Introduction to the *Research Handbook on International Water Law*

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CURRENT WATER CHALLENGES

Water is an essential and unevenly distributed resource. Although the amount of water on earth has not changed significantly in billions of years, pressures exerted on this essential resource have increased exponentially. With the rapid expansion of the global population and the increasing demands of industry and agriculture, the global competition for water has increased as has its relative scarcity per capita.

There are more than 270 international watercourses in the world, with more than 2.8 billion people (roughly 41 per cent of the world's population) living within transboundary river basins that cover more than 40 per cent of the earth's total land area.¹ The number of transboundary aquifers that have been mapped so far and the people living in the respective recharge areas is even higher. Regional tensions over shared watercourses are likely to increase as the global per-capita share of water decreases, leading countries toward either greater cooperation or greater conflict.

Global water resources and their management also face increasing uncertainty caused by global climate change or climate disruption. Where water resources will be found, the predictability of these sources and the demands placed upon them have all become less stable and predictable. This uncertainty makes governing and planning with respect to these resources increasingly difficult.

Against this backdrop, governance frameworks that provide for peaceful, stable and predictable management of water resources, while also allowing flexibility to address uncertainty, are of great importance. This book examines the role of international law in providing the frameworks needed for effective water governance. It first traces the evolution of international water (Part I) and provides an overview over its general principles and key obligations (Part II), before exploring the relationships with other areas of law (Parts III and IV). Finally, the book turns to the tested dispute settlement and compliance mechanisms (Part V) and closes with a final section that presents regional water governance frameworks and practice of applying the principles and obligations of international water law to individual basins across the world (Part VI).

¹ UNEP-DHI and UNEP (2016). *Transboundary River Basins: Status and Trends*. United Nations Environment Programme (UNEP), Nairobi, p. 2. (October 27, 2017) http://twap-rivers.org/assets/GEF_TWAPRB_FullTechnicalReport.pdf.

Evolution of International Water Law

Over the past centuries, hundreds of treaties have been concluded between states with respect to the management of transboundary rivers, lakes and aquifers. This state practice has led to the emergence of customary norms and guiding principles of international water law. Alistair Rieu-Clarke examines the evolution and reach of treaty practice relating to international rivers, lakes and aquifers in his chapter *From Treaty Practice to the UN Watercourses Convention* (Chapter 1). The chapter considers the extent to which previous treaty practices informed the development of the UN Convention on the Law of Non-Navigational Uses of International Watercourses (hereinafter ‘UN Watercourses Convention’)² and, in turn, the extent to which the UN Watercourses Convention has influenced succeeding treaties and agreements. The International Law Commission, in drafting the articles which became the basis for the UN Watercourses Convention relied not only on state practice through earlier agreements but also drew on the work of independent legal expert bodies. Joseph Dellapenna, in his chapter on *The Work of International Legal Expert Bodies* (Chapter 2), describes the development of the various documents that have been developed by the *Institut de Droit International (IDI)* and the International Law Association (ILA) and explores the role these organizations have had in the evolution and codification of international water law.

The two treaties with universal reach that currently represent the key guiding instruments in international water law are more closely explored by Attila Tanzi in his chapter on *The Global Water Treaties and their Relationship* (Chapter 3). Tanzi describes the 1992 United Nations Economic Commission for Europe Convention on the Protection and Use of Transboundary Watercourses and International Lakes (hereinafter ‘UNECE Water Convention’)³ and the UN Watercourses Convention as coexisting and complementary treaty regimes very similar in object and purpose.

In the final chapter of Part I on the evolution of international water law, A. Dan Tarlock and Rhett Larson examine *Inter-Jurisdictional Water Allocation in Federal Systems: Lessons for International Water Law* (Chapter 4). Comparing water allocation systems in Australia, Brazil, Canada, China, Germany, India and the US, they illustrate the lessons and principles that have been derived from these practices. General principles of international water law, such as the principle of equitable and reasonable utilization, have their roots in the practice of federal systems. The general principles, their relationship with each other and with other key obligations of international water law, are described in Part II.

General Principles and Key Obligations of International Water Law

Stephen McCaffrey opens this section of the book with a discussion of the interactions among the general principles and key obligations of international water law. He

² Convention on the Law of Non-Navigational Uses of International Watercourses, New York, May 21, 1997, U.N. Doc. A/RES/51/299.

