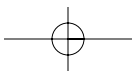
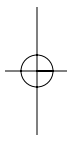
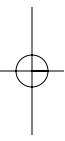
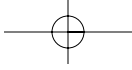


I OVERVIEW



1

Managing Global Environmental Change: An Introduction to the Volume

William C. Clark, Jill Jäger, and Josee van Eijndhoven

We live in an era of global environmental change and interdependence. The era is a young one, making its fundamental scientific discoveries, building its core institutions, and coming of political age almost entirely during the latter half of the twentieth century. The study reported in this book constitutes a historical reconnaissance of the formative years of the global environmental era—a period taken here as extending from organization of global environmental science with the International Geophysical Year (IGY) of 1957 to the celebration of international environmental politics that was the United Nations Conference on Environment and Development (UNCED) of 1992.¹ Over this interval—a single professional lifetime—the idea that human activities could transform the environment at continental and even planetary levels grew from its origins in the minds of a handful of individuals to spawn a billion-dollar international scientific research program and to reshape public values, private actions, and political agendas around the world. The Rio Declaration signed at UNCED constituted a formal recognition by 110 heads of state of humanity's conscious engagement in an effort to manage its interactions with the global environment (Caldwell 1996).

Much has been written about particular scientific discoveries, international institutions, and political negotiations bearing on issues of global environmental change. And thematic literatures are beginning to emerge on topics ranging from earth-system science, to international environmental policy, and global environmental politics. Lacking, however, has been much in the way of a long-term, large-scale, multinational perspective on *global environmental management*—a term we use broadly in this book to encompass the interplay between ideas and action in processes ranging from problem definition and goal articulation to the design and implementation of policies and other responses.

Some would argue that this is just as well—that the notion of global environmental management is at best technocentric hubris, at worst new clothes for old colonialist politics, and in any case infeasible. Efforts to manage humanity's interactions with the global environment may indeed turn out to be all of these things. They will

almost certainly be partial, contentious, and prone to failure. But the management of global environmental risks is also what an increasing number of political leaders, advocacy groups, scientific experts, and international organizations find themselves doing, not uncommonly with the best of motivations and the greatest of trepidation. Without denying the darker sides of global environmental management, much less presuming its effectiveness, a broad understanding of what its avowed practitioners have been up to, and to what effect, would nonetheless seem better than the alternative. Such a strategic perspective could offer at least three benefits: a context for the design and interpretation of more narrowly targeted scholarly studies; a framework within which particular proposed actions could be appraised; and a vantage point from which individual scientists, advocates, and politicians could reflect on the larger play within which they are seeking to learn their particular roles.

The research reported here seeks to contribute to such a strategic perspective. It does so by comparing the historical development of efforts to manage interactions between society and the global environment for a number of countries and issue areas and by exploring some of the factors and forces that may have been important in shaping that development.

1.1 Challenges for Management

Environmental problems at the local, regional, or even national level have been known and addressed for centuries. And a smattering of important transboundary-pollution and shared-resource debates substantially predate the postwar period that is the focus of our study. But the idea that human activities are systematically transforming the environment on continental and global scales is relatively new (Turner et al. 1992). DDT in Antarctic penguins, radionuclides in human breast milk, acidic degradation of remote lakes, and the gaping hole in the planet's protective ozone layer only suggest the range of global environmental concerns unimagined by earlier generations that have emerged onto the international agenda during the lifetimes of today's

environmental scientists, policy professionals, and political advocates.

Despite the novelty of the idea that human activities might adversely affect the environment on a large scale, significant programs of action have already been undertaken at the local, national, and international levels. The variety of such programs is remarkable, ranging from consumer boycotts and transformed school curricula, to comprehensive national legislation, to a growing body of international law that already contains more than 200 treaties and conventions dealing with regional and global environmental affairs. As a result, a number of problems—including, for example, those posed by DDT and oil pollution at sea—are now under at least partial control. And some—such as the problem of chronic, global radionuclide exposures, chlorofluorocarbons (CFCs), or threats to the Antarctic—even seem to be relatively well in hand (Young 1999). In short, society's management of its interactions with the global environment has grown in recent decades almost as dramatically as its understanding of the global environment itself.

Global environmental management nonetheless remains limited in ways that pose enormous challenges for the future:

- Wholly new concerns for the impact of particular human activities on the global environment will doubtless emerge in the future. Some of these new concerns, together with others already recognized, will eventually turn out to be less alarming than originally thought. Others almost certainly hold in store surprises that will be unpleasant indeed. Global environmental management will therefore continuously be confronted with new challenges, requiring an ability both to utilize existing knowledge despite its inevitable uncertainties and incompleteness and to generate new understanding of unprecedentedly complex systems.
- For the global environmental problems that are now recognized, most management actually remains far from global in scope. Relatively few of the world's nations, firms, or other potentially relevant actors are yet effectively engaged in collective management endeavors. Notions of the proper goals, objectives, and means of management differ among many of these actors and can be expected to change with time. Truly *global* environmental management will have to become much more inclusive than it is today by reaching out to engage both the knowledge and the politics of those affecting and affected by the changes that are under way.
- Finally, few of the management regimes now in place will work quite as planned, and some will fail outright. Even those that do work relatively well will rarely make the issues they address disappear, any more than efforts to

manage global economic development or weapons proliferation can be expected to produce final solutions. The significant progress of the last several decades notwithstanding, the world has only begun learning to manage its interactions with the global environment. Enhancing social capacity to manage those interactions will require learning how to learn not only from research but also from actual management experiences—successes and failures alike.

How well is society prepared to meet the challenges of global environmental management? What approaches have evolved in different countries and problem areas? What are their strengths and weaknesses? In what ways can their effectiveness be enhanced?

These are some of the pragmatic questions that motivate the present study. Efforts to illuminate them are important if for no other reason than the increasing prominence of global environmental issues in international affairs. Beyond such immediate justifications, a better understanding of the history of global environmental management—rich in its multiple actors, dependence on science and information, and creation of powerful new international norms—could well contribute to broader efforts to comprehend the changing role of governance in an interdependent and complex world (Mathews 1997; Jervis 1997).

