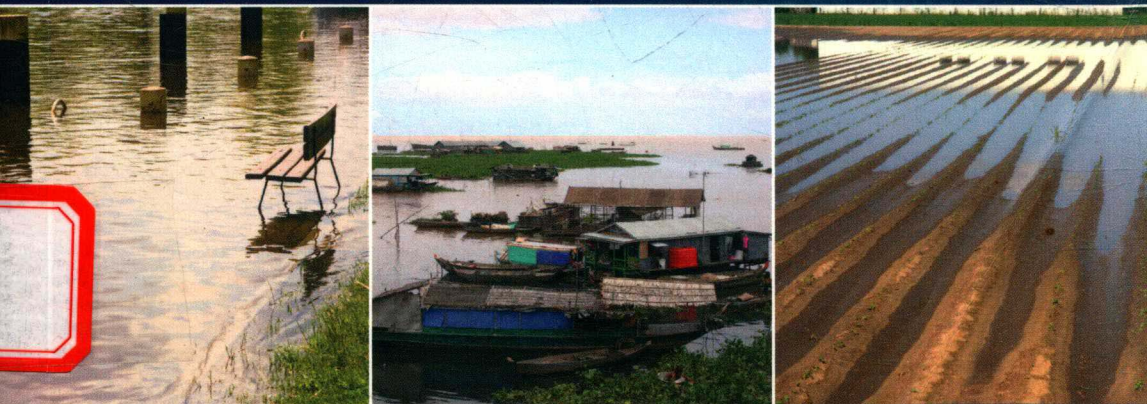


Anton Earle, Ana Elisa Cascão,  
Stina Hansson, Anders Jägerskog, Ashok  
Swain, and Joakim Öjendal

# Transboundary Water Management and the Climate Change Debate



Earthscan Studies in  
Water Resource Management

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Anton Earle, Ana Elisa Cascão,  
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# Transboundary Water Management and the Climate Change Debate

Climate change has an impact on the ability of transboundary water management (TWM) institutions to deliver on their respective mandates. The starting point for this book is that actors within TWM institutions develop responses to the climate change debate, as distinct from the physical phenomenon of climate change. Actors respond to this debate broadly in three distinct ways – adapt, resist (as in avoiding the issue), and subvert (as in using the debate to fulfil their own agenda).

The book charts approaches which have been taken over the past two decades to promote more effective water management institutions, covering issues of conflict, cooperation, power, and law. A new framework for a better understanding of the interaction between TWM institutional resilience and global change is developed through analysis of the way these institutions respond to the climate change debate. This framework is applied to six river case studies from Africa, Asia, and the Middle East (Ganges-Brahmaputra, Jordan, Mekong, Niger, Nile, Orange-Senqu) from which learning conclusions and policy recommendations are developed.

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and Joakim Öjendal*

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# **Stockholm International Water Institute (SIWI)**

SIWI is a policy institute working for a water-wise world. SIWI does independent research, generates knowledge, and provides expert analysis and advice on water issues to decision-makers and other agents of change. SIWI organises the World Water Week in Stockholm – the leading annual global meeting place on water and development issues – and hosts the Stockholm Water Prize, the Stockholm Junior Water Prize, and the Stockholm Industry Water Award.

## About the authors

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# Preface

Despite three decades of warnings and declarations, the global water crisis remains one of the unresolved and huge challenges to humankind. In fact, the water crisis is of such a magnitude that it is growing into an issue of a common global concern. And this situation is bound to get worse. Besides the obvious poverty creation inherited in, and development impediments held up by water scarcity, recent research is pointing out that inequality in water access is turning into political repression, gendered violence, and identity conflicts.

This perspective highlights transboundary water management (TWM): nearly 50 per cent of the global fresh water is to be found in 276 transboundary river basins; in Africa, it reaches 90 per cent, making the continent's development efforts hostage to effective governance of the shared water. The path to enhanced river basin management consists of two interwoven braids: knowledge (which we lack) and politics (which we do not understand).

Whatever the knowledge and understanding we do have, the existing agreements/regimes over transboundary rivers are increasingly turning volatile because of increased outtake and rendered unworkable due to the perception that global climate change (GCC) is altering the basic parameters for water governance. Whether physically correct or not – irrespective of which future scenario we apply – perceptions of GCC are undermining existing agreements, or are even instrumentally used to undermine the current water regime. Decreased river runoff is blamed on high evaporation rates or shifting rainfall patterns, while glacier lake outbursts seriously threaten water storage projects. Whereas governance and accountability always is an important couplet, in the international arena, GCC plays right into the securitization of transboundary water resources feeding a situation of non-transparency and non-cooperation.