³ Convention on the Protection and Use of Transboundary Watercourses and International Lakes, Helsinki (UNECE Water Convention), March 17, 1992, 31 ILM 1312.

describes these as *Intertwined General Principles* (Chapter 5) which are interrelated and also mutually supportive. One of the less written about, yet key bridging principles, is the topic of additional analysis in the next chapter. Christina Leb highlights the important bridging function cooperation plays as a general principle that facilitates and becomes the *sine qua non* for the achievement of the substantive objectives of international water law: equitable and reasonable utilization, the prevention of significant harm and the protection of watercourses. The important role of cooperation in the management of transboundary water systems has been recognized in the indicators set up to measure the implementation of the Sustainable Development Goal (SDG) related to water. In the *Implementation of the General Duty to Cooperate* (Chapter 6), Christina Leb provides a summary overview of the content of the principle and the obligations that are linked to this principle, as well as the way in which SDG implementation is monitored with respect to transboundary waters.

The duty of states to notify riparian or co-basin states of planned measures that may cause appreciable harm, is one of the customary obligations closely linked to the general duty to cooperate. Lucius Caflisch provides a detailed account of the obligation of *Prior Notice and Related Issues* (Chapter 7) and explores related rules of international water law concerning the peaceful resolution of disputes. Prior notification can also be a helpful tool to prevent harmful impact on ecosystems that are related to international watercourses. International law with respect to the environment has seen rapid development over the past decades, starting with the 1972 Stockholm Conference on the Human Environment and proliferating since the 1992 Rio Declaration on the Environment and Development.⁴

The inextricable link between environmental and ecological protection and the effective realization of the general principles and substantive obligations of international water law are explored by Owen McIntyre in his chapter on *Environmental Protection and the Ecosystem Approach* (Chapter 8). McIntyre describes the principles of environmental protection and points to the increasing recognition of an ecosystem approach in treaties, as well as in state practice and jurisdiction, and the consideration of a duty to maintain minimum environmental flows to preserve the basic ecosystem functions, such as water purification, that ultimately preserve the life-giving functions of freshwater. Part II of the book concludes with an analysis of the legal regime of the freshwater source that represents an essential resource for drinking water supply. In the chapter on *The Application of the General Principles and Key Obligations to Internationally Shared Groundwater* (Chapter 9), María Milanés-Murcia outlines the current trends in the regulation of transboundary aquifers around the world. Using the cases of the Guaraní Aquifer and the shared aquifers along the US-Mexico border, the chapter describes the legal instruments that have been adopted to address transboundary groundwater management and identifies the rules of customary international law that apply to these shared resources.

⁴ United Nations Conference on Environment and Development, *Rio Declaration on Environment and Development*, August 12, 1992, U.N. Doc. A/CONF.151/26 (Vol. I).

International Water Law and its Relations with Other Areas of Law

As with all areas of international law, water law does not stand apart but is closely interrelated with other fields. This reflects the cross-cutting nature of water as a resource that nurtures human, animal and plant life, as an input factor to production such as food and energy, and as a resource that is exposed to human-made (pollution) and natural impacts (climate change). Exploring the linkages of *Water and Multilateral Environmental Agreements: as An Incomplete Jigsaw Puzzle* (Chapter 10), Daniel Barstow Magraw and Patsorn Udomritthiruj point to the fragmented approach that has arisen with respect to aspects of water governance in international environmental law. This fragmentation results in gaps, overlaps and inconsistencies in the appreciation of water as a resource that is essential for the well-being of the environment. The authors go on to propose various solutions that should be considered to develop a consistent and comprehensive legal framework for the planet's water resources. This discussion is followed by an assessment of how international water law can be used to cope with climate disruption (CD), a question of great significance in today's world facing climate uncertainty. A. Dan Tarlock analyses the interplay between *International Water Law and Climate Disruption* (Chapter 11). This chapter examines the flexibility and relative stickiness of legal agreements with respect to their adaptive capacity to accommodate changes in the hydrological regime brought about by climate change.

Turning to the appreciation of water in commercial relations between countries, Daniel Barstow Magraw explores the treatment of the relationship between *Water and International Trade Law* (Chapter 12). The chapter examines trade law, focusing principally on selected World Trade Organization (WTO) agreements and related cases. The final chapter of Part III, deals with the impact of water on freshwater resources and its users. War and conflict not only inflict heavy human casualties but also impact the human environment in crisis zones. A key objective of humanitarian law is the protection of the civilian population and in this context also the protection of drinking water supplies. Exploring the role of *Water in International Humanitarian Law* (Chapter 13), Mara Tignino provides an examination of international humanitarian law and how it relates to the protection of freshwater resources and infrastructure during armed conflicts to maintain access to safe drinking water.

