

# Global Issues in Water Policy

Volume 6

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Eiman Karar  
Editor

# Freshwater Governance for the 21st Century

 Springer Open



*Editor*

Eiman Karar  
Water Research Commission (WRC)  
Pretoria, South Africa



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# Preface

This book on freshwater governance contains information that many practitioners in the water field will be looking for. The water-related challenges have reached a climax with an unoptimistic future expected to feature more competition between users. These stresses will be exacerbated by climate change which is likely to increase water demand while shrinking water supplies. Intense competition for water resources will be experienced not only by private users but will also affect the public sector; however, national plans repeatedly fail to show the ability to provide a coherent outlook for development in which water needs are adequately projected and resources smartly shared.

The list of contributors of this book (more than 30 authors from around the globe) reflects a wide range of expertise, and the themes covered will appeal to a broad spectrum of readers. These authors, while attempting to provide workable solutions, draw on their wealth of experience and in many instances share the lessons learnt from what has not worked to what has worked. The tools offered can also assist in furthering the thinking around water governance. Although the focus is on water, there are many synergies with the governance of many other natural resources.

The purpose of this book is to illustrate, in broad terms, the general matters of freshwater governance, mapping the spectrum of decision-making. The book aspires to contribute to the transitioning between techno-centric and eco-centric approaches, or a hybrid concept, to people-centric approaches. The set of book chapters presented in this volume will be based on the existing current knowledge as well as the authors' experience working in the water sector, using nontechnical jargon in order to reach a wider audience. The target audience of this volume will range from academics, technicians, decision-makers, and managers to students; the aim is to target not just academia but also policy-makers and deep thinkers. This book has been more than 2 years in the making, and for those who know the water sector, many changes will have occurred during these years. Some of the information contained in this book may therefore be dated as new information may have become available in the intervening years; nonetheless, I trust that the content will be of interest to the readers.

This book represents the tireless efforts of many dedicated individuals who devoted their time and resources to making it a reality. I thank them all, particularly our esteemed authors, as well as the reviewers who provided considered comments and valuable input to each chapter. This book was initiated and financially supported by the Water Research Commission of South Africa, which is hereby gratefully acknowledged.

Pretoria, South Africa

Eiman Karar

# Acknowledgements

This book was contemplated in late 2012 after the International Conference on Fresh Water Governance which was held in South Africa. It was actively pursued after the then newly appointed WRC CEO Mr. Dhesigen Naidoo led the initial authors' workshop in Madrid. The premise was that freshwater governance indeed needed some serious reflection and collective wisdom to chart its way forward. This is how this book came about.

We thank each and every chapter author for investing time in preparing their chapters and helping us realise this book. We also wish to thank all the reviewers who are listed here by name for providing insightful comments that helped us shape the chapters the way they are presented now:

**Mr. Brendan Bromwich** (Independent Water and Environment Consultant)  
(reviewed two chapters)

**Dr. Synne Movik** (Senior Researcher, Water and Society Division, Norwegian Institute for Water Research (NIVA), Oslo, Norway)

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Alejandro Jiménez (Ph.D.) works at the Water Governance team of the Stockholm International Water Institute. Alejandro has almost 15 years of working experience in the water and sanitation sector in developing countries, including direct work with service provision at local level, applied research, advisory services and capacity building. He has published several articles and book chapters, especially in the areas of rural water and sanitation governance, the definition of monitoring indicators for rural services, the role of local governments in the provision of services and the implementation of the human right to water and sanitation.

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Dr. Douglas Merrey is an independent consultant on natural resource policies and institutions. Doug Merrey holds a Ph.D. in social anthropology. He has worked his entire career on water resource management with a special focus on institutional and policies related to agricultural water management and river basin management in Asia and Africa. He spent 20 years working at the International Water Management Institute (IWMI) where he held several senior management positions including Director for Africa. An American citizen, he has lived in India, Pakistan, Sri Lanka, Indonesia, Egypt and South Africa and worked on a short-term basis in many other countries. He has published numerous papers and book chapters as well as authoring several books. He was appointed to the Board of the Water Research Commission of South Africa for three terms. He currently resides in North Carolina, USA, and continues to be active as a consultant.