1.2 Challenges for Understanding

The world hardly lacks for plausible ideas and opinions on how to achieve better international environmental policy. Some critical scholarship has even begun to examine the relative efficacy of different institutional designs and management approaches (e.g., Young 1999; Victor, Raustiala, and Skolnikoff 1998; Keohane and Levy 1996; Haas, Keohane, and Levy 1993). A number of scholarly case studies have focused on particular global issues and how they have been approached by particular countries or institutions (e.g., O'Riordan and Jäger 1996; Rowlands 1995; Mitchell 1994; Litfin 1994; Haas 1992). There is a growing comparative literature on environmental policy addressing transboundary issues (e.g., Desai 1998; Janicke and Weidner 1997; Anderson and Liefferink 1997; Weale, Pridham, Williams, and Porter 1996). But it is surprising how little is actually understood about the long-term development of society's efforts to manage its interactions with the global environment.

To begin reaching for such understanding, an essential first step is to move beyond simple models of a "management system" or "policy process" (Sabatier 1999). In particular, neither problem definition nor goal specification can be taken as external to the processes of global

environmental management. Indeed, the very idea of global environmental risks is a recent and highly contested invention (Yearley 1995; Rayner and Malone 1998). Both the processes by which certain environmental changes become viewed as global environmental risks while others do not and the processes by which such risks become framed in terms of one set of causes and effects instead of others are almost certainly central to the understanding we seek. Likewise, the goals for management of interactions between society and the global environment have seldom been self-evident. Rather, they have been invented and shaped as part of the same process that has defined the problems, sometimes following from specific problem definitions and sometimes driving such definitions. To understand the evolution of global environmental management, we therefore need a sufficiently broad perspective on social action and change that puts problem definition and goal formation, along with policy, squarely at the center of what is to be explained. Scholarship on the politics of problem definition (Rocheftort and Cobb 1994), agenda setting (Kingdon 1984), and issue dynamics (Baumgartner and Jones 1993; True, Jones, and Baumgartner 1999) provide one point of departure for such an analysis. Literatures on the stages of policy development (e.g., Jones 1984; von Pritwitz 1990; deLeon 1999) and functions of risk management (Kates, Hohenemser, Kaspersen 1985) furnish another. Modern views of risk assessment as a social process (e.g., NRC 1996; Beck 1992; Wynne 1995) constitute an additional perspective.

A concern with where conceptions of global environmental risks and management goals come from and how they change immediately implies the need for a long-term, multinational perspective. Understanding how particular negotiating strategies or political coalitions brought about particular treaties or forms of legislation is surely important. But many of the global environmental issues noted above spent years, even decades, as the concern of a few scientists and administrators before finally emerging onto the policy agenda of a single nation or international organization. The work of Weiss (1975) and others demonstrates that tracing the impacts of ideas on action in domestic arenas commonly requires analytic perspectives extending over a decade or more. To capture the spread of ideas across national boundaries surely requires that even longer periods be addressed. Beyond this, a conceptual framework is needed that allows both exploration of the conditions in which ideas transform action in the global environmental arena and comparison of these conditions with circumstances in which ideas do not transform action. This is the sort of question that has been effectively addressed through the comparative analysis of how different countries and other entities have responded

to the same basic discoveries and program proposals (e.g., Lundqvist 1980; Brickman, Jasonoff, and Ilgen 1985; Vogel 1986; Boehmer-Christiansen and Skea 1991).

The need for a broad conception of social action extends to the treatment of actors and agency. Global environmental management is an intensely political process, and no understanding of its development could be complete that did not take interests and their politics seriously. This is likely to be a complex task, for in the development of global environmental management both domestic and international politics—and the interactions between them—are likely to matter. Moreover, as important as state actors may be in this political play, influential parts have clearly been performed by a variety of nonstate actors as well. Experts, the private sector, nongovernmental “green” organizations, and the media also need to be considered in our explorations of society’s encounter with global environmental change. A vigorous body of recent scholarship suggests that it will be important to explore the coalitions (Sabatier and Jenkins-Smith 1993, 1999), communities (Haas 1992), and networks (Keck and Sikkink 1998) formed by such actors, rather than to focus on particular groups or sectors in isolation.

The long-term, multiactor orientation of the perspective sketched above poses particular challenges to the treatment of institutions. Viewed in the narrow sense of organizations, institutions such as the United Nations Environment Programme (UNEP) have certainly been important in the evolution of global environmental management. On the other hand, few of the organizations central to global environmental management at the close of the twentieth century even existed when global environmental concerns began to receive increasing attention from scientists a generation earlier. A focus on specific organizations, however valuable in itself, can therefore capture only parts of the overall story. A broader view of institutions as regimes—sets of rules and procedures that structure relations among relevant actors—is more consistent with this study’s interest in the long-term development of society’s effort to manage its interactions with the global environment. Even here, however, it is important to recognize that the management process may be spread across multiple regimes in space and time. Studies focused on single regimes, just as studies focused on single organizations, will provide partial perspectives on the overall story. An active program of research on institutions for global environmental management provides useful guidance on how to think about questions of effectiveness and the factors that shape it (Kay and Jacobson 1983; Keohane and Levy 1996; Young 1999).

Finally, if obviously, an understanding of the long-term development of global environmental management

demands a focus on dynamics and change. The interests, institutions, and ideas noted above can all be treated in dynamic perspective, with particular attention to the ways in which they influence change in one another. But the knowledge-intensive, diffuse character of global environmental management emphasizes as well the need for attention to the role of learning as an agent of change. Broadly conceived, the need is to understand how discoveries, experience, and innovations present in one part of the management system spread to others. This spread may be across actors within a country. It may be across countries. It may involve lesson drawing from management experience with one global environmental problem to inform management of another. One need not prejudge the extent, fidelity, or utility of such learning to be interested in assessing its actual role in the history of global environmental management and its potential for the future (Parson and Clark 1995; Lee 1993; Bennet and Howlett 1992).

In summary, with this study we seek to better understand the long-term development of efforts to manage interactions between society and the global environment. We conceive of *management* broadly to include problem and goal definition, as well as the formulation and implementation of action programs and policy. We explore the impact and interactions of ideas, interests, and institutions on the development of management practice. We want to know the extent to which, and means by which, efforts at global environmental management entrain multiple actors in multiple national and supranational arenas. Similarly, we are interested in the extent to which the management capacity for dealing with any specific global environmental concern is affected by the management capacity developed for dealing with other issues. Finally, we ask to what extent and in what ways learning has played a significant role in the development of society's approach to the management of its interactions with the global environment.

This view of the evolving management of humanity's interactions with the global environment leads to a set of specific conceptual questions for this study that complement the more immediate and pragmatic ones posed earlier:

- What has been the interplay among scientific research, policy analysis, and political action in the development of approaches to managing interactions between society and the global environment?
- How have some global environmental changes come to be characterized as risks worthy of management attention while others have not?
- To what extent, in what ways, and under what conditions have institutions, interests, and ideas shaped the development of global environmental management?

