III
STUDIES OF MANAGEMENT FUNCTIONS

Introduction

Part III of the book focuses on risk management "functions." As indicated in chapter 1 (Managing Global Environmental Change: An Introduction to the Volume) the "functional" characterization of issue development is derived largely from the literatures of policy analysis and risk management. While remaining skeptical of the linear or sequential relations among stages of issue development and the performance of particular tasks that is assumed in much of the literature, we nonetheless found particularly useful the common functional categories adopted by works as different as Kates, Hohenemser, and Kasperson's (1985) studies of technological hazards and Kay and Jacobson's (1983) early work on international environmental policy. Kay and Jacobson argue, and we agree, that through its focus on *what* is done rather than *who* does it, this functional framework 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 management activities:

- Risk assessment: "What is the problem?"
- Monitoring: "What is happening?"
- Option assessment: "What could be done?"
- Goal and strategy formulation: "What should be done?"
- Implementation: "What is being done?"
- Evaluation: "How are we doing?"

A Taxonomic Framework

Our studies of these individual risk management functions used 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? As pointed out in chapter 1, the beginnings of a taxonomic framework that would allow classification of empirical evidence relevant to such questions was developed in the 1980s by scholars of technological-hazard analysis (Kates, Hohenemser, and Kasperson 1985) and environmental-impact assessment (Beanlands and Duinker 1983). Figure IIIA summarizes the taxonomy developed from those initial works for this project. This framework is used in most of the chapters of Part III.

Panel A of figure IIIA 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 its 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 and practices* The implications for the environment of particular technologies or practices (such as coal versus natural gas fuels) may be discussed, with selection driven by interest in the technologies themselves, as a means for meeting basic demands, or in sources of pollutants of concern;

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 IIIA
A taxonomy of hazard management

• *Flux of materials* The release of certain materials (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 locales exposed to global sea-level changes) may highlight the exposure of specific local places to different sorts of stresses;

• *Consequences to people and the 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 IIIA 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.

For this study it was important 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 IIIA, 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 though forest plantations and liming of acidified lakes) that would directly affect the amount of emissions remaining in the environment or would 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 IIIA 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 underlying descriptive taxonomy.

Evaluating Functional Performance

Each chapter in Part III asks whether functional performance is getting better over time. To answer that question some evaluation criteria were required. As discussed in chapter 1, we use the metacriteria *adequacy, value, legitimacy,* and *effectiveness* in Part III for critical discussion on the question of what might be meant by "improvements" or "progress" in the performance of risk management functions.

Our working definitions of these metacriteria (Clark and Majone 1985) are as follows:

• *Adequacy* The role of criteria of adequacy is to permit the accumulation of certified facts, thus providing what historian Oscar Handlin 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."

• *Legitimacy* 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. Effectiveness is viewed not in terms of the creation of solutions but rather in terms of the ability of a given endeavor to shape the agenda or advance the state of the debate.

Linking Risk Management Functions

In part III the performance of the risk management functions is discussed in six separate chapters (chapters 15 to 20), each of which includes specific examples of performance, more general patterns and a discussion of whether performance is improving over time. Chapter 21 analyzes how linkages among the risk management functions have changed as the issues moved from the science agenda onto the policy agenda.

References

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