### **Zakariya Nakhooda**

Zakariya Nakhooda is a master's degree candidate at the University of KwaZulu-Natal with a specific focus on hydrology. At an undergraduate level, he has majored in the fields of hydrology and geography and completed his Honour's degree in hydrology. Zakariya's research focus is on integrated water resource management (IWRM) and approaches to achieving water resource management in a sustainable manner. The current project he is working on entails an assessment of catchment management agencies (CMAs) in South Africa. This encapsulates the various aspects surrounding these institutions, such as stakeholder relations, capacity of the institution and also relationships with the Department of Water and Sanitation (DWS). The project aims at determining shortcomings and also the advantages with regard to the CMA establishment in South Africa.

**Vishal Narain**

Vishal Narain holds a Ph.D. from Wageningen University, the Netherlands. His research and teaching interests are in the analysis of public policy processes and institutions, water governance and peri-urban issues. He is the author of *Institutions, Technology and Water Control: Water Users' Associations and Irrigation Management Reform in Two Large Scale Systems in India* (Orient Longman, 2003) and was lead editor for *Globalization of Water Governance in South Asia* (Routledge, 2014). His research is published in several international journals. He was a lead author for a chapter on human vulnerability to environmental change for GEO (Global Environment Outlook-4), a flagship publication of the United Nations Environment Programme (UNEP).

**Marian J. Neal**

Dr. Marian J. Neal is the Transboundary Water Programme Manager for the Stockholm International Water Institute. She has an interdisciplinary research background in wetland/landscape ecology, water governance, transboundary water management and social and environmental justice. She has worked in the fields of water allocation decision-making and complex social-ecological systems and examined how the issue of scale impacts on the management of shared water resources. Dr. Patrick has over 15 years of experience in transboundary water management and is currently the manager of the UNESCO Cat II Centre on Water Cooperation in Sweden.

**Geert-Jan Nijsten**

Mr Geert-Jan Nijsten is a senior researcher at the International Groundwater Resources Assessment Centre (IGRAC) which is based in Delft – the Netherlands. He has a MSc degree in Hydrogeology from the Free University of Amsterdam and has 20 years of working experience in water management and mainly in groundwater related projects. Before joining IGRAC in 2012 he worked in research, consultancy and as a policy advisor, with working experience in the Netherlands and Africa. At IGRAC Geert-Jan is mainly involved in groundwater assessment and governance.

**Anjal Prakash**

Before joining ICIMOD, Dr. Prakash led the South Asia Consortium for Interdisciplinary Water Resources Studies (SaciWATERs) that worked in six countries of South Asia. He holds a Ph.D. in social/environmental sciences from Wageningen University, the Netherlands. Dr. Prakash has been working in the areas of policy research, advocacy, capacity building, knowledge management, networking and implementation of large-scale and multi-country environmental development projects in South Asia. He is the author of *The Dark Zone: Groundwater Irrigation, Politics and Social Power in North Gujarat* (Orient Longman, 2005). His recent co-edited books are *Interlacing Water and Health: Case Studies from South Asia* (Sage, 2012) and *Water Resources Policies in South Asia* (2013), *Globalization of Water Governance in South Asia* (2013) and *Informing Water Policies in South*

*Asia* (2014), all published by Routledge. He is presently co-editing two books on gender, water supply and sanitation issues in India and peri-urban water security issues in South Asia to be published by Sage and Oxford University Press, respectively.

### **Robert Sarkozi**

Robert Sarkozi has a First Class BA in Geography from the University of the West of England. His Honours thesis produced pioneering research into resource management, applying game theory models of overfishing as vehicles for environmental education. Robert is now studying for his M.Sc. Environmental Management at UWE, focusing particularly on water management and sustainable development. He also works as an Associate for Sustain Limited providing energy and carbon reduction solutions to the public and private sector of the UK.