The Human Right to Water and Vital Human Water Needs

A separate part of the book is dedicated to the treatment of the relationship between human rights and international water law in both national and transboundary contexts. The recognition of the human rights to water and sanitation by the Human Rights Council (HRC) and the General Assembly (GA) in 2010⁵ and their reaffirmation in subsequent resolutions are an acknowledgement by the international society of states of the essential role of water for the achievement of very basic human rights standards and vital human needs. Inga Winkler's chapter on *The Human Right to Water* (Chapter 14)

⁵ HRC Resolution 15/9 on *Human rights and access to safe drinking water and sanitation*, September 30, 2010, U.N. Doc. A/HRC/RES/15/9. G.A. Resolution 64/292 on *The human right to water and sanitation*, July 28, 2010, U.N. Doc. A/RES/64/292.

traces the process of recognizing the human right to water and its status in international human rights law. The chapter explores the normative content and corresponding obligations of this right while also pointing to other human rights relevant in the context of water law and policy and human rights' principles. Finally, the chapter discusses the implications of a human right to water for international water law and policy.

Addressing the growing recognition of these concepts, also in the realm of international water law, Anna Russell follows up with a chapter on *The Human Right to Water in a Transboundary Context* (Chapter 15). This chapter examines the extra-territorial implications of the recognition of an international human right to water for states sharing international watercourses. The discussion focuses on the relationship between states' use of an international watercourse and the impact on, and legal remedies available to, affected individuals living in another co-riparian state. The chapter furthermore explores the effects a human right to water may have on existing international watercourse law and the workings of international institutions responsible for the management of such transboundary waters. In this context, the 1999 UNECE London Protocol on Water and Health (the 'London Protocol')⁶ plays a key role in the consolidation and implementation of an autonomous human right of access to water. Attila Tanzi and Gian Maria Farnelli provide an overview of the London Protocol and the role of international cooperation in implementing the right at issue in their chapter on *The UNECE Protocol on Water and Health for the Implementation of the Right to Drinking Water and Sanitation* (Chapter 16). The chapter summarizes the role and procedures of the compliance review mechanism and analyzes the relationship between the London Protocol and other human rights-related documents, as well as the practical aspects of the implementation and enforcement of the obligations of the London Protocol. More in-depth discussion of compliance mechanisms and dispute settlement procedures are the topic of the subsequent Part V of this handbook.

Dispute Settlement and Compliance

The International Court of Justice (ICJ) and its predecessor, the Permanent Court of International Justice (PCIJ) have played a significant role in the development and maturation of international water law. Laurence Boisson de Chazournes analyzes this role, examining the many and varied disputes involving water that have been brought before these two courts, in *The Permanent Court of International Justice, The International Court of Justice and International Water Law: Versatility in Consistency* (Chapter 17). This chapter reveals the way in which international law regulates water uses as well as the many forays it has made into the areas of water protection and the management of freshwater resources more generally.

The Role of Scientific and Technical Experts in the settlement of disputes before international tribunals is presented by Cicely Parseghian and Benjamin Guthrie (Chapter 18). Disputes concerning the management and protection of international

⁶ Protocol on Water and Health to the 1992 Convention on the Protection and Use of Transboundary Watercourses and International Lakes (London, June 17, 1999), entry into force August 4, 2005, (hereinafter "London Protocol").

watercourses regularly involve complex scientific and technical questions touching on areas of expertise that do not typically come within the realm of judges or legal counsels. This chapter follows the question on how courts should deal with these issues to ensure that scientific questions are duly addressed. Focusing on the procedure before the International Court of Justice, the authors discuss the evolving practice of increasing involvement of technical experts before the Court. Part IV concludes with a look at the “Mechanism to support implementation and compliance and the Implementation Committee” created under the UNECE Water Convention as an alternative dispute settlement procedure. Johan Lammers provides a detailed account of the procedures before this Mechanism as well as the respective obligations of the parties to the UNECE Water Convention in his chapter on *The Implementation Mechanism and Committee Established Under the UNECE Convention on the Protection of Transboundary Watercourses and International Lakes* (Chapter 19).

