

Preface

In hindsight, the year 2007 may look like a turning point in concern for the future of the global environment. It was the year in which signatories of the climate convention met in Bali to launch negotiations for a new climate treaty that will cover emission reductions for many years into the future. It was the year in which UNEP launched its fourth Global Environment Outlook report alerting the world to likely transformations in the global environment up to 2050. It was the year of big climate reports – The UK’s “Stern Report” asserting that climate change in future decades could seriously damage the world’s economy; and the three huge volumes of the Intergovernmental Panel on Climate Change (IPCC) providing finer detail than ever before about future consequences of climate change. Then in December came the ultimate acknowledgment that thinking about the future was useful to society – The IPCC and Al Gore were awarded the Nobel Peace Prize for their public work on climate change.

Although concern for the future may have reached a new peak in 2007, another set of events launched a decade earlier also had an important influence on planning for the future. Since the 1990s scientists and stakeholders have been working together on a series of wide-ranging international scenario exercises confronting the question of future changes in the global environment. Indeed, the number and importance of these exercises suggest that we are in a kind of golden era of global scenarios. The era’s beginning could be traced back to the development of the global emission scenarios of the Intergovernmental Panel on Climate Change. This was followed, among others, by the “World Water Vision Exercise” of the World Water Commission, and the scenarios of worldwide ecosystem services produced by the Millennium Ecosystem Assessment. Recent additions have been the global environmental scenarios of UNEP’s Global Environmental Outlook report, the integrated scenarios of the OECD Environmental Outlook, and the agriculture-related scenarios of the International Assessment of Agricultural Science and Technology for Development. Many of these scenario exercises are described in Chapters 3 and 6.

But not only the global scale has earned the attention of scenario developers. For decades many other groups have been developing environmental scenarios on the local, regional and national scales. Indeed, scenario analysis has been applied to a wide range of environmental problems and over a similarly large range of scales. Altogether these scenario studies make up a very rich collection of different views and estimates of the future environment.

Although it would be an exciting task to write a book about the many new environmental scenarios, this book is not about the future. Instead, *it is about the*

practice of studying the future. Rather than examining the scenarios themselves, here we describe the process for developing them. The book was motivated by the fact that surprisingly little attention has been given to assessing the deficiencies of environmental scenario analysis.

What are its shortcomings? A short list includes:

- A general lack of rigor in definitions and methodology which limits the credibility of results of a scenario exercise.
- A too narrow representation of different interests in the scenario exercises which takes away from the acceptance of the scenarios.
- A muddled use of different scales which leads to confusion about their results.
- A lack of unexpected “surprises” in scenarios which neglects the important role of surprising events in shaping the future.

The purpose of this book is to deal with these and other deficiencies of environmental scenario analysis with the aim to improve it as a methodology and make it even more useful for examining future changes in society and the natural environment. The following topics are covered by different chapters:

Chapter 1 “Introduction: The Case for Scenarios of the Environment” describes the two main threads of current scenario practice in environmental research and policy and the challenges they face.

Chapter 2 “Towards Guidelines. . .” is a synthesis chapter which aims to increase the rigor in environmental scenario analysis by systematically laying out definitions, procedures and methods, and by ordering methods used by many different practitioners. While pluralism of method is a worthy goal under some circumstances, in science and policy there is much to be said for rigor and reproducibility. This chapter includes among other topics a discussion of proposed criteria for evaluating scenarios.

Chapter 3 “A Survey of Environmental Scenarios” presents an overview of the rich and diverse range of environmental scenarios and serves as a kind of access guide for readers wishing to find out more about the details of different scenarios. Moreover this chapter presents a framework for understanding the different types and uses of environmental scenarios.

Chapter 4 “Searching for the Future of Land. . .” delves into an important and comprehensive type of environmental scenario, namely land use scenarios. Included are prescriptions for improving the development of these scenarios which are applicable to all types of environmental scenarios.

Chapter 5 “Participation in Building Environmental Scenarios” lays out the rationale and possibilities for increasing the engagement of scenario users in developing scenarios. Throughout this book the case is made that an intense engagement of end users is both desirable and possible in a scenario exercise and is essential for scenarios to gain legitimacy and credibility in the policy community.

Chapter 6 “. . . Combining qualitative and quantitative knowledge. . .” points out specific ways for exploiting the advantages of both narrative and numerical scenarios in a single exercise, with the aim to better serve the needs of both science and policy.

Chapter 7 “Scale Issues in Environmental Scenario Development” addresses the key scientific and policy problem of how to incorporate the many scales of environmental phenomena in a scenario analysis.

Chapter 8 “Dealing with Surprises in Environmental Scenarios” confronts the issue of creativity and surprise in scenarios. How can scenarios be informative and surprising and be scientifically valid at the same time?

Although final versions of book chapters were written in 2007, the idea for the book originated much earlier at a workshop in Kassel, Germany. The editor and authors are very grateful to participants of this workshop for their intellectual contributions to this book.¹

We also thank Martina Weiss for assistance in editing the manuscript and gratefully acknowledge the following reviewers of various chapters: Jan Bakkes, Karl-Heinz Simon, Sebastien Treyer, Kees van der Heijden, Ruud van der Helm, Dörthe Krömker, and Monika Zurek. We are particularly grateful to Tony Jakeman for his sponsorship of this book.

Finally, it is sad to note that one of the book’s authors, our good friend and colleague, Gerhard Petschel-Held, died tragically in 2005. I can say with assurance on behalf of all the authors that we sorely miss Gerhard’s good humor, friendly disposition and intellectual power. It is a shame we can no longer work with him on imagining the future.

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January, 2008

¹ “Scenarios of the Future: the Future of Scenarios – An international workshop on scenarios of the environment” University of Kassel, Germany, 2002. Participants of this workshop were Joseph Alcamo, Jan Bakkes, Hartmut Bossel, Timothy Carter, Joan Davis, Charlotte De Fraiture, Petra Döll, Peter Eder, Andreas Ernst, Anton Geyer, Thomas Henrichs, Jippe Hoogeveen, Jill Jäger, Dörthe Krömker, Carlos Larazani, Rik Leemans, Josefina Lindbloom, Dennis Meadows, Laurent Mermet, Tsuneyuki Morita, Nebosja Nakicenovic, Claudia Pahl-Wostl, Gerhard Petschel-Held, Teresa Ribeiro, Dale Rothman, Karl-Heinz Simon, Erik Terk, Ferenc Tóth, Sebastien Treyer, Kees van der Heijden, Ruud van der Helm, Sara Vassolo, Monika Zurek. The editor expresses thanks to the European Forum for Integrated Environmental Assessment (EFIEA), the Volkswagen Foundation, and the European Environment Agency (EEA) for support for this workshop.