### **Friedemann Scheibler**

Mr Friedemann Scheibler is a researcher at the International Groundwater Resources Assessment Centre (IGRAC). He received his BSc degree in Geography from Friedrich-Schiller University Jena (Germany) and his MSc degree in Hydrology, Hydrogeology and Water Resources from Stockholm University (Sweden). Before joining IGRAC in 2013, Friedemann worked for over 3 years on groundwater and surface water related projects in Germany, South Africa, USA and Sweden, both in research and consultancy. At IGRAC, Friedemann mainly holds responsibilities regarding Managed Aquifer Recharge, Geo Information Systems and Remote Sensing.

### **Barbara Schreiner**

Barbara Schreiner is Executive Director of the Pegasys Institute and a Director of Pegasys Consulting. She has over 20 years of work experience in the water sector in South Africa and internationally. She has considerable expertise in research, policy, strategy, regulation and financial and institutional issues, particularly in the public sector. She is a member of the Board of the International Water Management Institution, a member of the Programme Oversight Panel of the Aquatic Agricultural Systems research programme of the Consultative Group on International Agricultural Research (CGIAR) and an ex-Board member of the CGIAR Challenge Programme on Water and Food. She has an M.Phil. in Environmental Science (with distinction) from the University of Cape Town. She has authored a number of papers on water issues and is the co-editor of *Transforming Water Management in South Africa: Designing a New Policy Framework*, published by Springer (2012).

### **Chad Staddon**

Professor Chad Staddon is the Director of the International Water Security Network based at the University of the West of England in Bristol. He is also Research Professor jointly with the School of Geography and Development and Biosphere 2 at the University of Arizona and holds a Research Fellowship at the Global Research Institute of the University of North Carolina, Chapel Hill. He has over four dozen

publications on issues related to natural resource management and policy and political ecology particularly with respect to water and forests issues. His current research focuses on the complex relations between cities and water services, articulated through the “urban hydrosocial transition” concept.

### **Sabine Stuart-Hill**

Dr. Sabine Stuart-Hill is a lecturer at the University of KwaZulu-Natal and a member of the Centre of Water Resources Research. She holds a doctoral degree in hydrology from the University of KwaZulu-Natal. Sabine specialises in adaptive water management and water governance of South Africa. A specific focus of her Ph.D. research was mainstreaming climate change and adaptation into decision-making processes. Furthermore, she is involved in the Governance Think Tank of the Water Research Commission, a member of the WISA Management and Institutional Affairs Division committee championing the governance theme and since March 2013 a member of the Interim Steering Committee for the re-establishment of the South African Country Water Partnership of the Global Water Partnership. She is leading multi-institutional research projects with national and international funding and is an often-invited speaker to national dialogues and international conferences.

Participatory processes are a strong focus of her research, and besides designing, organising and facilitating workshops, involvements with the Catchment Management Fora of the Msunduzi and the Upper Mgeni in KwaZulu-Natal are a given. Being on the Reference Group for the establishment of the Catchment Management Agency for KwaZulu-Natal has opened a window of opportunity to bring science directly into the water policy and management field. She has and is also being included in many of the policy design processes of the country related to the water sector. Sabine has an applied and transdisciplinary research approach which in the South African context has brought a strong emphasis on current and emerging vulnerabilities into her work.

### **Larry A. Swatuk**

Dr. Swatuk has a 30-year association with Africa, having first lived and worked in Lesotho in 1984. Among other things, he has been a Ford Foundation Fellow at the University of the Western Cape, South Africa; a Visiting Research Fellow at Rhodes University, South Africa; Senior Research Fellow at the African Centre for Development and Strategic Studies, Ijebu Ode, Nigeria; and a lecturer and associate professor at the University of Botswana. Trained in political science and international relations, Dr. Swatuk first began researching and writing on the politics of the environment and natural resources in the early 1990s. Among his recent publications is a co-edited collection (with Matthew A. Schnurr), entitled *Natural Resources and Social Conflict: Towards Critical Environmental Security* (London: Macmillan, 2012).

