Book Proposal

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Title

Ecological Economics of Sustainable Watershed Management

Editors

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Motivation

Ecological economics has emerged as a transdisciplinary participatory approach to environmental problem solving. Traditional environmental management paradigms have tended to reduce environmental decisions to one metric in one value to advise the choice of one decision-maker. In contrast, ecological economics has been problem-oriented, allowing the context and stakeholders of the conflict at hand to help shape the methods and define the scenarios that ultimately lead to policy choices.

At the watershed scale, conflicts over water and land resources are inherently multi-attribute, multi-stakeholder, and multi-discipline decision problems. Watershed systems – from n^{th}-order tributaries to large-scale lake and river systems – provide direct inputs to economic processes, a waste sink for economic output, and ecosystem services that make life possible. For instance, a single watershed may provide water for consumption, transport, and recreational use, a depository for treated sewage and industrial pollutants, and the source of life and sanctuary for diverse species. A watershed perspective is more holistic than standard analysis of use or exchange value, explicitly recognizing emergent properties of the system, feedback loops between system components, and conflicts amongst competing uses. Conflicts arise over the use and allocation of these resources from diverse actors in watershed economies. Characterizing the degree of trade-offs or incommensurability between the conflicting goals that often arise requires expertise drawn from diverse disciplinary perspectives.

The challenge to ecological economics at the watershed scale is thus to provide a decision framework that is both normative and positive. The description of the system (positive analysis) should be open to multiple metrics and points of view, while advice to decision-makers (normative analysis) must be grounded in sound methods and an accepted valuation framework. Since ecological economics takes a problem-oriented approach, a further challenge is to investigate the transferability of integrated methods across diverse environmental and social contexts. The attraction of traditional approaches has been a "one size fits all" approach to decision problems. Due to the pluralistic nature of ecological economics, this will probably never be the case. However, flexible integrated frameworks of analysis have the potential to be adaptable to many decision problems.

Objective

The objective of the book is to present new developments in and new approaches to watershed management grounded in principles of ecological economics. This proposal is the result of collaboration between the Ecological Economics graduate programs at Rensselaer Polytechnic Institute (RPI, Troy, NY, USA) and the University of Vermont (UVM, Burlington, VT, USA) and the Centre for Environmental Research (UFZ, Leipzig and Halle, Germany). The book will illustrate and compare experiences from methodological findings and pilot application to case studies in Germany and the United States. The degree of transferability of methods and results will be emphasized in the context of a number of environmental conflicts. Specific tools drawn from different disciplines include social accounting and input-output analysis, geographical information systems, cost-benefit analysis, environmental monitoring, and the analysis of environmental policy instruments. Frameworks to integrate these tools include multi-criteria decision aid and dynamic systems modeling using participatory approaches. Conflicts include U.S. and German cases arranged around diverse goals of watershed management, including economic output, water quality, and land and nature conservation.

Organization

The book will assemble individual papers from various disciplinary views around four themes: (1) ecological economics as a theoretical framing for the issue of watershed management, (2) the context and status of watershed managment in the U.S. and Germany, (3) methodological challenges within watershed management, and (4) lessons learned from the U.S. and German experiences. A short comparative synthesis will follow each pair of U.S./Germany cases. The first and last thems will serve as bookends the comparative analysis. Specifically, the introduction will set the book in the theoretical context of ecological economics and the application domain of watershed management. The conclusion will draw lessons on the applicability of the U.S. and German approaches to broad environmental conflicts around the world.

Each chapter will be sent to an outside referee with experience in the particular subject matter. In addition, the entire book will be reviewed by Dr. John Gowdy and Dr. Bernd Hansjuergens, two senior colleagues who are also charged with writing the conclusion to this comparative analysis. Commitments from authors have been obtained and are summarized in the following book outline. Chapter and section titles are meant to capture the general theme of each, are are subject to refinement.

Outline (Oct. 10, 2002)

Ecological Economics of Sustainable Water Management

Editors: Jon Erickson, Frank Messner, Irene Ring

I. Ch. 1: Ecological Economics at the watershed scale: linking economics and natural science problems and methods
John Gowdy, Frank Messner, Jon Erickson, Irene Ring

II. Watershed management in the United States and Germany: problems, policies and institutional structure of the Elbe and the Hudson River Basin

Ch. 2: Watershed management in Germany and the EU: new perspectives
Daniel Petry, Ines Dombrowski

Ch. 3: Watershed management in the US
Austin Troy

Comparison / Synthesis (*Jon Erickson, Frank Messner*)

III. Dealing with the methodological challenges of watershed management

1. Scenario analysis

Ch. 4: Scenario analysis in the Elbe River Basin as part of integrated assessment
Frank Messner

Ch. 5: Scenario analysis in the Hudson River Basin
Karin Limburg, Jon Erickson

Comparison / Synthesis (*Frank Messner, Jon Erickson*)

2. Integrated Modeling

Ch. 6: Elbe – Integration of economic evaluation and the hydrological model ArcGRM
Matthias Karkuschke, Michael Kaltofen, Oliver Zwirner, Frank Messner

Ch. 7: Elbe – integration of agro-economic analysis and ecological modeling
Thomas Schmidt

Ch. 8: Hudson – Integration of Economic Modeling and Land Use Planning
Audra Nowosielski

Ch. 9: Hudson – Integration of Land Use Modeling and Policy
John Polimeni

Comparison / Synthesis (*Karin Limburg*)

3. Evaluation Approaches

Ch. 10: Elbe - Practical problems of the evaluation of river development projects for inland navigation
Bernd Klauer, Daniel Petry

Ch. 11: Elbe - Participation and Integrated Assessment under uncertainty in the Elbe River Basin
Frank Messner, Oliver Zwirner

Ch. 12: Hudson – Participatory Multi-Criteria Decision Aide in the Hudson River Valley
Caroline Hermans

Comparison / Synthesis (*Bernd Klauer*)

4. Innovative Policy Instruments

Ch. 13: Historical perspective of water economics and compensation schemes in the Catskills
Mindy Kane

Ch. 14: Intergovernmental fiscal transfers: compensating local jurisdictions for ecological public functions
Irene Ring

Ch. 15: Full cost recovery water prices for river basin mangement – perspectives in Germany and the EU
Frank Messner, Bernd Hansjuergens, Herwig Unnerstal

Comparison / Synthesis (*Irene Ring*)

IV. Ch. 16: Lessons to be learned for an integrated watershed management

John Gowdy, Bernd Hansjuergens

Time horizon for the book to be published by Elsevier Science:

Final outline and chapter author commitments: December 1, 2002

First draft of chapters due to editors: March 1, 2003

Edited volume sent for external review: July 1, 2003

Deliver to Publisher: September 1, 2003