The increasing global water scarcity and the changes (both real and perceived) that global climate change (GCC) will have on the management of transboundary water constitutes a concrete impediment to development efforts. Changes in quantity and quality of water – or the mere expectation of such changes – may provoke increased tensions and conflict; and hamper regional integration and development efforts.

In this book, we analyse the problematique of good governance of transboundary water resources. The reason for this undertaking is that the critical

development—need for enhancing knowledge on how to most effectively govern these resources in the face of increasing uncertainties, and in particular in relation to GCC. With the help of in-depth study of six major transboundary river basins in Asia, Africa, and the Middle East, the book investigates the inflexibility of many basin agreements, regimes, and management principles in general. With the help of compared and contrasted findings from strategically situated case studies, the book provides generalized conclusions of relevance to a range of transboundary basins globally.

This co-authored book is a collaborative effort in the true sense. Each of us has tried to bring in her or his individual expertise and understanding base to support this group project. We have worked hard to provide a focused and integrated understanding of the problem and, at the same time, provide detailed analysis of cases.

The book is the result of a long, collaborative, and mostly enjoyable journey for which there are many to thank. Most of them are colleagues at the Stockholm International Water Institute (SIWI), School of Global Studies at Gothenburg University, and Department of Peace and Conflict Research at Uppsala University. We are also grateful to Florian Krampe for his assistance in editing the manuscript. The research for the book has been partly financed by the Swedish Research Council, the Stockholm International Water Institute (SIWI), and the United Nations Development Programme (UNDP).

Finally, we thank Earthscan (Routledge) Publishers for invaluable support to the project. We are particularly grateful to Tim Hardwick and Ashley Wright for their unlimited patience and insightful guidance.

Anton Earle  
Ana Elisa Cascão  
Stina Hansson  
Anders Jägerskog  
Ashok Swain  
Joakim Öjendal

# Foreword

UNESCO is deeply committed to addressing the challenges associated with the impact of climate change on water resources. Changes in the hydrological regime are increasing in many parts of the world, leading to extreme hydrological events and tensions over water that crosses political boundaries. *Transboundary Water Management and the Climate Change Debate* highlights the role that transboundary water management institutions can play in rising to these challenges and also the need for these organizations to adapt their respective mandates accordingly. The book contributes to the understanding of the importance of multidisciplinary research and the linkages between transboundary water management, climate change, peace, and water security.

Over the last decade, the debates on transboundary water management and global climate change have increasingly overlapped. This is a positive development, as much of the anticipated climate change will be clearly linked with effects on water. More water, less water, water at the wrong time and in the wrong place: climate change is bound to affect transboundary water management and the relations between states. This book sets forth practical examples of how climate change can affect water flows in basins such as the Nile, Ganges, Niger, Jordan, Orange-Senqu, and the Mekong, without attempting to present an exhaustive assessment of these phenomena. The authors approach the issue from the perspective of political discourse, and focus their attention on how the climate change debate is used in addressing dialogue on transboundary waters.

I hope this book will be a valued contribution to the debate on water diplomacy and shared water resources management, themes that are essential to the mission of the UNESCO International Hydrological Programme (UNESCO-IHP). IHP has long been engaged in transboundary water management through its role in supporting research on water cooperation. UNESCO's pioneering work, through the International Shared Aquifers Resources Management (ISARM) initiative and the From Potential Conflict to Cooperation Potential (PCCP) programme, has contributed extensively to the body of knowledge on transboundary water management and diplomacy.

Water cooperation is a subject fully included in the programme of the Eighth Phase of the IHP (2014–2021), 'Water Security: Responses to Local Regional and Global Challenges'. UNESCO is supporting the organization of training

programmes and the strengthening of research capacities in this field throughout its network of centres and chairs. The authors of this book are collaborators of the newly established UNESCO International Centre for Water Cooperation (ICWC). This centre, established in 2014 and hosted by the Stockholm International Water Institute (SIWI), will play a pivotal role in fostering research and sharing knowledge in this domain.

For researchers and practitioners alike, this book offers important insights on the inherently political nature of water and climate change.

Some 276 river basins cross the political boundaries of two or more countries and 608 transboundary aquifer systems have been inventoried by the UNESCO IHP, but very few are the focus of projects that aim to improve the understanding of the link between transboundary water management and climate change.

I sincerely hope that this publication will raise awareness of these sensitive and urgent debates.