- Which pathways and mechanisms have been most important in spreading new ideas and experience throughout the community of actors engaged in global environmental management?

1.3 The Design of This Study

This study traces the evolution of efforts to address the issues of acid rain, stratospheric ozone depletion, and climate change over a period extending from the IGY of 1957 through the UNCED of 1992. It offers a comparative exploration of the development of these issues across a range of national and international settings consisting of Germany, the United Kingdom, the Netherlands, the former Soviet Union, Hungary, Japan, Mexico, Canada, the United States, the European Union, and the family of international environmental organizations. It describes the development of management response along two dimensions: one focusing on problem framing, agenda setting, and issue attention; the other on management functions of risk assessment, option assessment, goal and strategy formulation, implementation, evaluation, and monitoring. It analyzes the impact on the management process of key ideas, interests, and institutions. The study seeks to fashion a long-term, large-scale overview of how the interplay between ideas and actions has laid the foundations on which contemporary efforts in global environmental management are now building.

The study was conducted by the Social Learning Group, a team of thirty-seven members whose names and institutional affiliations are given in the front matter of this book. The Group's members came from ten countries and reflected disciplinary backgrounds including the natural sciences, political science, science studies, and policy analysis. Organization of the research can be visualized as a matrix in which the columns are the individual arena (country) studies that make up part II of this book, and the rows are the management function studies that make up part III of the book. Research teams were initially assembled to conduct the individual arena studies, drawing largely on individuals from the relevant arena. Function studies were then designed to include one or more individuals from each arena. Integration was provided through extensive electronic exchanges, periodic small meetings of particular "chapter" teams, and annual week-long summer studies.

Group members collaborated in the design of a detailed research protocol to guide the research and ensure comparability across cases, arenas, and functions. That protocol is included as appendix A in volume 2. Data were drawn from interviews with key actors, primary-source material (ranging from assessment reports to internal strategy documents), and the secondary literature.

Box 1.1

Key definitions and terminology

Actor is a term used here to encompass government, industry, nongovernmental environmental organizations (NGOs), expert communities, and the media.

Arena is a term used here to encompass the nations we studied (Germany, the United Kingdom, the Netherlands, the former Soviet Union and its successor states, Hungary, Japan, Mexico, Canada, and the United States), plus the European Community and the family of international institutions.

Issue is a term used here to encompass the three cases of environmental change we studied—acid rain, climate change, and stratospheric ozone depletion.

Management is a term we use here to encompass the range of self-conscious actions undertaken by actors to grapple with the issues of global environmental change. It is broader than *policy* to the extent that the latter implies activities of government only. It is not intended to imply comprehensive or successful action or intent.

The data sets emerging from implementation of the protocol, plus intermediate working papers of the project, are stored in the project archives, deposited and cataloged at the Harvard University Library. The rationale behind our major research-design choices is reviewed in the sections that follow. Key definitions and terminology used throughout the book are summarized in box 1.1, which is meant to serve as a convenient point of reference for use in reading other chapters.

1.3.1 Issue Histories

This study addressed its central questions through a comparative examination of three environmental issues that emerged from basic scientific research onto the international political agenda during the latter half of the twentieth century. Although the processes of problem defining, framing, and naming are central to our study, we refer to these issue areas throughout the book by their popular names of acid rain, stratospheric ozone depletion, and climate change. As described in detail in chapter 2, each of these issues involves human activities emitting substances to the atmosphere, transport of those substances over continental to global scales, and potential impacts on humans and things that they value.

The study addressed multiple issues because we wanted to understand how the development of global environmental management was contingent on issue characteristics rather than simply on underlying political and institutional relationships. We chose similar issues rather than comparing, say, marine oil pollution and endangered-species management, for two reasons. First, prior scholarship suggested that large differences in issue

structure were likely to be associated with large differences in management responses. We therefore sought finer resolution, in hopes that we could begin to sort out how relatively small differences in issue characteristics led to differences in the evolution of management response. A second reason for picking similar issues was our interest in exploring cross-issue learning. The absence of much cross-referencing of other issue experiences in the existing literature on global environmental management, combined with the more general literature on social learning, led us to suspect that such cross-issue lesson drawing would be rare. Through our study design we sought to maximize the chances that we would find some significant cross-issue learning to examine. Obviously, this choice meant that our study would be able to conclude relatively little about the prospects for learning across larger issue differences.

We picked the particular atmospheric issues of acid rain, stratospheric ozone depletion, and climate change for a number of reasons. First, as described at length in chapter 2, all have relatively long histories, with scientific attention dating back at least three decades. Second, all have relatively unproblematic transboundary or commons dimensions. Climate change and stratospheric ozone depletion are truly global phenomena, with materials emitted from one part of the planet potentially influencing the environment everywhere in the world. The physical and chemical transformations associated with acid rain are of somewhat smaller scale but still extend across multiple nations and thousands of kilometers. We were interested to discover whether, and if so how, relatively early experience with the transboundary issue of acid rain had furnished lessons for society's later and larger-scale engagement with the issues of climate and ozone. Finally, the histories of all of these issues were strongly grounded in science, again providing ample opportunity for learning and sharing across issue histories. These properties of our three issues are common to many pollutantlike environmental problems of the air, water, and land, opening the prospect for broad applicability of our findings. They are less clearly common to many renewable-resource problems with an international dimension, making us less confident that our studies will illuminate this important class of cases.

Our interest in tracing the impact of causative, instrumental, and normative beliefs on the management of these three issues led us, following Weiss (1975) and others, to adopt a multidecade time horizon for our study. Substantively, our interest was in tracing evolution of the acid rain, ozone depletion, and climate change issues from their initial discussion in the natural science community to their arrival on the international political agenda. Though no precise delineation of this interval is

possible, we elected to bound our study with the IGY of 1957 and Rio's UNCED of 1992. Of course, scientific research relevant to each of our issues had begun well before the IGY and continues today. And the politics of their management will extend well into the twenty-first century. Nonetheless, the IGY-to-UNCED frame captures both substantively and symbolically the transition from primarily scientific issues to significantly political issues that is the focus of our concern.

1.3.2 Arenas and Actors

The basic histories of our three global environmental issues start with ideas and initiatives initially held only by a few individuals or groups. They proceed to the adoption of shared beliefs and commitments across much larger communities around the globe. For this study's initial reconnaissance of the development of global environmental management practices, we did not want to assume the primacy of particular actors, levels of political organization, or nations in the process.

