collective actions of organized actors and interorganizational relations in the public policy process (Marin & Mayntz, 1991).
- There is a limit to the utility of policy network analysis. It is good for describing the relationships among actors but not so effective for deriving causal explanations in structural terms (Dowding, 1995). Policy network analysis provides a valuable tool for allowing governmental and administrative actors to better manage policy networks (Klijn et al., 1995), and policy network analysis provides a powerful tool to study highly complex structure in modern politics (Kenis and Schneider, 1991).

Although policy network analysis does not provide a coherent theory of public policy formulation and implementation, proponents of the policy network approach argue that continued study is important because the world is increasingly "networked," and policy network analysis provides an important analytical tool for better understanding the policy process (Bressers, O'Toole, & Richardson, 1994). Dowding (1995) counters by arguing that although policy network analysis can effectively describe a policy network, its actors, and relationships, it does little to explain the policy process because it cannot be ascertained whether government agents acted as interested participants, disinterested intermediaries, or were "captured by certain groups."

Beyond its analytical strengths, Klijn et al. (1995) argues that policy network analysis can be used by government organizations to manage complex networks of stakeholders and to provide criteria for the assessment

and improvement of networks. Kenis and Schneider (1991) argue that policy network analysis can be used to

- compare networks regarding the prospects for cooperation and coordination in the policy process,
- conduct cross-network comparisons to develop hypotheses explaining the effect of aggregation on specific interactions,
- develop and test formal models of the policy-making process,
- test hypotheses including structural propositions,
- identify and reconstruct the relations or patterns of actions between actors in the formulation and implementation of a policy, and
- reconstruct network dynamics in terms of structural transformation or stability.

Despite this positive outlook, the reality is that it is often difficult to fully identify all of the actors and relationships in a particular policy or issue network. In the meantime, policy network analysis does generate academic interest both nationally and internationally.

Advocacy Coalition Framework

Sabatier and Jenkins-Smith (1993) have developed the advocacy coalition framework (ACF) to explain the emergence of particular public policies. They contend that competing advocacy coalitions form around specific policy subsystems, and that these advocacy coalitions are composed of diverse sets of actors from both the public and the private spheres, including multiple layers of government, and have a core set of beliefs in common. These core beliefs tend to be stable and hold coalitions together (e.g., environmental concerns must be considered of equal importance to economic concerns, or market forces should determine levels of environmental protection, etc.). These core beliefs and the dominance of certain coalitions over others, can usually only be changed by external pressures from outside the policy subsystem.

Advocacy coalitions also share secondary beliefs regarding the way core beliefs should be implemented. These are more likely to change and may vary somewhat over time. Policy-oriented learning between advocacy coalitions or between advocacy coalitions and "policy brokers" can influence secondary beliefs within a coalition, leading to policy change. Even secondary beliefs, however, are not likely to be changed immediately by an

evaluation or some other analysis, but instead change gradually over time (Sabatier & Jenkins-Smith suggest a decade or more as the proper time frame) as new information is presented and integrated into the belief system. Fundamental change will occur only if significant forces outside the policy subsystem change the composition, influence, or beliefs of actors within the subsystem. Sabatier and Jenkins-Smith also make a distinction between "purposive" and "material" groups. Purposive groups are centered on core beliefs, and view interests (comparable to secondary beliefs) as being flexible as long as their core beliefs are sustained. Material groups, on the other hand, are focused on immediate interests, and core beliefs are of less importance as long as their interests are met. Material groups may be willing to abandon their core beliefs if it serves their material interests to do so. Therefore, core beliefs for material groups will tend to be less stable than those for other groups.

Although the advocacy coalition approach has generated enormous interest because it concentrates on the importance of ideas and their origins in policy analysis, several commentators are quite critical. Dowding (1995) argues that because the advocacy coalition approach centers on beliefs as instigators of policy change, it forces attention away from the concept of knowledge as power and away from the idea of viewing policy change as a consequence of ideological battles between groups. Therefore, by concentrating on two causes of policy change (values of coalition members and shocks to the system) the advocacy coalition approach fails to address how such ideas "can be used and misused by other agencies." Schlager (1995) takes a more positive stance suggesting that the advocacy coalition approach can benefit from more thoroughly considering how coalitions form and maintain themselves over time and the strategies they use to achieve their goals. Even Dowding maintains that the advocacy coalition approach, taken together with institutional rational choice theory (discussed above) "may prove one of the most useful theories of the policy process."

Epistemic Communities

Advocacy coalition frameworks have been faulted for failing to recognize the power of knowledge in public policy analysis. The concept of epistemic communities cedes knowledge center stage and demonstrates its importance in policy innovation, particularly in the area of international policy making.

Haas (1992b) defines an epistemic community as “a network of professionals with recognized expertise and competence in a particular domain and an authoritative claim to policy-relevant knowledge within that domain or issue area.” The professionals making up an epistemic community may come from different backgrounds and disciplines; however, they have in common the following characteristics:

- Shared beliefs (normative and principled), which provide a value-based rationale for the actions of members
- Shared causal beliefs derived from their expertise and past practice concerning problems in their domain, which in turn serves as a foundation for discovering linkages between possible policy actions and desired outcomes
- Shared notions of validity, which establish criteria for weighing and validating knowledge within their domain of expertise
- Common policy enterprise, which defines a set of common practices directed toward the policy problems in their domain of expertise

Epistemic communities are distinguished from other policy actors and policy groups as outlined in Figure 5-3.