Flavia Schlegel  
Assistant Director-General  
for Natural Sciences  
UNESCO

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# 1 Introduction

## **Transboundary water management between a rock and a hard place**

Watching CNN in late January 2011, the same week this book project was born, the first four news headlines were weather related – torrential rains with devastating mudslides in Brazil; cruel blizzards raging in the central United States bringing a large part of the country to a halt; flooding of the millennium tormenting north-eastern Australia (an area the size of France submerged); an emerging epic starvation in the Horn of Africa resulting from seasonal absence of rains – and all presented as global climate change related. Water movements were driving these disasters in different ways, and emerging with such supremacy that even the most powerful countries were failing to manage these disasters, let alone govern them proactively.

This volume recognises three levels where climate change ‘exists’: first, as a physical fact where human activity considerably alters the global climate. This is established as far as natural science can take us to-date.<sup>1</sup> Second, it is important to differentiate between climate change and climate variability. Natural climate variability is the norm, and some regions of the Earth have experienced large swings in climate over millennia. This variability can refer to long-term variations in climate as well as short-term fluctuations – inter-seasonal or annual. Third, climate change ‘exists’ as an issue of popular discussion; it has erupted out of the august corridors of scientific and academic research institutions and become a public topic, inciting a range of views and responses. The discussion is prominent on television talk shows, political debates, social media, conventional news, and during street protest movements. In the news press, public policy documents, and in popular perception there is a general underlying assumption that global climate change is responsible for extreme weather events, and that it is here to stay (and grow). This implies that the discussion around climate change carries political significance, and that there will be interests at various levels that will *adapt to it, resist it, and/or subvert it*. It is this last understanding of global climate change as a publicly discussed issue, with political dimensions, that is the focus of this book.

Therefore, this book provides no opinion on whether climate change is indeed the direct cause of current and future weather-related catastrophes. However, this link has been discursively established globally and reinforced through politicians, government officials, the media, academics, and civil society groups. Hence, the phenomenon of climate change has broken out from the strict, natural, science-based models and has – with a formidable, discursive power – entered the politics of constructing the root cause of the problems that we see around us, and is interpreting the possible solutions to the problem as it is constructed (cf. Edkins & Pin-Fat 1999). We are at the beginning of a global discussion with strong political motivations that will have major implications in many contexts. The way that transboundary water management institutional frameworks respond to this discussion needs to be understood, which in essence is the goal of this book.

A key issue to consider is the quality of transboundary water management (TWM) institutional arrangements, moving beyond counting the number of agreements between states in a basin or the presence or absence of a basin management organisation (cf. De Stefano et al. 2012). At the international level, this management process is projected to become more complex due to the pernicious impacts of climate change (Drieschova et al. 2009; Gleick and Cooley 2009; Falkenmark & Jägerskog 2010). This is a real dilemma since the ‘unstoppable object’ of the climate change discussion meets the ‘unmovable structure’ of conservative TWM practices; in this process, something will have to yield. Research on this dilemma has just emerged (Beck & Bernauer 2011; Tir & Stinnett 2012; cf. Huntjens et al. 2008), although the role of River basin organisations is uncertain and neglected (Tir & Stinnett 2012), and we certainly need to learn a lot in a fairly short time in order to adapt institutionally to the challenges of the climate change (Huntjens et al. 2012). Hence, this book aims to assess the impact of the climate change *discussion* on TWM and the institutions tasked to solve these problems. Essentially, we ask, ‘What are the governance responses to the climate change discussion?’ These responses could be seen in TWM institutions (basin-wide or on a sub-basin level), from individual basin states, or even from local institutions within a basin state. Let us consolidate and elaborate these ambitions below.

### **Framing the problem**

Two major issues emerge from the growing public debate around climate change and impacts on freshwater resources, presenting those responsible for water management with a difficult decision.

First, climate change is happening. The Stern Review, the Intergovernmental Panel on Climate Change (IPCC), and the United Nations Framework Convention on Climate Change (UNFCCC) have confirmed this, and there is now a popular understanding that climate change is real. The climate-related processes around us, to which we did not previously pay any particular attention – such as receding glaciers, lengthening of grazing periods on high-altitude plateaus, and

the thawing of permafrost areas – are now popularly deemed part of the larger package of climate-change impacts. When news of exceptionally heavy rainfall, higher-than-average temperatures, or lengthened droughts is reported, the public typically ascribes these unusual meteorological conditions to climate change. These outcomes of climate variability have always been part of the picture in one way or another, but are now being portrayed as something new. At times it looks like politicians and technicians in the countries and/or regions affected are using climate change discussions to take the responsibility out of their hands, to justify their inability to deal with the recurrent climate disasters.