We therefore designed the study to examine the historical roles that might have been played by a wide range of potentially relevant groups: experts, governments, private-sector organizations, "green" nongovernmental organizations (NGOs), and the media. We tried to stay especially alert to emergence of the communities, coalitions, and networks of actors that the literature suggests are likely to be important as agents of policy learning and management change.

The levels-of-organization question was harder. Given the widespread trend over our study period away from the nation state as the sole focus of policy making, we wanted a design that would let us explore the respective roles and contributions to global environmental management of actors at multiple levels of organization. Looking up from the level of the state, we identified two supranational sites for analysis. One was the family of international environmental organizations represented by UNEP, the World Meteorological Organization (WMO), and the International Council of Scientific Unions (ICSU). The second was the European Community (later European Union), interesting both for its particular contributions to the development of our issues and as a representative of the new forms of transnational governance developing around the world.

Individual countries constituted our primary locus of analysis. Previous comparisons of national approaches to environmental management and regulation suggested that the appropriate comparative country design would let us explore the significance of differences in such factors as perceived vulnerability to or responsibility for the environmental problem in question, deference to science

in state decision making, openness of the state policy apparatus to interventions from domestic NGOs or international actors, and role of the media.

Within countries, we focused on the "elite" discourse of professionals and political leaders, rather than the views of lay or grassroots groups. We did this for both theoretical and practical reasons. The perception of global environmental issues by lay publics and the role of such publics on both the cause and effect sides of global environmental change are topics of enormous importance and some stimulating scholarship (e.g., Kempton 1995; Collier and Lofstedt 1997; Lipschutz and Conca 1993). But the general literatures on agenda setting, issue framing, and policy making suggest that accounting for lay perspectives is unlikely to be essential for explaining many of the questions that most concern us here. Moreover, for the long time periods and comparative perspectives that interest us, the practical difficulties of reliably assessing lay perceptions and responses are overwhelming. In our research, we therefore looked down from the perspective of policy making and management at the national level, picking up subnational actors, interests, and ideas only as they appeared on the stage of national discourse. In practical terms, we focused our data collection on discourse occurring in national media, legislatures, professional journals, and the like. When the ideas or actions of substate actors surfaced at this national, elite level, we noted them and explored their origins and impacts. When they did not, we ignored them—and thus rendered ourselves blind to global environmental change and management as they are experienced by the vast majority of the world's citizens.

Our choice of *which* national perspectives to pursue in the study was also a joint product of theoretical and practical considerations. Our initial research design was simply to sample the world's experience with global environmental management, choosing cases from among countries of the industrialized nations of the Organization for Economic Cooperation and Development (OECD), the formerly communist countries of Europe, and the developing world. We sought to select countries varying with respect to their international standing in politics, science, and environmental leadership and with respect to their domestic treatment of science input to the policy process. These design principles were matched against practical considerations of where we could mobilize effective study teams. From the formerly communist countries, we selected the (former) Soviet Union and Hungary.² For Western Europe, in addition to the supranational arena of the European Union, we selected the United Kingdom, the Netherlands, and Germany (West Germany before the reunification, united Germany thereafter). Sweden, with a central role in the issue histories

we studied, was included in the initial research design but was dropped when the research team scheduled to address it failed to materialize.³ Of the industrialized countries of Asia, we selected Japan. North America was covered fully, with studies of Canada, the United States, and Mexico—the latter intended as a “bridge” between northern and southern perspectives on the project’s central research questions.

Our greatest source of discomfort with this entire study is that the developing world turned out to be beyond our grasp and—taking most of humanity with it—is absent from the story about the evolution of global environmental management reported here. The reason, if not excuse, for this omission is that we started to develop our research protocol for the countries we knew best. In the interests of generating reliable and comparable data, this protocol presumed extensive use of documentary sources and media accounts to supplement interviews with relevant individuals still available for comment. Our preliminary effort to extend this protocol to more recently developing countries through our Mexican case study strongly suggested that such documentary sources simply did not exist at anywhere near the density we were working with in countries that had industrialized earlier.

We could, of course, have applied the interview portion of our protocol to individuals currently active in the developing world’s substantial engagement with issues of global environmental management. And we could, as we did in Mexico, have found some documentary material. We could, and perhaps should, have changed the entire research protocol to a version more appropriate for a truly global study of global environmental management. But given the people, resources, time, and imagination available to us, we reluctantly decided that we could not reliably document in a useful cross section of developing countries a long-term history of global environmental management for the atmospheric issues we had selected. The density and comparability of the histories we have assembled clearly benefited from this decision. The scope and potential relevance of the overall study has clearly suffered, leaving many crucial questions about global environmental management unasked and unanswered.

1.3.3 Describing Issue Development

The empirical work of this study was organized around the construction of descriptive histories of each issue’s evolution within each of the arenas investigated. In addition, special attention was given to cross-arena and cross-issue interactions. These histories were intended to capture not just changes in scientific knowledge and public policy but also variation in the relevant beliefs,

interests, norms, and actions of a changing array of actors and institutions. The long time scales and multiple arenas addressed in the study made it particularly challenging to design a research protocol that would ensure comparability of data across time and political cultures, thus providing a firm foundation for subsequent fact-finding and explanatory efforts. We addressed this challenge by borrowing from existing research traditions frameworks for data collection on three broad topics: what level and kind of concern people exhibited about global environmental issues and their management, what people talked about when they addressed global environmental issues and their management, and what people did when they worked on understanding and managing the interactions between society and the global environment. We summarize these descriptive frameworks below. Details are provided at the end of volume 2 in the project’s Research Protocol (appendix A). As noted earlier, data were assembled covering the historical development of each of the three global environmental issues in each of the ten national and supranational arenas addressed in the study.

The Dynamics of Concern Our first framework provides for an essentially social characterization of the level and kind of concern shown by society for global environmental issues. It draws from the political science literature on issue-attention cycles (Downs 1972), agenda setting (Kingdon 1984; Cohen, March, and Olsen 1972), and the politics of problem definition and issue framing (Rocheffort and Cobb 1994; Schon and Rein 1994; Hajer 1995; Jachtenfuchs and Huber 1993). Generally, this literature led us to expect that though attention paid to global environmental issues by scientists and technical experts might be sustained or slowly grow through time, public and political attention would come in relatively rare and short-lived bursts. These bursts of attention, however, were likely to provide important opportunities for institutionalizing and acting on the issues in question. To provide the basic empirical foundations for theorizing about the causes and consequences of such attention cycles, we therefore sought to document the rise and fall of public attention to each of our issues within each of our study arenas.

