Integrated Assessment of Water Resources and Global Change
Integrated Assessment of Water Resources and Global Change

A North-South Analysis

Edited by

ERIC CRASWELL
Global Water System Project, Bonn, Germany

MIKE BONNELL
UNESCO Division of Water Sciences, Paris, France

DEBORAH BOSSIO
International Water Management Institute, Colombo, Sri Lanka

SIEGFRIED DEMUTH
Federal Institute of Hydrology, Koblenz, Germany and
University of Freiburg, Germany

NICK VAN DE GIESEN
Delft University of Technology, The Netherlands

Reprinted from Water Resources Management, Volume 21(1), 2007

Springer
Table of Contents

**Preface** 1–2

Shift in Thinking to Address the 21st Century Hunger Gap – Moving Focus from Blue to Green Water Management
Malin Falkenmark 3–18

A Grid-Based Assessment of Global Water Scarcity Including Virtual Water Trading
Md. Sirajul Islam, Taikan Oki, Shinjiro Kanae, Naota Hanasaki, Yasushi Agata and Kei Yoshimura 19–33

Water Footprints of Nations: Water use by People as a Function of Their Consumption Pattern
A. Y. Hoekstra and A. K. Chapagain 35–48

Transitions Towards Adaptive Management of Water Facing Climate and Global Change
Claudia Pahl-Wostl 49–62

Stakeholder-Driven, Enquiry-Driven, or Stakeholder-Relevant, Enquiry-Driven Science?
W. James Shuttleworth 63–77

Learning Alliances for the Broad Implementation of an Integrated Approach to Multiple Sources, Multiple uses and Multiple Users of Water
Frits W. T. Penning de Vries 79–95

Possibilities and Problems with the use of Models as a Communication Tool in Water Resource Management
Johanna Alkan Olsson and Lotta Andersson 97–110

Integration of the Biophysical and Social Sciences Using an Indicator Approach: Addressing Water Problems at Different Scales
Caroline Sullivan and Jeremy Meigh 111–128

Capturing the Complexity of Water uses and Water Users Within a Multi-Agent Framework
Thomas Berger, Regina Birner, José Díaz, Nancy McCarthy and Heidi Wittmer 129–148

Upscaling Field Scale Hydrology and Water Quality Modelling to Catchment Scale
Alaa El-Sadek 149–169

Linking Databases of Different Sources and Scales for Groundwater Research in the Urema River Basin/Central Mozambique
Franziska Steinbruch and Luis Macario 171–184
Integrated Water and Food Analysis at the Global and Basin Level. An Application of WATERSIM
Charlotte de Fraiture 185–198

The Adaptive Integrated Data Information System (AIDIS) for Global Water Research
Wolfgang-Albert Flügel 199–210

Policy Implications of a Pan-Tropic Assessment of the Simultaneous Hydrological and Biodiversity Impacts of Deforestation
Ellen M. Douglas, Stanley Wood, Kate Sebastian, Charles J. Vörösmarty, Kenneth M. Chomitz and Thomas P. Tomich 211–232

Towards Better Water Security in North China
Jun Xia, Lu Zhang, Changming Liu and Jingjie Yu 233–247

Towards Transition Management of European Water Resources
Rutger van der Brugge and Jan Rotmans 249–267

Some Foci of Integrated Water Resources Management in the “South” Which are Oft-Forgotten by the “North”: A Perspective from Southern Africa
Roland E. Schulze 269–294

Charles Rodgers, Nick van de Giesen, Wolfram Laube, Paul L. G. Vlek and Eva Youkhana 295–313

Integrating a Climate Change Assessment Tool into Stakeholder-Driven Water Management Decision-Making Processes in California
David R. Purkey, Annette Huber-Lee, David N. Yates, Michael Hanemann and Susan Herrod-Julius 315–329

Involving Stakeholders in Integrated River Basin Planning in England and Wales
Paula Orr, John Colvin and David King 331–349

Integrated Assessment of Water Resources: Australian Experiences
Preface

Paul L. G. Vlek · Eric T. Craswell

This Volume contains selected papers from a conference held in Bonn, Germany in February 2005. The topic was Integrated Assessment of Water Resources and Global Change: A North-South Analysis and the 130 participants came from 29 countries.

The conference was organised by the Global Water System Project (GWSP) in cooperation with the Project on Global Change in the Hydrological Cycle (GLOWA) at the Centre for Development Research (ZEF), University of Bonn, Germany; the German Federal Ministry of Education and Research (BMBF); the German National Committee of the International Hydrological Programme (IHP) and the Hydrology and Water Resources Programme (HWRP); the initiative Hydrology for the Environment, Life and Policy (HELP) of the United Nations Educational, Scientific and Cultural Organization (UNESCO); the Challenge Program on Water and Food (CGIAR); and the International Association of Hydrological Sciences (IAHS).

We acknowledge the financial support from UNESCO, the German Federal Ministry of Education and Research (BMBF), the government of North Rhine Westphalia, the City of Bonn, and INWENT (Capacity Building International, Ministry for Development Cooperation (BMZ) Germany).

The main themes of the papers published here include:

- Water science and policy interactions
- Stakeholder perspectives
- Water resource data
- Scaling
- Integration

P. L. G. Vlek
Centre for Development Research, Chair, Conference Organising Committee

E. T. Craswell
Global Water System Project, Chair, Guest Editors
We hope that readers, especially water scientists and water resource managers from both industrialised and developing countries, will benefit from the new insights that abound in the papers published here. Hard work by the Guest Editors – Mike Bonell, Deborah Bossio, Nick van de Giesen, and Siegfried Demuth – and the many anonymous reviewers are also gratefully acknowledged.