### **Håkan Tropp**

Håkan Tropp works with the Stockholm International Water Institute as a Managing Director. He heads the organisation’s thematic work on research, policy and capacity

development. He has written extensively on water governance and other water-related topics and worked in several capacities as policy advisor and developer and implementer of several water governance programmes. He was the Director for Water Governance Facility, 2005–2013, and is also a founding member of the Water Integrity Network. He holds a Ph.D. from Linköping University, Sweden, where he also worked as lecturer.

### **Jac van der Gun**

Jac van der Gun is a groundwater hydrologist, graduated at Wageningen University. During most of his career he was employed by the Institute of Applied Geoscience of the R&D organization TNO in The Netherlands, initially participating in and directing the Groundwater Reconnaissance of The Netherlands, later involved in numerous international water resources assessment and management projects and consultancies. He has also lectured on groundwater at the UNESCO Institute for Water Education (UNESCO-IHE) for more than 30 years. He was actively involved in establishing the International Groundwater Resources Assessment Centre (IGRAC) and in 2003 became its first director. After retirement, he remained active in several groundwater-related projects of international organisations and in 2013 he co-authored with Jean Margat the book '*Groundwater around the World: A Geographic Synopsis*'.

### **Barbara Van Koppen**

Barbara Van Koppen (Ph.D.) is the Principal Researcher on Poverty, Gender, and Water at the International Water Management Institute. Her research focuses on institutional and legal dimensions of pro-poor and gender-equitable water development and management for multiple uses, primarily in sub-Saharan Africa and Asia. She is a lead editor of five books and (co-)author of over 120 international publications. In addition to capacity building of post-docs, Ph.D. and M.Sc. students, she advises in national and global policy dialogue.

### **Robert G. Varady**

Robert Varady is Deputy Director and Research Professor of Environmental Policy at the Udall Center for Studies in Public Policy at The University of Arizona. He is also a research professor of arid lands studies in the School of Natural Resources and the Environment, and adjunct professor of hydrology and water resources. Varady obtained his PhD in 1981 in modern history from The University of Arizona, and holds BS and MS degrees in mathematics from the City College of New York and the Polytechnic Institute of NYU, respectively. At the Udall Center since 1989, Varady has examined environmental and water-management policy in arid regions—with a transboundary emphasis—especially in the U.S.-Mexico border area.

### **Philip Wallis**

Dr. Philip Wallis is a Research Fellow at the Monash Sustainability Institute, Monash University, Australia, and is a member of the Systemic Governance Research Program. His current research focuses on the governance of

social-ecological systems, particularly in the areas of water resources, Australia's Murray-Darling Basin, climate change adaptation, catchment management and water-sensitive cities. This research is mainly transdisciplinary in nature, drawing on social, political and technical inquiry into complex situations. His previous Ph.D. research was in green chemistry, looking at the role of modified clay minerals as catalysts for organic synthesis and as models of soil carbon sequestration. He was awarded as a Fellow of the Peter Cullen Trust in 2010.

**Zhifang Wu**

Dr. Zhifang Wu is currently a Research Fellow at the Centre for Comparative Water Policies and Laws (CCWPL), University of South Australia. She received her undergraduate in Economics at Changchun Taxation Institute in China. After completing her Ph.D. degree at the University of South Australia, Dr. Wu was employed by the CCWPL and working on research projects with the colleagues in the centre. Her research interests lie in the field of exploring community attitudes and perceptions regarding using non-conventional water sources, such as stormwater, reclaimed water, etc. Dr. Wu also has interests in water governance and in particular institutional and policy analysis in relation to diversifying sustainable water supply portfolio.