Following Baumgartner and Jones (1993), we quantitatively tracked coverage of each issue through time in the newspapers read by each arena’s elites. Where possible and relevant, we complemented the data on media coverage with quantitative measures of the amount of attention devoted to the issue in legislative forums and professional publications. Other media and measures would have been possible. But none provided as much comparability and

continuity across the long time periods and multiple arenas addressed in this study. Results for individual arenas are reported in the chapters of part II of this book, with cross-arena patterns analyzed in chapter 14.

The quantity of attention paid to global environmental issues is only one measure of public concern. A second is quality or content. The literatures noted above also emphasized the potential importance of how issues are characterized, defined, or framed in scientific, political, and public discourse.⁴ Too much of the literature on issue framing, however, has been undercut by its failure to construct a formal structural framework or taxonomy for objectively classifying the different ways in which different groups characterize developing issues. Some such formal taxonomic framework seemed to us especially important for a study seeking to compare issue framings across multiple languages, nations, and time periods. Its development therefore became a central task of our research strategy. The result is described in the next section.

A Taxonomy of Hazard Management One of our most fundamental requirements was for a common taxonomic framework to characterize and classify the content of discourse about global environmental issues and their management. Did scientists present end-to-end, “integrated” assessments of the issue, or did they concentrate on particular facets of the overall story? Did policy advocates focus on measures to address causes or effects? Did controversies range over all aspects of the issue, or were

they more narrowly confined? The beginnings of a taxonomic framework that would allow classification of empirical evidence relevant to such questions had been developed in the 1980s by scholars of technological hazard analysis (Kates, Hohenemser, and Kasperson 1985) and environmental impact assessment (Beanlands and Duinker 1983). Initial applications to problems of global environmental change were carried out by Schelling (1983), Clark (1985), and Crutzen and Graedel (1986). This early work was generalized into a taxonomy of environmental hazards by Norberg-Bohm et al. (2000), who applied it to a wide range of issues and national contexts. Figure 1.1 summarizes the elaboration of these previous hazard taxonomies developed by this project and applied throughout the present volume.⁵ As can be seen in the figure, our taxonomy is divided into several parts.

Panel A of figure 1.1 lists our categories for classifying discourse about environmental issues. Our use of these categories is intended to be purely descriptive; no ordering or priority in how or when society addressed them is assumed:

- *Demand for goods and services* Any environmental concern (such as energy) may be traced back to origins in human demands for goods and services. Conversely, the environmental implications of particular social demands for goods and services may be explored.
- *Choice of technologies or practices* The implications for the environment of particular technologies or

A. Issues	Demand for goods and services	Choice of technologies and practices	Flux of materials	Valued environmental properties	Exposure of people and things	Consequences to people and the things they value
B. Actions (options)	Change demand	Change choice	Change flux	Change environment	Change exposure	Change consequences
C. Groups of actions (options) used in this study	Emissions		Environment		Impacts	
D. Other groups of actions used by actors documented in this study	Mitigation options				Adaptation options	
	Preventive		Offset		Adaptation	
E. Framing categories used in this study	Causes		Environment		Impacts	

Figure 1.1
A taxonomy of hazard management

practices (such as coal versus natural gas fuels) may be discussed, with selection driven by interest in the technologies themselves, or in a means for meeting basic demands, or in source of pollutants of concern.

- *Flux of materials* The release of certain materials to the environment (such as sulfur dioxide, chlorofluorocarbons, and carbon dioxide) to the environment may become the subject of attention—perhaps in their own right, perhaps as a possible threat to valued environmental properties, or perhaps as a possible consequence of certain development choices people make.
- *Valued environmental properties* Certain properties of the environment (such as global climate, stratospheric ozone, and precipitation acidity) are singled out by scientists, advocates, or political leaders as meriting concern.
- *Exposure of people and things* Discussions of global environmental change (such as coastal localities exposed to global sea-level changes) may highlight the exposure of specific local places to different sorts of stresses.
- *Consequences to people and things they value* People may discuss possible impacts of global environmental change (such as crop loss and health implications) on themselves or on other things they value.

Panel B of figure 1.1 lists our basic categories for classifying discourse about actions that might be undertaken in response to concern for environmental issues. It simply reflects the obvious but important fact that actions could in principle be undertaken within every one of the categories used to characterize the issue itself (Schelling 1983). We employed this symmetrical classification in our basic research protocol and analysis.

In the course of our investigations, however, we discovered two things that made our descriptive taxonomy of actions less straightforward than our taxonomy of issues. First, discourse about actions to address global environmental issues tended to group multiple categories into larger clusters. For example, we commonly encountered discussions of preventive options for reducing greenhouse gas emissions that included in a relatively undifferentiated way measures for both demand reduction and technology switching. This tendency to group and apply common labels to discussions of different types of response options would not have been problematic except for the fact that different actors and different arenas employed different groupings. In addition, however, we discovered that the labels applied to these groupings by the actors themselves were often strategically selected. At one point in the climate debate labeling options as *adaptive* had become so out of favor that virtually all actions considered were described as *mitigation*, independent of

which aspect of the climate issue they were addressing. Such strategic naming is, of course, of substantial interest in a study such as this. But it was important for us to distinguish what advocates of particular actions were actually talking about from how they were seeking to package their proposals. We therefore focused our descriptive taxonomy of action proposals on the same basic categories outlined above. When grouping was called for, we adopted the relatively neutral and descriptive terms shown in figure 1.1, panel C:

- *Emissions* This category captures measures (such as energy taxes and bans on CFC propellants) that would directly affect emissions of pollutants of interest through changing demand or changing the choice of technologies and practices.
- *Environment* This category captures measures (such as carbon sequestration through forest plantations and liming of acidified lakes) that would directly affect the amount of emissions remaining in the environment or would directly alter valued environmental properties.
- *Impacts* This category captures measures that alter the impact of changes in the environment on people and things they value. Such measures (such as shielding people from ultraviolet radiation and air conditioning places where people work) can work by changing exposure or changing vulnerability.

Panel D of figure 1.1 shows how our descriptive taxonomy relates to various categories of actions used by the actors we studied in their discussions about global environmental problems.

Finally, panel E introduces terminology employed in our analysis of issue framing and relates this to the other categories and to the underlying descriptive taxonomy.

