

# Chapter 1

## Introduction and Reflections

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This book explores the challenges most countries face in dealing with governance issues and highlights the advantages and disadvantages of various approaches to achieve effective freshwater governance for the twenty-first century. The idea for writing this book was triggered by the successful hosting of the International Conference on Fresh Water Governance for Sustainable Development, 5–7 November 2012, at the Champagne Sports Resort, Drakensberg, KZN, South Africa. At that conference, the need to bring together the research communities from different disciplines and practitioners at different levels of jurisdictions from around the world was tangible. The exchange of experiences and the interrogation of frameworks, policies and perceptions around best practice were invigorating. This book is not a direct result of that conference, but the exchange of experiences provided the impetus to embark on this undertaking.

The intention of this book is to pool some salient ideas around the thinking of water and its governance, tackling it from a global view to a local reality, from within and outside the numerous watersheds that fall under various administrative agencies to end users, the private sector and civil society. It can also identify sovereign boundaries and regional or transnational boundaries. As fluid as water is, so is the concept of its governance. A striking feature is that the term “governance” means different things to different people. The aim of this volume is not to provide a universal definition of governance; instead, each chapter will frame its own meaning in the context of the specific topic covered.

But first, one might ask why freshwater governance is of such importance and what is so special about the twenty-first century governance to warrant writing a book about it.

In his closing address at the Fresh Water Governance Conference on 7 November 2012, the CEO of the WRC, **Dhesigen Naidoo**, highlighted the fact that the global

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dialogue on water is generally unanimous that we are moving into a very difficult water future, on the back of factors including unprecedented population growth combined with rapid levels of economic movement, particularly in the developing world. The latter has resulted in growing middle classes with the resultant change in consumption patterns. This in many ways is starting to define the new Malthusian challenge of the twenty-first century. At the same time, years, decades and indeed centuries of environmentally insensitive and water-wasteful mining and industrial practices have come back to haunt us. This, combined with the newer challenges of global climate change, has defined the “water challenge” of the twenty-first century. We are also clear that developments in water sciences and engineering alone have not delivered adequately to engage this challenge, and there is a strong need to consider the social dynamics, culture and heritage issues towards more holistic and complete solutions. In fact, we have for a while in our individual corners been lamenting the lack of a reasonable dialogue on this very important matter of water governance.

The challenge of both water quantity and quality has become a sharp focus of our time. The global water conversation has taken a new turn on the back of increased information access and the world reaching a point where it is now impossible to ignore the scarcity of the resource. It is also important that the dialogue now includes business partners as the World Economic Forum recognises the availability of good quality water as a principal business risk globally. Those countries that have relatively larger successes in meeting the water challenge have done it on the back of four principal pillars. Firstly, the water management in these more successful areas is informed by high levels of science, technology and innovation. The decision-making is highly informed, and water is a critical upfront consideration in any development plan. The second is good, well-maintained infrastructure. The third is the development and availability of large pools of skilled talent to plan, develop, operate and maintain the water management system at all levels. The fourth and in many cases differentiating factor in most systems is water-use behaviours across the spectrum from large industry and agriculture to the individual at household level. It is easy to see that each of these elements and the quartet as a whole depend fundamentally on levels of water literacy and consciousness and the model of water governance.

Freshwater governance, as it has been discussed in the realm of peer-reviewed papers and equivalent conferences, has been seized with models of institutional arrangements and the critique of the hierarchies of laws. This has certainly been the obsession in democratic South Africa over the past 19 years. The most important learning in the frustration of insufficient implementation of what has been deemed the best national water law in the world, the South African National Water Act of 1998, is that a smartly conceived internationally leading model law is not enough. That while such a law represents the apex summary of the governance basket, its effective roll-out depends on the building of the various governance building blocks using the blueprint of the law as both the design eventuality and an indicative roadmap. Water governance is seen as a multisectoral, dynamic process, a complex socioecological system involving continuous learning and the capacity to adapt

effectively to unpredictable outcomes, where the results of system interventions are not predictable.