Regional Approaches

The final part of the book brings together the various aspects discussed in the previous sections. It investigates how these are considered in the state practice of using international law as a means to organize the interaction of riparian states for the mutual beneficial development of shared freshwater resources. This part of the book takes the reader on a journey from the rich basin-level cooperative experience on the African continent, in Europe and in Central Asia, further east to South and East Asia where cooperation is in most cases characterized by bilateral treaty relations between countries sharing international watercourses, before concluding with a description of the legal frameworks in the Americas.

The journey opens with an account of the process of *Creating Basin Mechanisms in Southern Africa* contributed by Richard Paisley and Maaria Curlier (Chapter 20). The chapter discusses six of the 11 major shared drainage basins in the region. It reviews the application of general principles to the regional international water law regime established among the states of mainland Southern Africa (i.e., all Southern Africa except Madagascar, Mauritius and Seychelles). Moving within the African continent, Makane M. Mbengue and Nwamaka Odili present a detailed description of the *West African Approaches to International Water Law and Treaty Practice* (Chapter 21) which demonstrates that international water law has long been important in Western Africa. This chapter provides an overview of the evolution and current practice of international water law in West Africa, which includes some of the most progressive legal regimes for basin-level cooperation and offers recommendations for its continuing evolution and role in the region. In his chapter on *The Nile River Basin and its Changing Legal Contours* (Chapter 22), Salman M.A. Salman traces, discusses and analyses the history of agreements in the Nile Basin, arguing that a new legal order is gradually emerging which is grounded on the basic principles of international water law.

Away from Africa, the journey takes the reader to Europe, where the subject matter typically governed by international water law has become part of the supranational legal regime of the European Union. This legal system places strong emphasis on regulating and coordinating water uses and users according to the natural flow regime,

i.e. at the basin level, even where this cuts beyond the ever-growing borders of the European Union. Götz Reichert looks at international water law in the context of Europe and the EU water framework directive, showing the evolution of a sophisticated legal framework for the protection and management of freshwater resources in *Europe: International Water Law and the EU Water Framework Directive* (Chapter 23).

In Central Asia, the states that emerged from the Soviet Union have, to some extent, recreated the institutional mechanisms that existed in the prior period. Yet, the countries continue to struggle with the legacy of the drying-up of what used to be the world's fourth largest lake and inter-seasonal water management in a context of ageing infrastructure. In the chapter on *Central Asia: the Aral Sea Basin* (Chapter 24), Dinara Ziganshina analyses the existing legal and institutional frameworks which form the basis of transboundary water cooperation in the Aral Sea basin and the question of whether these are adequate in dealing with the challenges facing the region, such as growing and competing water demands as well as decreasing availability and degradation of water resources, challenges further exacerbated by the impacts of climate change.

The next two chapters illustrate the differences in the ways in which riparian countries organize coordination on international watercourses in the various regions. Whereas the majority of relations in Africa, Europe and Central Asia are organized with a view to basin-level coordination, states in South Asia and East Asia have taken a different approach. Kishor Uprety, in *South Asian Water Treaty Practice: An Overview* (Chapter 25), discusses the characteristics of South Asian water treaties. The region is characterized by unique water systems, owing to highly seasonal flow regimes, frequent occurrence of floods and droughts and the increasing pressure on existing water supplies due to rapid population growth, industrialization and unique geopolitical and infrastructure challenges. The chapter reviews the regimes that are already in force between the countries and those still in development.

The country upstream of all South Asia's large transboundary river systems, as well as of most of the other river systems which it shares with its 14 neighbours, is China. Given this geographic position and having realized the potential of cooperation on transboundary rivers, China is a country of growing significance and involvement in regard to international watercourses and international water law. In *China's International Water Relations* (Chapter 26), Yu Su provides valuable insight into the riparian relationships of this important country with an examination on the stance China has taken regarding international water law as well as its relations with neighbouring countries regarding shared freshwater resources. This account of the Chinese perspective and practice with respect to international water law is complemented by the description of the riparian relations of its next-door neighbor, Russia. Sergei Vinogradov and Patricia Wouters provide an overview and evaluation of the institutional arrangements and various legal frameworks which govern the utilization and protection of transboundary waters shared by Russia in *Transboundary Water Cooperation between the Russian Federation and the Neighbouring States: Legal and Institutional Frameworks* (Chapter 27). Describing the massive land mass, the authors identify and analyze the complex legal relations Russian Federation shares with diverse co-riparians along its extensive borders that are chiseled by numerous transboundary watercourses.