A Functional Framework for Describing Global Environmental Management Our final framework constituted a functional characterization of issue development. It drew largely from the literatures of policy analysis and risk management. These emphasize the stages of issue development and the tasks that are performed in each (Jones 1984; von Prittwitz 1990; Winsemius 1986). While sharing modern skepticism (e.g., deLeon 1999) regarding the linear or sequential relations among stages and functions that are assumed in much of the policy literature, we nonetheless found particularly useful the common functional categories adopted by works as different as Kates, Hohenenser, and Kasperson's (1985) studies of technological hazards and Kay and Jacobson's (1983) early work on international environmental policy. As shown by Kay and Jacobson, this functional framework's focus on *what* is done rather than *who* does it is

particularly appropriate for long-term, comparative studies in which comparability of actor groups and institutions might otherwise be problematical. Our functional framework for the description of issue development, somewhat modified from that of Kates and Kay and Jacobson, addresses the following six management activities: monitoring, risk assessment, option assessment, goal and strategy formulation, implementation, and evaluation. These functions are summarized in box 1.2 and constitute the focus for part III of this book.

1.3.4 Analyzing Issue Development

We reiterate that our primary goal in this study was to provide a preliminary historical reconnaissance of the development of selected management problems during the formative years of the global environmental era. Our intent has been that the resulting rich descriptive account will provide the empirical puzzles and factual foundations without which most attempts at causal inference on the factors responsible for the development of global environmental management practices will remain unconvincing and premature. These limited ambitions notwithstanding, we also sought in our empirical work to document patterns in some of the variables and processes that prior studies have suggested are likely to be involved in the shaping of issue development.

Variables Due to the iterative character of issue evolution, many of the potentially explanatory variables turn out to be similar to those we use to describe issue evolution in the first place. Rather than signifying a conceptual weakness in our study, this is simply a reflection of Wildavsky's (1979) observation that policy—which we would expand to issue development—more often than not becomes its own cause. Our principal focus, as described earlier, has been on the roles of ideas, interests, and institutions.⁶

Ideas Two presently distinct but potentially complementary literatures on the role of ideas in issue development provide points of departure for the present study. The first, grounded in the policy-science and science-studies literatures, emphasizes the importance of issue *images* and *frames* for defining what knowledge matters and who feels concern (Nelson 1984; Stone 1988; Schon and Rein 1994; Hajer 1995). The second, based in international relations, emphasizes the importance of shared beliefs in stabilizing coalitions of actors that often provide the motive force behind policy change (Hall 1989; Haas 1990; Goldstein and Keohane 1993; Blyth 1997). Neither tradition has been particularly successful in showing how or under what conditions such ideas affect issue development. We nonetheless attempted to be alert

Box 1.2

Management functions

Risk assessment Research on this function traces changes in understanding the nature, causes, consequences, likelihood, and timing of the risk in question. Particular attention is paid to the subset of all causes and consequences addressed by particular actors.

Monitoring Research on this function traces the evolution of efforts by any of the actors to document actual changes in aspects of the environment affected by the risk in question, relevant emissions, human responses, and results of management strategies and specific implementation measures.

Option assessment Research on this function documents and explains changes in the assessment of possible options for responding to the problem in question. Options are particular measures that an actor might undertake to help manage a risk. Assessments of options are systematic examinations of the feasibility, costs, or benefits of particular options.

Goal and strategy formulation Research on this function traces changes in management goals, the design of a package of options appropriate for achieving them, and the selection of modes (such as command and control, incentives, and persuasion) for implementing those options. Goals are statements of objectives or of conditions that an actor wishes to bring about. Strategies are plans for how—in what combination and at what time—particular response options will be combined to achieve a goal. Strategies thus organize particular means (options) to achieve particular ends (goals).

Implementation Research on this function traces changes in the actions actually taken by various social actors with regard to management of the issue in question. Implementation may include persuasion through normative pronouncements, educational activities, the exchange or dissemination of information, rule making, provision of incentives, supervision or enforcement of compliance, and coordination of programs.

Evaluation Research on this function documents self-conscious efforts of actors to reflect on and evaluate their own and others' performance in contributing to management of the risk under consideration.

for impacts of powerful images and shared beliefs in our empirical studies.

Interests Questions of who pushes issue evolution are clearly central to our concerns. Who provides the problem definitions and policy proposals that eventually are adopted? Who furnishes the energy that moves and motivates policy change across the long periods and large scales that concern us here? How do whose interests affect the management of global environmental change? We have sought in this study to remain sensitive to the influence of the traditional state and nonstate actors delineated earlier. In addition, however, we have taken seriously recent work stressing the importance of ad-hoc groups composed of different kinds of actors in

promoting particular directions for issue development. Where possible, we have documented the activities of such *issue networks* (Hecló 1978; Keck and Sikkink 1998), *advocacy coalitions* (Sabatier and Jenkins-Smith 1993, 1999), or *epistemic communities* (Haas 1990) as have been active on the stage of global environmental management.

Institutions Modern institutional approaches to issue development focus on the ways in which relatively stable rules, procedures, and operating practices structure the interactions among interested parties (e.g., Koelbe 1995). Institutions can influence the distribution of power among actors, actors' perceptions of their own interests, and thus the goals that shape issue evolution. Research at the domestic level has emphasized the historical grounding of institutional capacity in past experience and the importance of that historically bound capacity in both framing and resolving new issues (e.g., Skopol and Finegold 1983; Steinmo, Thelen, and Longstreth 1992). At the global level, a substantial body of scholarship in recent years has attempted to trace how and under what conditions international institutions promote effective environmental management. Keohane, Levy, and their colleagues (e.g., Haas, Keohane, and Levy 1993; Keohane and Levy 1996) have proposed that such institutions exert their influence on policy through increasing concern among advocates and policy elites, enhancing the contractual environment for enforceable agreements, or strengthening the capacity of the management system to perform its various functions. We have sought to document evidence of such causal pathways in the work reported here. At the same time, we have attempted to avoid the static bias of many institutional analyses and to remain alert for the ways in which the profound changes in institutions bearing on global environmental issues have affected their management over the decadal scales.

Processes In addition to documenting variation in the ideas, interests, and institutions that might be expected to shape the development of global environmental management practices, this study attempted to trace some of the most important processes and pathways through which their influence occurs. Where do the ideas and beliefs about the management of global environmental risks come from? Why do particular actors come to see themselves as interested parties in the development of some global environmental issues but not others? How do institutions promote changes in concern, capacity, and contractual environment that affect the management of global environmental risks?

Efforts to probe such deeper questions about the factors and processes shaping issue development must be sensitive to a variety of possible answers that have little

to do with the global environment. The most obvious are overarching political changes, such as the dissolution of the Soviet Union or the coming of Reaganism and Thatcherism to the world stage. Less dramatic but potentially important nonetheless are explanations grounded in the bureaucratic politics of the relevant organizations and institutions (e.g., Allison 1974). While addressing such processes where they seemed particularly interesting or relevant, this study focused on the possible complementary role of learning. In particular, we followed Harvey Brooks (1977, 243) in asking in what sense, and in what ways, the development of global environmental management can usefully be viewed as "a sustained social learning process."

