Preface

Within natural resource management water issues have always been in a prominent position. The reasons for that are obvious. Events like flooding of land, extreme droughts, shortage of drinking water, spread of infectious diseases and long-term problems such as inefficient irrigation and bad water quality cannot be ignored. These water-related issues reflect social challenges that had to be met centuries ago as well as today.

Recently both climate change, and its impacts on water systems, and raised ambitions within the European Union (EU) caused water issues to rapidly re-enter the priority agenda. Large-scale flooding in several European countries as well as severe periods of droughts caught public attention. Serious contemporary water management challenges now have to be addressed. These include realizing huge storage locations to buffer excess water, improving irrigation works, disconnecting urbanized and rural water systems for improving water quality and restoring the ecological and natural quality of water systems.

The resources for water management have not increased relative to elevated problem pressures and ambitions. Meeting the challenges requires substantial interference in society and claims on society's resources. Water managers have to adapt to these new challenges. For the last few decades water managers were perfectly equipped to solve single water issues in a technological manner without being intrusive on other sectors of society. Now they enter into processes of negotiation and even risk conflict between water management and vested interests in society. Water managers have to reconsider their position and strategies. Often dependencies exist and this inevitably implies joining forces with other sectors in order to cope with contemporary water issues while minimizing sacrifices within society. Problem-solving capacity in modern and democratic societies is dispersed over many actors that hold ownership rights, user rights and management rights. Synthesized solutions based on pooling of ambitions and resources are called for. This leads to increasingly complex multi-purpose projects.

Water managers now have to learn a new art of juggling multiple actors, multiple preferences, multiple problem perceptions and multiple institutional rule settings. They have to engage in all kinds of collaboration across sector and organizational boundaries, enter into political and strategic alliances, and seed social capital in those networks. This requires

opening up, becoming receptive and adaptive to other sectors and actors in society.

Dealing with barriers in society implies seeking cooperation, searching for well-equipped coalitions that have the necessary resources in place. If actors act in a purposeful manner while linking across subjective demarcation lines in the social world we label this as boundary spanning. Boundary spanning of water managers encountering complex water challenges is therefore defined by us as: *adaptive governance of activities by linking their sector, scales and timeframes to other previously independent sectors, scales and timeframes.*

In this context the message of this book is that a careful reconsideration of strategies to achieve water ambitions, together with a more in-depth knowledge of the theories and practices of boundary spanning, could thus make solutions for contemporary water problems become closer to fruition. The content of this book incorporates conceptual, theoretical and practical foci that deal with complexity and conflict by boundary spanning in adaptive water management. The conceptual and theoretical frameworks dominate the majority of Chapters 1–4. In Chapters 3–10 empirical cases of boundary spanning issues are presented and analyzed with the help of these frameworks. Guidance for boundary spanning in practice is given, among others, in Chapters 10 and 11. In several chapters storylines of important contemporary water management themes are included. These contemporary water management themes are flooding and flood policy (Chapters 3, 5 and 6), water depletion (Chapters 4 and 8), water (restoration) and nature (Chapters 6, 8 and 9), acceptance and use of scientific models and information (Chapter 8) and international cooperation on water basins (Chapter 10).

Chapter 1 starts with a historical perspective on the role of water management in society, then describes three memorable water management innovations that occurred during the last decades. In the context of adaptive water management the concepts, forms and applications of dealing with boundaries are described: often strategies for spanning boundaries, but sometimes also emphasizing boundaries or even creating boundaries.

In Chapter 2 the concept of boundary judgements and its sector, scale and time dimensions are introduced. An explanatory framework is presented for analyzing their role in social interaction processes within a layered context and to illustrate the points of intervention to apply change strategies.

Chapter 3 elaborates boundary spanning in flood policies. It deepens the understanding of the roles of boundary spanners across sectors, scales and time in a longitudinal perspective. The analysis is related to the conceptual framework presented in Chapter 1.

Chapter 4 deepens the conceptual and theoretical understanding of the time perspective within the explanatory framework, with an example of resource depletion by irrigation. It describes the impact of the time perspective on the likelihood of conflict, rivalries, problem recognition and adaptive action taken. It ends by indicating the implication for actors that want to be boundary spanners. The elaboration is related to the theoretical perspective presented in Chapter 2.

Chapter 5 uses the theoretical framework introduced in Chapter 2 to analyze a case in which an inhabited area was prepared for use as water buffering storage in case of threatening river water levels. The multi-functionality of land use that was partially realized after a complicated process shows many of the boundary issues that have to be dealt with in contemporary water management. It ends with reflections on managing complexity with boundary spanning.

Chapter 6 is another case study using the same format as Chapter 5. In this case of building a new river to reconnect a natural creek system to the tributary river basin it once belonged to, the multi-functionality aimed for is even more unavoidable and challenging.

Chapter 7 concentrates on the implications of a certain institutional setting of multi-sector cooperation for boundary spanning. Two processes of wetland restoration are analyzed with the help of one of the theoretical tools described in Chapter 2. The degree to which an institutional setting is helpful for boundary spanning is shown to be dependent on the details of the context.

Chapter 8 focuses upon spanning the boundary between natural science-based knowledge and its use in decision-making processes. The position of scientific models is discussed, a case analyzed and lessons presented with regard to exchange of natural science knowledge and policy processes.

In Chapter 9 two approaches towards project implementation are discussed: serial and parallel implementation. Often there is no single solution in the sense that one approach is always better than the other. What is offered is guidance on when to apply which approach.

In Chapter 10 boundary spanning across national borders of sovereign countries is analyzed and four guidance schemes for boundary spanning in practice are presented. The process conditions and circumstances that need attention are addressed.

Chapter 11 finally presents our conclusions from both the scientific perspective and from the perspective of boundary spanning in practice.