Three main messages have emerged from the discussions and analyses that are summarised in the pages that follow. First, old forms of governance in both the public and private sectors are becoming increasingly ineffective. Second, the new forms of governance that are likely to be needed over the next few decades will involve a much broader range of active players. Third, and perhaps most importantly, two of the primary attributes of today's governance systems – the usually fixed and permanent allocations of power that are engraved in the structures and constitutions of many organisations and the tendency to vest initiative exclusively in the hands of those in senior positions in the hierarchy – look set to undergo fundamental changes.

The objective of this book is to illustrate, in broad terms, the general matters of freshwater governance, mapping the spectrum of decision-making, from a techno-centric and ecocentric approach, or a hybrid concept, to a people-centric approach, mapping the transition. The challenges to water governance models will be considered as well as examining the multilevel provisions, the integration challenge, the hierarchy for decision-making, the emergence of water-sensitive designs in urban as well as rural settings, the interdependencies between the stakeholders, the power play in inclusive participation and the issue of geographic scales and boundaries. This information will be presented in an integrated and a comprehensive way building on some detailed case studies from around the world. 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 non-technical 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.

There are 12 chapters in this book; in Chaps. 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 the lead authors and their contributing authors share their experiences and introduce some novel approaches to freshwater governance, articulated as related issues in three main baskets: the first basket includes the framing of water governance issues from a water security dimension, a multilevel dimension, the transboundary dimension, a water integrity dimension and a regional/national dimension; the second basket offers some regulatory aspects such as market forces and regulation of achieving equity, development and sustainability; while the third basket is around governance mechanisms for portfolio-based urban planning and management, for inclusive governance, groundwater governance and governance futures in South Asia and Africa.

The main water governance issues are shared by **Chad Staddon**; the development and extension of water services infrastructure has been a key foundational element of industrialisation and urbanisation since at least the “Great Sanitary Awakening” of the mid-nineteenth century. As urban areas became both larger and more densely inhabited, the collective need for better water services (drinking water and sanitation in particular) became overwhelming. Cities simply could not grow beyond a certain relatively modest size without the simultaneous articulation of an

integrated water services infrastructure to replace the piecemeal local arrangements then in place. The mid-twentieth century completion (in Europe, North America and parts of Australasia) of the resulting “project” of mass provision of standardised water supply and sanitation services, explored elsewhere and called “hydromodernism”, was then followed by several waves of restructuring in the water services value chain, based particularly on new ideas about the respective roles of the public and private sectors, new technologies and water needs of the natural environment. Of course, in much of the developing world, even “hydromodernism” is as yet unattained and perhaps unattainable. In addition, rapid urbanisation in many developing nations has gone hand in hand with the growth of what are called “peri-urban” areas that combine “urban” and “rural” characteristics and present new challenges to water (and other) services provision.

Fortunately, they claim, there is a way of easily presenting the historical progression from a low to a higher level of water services provision. More to the point, it is possible to indicate the key drivers of water services development or, conversely, the key impediments to same. Cities around the world can be understood from the point of view of their location within the “urban hydrosocial transition (UHT)”, a historical geographical framework that sees cities as manifestations of successive “hydrosocial contracts” between agents of economic, political, cultural and technological change. This concept builds on work undertaken by Brown et al. (2011) on “water-sensitive cities”, Lundquist (2001) on the “hydrosocial contract”, Swyngedouw (2005) on “urban metabolism” and Thapa, Varady and Scott (2014) on “water security indices”. A key innovation offered here is the simplified three-part historical geographical schema based on a limited number of readily available key indicators and associated drivers. Brief case studies from around the world are presented by way of illustration.

**Aziza Akhmouch** offers an analytical framework to assess the impact of stakeholder engagement on water-related decision-making and policy implementation based on interdependent components. Citizens increasingly demand to be more engaged in how public policy decisions are made. In this environment, stakeholder engagement has emerged as a principle of good water governance. However, despite extensive research and case studies on the topic in recent years, the lack of evidence-based assessment on how effective engagement processes have proven to be in reaching intended objectives of water governance is striking. This chapter presents the key findings of an OECD study, which relies mainly on empirical data from a survey carried out across 215 stakeholders, within and outside the water sector and derived from 69 case studies collected worldwide. It suggests an analytical framework to assess the impact of stakeholder engagement in water-related decision-making and policy implementation, based on interdependent components, i.e. drivers, obstacles, mechanisms, impacts, costs and benefits.