The analysis of issue development as a process of social learning stems from early work of Deutsch (1963) and Hecló (1974). It has more recently produced illuminating studies of the development of democratic politics (Eder 1987), Keynesian economics (Hall 1989), international quarantine practices (Cooper 1989), and norms for nuclear arms control (Nye 1987; Adler 1992). In the environmental realm, social learning processes figure prominently in Peter Haas's (1990) analysis of international cooperation on the Mediterranean Action Plan and other international environmental issues (Haas and Haas, 1995), Kai Lee's (1993) groundbreaking work on sustainable development, Sabatier's studies of policy change (Sabatier 1999), and Harvey Brook's (1977) call for a broader approach to scholarship on the management of global environmental risks. All of this work emphasizes the "fundamentally messy, contingent, and ambiguous intermingling of knowledge, power, interests, and chance in the workings of the world" (Parson and Clark 1995, 457). None of it suggests that learning approaches are yet ready to generate tight theories or crisp predictions of social change. Rather, viewing long-term issue development through a "learning" lens may highlight significant processes and relationships that complement other equally partial explanations (Sabatier 1993, 1999). Our approach to the study of learning in the development of social approaches to the management of global environmental risks can be summarized in terms of its answers to three questions posed by many students of learning: Who learns? What is learned? What counts as learning?⁷

Who Learns? Much of most peoples' intuitive feel for learning focuses on learning by individuals. Such learning is clearly important. Moreover, in keeping with this study's focus on the multiple actors and groups involved in global environmental management, we have attempted to distinguish which of these actors learns which lessons. In addition, however, we have extended our reach to

include the likelihood of learning within—and perhaps by—various organizations and institutions. Finally, we have kept in mind that learning often involves would-be teachers as well as potential learners. Discovering who is trying to promote lessons about global environmental management, as well as who is trying to learn them, is almost certainly an important part of explaining issue development.

What Is Learned? Much of the ordinary discussion and formal literature on learning concentrates on the incorporation of new knowledge or experience into existing practices, causal models, and decision-making processes. Increasingly, however, it has become clear that some of the most important learning involves changes in higher-order concepts including norms, goals, and the overall interpretive frameworks that Hall (1993, 279) has called *policy paradigms* and we have treated under the heading of *issue frames*.⁸ Our approach adopts this larger view of learning. We treat it as a process that may help to bring about cognitive changes at multiple levels ranging from issue frames (Vig 1997, 1) and basic beliefs (Keohane and Nye 1989, 264), through goals (Hall 1993, 278), strategic perspectives on one's relationships with other actors (Haas 1990; Haas and Haas 1995), and behavioral intentions (Sabatier 1988, 19), to more elemental concepts including cause-and-effect relationships, appraisal of the efficacy of particular management interventions, and basic skills of management practice.⁹

What Counts as Learning? Much social science literature presumes that *learning* is synonymous with increasing one's ability to cope with the world. We found this conception too broad to be analytically useful. At the other extreme, we share the view of Breslauer (1987, 432), Keohane and Nye (1989, 264), and others that learning should not be definitionally restricted to processes that lead to better outcomes.¹⁰ A less restrictive view of policy-oriented learning has been promoted by Sabatier and his colleagues, building on the work of Hecló (1974). This focuses on cognitive changes “that result from experience and are concerned with the attainment (or revision) of policy objectives” (Sabatier 1988, 19). Two further expansions of this answer to the “What counts?” question are important for the study reported here. First, along with other students of learning, we found that focusing on *experience* alone as a source of cognitive change is too narrow a view and have broadened ours to encompass *experience and new information* (Hall 1993, 278; see also Keohane and Nye 1989, 264). Second, in view of this study's concern with the long-term development of not just policy but rather the broader-range activities involved in the management of global environmental risks, we have substituted *management objectives* for the

more restrictive phrase *policy objectives* in Sabatier's answer to the “What counts?” question. In this study, we have therefore counted as learning those processes that deliberately utilize experience or information to bring about cognitive changes that are concerned with global environmental management. We have left questions regarding the instrumental effectiveness and normative implications of learning to be treated empirically rather than definitionally (see below).

Norms To what extent did the actors, institutions, and societies addressed in this study learn better management of global environmental risks? This wholly reasonable question introduced normative dimensions into the study with which we remained uncomfortable from beginning to end.

As noted earlier in this chapter, our study sought to remain open on the question of whether the issues in question merited more or less attention and action. We focused instead on documenting and understanding how actors and arenas came to give particular management responses to the issues. This meant that we rejected from the outset evaluative criteria that would have defined “better” management in terms of more success at raising the political profile of the issues or taking action on them. Moreover, we both expected and observed in our initial empirical work a great variety of different views on what constituted better management of the issues at hand. These differences reflected not only contrasting perspectives of various actors (such as scientists, NGOs, and industry) but also systematic differences among arenas based on both interests in the issue at hand and more general orientations regarding the use of scientific findings in policy contexts (e.g., Brickman, Jasanoff, and Ilgen 1985).

Faced with this variety of evaluative perspectives, our study group was unwilling to impose on our empirical material a rigid normative framework of our own making. We were also, however, unprepared to give up on the normative discussion by simply assuming that all outcomes are equal. Ultimately, we found an uneasy middle ground in Ravetz's (1971) historical studies on the application of expert knowledge to social problems. In essence, Ravetz argued that despite differences in the specific norms applied by particular parties in particular circumstances, it was possible to discern across multiple cases and circumstances a channeling of critical debates along lines that could be captured by a small number of *metacriteria*. As further developed in Clark and Majone's (1985) empirical study of normative criteria employed in a wide variety of energy and environmental debates and in Guston's (1997) work on science advising, metacriteria for addressing knowledge-action dynamics have been summarized under the headings of *adequacy*, *value*, *legitimacy*, and

Box 1.3

Criteria for evaluating efforts to link knowledge with action

Adequacy The role of criteria of adequacy is to permit the accumulation of certified “facts,” thus providing what historian Oscar Handlin (1979, 408) has called the “grounds for peaceful discourse.” Two potential uses of such criteria stand out as particularly relevant for efforts to link knowledge with action in the management of global environmental risks. The first is the simple posting of known pitfalls: methodological blunders and inappropriate use of data that immediately vitiate any assessment that fails to avoid them. The second is the channeling of disputes into well-defined categories where focused and informed discussion can be carried out.