		Causal Beliefs		Knowledge Base	
		Shared	Unshared	Consensual	Disputed or Absent
Principled Beliefs	Shared	Epistemic Communities	Interest Groups and Social Movements		
	Unshared	Disciplines and Professionals	Legislators, Bureaucratic Agencies, and Bureaucratic Coalitions		
Interests	Shared			Epistemic Communities	Interest Groups, Social Movements, and Bureaucratic Coalitions
	Unshared			Disciplines and Professionals	Legislators and Bureaucratic Agencies

Figure 5-3. Distinguishing Epistemic Communities from Other Groups. (Haas, 1992b).

A good example of an environmentally related epistemic community is the ecological epistemic community, which was responsible for framing the international debate on ozone depleting chemical emissions—specifically chlorofluorocarbons (CFCs). The ecological epistemic community was composed of atmospheric scientists and like-minded policy makers. They shared a common set of values—preserving the quality of the environment—and accepted the causal analysis that CFC emissions were responsible for destroying the earth's ozone layer. Their policy enterprise consisted of preserving the earth's ozone layer. Finally, they shared common validity tests based on the scientific method. The result of their efforts was the enactment of the Montreal Protocol on Substances That Deplete the Ozone Layer in 1987 (Haas, 1992a).

The basis of any epistemic community is consensual knowledge (not guesses or raw data), which is the product of human interpretation. It is not necessarily the truth. The focus of the epistemic community approach is to reach consensus in a particular area and then diffuse that information to other actors. The members of an epistemic community focus on the practical influence they can have on collective decision making rather than concentrating on generating truth. The diffusion of knowledge occurs when epistemic community members educate decision makers as to problems and assist decision makers in identifying state interests, and when decision makers solicit their views and delegate responsibility to them. As such, epistemic communities can be viewed as an extranational "force" working to develop intellectual consensus among state interests. The epistemic community approach to the diffusion of knowledge suggests a nonsystemic origin of state interests and identifies the dynamic of cooperation outside existing power structures. As such, epistemic communities can be most effective in situations involving uncertainty and when state interests are not clearly apparent (Haas, 1992b).

Epistemic communities are viewed as generators of policy innovation. Their policy ideas evolve independent of government influence, and they act independently of the policies of the top leaders of their respective governments (Haas, 1992b). Thus they may present new patterns of reasoning or new courses of action to decision makers, which in turn may lead to unpredictable outcomes (Adler & Haas, 1992).

Adler and Haas (1992) note that epistemic communities can influence international policy innovation by

- framing the range of a political controversy surrounding an issue (e.g., ecological epistemic community with respect to CFCs),
- defining state interests, and
- setting standards.

Once their ideas are adopted, epistemic communities continue to influence state policy practice in that area via institutional habit and inertia.

The epistemic communities approach has been criticized from several directions. Sebenius (1992) argues that although epistemic communities influence policy through bargaining, there is no theory of bargaining described in the approach. More specifically, the emphasis of the epistemic approach has been to identify communities, their members, and their positions, rather than to systematically discuss the mechanism by which epistemic community members translate their beliefs and preferences into influence over policy outcomes. A deeper problem with epistemic communities is the disproportionate power that is presumably given to an ad hoc group of appointed bureaucrats to influence critical global decisions and the apparent lack of "national interest" exhibited by community members (Susskind, 1994).

Dowding (1995) argues that, fundamentally, epistemic communities want to see their belief systems lead to policy convergence rather than viewing international agreements as the result of power bargaining between self-interested nations. Baark and Strahl (1995) argue that, although the epistemic communities approach may explain coordination and convergence on policy issues among nations, it has not been very effective in changing the policy agenda of specific international organizations

Seemingly, epistemic communities have been effective in addressing international environmental policy making, particularly in situations where there is great uncertainty as to proper policy directions. Narum (1993) even expresses the hope that epistemic communities in the environmental field can be critical players in establishing the rights of future generations in international environmental policy decisions and agreements. It is not quite clear how to test these propositions or whether they will apply in other policy-making contexts.

CONCLUDING REMARKS

The material presented in this chapter traces the development and evolution of policy sciences over the course of this century. Policy science,

viewed by Lasswell as a means of enhancing the democratic process, shifted to predominantly rational or scientific approaches, which relied on a notion of "value-neutral" analysis. The successes or failures of these analyses were increasingly seen as driven by institutional and hierarchical forces. Newer approaches, which ostensibly attempt to bring policy science back in line with Lasswell's ideals, all but reject the notion of scientific analysis in favor of approaches that stress enhanced communication (e.g., rhetorical methods, as discussed in Chapter 6) and focus on institutional influences on the individual within the policy-making process. Our conclusion is that there is still a need for scientific policy analysis—particularly in the area of environmental policy making—but that we have reached a point where it is both possible and necessary to integrate, as Wildavsky would say, intelligence and social interaction.