Results highlight the need for better understanding of the pressing and emerging issues related to stakeholder engagement. These include the external and internal drivers that trigger the engagement processes, arrival of new entrants that ought to be considered, innovative tools that have emerged to manage the interface between multiple players and types of costs and benefits incurred by engagement at policy

and project levels. This chapter concludes with policy guidance to decision-makers and practitioners in the form of overarching principles on how to set up the appropriate framework conditions for inclusive water governance.

Evidence presented in this chapter demonstrates that decision-makers who adopt a systemic, inclusive approach to water governance are likely to get a better return on the time and resources they invest. They will also be better equipped to handle stakeholder issues and risks more effectively.

For engagement processes to be relevant, a careful balance is required between what they try to achieve, the resources they require and whether they succeed in reaching the intended objectives. Decision-makers at all levels have a critical role to play in establishing the enabling environment for result-oriented, effective and impactful stakeholder engagement. Although engagement processes cannot be easily replicated from one context to another, the OECD proposes six principles for creating the necessary conditions for inclusive water governance.

**Anton Earle** defines transboundary watercourses, including rivers, lakes and aquifers (confined and unconfined), shared between two or more countries that are home to over 70 % of the world's population and supply water for roughly 60 % of the global food production. It is no surprise that the management of these watercourses has been entrusted to national states, which have the power to make sovereign decisions over their management, use and conservation. State sovereignty is mitigated through the existence of a global institutional framework comprised of customary international water law (the norms dictating how states behave), global and regional conventions, basin-level agreements and basin management organisations. The good news is that there is a large body of joint institutions between countries with transboundary watercourses, the UN estimating that around 3 600 exist. This in part explains the relative lack of military interstate conflicts. Less good news is that despite the existence of international and basin-level agreements and basin organisations, the benefits to be expected from international cooperation around transboundary watercourses have in most cases not materialised. Acute, persistent and seemingly intractable problems persist, with ecosystem degradation not being reversed, joint investments in water infrastructure not materialising and joint management organisations failing to attract significant long-term support from the respective basin states. Despite at least two decades of concerted support by the international development community, the impacts of enhanced interstate cooperation are noticeable through their absence.

This chapter investigates why this may be so and introduces a starting point which moves beyond the state-centric approach to transboundary water management. In doing so it does not challenge the sovereign right of states to manage their watercourses; instead it shows how a range of non-state actors do in fact influence state practice through a variety of mechanisms. As these mechanisms are frequently covert, it becomes difficult to assess the integrity of the relationships between actors, in turn making public engagement and participation difficult. Needed is a governance paradigm which opens the decision-making arena to non-state actors all in support of the national governments and their respective mandates. This chapter ends with an indication of what such a governance arrangement might look like

across the four success factors identified in the introduction of this book, namely, science-informed decision-making, investments in appropriate infrastructure, development of skills and talent and the water-use behaviour of stakeholders.

**Richard Meissner** argues that the establishment of a governance institution like a river basin organisation is not only a governmental activity. Neither does its establishment only revolve around the stipulations contained in regulatory mechanisms and policies. Establishing a river basin organisation, like a Catchment Management Agency (CMA), involves a number of actors or stakeholders from both the governmental and non-governmental spheres. There are practices involved in their establishment that go beyond regulatory mechanisms and often bring in personal experiences and the overall political landscape as well as administrative development trajectories. He and his contributing authors reflect on some of the administrative processes as a way to discern noticeable practices in the establishment of CMAs. The case study material is South Africa's CMA establishment process to date. Some of the practices that come out strongly are human resource issues and financial accounting practices that practitioners need to consider when establishing such a river basin organisation. This chapter is based on research conducted for South Africa's Water Research Commission between 2014 and 2016. The process of establishing the *Flussgebietsgemeinschaft Elbe* in Germany is also outlined to illustrate the similarities and differences in the experience of establishing a river basin organisation in a developed and developing country.