Value The role of criteria of value is to help channel inquiry into important areas where it has some prospect of making contributions that extend beyond the immediate gratification of those performing the inquiry. At one level, such criteria address such commonsense notions of worth or relevance. At another, somewhat deeper level, they include evaluations of feasibility, encompassing exhortations from a number of fields that temper inclinations to attack only the really important problems with due respect for “the art of the possible.” Without well-developed criteria of value to root intellectual activity in issues of the world, there is a great tendency to concentrate on what John Passmore has called the “charmed circle” of presently exciting problems. There is also little defense against the *internal* criteria of adequacy developed by some intellectual field displacing any external social reference point in the evaluation of good work.

Legitimacy As Lindblom has noted, “A deep conflict runs through common attitudes to policymaking. On the one hand, people want policy to be informed and well analyzed. On the other, they want policymaking to be democratic. . . . In slightly different words, on the one hand they want policymaking to be more scientific; on the other, they want it to remain in the world of politics” (Lindblom 1980, 12). In political contexts, legitimacy rests on questions of majority and minority and how to control the treatment of the latter by the former. In scientific contexts, it has been centrally bound with “the fair play of ideas” and how skeptical questioning of accepted interpretations can be simultaneously encouraged yet kept from arbitrarily dismantling consensual understanding.

Effectiveness The role of criteria of effectiveness is simply to evaluate whether knowledge- or action-based efforts undertaken to help resolve problems actually do so. Efforts to develop such criteria must contend at the outset with what Carol Weiss (1975), commenting on the problems of evaluating policy, has called the dilemma of “little effect.” With depressing regularity, evaluations of policies produce verdicts that they have left the world “out there” pretty much the same. In part, this doubtless reflects the real difficulties of bringing about change in the world. In part, it also reflects a naive view of the processes by which both scientific ideas and public policies develop. Recent scholarship has shown that in both science and policy, critical findings that radically and unambiguously change the existing order are in fact rare. Effectiveness is better viewed not just in terms of the creation of solutions but rather in a broader context that includes the ability of a given endeavor to shape the agenda or advance the state of the debate (see Majone 1980; Keohane 1996).

effectiveness. Our use of these terms is defined in box 1.3. We employ the Ravetz criteria throughout this book as framework for critical discussion on the question of what might be meant by *improvements* or *progress* in the management of global environment.

1.4 The Organization of This Book

This book is organized in four parts.

Part I introduces the study. This chapter (chapter 1) summarizes the work’s motivations, the questions it seeks to address, and the research approach it follows. Chapter 2 follows with an overview of the three issues addressed in the study: acid rain, stratospheric ozone depletion, and climate change.

Part II reports on our arena studies. Chapters 3 to 13 describe how our three atmospheric issues were managed in single arenas. Individual chapters have been written for Germany, the United Kingdom, the Netherlands, the former Soviet Union, Hungary, Japan, Mexico, Canada, the United States, the European Community, and the family of international environmental institutions. Chapter 14 presents an analysis across arenas of our findings on issue attention, framing, and actors.

In volume 2, part III reports on our function studies. Individual chapters describe the development of a single management function, drawing on experience from all our arenas and issues. Chapters are presented for risk assessment, monitoring, option assessment, goal and strategy formulation, implementation, and evaluation. Chapter 21 closes part III with an analysis of our findings on linkages among management functions. Part IV concludes the study with a single forward-looking synthesis chapter 22.

Appendix 1A. Acronyms

CFC	chlorofluorocarbon
ICSU	International Council of Scientific Unions
IGY	International Geophysical Year
NGO	nongovernmental organization
OECD	Organization for Economic Cooperation and Development.
UNCED	United Nations Conference on Environment and Development
UNEP	United Nations Environment Programme
WMO	World Meteorological Organization

Notes

1. We agree with those such as Lipschutz and Conca (1993) who point out that global environmental change and global environmental management are only two of many possible constructions of what is going on in the environmental realm today. Moreover, these are indeed constructions that privilege the position of elites—global technical actors such as scientists, senior civil servants, big nongovernmental organizations, and the like. But this just means that there are other stories to be told. Global environmental change is a real discourse, with real people doing work on it. Global environmental management is something that lots of actual people think they are doing when they get up each day. Our goal is not to say these are or should be the only frames for contemporary discussions of environmental affairs. Rather, we propose that it would be worthwhile to understand what is actually going on in the communities of global change elites whether one's goal is to help, critique, or comment on those activities.
2. Our study period carried on across the democratic revolutions that swept these countries in the late 1980s. The respective country studies address the possible significance of those revolutions for the nation's participation in the management of global environmental change.
3. Swedish contributions to the development of management approaches to our issues are touched on where possible in the relevant chapters of the book.
4. Drawing on a presentation by Sheila Jasanoff, Global Environmental Assessment (GEA 1997, 107) notes that "the concept of framing is employed in the social sciences as a means of drawing attention to the processes of selection, emphasis, and presentation through which a particular view of an issue or problem comes to dominate other possible ones over particular periods and for particular groups. The framing of an issue in a particular way—for example as 'the CO₂ problem'—tends to carry with it an implicit choice of what matters. . . . Likewise, it points to where solutions are to be sought."
5. We emphasize that our use of this taxonomy is for classification purposes only. We use it to describe and categorize what various actors were talking and writing about at specific times and not to imply anything about the truth, intent, or relevance of their assertions. In particular, we have been at pains to avoid imposing through the taxonomy any assumption that good management (whatever that might be) necessarily involves attention to any or all of the categories or that the categories are connected or sequenced in any particular order.
6. For a review of the changing relationships among ideas, interests, and institutions in modern thinking about public policy and administration, see Majone (1996).
7. E.g., Bennett and Howlett (1992). For a look at how participants in this study have developed our somewhat pluralistic perspectives on theories of learning, see Parson and Clark (1995), Liberatore (1993), Jachtenfuchs and Huber (1993), and Huber (1993).
8. See also Jachtenfuchs and Huber (1993) on the closely related concept of *policy frames*.
9. Many authors have proposed distinct hierarchical levels for classifying what gets learned—for example, Argyris and Schon's (1978) single versus double loop learning and Hall's (1993) three types of learning. We have no quarrel with any of these classifications, but neither did we find our own evidence sufficiently compelling to postulate discrete categories as opposed to a continuum of answers to the "What is learned?" question.

10. Leaving aside the operational problems of assessing better outcomes, it is surely true that people learn the wrong lessons from experience and learn to do bad things well.

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