PART I

UNDERSTANDING AND MEASURING ENVIRONMENTAL PROBLEMS
We do not really understand how the world works. This lack of understanding can lead either directly or indirectly to environmental problems. These, in turn, can have negative impacts on the welfare of all species and ecosystems, as well as on the long-range sustainability of human activities within the ecosphere. To work towards a sustainable future, managers need to:

- broaden their perspectives and gain new visions with respect to understanding and meeting the challenges of sustainability;
- acknowledge and accept new mandates and responsibilities;
- gain access to new sources of information and find more effective ways of sharing and communicating that information;
- re-examine traditional ways of valuing the environment; and
- define and test new ways of measuring progress, status, and change.

These concerns are reflected in Part I of this book. As a group, these chapters can be succinctly characterized as an exploration of managers' “need to know,” along with some suggestions for meeting that need. They are not necessarily sequential; they are overlapping, complementary, and interrelated. They represent a collection of building blocks for capacity building, aimed at the enhancement of our understanding and our ways of measuring environmental problems.

Chapter 1, “Reflections on Sustainable Development,” addresses the need for managers to broaden their perspectives by examining the physical and historical roots of our current situation and the global problematique. This chapter is based on the personal reflections of one person concerning where we have come from, where we are going as a global community, and how we can tell if we are making progress towards a sustainable future. Human beings — relatively late arrivals in the evolutionary chain — radically changed the traditional equilibrium among the Earth's natural systems, through processes such as cultivation, domestication of plants and animals, and the emergence of transportation and communication technologies. These impacts continued and were intensified through the scientific and industrial revolutions, with increasing emphasis on Western modes of thought. Our understanding of the concept of sustainability — as difficult as it is to define — has evolved within this context. This chapter links the problems of poverty, inequality, and environmental security in a development context, and proposes specific needs, priorities, and actions in the search for a “common cause.”

Chapter 2, “A New Agenda for Managers,” examines the changing responsibilities being placed on managers and their increasing accountability — both legal and ethical — for the impacts of their decisions. The current environmental revolution may have as profound effects on our management methods and responsibilities as the social revolution of the last century, compelling managers to internalize an entirely new set of values into their management and decision-making processes. Agenda 21 and the Con-
ventions on Climate Change and Biological Diversity — the key products of the recent United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro — will influence management and decision-making processes and will challenge contemporary managers in many ways. In themselves, these documents represent a global consensus and a mandate for environmental sustainability in management and planning. Adapting to this new mandate will require changes in both processes and institutions. This chapter examines some of the responses of governments and corporations to these challenges.

Chapter 3, “Environmental Information for Better Decision Making,” emphasizes the need for managers to gain access to new sources of information. Electronic data sources, state of environment reporting, monitoring of global systems, and other sources represent invaluable information bases that are increasingly accessible and may prove to be immeasurably useful in the context of managing for sustainability. This chapter addresses the question: “How can we begin to meet the informational needs and enhance the capabilities of a diverse group of decision makers — from policy makers to policy recipients, from researchers to the general public, from non-governmental organizations to government to corporate managers — in a context that ranges from local to global, from developing to industrialized, from North to South?” It emphasizes the importance of viable databases, better information management systems, effective communication and reporting of environmental information, and the strengthening of institutions and partnerships.

Chapter 4, “Valuing the Environment: Seeking Answers from the Swamp,” aims at broadening the managerial perspective by exploring the range of values derived from the environment in the form of goods, services, and experiences. The challenge is to find ways to incorporate a broad range of values — including many non-market values — into our decision-making processes. To understand global interrelationships more clearly, it is sometimes useful to focus on the microcosm of a specific ecosystem. This chapter draws general lessons from a comprehensive, detailed study in which methods of valuation were examined for the entire spectrum of environmental functions deriving from four specific wetland ecosystems. Important steps towards sustainable development will be to establish the presence of a range of environmental functions; to link specific functions to social goals; to assess the benefits that derive from specific attributes of the environment; and to analyze the sensitivity of these benefits to alterations in those specific environmental attributes.

Chapter 5, “Indicators and Indexes: The Signs of Life,” explores some alternative ways of measuring our progress towards sustainability. Indicators are one way for managers to get a more complete picture of human interactions with the environment. Traditionally, managers have relied on a small set of indicators with a narrow, economic, growth-oriented bias. We need to re-examine the indicators that are in common use today, with the goal of selecting or creating more realistic, more useful, more comprehensive, more effective indicators. The utility of broad indexes of progress and welfare is discussed in the context of sustainable development. A sectoral approach is also presented, in the example of a set of proposed indicators of sustainable tourism developed for the World Tourism Organization. This chapter highlights the need to make key information easily accessible to managers in a concise and compact form that is directly usable in the decision-making process.

Chapter 6, “The Sustainable Livelihood Security Index: Developing and Applying a
Composite Indicator" presents a specific example of the design and application of a comprehensive index of sustainability — the Sustainable Livelihood Security Index (SLSI). The chapter provides a brief historical review of existing composite indicators of overall welfare. The design and development of the SLSI is discussed, and the index is then applied to several regions in India. There are challenges, limitations, and advantages inherent in the choices that must be made in designing the various components of the index. The three components of the SLSI — representing ecological security, economic efficiency, and social equity — are, themselves, composite indicators. This very specific example is used as a vehicle for discussing some of the larger issues involved in the design, calculation, and implementation of comprehensive indexes. Many of these issues and limitations are typical of the problems encountered in calculating and operationalizing any composite index. In spite of these limitations, composite indexes like the SLSI can be very effective in defining sustainable use patterns, testing the effectiveness of proposed projects and policy interventions, or indicating specific areas for concern.

The need to know, the need for accessible, relevant information, and the need to broaden perspectives, question traditional value systems, and accept new responsibilities represent the focus of this set of chapters. The challenge of learning to manage towards a sustainable future is real and urgent. It will require significant changes in our behavior and modes of operation as governments, corporations, organizations, and individuals, if we are to respond effectively. Only through better information concerning the impacts of our actions on critical elements of the environment can we accept responsibility and accountability for the full range of values affected by our management decisions.