Multilevel governance is at the order of the day when considering the case of South Africa's CMA establishment process. The establishment process is not only about pitfalls and challenges; there are also opportunities to take advantage of. One such opportunity is the knowledge of public administrative processes held by DWS officials. Such knowledge can be a defining resource between a successful and stalled establishment process. The identified practices and conclusions drawn should not be seen as a set of recommendations for policy-makers and stakeholders involved in CMA establishment processes only but also for scientists researching the process. Scientists are, after all, also stakeholders when they research CMAs and may also be involved in some of the CMAs currently being established. The research has shown a strong link between the successes or challenges of the establishment process and the way in which CMAs operate. This is an area where further research is needed as the process of establishing the other seven CMAs progresses.

In his chapter, **Håkan Tropp** contends that in most countries, water crises are not primarily driven by resource scarcity but by governance failures. A fundamental argument put forth is that the water sector is prone to corruption that leads to very dire consequences for sustainable, efficient and equitable water use, access and allocation. It has contributed to severe limitations in water reform implementation, where processes of decentralisation and privatisation sometimes rather have opened up for new groups to exploit the system, despite that arguments of better transparency and accountability were used to institute such changes in the first place.

This chapter outlines that lack of water-related integrity incurs huge cost for societies, in lives lost, stalling growth, wasted talent and degraded resources. For

example, corruption fuels unfair distributions of costs and benefits between different user groups or completely excludes certain groups of a particular water use. It can also be a strong driver to falling groundwater tables and diminishing ecosystem services due to unaccounted water withdrawals of lakes and rivers. It increases transaction costs and implies very high investment risks for both public and private investors. In sum, increased sustainability, equity and efficiency of water resources and services allocation; access; and use will in many places be very hard to come by – or attained at a much higher cost – without improving integrity.

Water integrity is defined as the adherence of water stakeholders and institutions to governance principles of transparency, accountability and participation, based on core values of honesty, equity and professionalism. In a more practical sense, integrity can refer to how well governance regimes or systems adhere to the rule of law, predictability in decision-making procedures and outcomes and if decisions hold up for public scrutiny and to what extent they can withstand different types of vested interests and corrupt practices. Corruption in water is used as a particular case to highlight issues of water integrity. Integrity is strongly manifested in water decision-making, and the level of integrity plays a critical role in deciding the outcomes of decision-making, that is, who gets what water, when and how.

Based on country examples, this chapter identifies corruption hot spots in the water sector such as the initial phases of procurement processes, kickbacks in awarding contracts or delivering water services (irrigation and drinking water supply) and political capture of administrative processes. It also identifies and synthesises country-based examples of transparency and accountability measures to improve integrity. They argue that it is much overdue to start to speak about the politically sensitive and unspoken drivers and consequences of corruption in the water sector and above all to make a systematic and coherent effort to improve water integrity. This chapter points towards a need to strongly include integrity- and corruption-related issues in the analysis of and policy responses to water crises. Not only is there a need for changed behaviours among public and private water decision-makers and users but also high time for setting in place a strong research agenda to assess impacts of corruption in water and to contextualise policy responses and interventions to improve water integrity.

**Claudious Chikozho** submits that key actors in various developing countries are often confronted by difficult choices when it comes to the selection and deployment of appropriate water governance regimes taking into account national socio-economic and political realities. Indeed, scholars and practitioners alike continue to grapple with the need to create the optimum water supply and allocation decision-making space applicable to specific developing countries. This chapter uses case studies to explore the utility of developmental statism and free-market economics as two major paradigms that have emerged in the face of enduring questions regarding how best to govern water supply systems in developing countries. Increasing pressure on available natural resources may have rendered obsolete some of the water supply systems and governance regimes that have served human societies very well for many decades. It is clear that national water supply governance paradigms tend to change in tandem with emerging national development theoretical

frameworks and priorities. Each nation feels compelled to adopt a particular framework to fulfil its unique needs. While many developing countries have adopted water policy prescriptions from the international arena, national and local socio-economic and political realities ultimately determine what works and what does not work on the ground. Thus, the choice between free-market approaches and developmental state-oriented approaches is never simple. Indeed, the majority of countries rely on a mix of market economics and developmental statism to make their water governance regimes more realistic and workable on the ground.

