

BRIDGING SCALES A • N • D KNOWLEDGE SYSTEMS

**Concepts and Applications
in Ecosystem Assessment**



EDITED BY
**WALTER V. REID, FIKRET BERKES,
THOMAS J. WILBANKS,
AND DORIS CAPISTRANO**

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A • N • D
KNOWLEDGE SYSTEMS

**Concepts and Applications
in Ecosystem Assessment**

A contribution to the
MILLENNIUM ECOSYSTEM
ASSESSMENT

BRIDGING SCALES A • N • D KNOWLEDGE SYSTEMS

Concepts and Applications in Ecosystem Assessment



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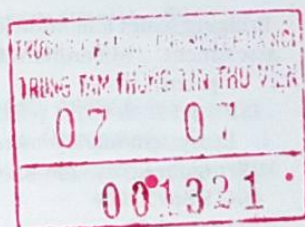
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PREFACE

The Millennium Ecosystem Assessment (MA) was carried out between 2001 and 2005 to assess the consequences of ecosystem change for human well-being and to establish the basis for actions needed to enhance the conservation and sustainable use of ecosystems and their contributions to human well-being. The MA was originally conceived as a global scientific assessment that would be modeled on two intergovernmental processes that have contributed significantly to policy development in relation to the problems of climate change and stratospheric ozone depletion: the Intergovernmental Panel on Climate Change and the Ozone Assessment.

The very first meeting of the group tasked with exploring whether the MA should be launched, however, set the design of the assessment on a very different course. While many aspects of the MA process did still draw heavily on the experience of other international assessments, that first meeting and subsequent design team meetings introduced three novel dimensions. First, the group concluded that the assessment could not be done at a single global scale and would need to examine processes of ecosystem change and human impacts at other scales, including in particular the scale of individual communities. Second, it was evident that the audience for the findings of an assessment of these issues was much broader than the traditional audience of global assessments (national governments) and must include other stakeholders from business, nongovernmental organizations, indigenous people, and other civil society groups. Finally,

it was clear that the knowledge base for an assessment of this nature could not be limited to the scientific literature but must draw on other "informal" sources of knowledge, including local, traditional, and practitioner's knowledge.

The MA was the largest assessment effort ever to attempt to incorporate all of these dimensions in its design, and in that regard it can be seen as an experiment or pilot in applying multiple scales and knowledge systems in an assessment. But, in fact, a tremendous depth of research and experience exists in relation to each of these dimensions of scale, stakeholders, and knowledge systems. Recognizing that this existing experience could significantly aid the MA process, and also recognizing that the MA itself provided an experiment that could further advance understanding of issues of scale and epistemology, the MA Sub-Global Working Group organized an international conference on these issues called *Bridging Scales and Epistemologies: Linking Local Knowledge and Global Science in Multi-scale Assessments*. More than two hundred people from fifty countries participated in that conference, which was held in March 2004 and hosted by the Bibliotheca Alexandrina in Alexandria, Egypt.

This book—*Bridging Scales and Knowledge Systems: Concepts and Applications in Ecosystem Assessment*—is one product of that conference. While the MA provides the motivation for this book, and while several chapters present experiences from the MA, this book, like the conference, reaches far beyond the MA process to explore the challenges, costs, and benefits of bridging scales and knowledge systems in assessment processes and in resource management. The issues explored in this book push the limits of science, politics, and social processes. Although a number of general lessons emerge, many questions remain unanswered about how to make such processes work, how to address issues of power and empowerment, and how to address technical issues of information scaling and knowledge validation. In this respect, the volume does not attempt to provide a blueprint, but it does illustrate the multiple dimensions of the challenges inherent in bridging scales and knowledge systems.

ACKNOWLEDGMENTS

We would like to thank the MA Sub-Global Working Group, for its initiative in organizing the March 2004 conference that led to this book, and Ismail Serageldin and the Bibliotheca Alexandrina, for hosting the conference. One of this book's editors (Doris Capistrano) was one cochair of the MA Sub-Global Working Group, and we would like to recognize the central role that the other Working Group cochair, Cristián Samper, played in designing the conference. We thank the conference international advisory committee, composed of Janis Alcorn, Alejandro Argumedo, Fikret Berkes, Marie Byström, Esther Camac, Doris Capistrano, William Clark, Angela Cropper, Elaine Elisabetsky, Carl Folke, Madhav Gadgil, Sandy Gauntlett, C. S. Holling, Louis Lebel, Liu Jiyan, Akin Mabogunje, Jane Mogina, Harold Mooney, M. Granger Morgan, Douglas Nakashima, Thomas Rosswall, and Cristián Samper. We also thank the Conference Organizing Committee, which consisted of Carolina Katz Reid, Walter V. Reid, Chan Wai Leng, John Ehrmann, Marcus Lee, Nicolas Lucas, Ciara Raudsepp-Hearne, and Sara Suriani. Special thanks are due to Carolina Katz Reid for her tireless work as the conference organizer. We also thank the MA Board and Assessment Panel listed elsewhere in this volume.

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Each of the contributed chapters in this volume underwent peer review. We thank the reviewers for their significant contribution to this volume: Neil Adger, Katrina Brown, David Cash, Donna Craig, Chimere Diaw, Polly Ericksen, Christo Fabricius, Cathy Fogel, Keith Forbes, Tim Forsyth, Peter Frost, Cole Genge, Clark C. Gibson, Madhav Karki, Don Kash, Ann Kinzig, Rene Kuppe, Murari Lal, Micheline Manseau, Peter H. May, Ronald Mitchell, P. K. Muraleedharan, Timothy O'Riordan, P. Ramakrishnan, Maureen Reed, Benjamin Samson, Marja Spierenburg, Angelica Toniolo, Ellen Woodley, and Fernanda Zermoglio.

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CHAPTER 1

Introduction

WALTER V. REID, FIKRET BERKES,
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Local communities, national governments, and international institutions all face difficult choices concerning goals, priorities, investments, policies, and institutions needed to effectively address interlinked challenges concerning development and the environment (Millennium Ecosystem Assessment 2005a). They must make these choices in the face of substantial uncertainty about current conditions and the potential future consequences of actions taken, or not taken, today. One way to improve those decisions is to ensure that the best knowledge concerning the problem and potential solutions is available to decision makers and the public. Better knowledge does not guarantee that better choices will be made, but it does provide a sound basis for making better decisions and for holding decision makers accountable.

But how can knowledge concerning environment and development be best mobilized in support of decision making? Over the past thirty to forty years, many different mechanisms have been developed to assemble, assess, and synthesize information for use in decision processes, including environmental impact assessments, technology assessments, scientific advisory boards, national environmental reports, global environmental (or development or economic) reports, and global environmental assessments. Both the processes and scientific methods used for these types of "knowledge assessments" have evolved considerably during this time. Modern global assessments, for example, commonly make use of such tools as scenarios and integrated assessment