The final chapters on regional practice are dedicated to the Americas. In *A Panoptic View of International Water Law in Latin America* (Chapter 28), Lilian del Castillo Laborde provides a comprehensive overview of the treaty regimes that apply to the shared water resources of Latin America, a region with numerous international watercourses and shared aquifers and a long-standing tradition of utilizing international jurisprudence, regional treaties and institutional mechanisms to address these shared and precious resources. The journey across regional practice ends with the description of one of the oldest legal regimes that governs boundary water management across multiple basins shared between two countries. In *A Long History of Cooperation Between Canada and the United States on Boundary Waters* (Chapter 29) Richard Paisley critically reviews the application of international water law by Canada and the United States along their approximately 9,000 km/5,500 mile undefended border marked by numerous shared water bodies. In this chapter, the author pays particular attention to the Boundary Waters Treaty of 1909,⁷ which underlies the long-standing bilateral relationship, as well as the treaties governing the largest water bodies on the joint border, the Columbia River Treaty of 1964⁸ and the Great Lakes Water Quality Agreement of 1972 and its subsequent amendments.⁹

THE FUTURE CHALLENGES FOR INTERNATIONAL WATER LAW

The rich experience and decades of cooperation of states on the management of shared water resources using international law that is presented in this book, holds important lessons on addressing future challenges in the field. From time-immemorial the hydrologic cycle has been subject to change and fluctuations. Water managers have devised means to address these fluctuations and have introduced some flexibility into legal regimes. However, the pace of climatic change has accelerated and compounded with continued, exponential population growth posing challenges to water resources management that had not been envisaged at the times when some of the water treaties currently in force were adopted. For instance, the 1960 Indus Waters Treaty does not provide explicit provisions on environmental flows and on how to deal with climate change and its impact on the glacierized upper basin from which originates the spring flows feeding the first crops. One way to deal with change, as has been highlighted

⁷ Treaty Between the United States and Great Britain Relating to Boundary Waters and Questions Arising Between the United States and Canada, Jan. 11, 1909, 36 Stat. 2448, T.S. No. 548, more commonly known as the Boundary Waters Treaty of 1909 (BWT).

⁸ Treaty between the United States of America and Canada Relating to Cooperative Development of the Water Resources of the Columbia River Basin, Washington, January 17, 1961, 15 UST 1555, TIAS No. 5638, 542 U.N.T.S. 244, hereinafter Columbia River Treaty or CRT.

⁹ Agreement on Great Lakes Water Quality, U.S.-Can., Apr. 15, 1972, 23 U.S.T. 301 [1972 GLWQA]. The 1972 GLWQA was superseded by a subsequent instrument, the Great Lakes Water Quality Agreement of 1978, done at Ottawa on November 22, 1978, which in turn was amended on October 16, 1983, and November 18, 1987. The most recent iteration is the Great Lakes Water Quality Protocol of 2012, signed by the United States and Canada in Washington on September 7, 2012, which amends the 1978 Agreement, as amended.

with the Great Lakes and other agreements is to revise and amend existing treaty regimes. Another solution is to vest new agreements with built-in adjustment mechanisms (e.g., regular review of use allocations) that are regularly monitored and adapted by effective joint institutions. Similarly, other areas of law can provide clues on how to address changing conditions with new technology, such as the question of regulating radical geo-engineering interventions that have been proposed to slow-down the rate of global temperature increases and on the potential needs for a legal regime governing the use of water traveling through the air as cloud formations and humidity.

Securing access to safe drinking water in the near and long-term, knowledge about and regulation of groundwater resources, their exploitation and the protection of recharge zones, is one of the areas where further legal development is needed. The worlds' groundwater resources remain only partially mapped and the development of international treaties for the exploitation of shared aquifers has so far been slow. This is an area for legal development, required to facilitate the effective implementation of the human right to water, as countries increasingly defer to the exploitation of their underground waters to secure access to sufficient, safe and affordable water. The sensitivity of aquifers to pollution and the difficulty of clearing recharge zones once pollution has occurred is an area that demands further development of effective MEAs. Overall, the trend of state cooperation on managing shared freshwater resources for the benefit of human and environmental uses is pointing in the right direction. By adopting a positive outlook and trust in rational behavior, we can expect that in the long term (with the obvious temporary set-backs) states will continue to come together to address the increasing relative resource scarcity, caused by the growing population that inhabits the planet, to sustainably manage the shared watercourses and ecosystems that support human, animal and plant life.