The authors conclude by stating that it is always important to remember that in water governance, context matters. National water supply governance paradigms tend to change in tandem with emerging national development theoretical frameworks and priorities. Each nation feels compelled to adopt a particular framework to fulfil its needs. In practice, more and more water utilities and planning agencies have been shifting their focus towards exploration of water supply system efficiency improvement possibilities, implementation of options for WDM within the confines of IWRM, equitable reallocation of water among competing users and uses to reduce consumption and meet future water demand. While many developing countries have adopted water policy prescriptions from the international arena, national and local socio-economic and political realities ultimately determine what works and what does not work on the ground. Thus, the choice between free-market approaches and developmental state-oriented approaches is never simple. Experiences across the globe indicate that careful analysis of local socio-economic and political conditions is crucial before deploying specific water supply governance frameworks. Application of the principles of sustainability and equity will help bridge the gap between diverse and competing interests and unleash the potential for more innovation in water supply governance.

In her chapter, **Barbara van Koppen** explores rights-based freshwater governance. The UN recognition of a human right to water for drinking, personal and other domestic uses and sanitation in 2010 was a political breakthrough in states' commitments to adopt a human rights framework in carrying out part of their mandate. This chapter explores other domains of freshwater governance in which human rights frameworks provide a robust and widely accepted set of normative values to such governance. The basis is General Comment No. 15 of the Committee of Economic, Social and Cultural Rights (CESCR) in 2002, which states that water is needed to realise a range of indivisible human rights to nonstarvation, food, health, work and an adequate standard of living, and also procedural rights to participation and information in water interventions. On that basis, this chapter explores concrete implications of the Comment for states' broader infrastructure-based water services implied in the recognised need to access to infrastructure, rights to non-discrimination in public service delivery and respect of people's own prioritisation. This implies a right to water for livelihoods with core minimum service levels for water to homesteads that meet both domestic and small-scale productive uses, so at least 50–100 l per capita per day. Turning to the state's mandates and authority in allocating water resources, this chapter identifies three forms of unfair treatment of small-scale users in current licence systems. As illustrated by the case of South Africa, the legal tool



of “Priority General Authorisations” is proposed. This prioritises water allocation to small-scale water users while targeting and enforcing regulatory licences to the few high-impact users.

The authors discuss how international human rights instruments in general and the CESCR General Comment No. 15 on the human right to water in particular provide a robust normative system that is well able to address end goals of human well-being across the key mandates of the water sector, namely, infrastructure development and water resource allocation. While the recognition of a justiciable and enforceable right to water for drinking, personal and other domestic uses and sanitation has been an important milestone in closing the disconnection between the state as duty-bearer for human rights and the state as investor in water infrastructure and regulator, the authors argue that this has only been a very partial interpretation of the underpinning General Comment No. 15 of the Committee on Economic, Social and Cultural Rights. The same Comment also indicates priorities in other freshwater governance domains to realise the substantive rights to livelihoods, food, health and an adequate standard of living. This has concrete implications for the state’s infrastructure-based water services. Poor people’s productive water needs should be fully recognised and met in a non-discriminatory manner. The definition of a core minimum should not be assumed to be for domestic uses only but should include water for small-scale productive uses at and around homesteads as well. This priority for multiple basic uses is already a widespread practice, but often still seen as “illegal” by sectoral professionals who design single-use infrastructure. An inclusive people-driven planning process for infrastructure services will spontaneously identify such multiple priorities.

The identification of these further implications of General Comment No. 15 underlines this chapter’s premise that human rights frameworks provide the indispensable normative framework for the twenty-first century freshwater governance.