Global climate fluctuates naturally through numerous phenomena, but climate can be modified through human activities. The UNFCCC states in Article 2: “Climate change” means a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods’ (UNFCCC 1994). According to the IPCC, human impact on global climate since the beginning of industrialisation exceeds the natural processes of climate variability (Solomon et al. 2007). Good water management strategies have always sought to take into account natural climatic variability; the difference now is that there is evidence and a belief that the water management practises of the past will not be sufficiently robust to respond to the new dimension of climatic change (Lenton & Muller 2009).

Whether climate change is man-made or ‘natural’, or indeed globally relevant, may be debated for decades, with various actors taking up positions driven by their interests. Unsurprisingly, the representatives of major carbon emitters, such as oil companies and coal mines, seek to downplay the scale of the changes, as well as the contributions from human activities. Likewise, promoters of alternative energy, flood defence, and water efficiency technologies warn of the dire consequences of inaction. The discussion around climate change has started to form a political and sanctioned discourse of its own, finding constituencies, and interpretations as well as scenarios and action plans (e.g. Huntjens et al. 2012). The politicised nature of the climate change discussion segues into the existing debates around water management and specifically TWM, where actors’ responses mirror the partisan responses found in other sectors, as the case studies in this book will show. As Castree (2004:163) has commented, ‘Geographical imaginations matter. This is precisely why we need constantly to interrogate their presuppositions, as well as the kind of world they aim to engender’.

Climate change, due to greenhouse gas emissions, is predicted to particularly affect the variability of water resource availability globally. It is true that the IPCC has come under question – for instance, over the prediction that the Himalaya glaciers could possibly melt away as early as 2035. In a statement the IPCC confirmed that this prediction was wrong and not based on rigorous scientific modelling (IPCC 2010). Nonetheless, in the same statement the IPCC affirmed that its conclusions that ‘climate change is expected to exacerbate current stresses on water resources from population growth and economic and land-use change, including urbanization’ is still scientifically verified and remains unchallenged



(IPCC 2010). Moreover, the increase of global surface temperature, through the greenhouse effect, is expected to increase the ‘atmospheric water-holding capacity’ (Min et al. 2011), among others, because of increased evaporation. That means scientists expect changing patterns of precipitation ‘in the intensity, frequency, and duration of events’ (Trenberth et al. 2003 in Yilmaz et al. 2014). As a consequence, floods and droughts will become more frequent. It is difficult to attribute the increased number and intensity of droughts and floods to climate change by excluding natural climate variability. However, recent studies seem to confirm that human-induced climate change already contributes to today’s ‘more-intense precipitation extremes’ (Min et al. 2011) and can, for instance, be attributed to recent floods in the United Kingdom (Pall et al. 2011).

Scientific evidence is clear that the climate is changing (despite the magnitude and the impacts of the changes being under debate); but evidently – and more important for this volume – discursively, something is changing and growing in magnitude. The size, existence, and pace of the physical changes are primarily understood through complex global and regional circulation models that only highly trained scientists can access and interpret. In contrast, the politics of understanding and responding to climate change is open to a far wider audience; politicisation is the ultimate result. Echoing Buzan (1995), the climate change debate has become ‘securitised’ and has jumped the queue of political priorities, implying that climate change can have direct impacts to human, state, and even regional security. Climate change is presented as an existential threat to society, with direct impacts for human and state security. A ‘security logic’ naturally moves the issue higher up the political agenda, which is clearly what can be noticed with regards to climate change in recent years (Jägerskog 2008; Swain 2013).

A range of government and security entities have now responded to the possible threats posed by climate change. A report by the German Advisory Council on Global Change (WGBU) predicts that ‘without resolute counteraction, climate change will overstretch many societies’ adaptive capacities within the coming decades. This could result in destabilization and violence, jeopardizing national and international security to a new degree’. In the United States, the Pentagon, in its Quadrennial Defence Review of 2010, identifies climate change as one of the ‘trends . . . whose complex interplay may spark or exacerbate future conflicts’ (Department of Defence 2010), while the Central Intelligence Agency has established a Centre for the Study of Climate Change. The charter for the CIA’s centre is ‘not the science of climate change, but the national security impact of phenomena such as desertification, rising sea levels, population shifts, and heightened competition for natural resources’ (CIA 2009). In NATO’s ‘Analysis and Recommendations of the Group of Experts on a New Strategic Concept’, climate change is identified as one of the probable unconventional threats to the alliance and its partners (NATO 2010). A scoping study performed by the OSCE on the security implications of climate change for Europe concludes that ‘Climate change will alter the socio-economic foundations of society. It will transform constants into variables . . . A particularly