**Raymond Ison** explains how mechanisms for inclusive governance are built on the framing choices that are made about governance and that which is being governed. His chapter unpacks how governance can be understood and considers different historical and contemporary framings of water governance. A framing of “governance as praxis” is developed as a central element in this chapter. What makes governance inclusive is explored, drawing on theoretical, practical and institutional aspects before elucidating some of the different mechanisms currently used or proposed for creating inclusive water governance (though we argue against praxis based on simple mechanism). Finally, the factors that either constrain or enable inclusive water governance are explored with a focus on systemic concepts of learning and feedback.

An inclusive, systemic approach to freshwater governance begins by making the distinction between situation and system; no one governance situation is the same so contextual design and application are needed even if some of the principles and practices employed are held in common across contexts. In this chapter the authors have given considerable attention to framing issues and the role of language. All metaphors bring forth an associated system; in other words language precedes system. In fact, the choice to see a freshwater river as a system is a framing choice – the

system does not precede the choices that different actors make. In this chapter the authors have presented a narrative that supports their normative position – that it makes sense to see freshwater systems as coupled social-biophysical systems so that, in a human-induced climate change world, the relational dynamic between and within the social and biophysical will benefit from moving towards forms of inclusive, systemic governance.

**Jennifer McKay** presents a portfolio-based approach to planning and management and argues that rapid urbanisation, growing urban populations, environmental issues and climate change all present significant challenges for water resource management, the delivery of essential water and sanitation services and environmental protection. As a result, traditional approaches that have relied heavily on large-scale infrastructure development are making way for new approaches such as the portfolio-based approach to planning and management. In an urban context this includes integration of all components of the urban water cycle, and most state governments in Australia have embarked on implementing this integrated approach by having a mix of water supply sources including demand management and conservation measures. However, effective implementation of this approach depends on policies and regulations and encounters various impediments. Accordingly, this chapter focuses on the City of Adelaide in South Australia and explores the legal and policy challenges for implementing an integrated urban water management plan in Metropolitan Adelaide. Drawing on the results of governance studies carried out in Australia that included a literature review and stakeholder and community surveys, this chapter attempts to better understand the barriers to transitioning Adelaide to a water-sensitive city.

With regard to implementing an integrated urban water management strategy in Australia, there is no “one size fits all” structural arrangement. Although there is growing support for implementing a portfolio of water supply sources, it is also true that there are impediments to implementing this approach. The authors caution that achieving (cultural) transformations to encourage institutional change for implementation of an integrated urban water management approach may take several years, and therefore planners and policy-makers must have a long-term framework for addressing these issues. Looking ahead, there is scope for further research to explore the intergovernmental issues and provide models to enable this transition and hence be a model for the world in portfolio approaches.

**Marguerite de Chaisemartin** provides an overview and thus contributes to a better understanding of the world’s groundwater resource, its distinctiveness and its governance – describing the principal elements of and key instruments employed in groundwater governance. To this end, the authors introduce several case studies from across the globe and offer some corresponding lessons learnt. In particular, this chapter presents an analysis of the role of monitoring and assessment in groundwater governance, showcasing the example of the Netherlands. A global diagnostic of the current state of groundwater governance is provided, based on information from a set of commissioned thematic papers and the outcomes of five subsequent regional consultations carried out within the framework of a GEF-supported project on Global Groundwater Governance. It includes insight into some of the findings of

that project as regards the four main components of groundwater governance: actors, national legal frameworks, policies and information and knowledge. In addition, the authors address the issue of governance of transboundary groundwater resources and the relevant existing international legal frameworks. In conclusion, through a Global Vision for 2030, this chapter presents a way forwards to govern groundwater and a framework for action to achieve good governance, formulated by the Groundwater Governance Project jointly implemented by UNESCO, FAO, World Bank and IAH.

To achieve the goals of the Shared Vision 2030, a Framework for Action has been developed. It describes the main steps to be taken, provides guidance on planning and prioritising actions and is an urgent call for action to all who can make a difference: national and local governments, international organisations, the private sector, civil society, media, educational institutions and professional organisations – but also well owners, groundwater users and concerned citizens everywhere. The main steps elaborated in the Framework for Action are understanding the context, creating a basis for governance, building effective institutions, making essential linkages, redirecting finances and establishing a process of planning and management.

The Shared Global Vision for Groundwater Governance 2030 and the Global Framework for Action to achieve the vision on Groundwater Governance call for strengthening groundwater governance. This call for action urges countries, districts, communities, companies, organisations and individuals to safeguard the groundwater resource that is essential to meet their common future objectives and Sustainable Development Goals. This Framework for Action is designed to set in place the groundwater governance arrangements that will achieve this vision.

**Doug Merrey** explores the likely trends and outcomes in water governance with a particular focus on cooperation and conflict over the management of water resources in two regions: South Asia and Southern Africa. With its extremely large-scale shared river basins inhabited by nearly a billion mostly poor people, South Asia has struggled to find ways to co-manage water resources to benefit everyone equitably in a context where there is much potential benefit to be achieved. Southern Africa is considered an example of relative success in developing ways to cooperate – but implementation is incredibly complex in systems more water scarce than South Asia, though not as large. They examine the prospects for developing governance arrangements in the two regions through three “lenses” which they characterise as “beyond disciplines”, “beyond scales” and “beyond ‘institutional’ hardware to ‘human’ software”. Even those who have advocated for the role of institutions above, individuals have conceded, as noted for South Asia, that the behaviour of individuals within organisations determines the outcomes. More research needs to be conducted on the role of the individual in actively addressing complex water-related challenges, in redefining how multiple sectors cooperate around these issues and ultimately influencing socio-economic development at the regional level.

At present, governance structures, organised nationally and transnationally on a basin scale in both regions, presume that “stakeholders” can adequately represent themselves in formal settings where allocation, use and management decisions are

taken. This is problematic in at least three ways, namely, where rural areas are divided in terms of large-scale, cash crop producers and small-scale producers (Southern Africa) or in terms of wealthy expanding urban centres and small-scale producers (South Asia); in urban areas divided between the rich few and the many poor and where dominant narratives and framing concepts such as “climate change-induced scarcity” and “closed basins”, to name but two, reinforce path dependencies, as the “haves” aim to hold onto what they have and to extend their water “rights” where possible. The authors argue that, if left unattended, these three factors will not only reinforce social inequity, economic inefficiency and ecological unsustainability, they also heighten the likelihood of conflict among “stakeholders” at a wide variety of scales: within the state, within the city, across the countryside and across state borders.

The authors conclude that the prospects seem good in Southern Africa, if the countries can move from talking to investing and creating a more integrated regional economy. The potential is great but prospects are less rosy in South Asia with its growing challenges in providing water and power services. Without stronger regional networks, partnerships and institutions supported by external facilitators, South Asia may fail to take full advantage of its water resources to achieve better lives for its people by 2030.

## 1.1 Reflections

We believe that this book goes beyond what is already known and explores largely unknown territory. The issues and arguments presented here are discussed clearly and convincingly. Our hope is that readers will be persuaded, enriched and inspired by the discussions of the issues.

When under pressure, water can carve new paths to flow; the same can be said for its governance. However, the water governance evolutionary path is non-linear, and hence it is very difficult to predict what it might look like in the future. However, in this book, we hope the reader will be able to identify with some signals or flags that point to the progress made in understanding and executing the governance of freshwater. As many of the authors have pointed out, it is always important to remember that in freshwater governance, context matters.

While the book has avoided providing a universal definition for water governance, I would venture to define it as a process through which society and the economy are prodded in a vector towards common goals for the benefit of society as a whole. It can be produced through and in different modes of hierarchy, through markets or through networks that emphasise the interactive nature of making decisions to deal with wicked problems. A combination of the different modes would exist depending on the framing of the water problems.

In the past, decisions around freshwater governance were made by central administrations that initially focused on the provision of services to the elite through engineering solutions. This has evolved into acknowledging a number of facts: that

all users have a stake and can potentially benefit the governance of water by taking part in decisions relating to managing water at local, national or regional levels; that access to water cannot be coupled with the ability to pay for services and that the building of large dams as a solution to water supply problems needs to be coupled with alternative solutions, such as more sustainable and efficient use of local resources.

The ability to pay for water services is no longer a differentiator for who gets access to the resource. There is recognition of the fact that access to a certain essential amount of water is a fundamental human right and that provision needs to be made for nature to sustain its ecosystems and biodiversity (South Africa is one of a few countries in the world to make legal provision for a water allocation to the environment). Green growth offers a broad range of social, environmental and economic benefits: societies benefit through increased stability of water supply, improved water quality, reduced health risks and potentially fewer water restrictions; environmentally, the benefits include improved water quantity and quality to meet ecological reserve requirements and improved ecosystem service provisioning, encouraging water reuse and recycling, as well as reducing the ecological footprint; and economically, benefits are derived by reducing the economic losses due to environmental degradation, improved environmental accounting, well-timed infrastructure investments and the creation of green jobs in areas such as ecotourism and sustainable fisheries.

The implications of climate change uncertainties, mainly rainfall in its spatial and temporal distribution, are hampering the traditional approach of building dams as a solution to lack of water in certain locations. There are more successful examples of local water technologies that point to the building of more water-sensitive structures that imitate nature in ways able to enhance adaptation and mitigation of climate changes and allowing for greener solutions.

An important dimension which is not covered adequately in this book is the pricing of water. In a development context, the adoption of the green growth approach could be regarded as supporting a strategy of decoupling economic growth and jobs from resource exploitation and climate damage, to sustain economic growth and alleviate poverty. Well-managed water systems can be an important driver for economic growth, particularly in water-scarce countries that experience suppressed demand. Efficient water pricing, specifically calculating a price that reflects the true value of water, has a large part to play in this endeavour, as it helps to overcome certain barriers that include market constraints and distortions that can reduce the overall benefits that accrue to society. Incorporating The Economics of Ecosystems and Biodiversity (TEEB) concept adds an economic dimension and could guide the choice and design of policy instruments for the pricing of natural resources, particularly where natural resources are scarce and under pressure. One can argue that it is often the poor who are most exposed and most vulnerable to ecological damage, and thus internalising TEEB in water pricing systems can become a powerful water equity policy instrument.

Another aspect that is not adequately covered is data governance. There are some fundamental advances around unstructured and structured data that point to a future

where data governance is more converged and transparent. Data sources are currently more divergent and scattered than ever before. With more interest of users in protecting water resources and the advances in mobile mapping and remote sensing technologies, availability of data is diverse and variant. Today it is likely that (younger) employees are using texting, Twitter and even WhatsApp, tied to Facebook, to share information in a work context. With data stored in ever more increasing locations, how do we distinguish between work and personal data and select quality data for long-term storage and retrieval? And, given the increasing levels of stakeholder involvement and the growing number of interdisciplinary dialogues, how is non-text data saved and analysed, and what are the rules and regulations that could govern that? Perhaps the solution lies in providing access to real-life data that has the ability to secure stakeholder confidence levels, process adherence levels and enhance overall participation levels capable of responding to eminent changes and disasters.

In the uncertain global economic future, there are forces at play between the current capitalist dominance and the eroded socialist doctrines. For all people to benefit, the freedom to make choices remains the secret of true development through being afforded development options and the ability to make those choices. Until we reach this empowerment level, water will remain an important topic for its professionals and the stakeholders who benefit. The governance of water needs to go beyond disciplines, beyond scales and beyond the institutional hardware to the human software. The future of water governance is about the promotion of the human software as embedded within a broader political system.

When defining the governance mechanisms, there is a need for framing the theoretical, practical and institutional tool boxes afforded in the specific contexts. Framing governance requires documenting good practices and is very important for learning which needs to happen not only within water management institutions but also by all stakeholders at the various levels. Localised successes of good water management face the challenge of amplified implementation and upscaling mainly due to contextual variation. While leapfrogging can help in identifying workable solutions, there is a need for context-specific tool boxes that can be helpful in the implementation of good water governance.

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