Introduction

Water permeates everything; it provides a link among living things, land and the atmosphere. Water sustains and can destroy life; it shapes the landscapes that it travels through, and it is part and parcel of the air we breathe. Water also connects States: with the exception of island nations, virtually all countries share one or more transboundary freshwater systems with their neighbours. These international rivers, lakes and aquifers create inevitable linkages and interdependencies among States. The use of transboundary water systems by one State almost invariably impacts other States sharing the same system. Such impacts can be of a factual or an immaterial nature; they can affect a State's physical territory or its existing or future rights; they may cause harm; and they can be beneficial. States are therefore well advised to coordinate their activities regarding the utilisation of their shared water resources to prevent mutual damage and to enhance beneficial effects; in fact, the hydrologic interconnectedness almost necessitates coordination. Cooperation is the process by which States take coordination to a level at which they work together to achieve a common purpose that produces additional mutual benefits that otherwise would be unavailable with unilateral action.[1] Experience in transboundary basins shows that cooperation among riparian States more often leads to greater benefits for all basin States than non-cooperation.[2]

The present analysis explores the principles and norms of international water law through the prism of cooperation; by examining international

[1] I. W. Zartman, 'Concept: Cooperation' (2008) 30 *PIN Points* 5–7.
[2] World Bank, 'Creating Benefits from Cooperation in Shared Water Resources: Lesotho's Highlands Water Project Phases IA and IB' (2008) 12 *Water Feature Stories*; D. Phillips *et al.*, *Trans-boundary Water Co-operation as a Tool for Conflict Prevention and Broader Benefit Sharing*, Global Development Studies (Stockholm: Ministry of Foreign Affairs, 2006).

water law from this angle, the analysis intends to illustrate that the legal principles and rules that promote cooperation can help to navigate the challenges of transboundary water resources management. At this point, it is worth clarifying that the term 'transboundary' is applied here, primarily, relative to water resources that cross political boundaries between sovereign States, thus only referring to freshwater resources that are shared internationally. Other definitions of the concept 'transboundary' – which may refer to administrative boundaries delimiting communities or electoral districts or to boundaries between provinces or states in federal systems or others – are not applied here.

In the course of history, riparian States on many international watercourses engaged in and enhanced their cooperative relationships in managing the utilisation, protection and development of their shared waters. They frequently sealed their mutual agreements with international treaties that described how the resources should be managed and the specific rules of conduct; this contributed to the crystallisation of a law of transboundary freshwater resources (hereinafter also referred to as 'international water law'), including customary principles and rules. The scope of application of the principles and rules expanded over time and continues to widen. Earlier treaty practice mostly concerned surface water bodies; later, as knowledge and utilisation of groundwater resources grew, these resources were also considered in water treaties, first separately in agreements managing boundary waters and then as resources that are connected to and form integrative parts of surface water bodies. More recently, the focus has turned to non-renewable, or fossil, transboundary groundwater resources and to aquifers not connected to watercourses. In the future, it is likely that the ever-increasing water demand of the continuously growing world population and the effects that climate change will have on the global distribution of water resources will lead to further expansion in the scope of the law of transboundary freshwater resources.

In parallel to the developments in international law more generally, a trend away from a law of coexistence towards a law of cooperation can also be observed in international water law.[3] Early treaties generally focused on water and its uses in relation to individual States' territories: this

[3] L. Boisson de Chazournes, '*Eaux internationales et droit international: vers l'idée de gestion commune*', in L. Boisson de Chazournes and S. Salman (eds.), *Les ressources en eau et le droit international – Water Resources and International Law*, Académie de droit international, (Leiden/Boston: Martinus Nijhoff Publishers, 2005), pp. 10–30. For a conceptualisation of this evolution, see W. Friedman, 'General Course in Public International Law' (1969) 127 *RCADI* 39–224.

included the drawing of political boundaries along rivers or across lakes, as well as regulating rights related to the passage over one State's territory by ships navigating under the flag of another. Agreements on managing shared water resources in a coordinated and cooperative manner became increasingly more common once the negative impacts of water uses by one riparian State on other riparian States grew, particularly with respect to the increase in industrial and agricultural water uses and their negative effects on water quantity and quality. These treaties and coherent State practices led to the emergence of a general duty to cooperate on transboundary freshwater resources. This general duty is now widely recognised as one of the so-called general principles of international water law, together with the principle of equitable and reasonable utilisation, the obligation not to cause significant harm and other principles.[4]

Given the importance of cooperation in the management of transboundary water resources that interlink State territories, it is interesting that the recognition of the general duty to cooperate as a 'general principle' has been open to question. Legal instruments concerning transboundary water systems refer more often to cooperation than they do, for example, to the principle of equitable use.[5] However, the question of recognition was subject to debate, for example, during the United Nations (UN) International Law Commission's (ILC) discussions and elaboration of the 1994 *Draft Articles on the Law of Non-Navigational Uses of International Watercourses* (hereinafter ILC 1994 *Draft Articles*),[6] which form the basis of the 1997 *UN Watercourses Convention*. The general duty to cooperate also received comparatively less scholarly attention than other general principles of international water law.[7] Yet, cooperation is essential not only for the management and development of shared resources; it is also

[4] Part II of the *United Nations Convention on the Law of Non-Navigational Uses of International Watercourses* (hereinafter '1997 *UN Watercourses Convention*'), New York, 21 May 1997, not yet in force, UN Doc. A/RES/51/299.

[5] See Annex: about 56 per cent of treaties mention cooperation whereas only half as many refer to equitable utilisation.

[6] ILC, 'Summary Records of the Meetings of the Thirty-Ninth Session 4 May–17 July 1987' (1987) I *YBILC*, UN Doc. A/CN.4/SER.A/1987, pp. 70–95.

[7] For example, A. D. Tarlock and P. Wouters, 'Are Shared Benefits of International Waters an Equitable Apportionment?' (2007) 18 *CJIELP* 523–536; K. Hayward, 'Supporting Basin-Wide Reforms with an Independent Assessment Applying International Water Law: Case Study of the Dnieper River' (2007) *CJIELP* 633–664; I. Kaya, *Equitable Utilization: The Law of Non-navigational Uses of International Watercourses* (Aldershot: Ashgate 2003); J. W. Dellapenna, 'The Customary International Law of Transboundary Fresh Waters' (2001) 1 *IJGEnvI* 282–284; J. G. Lammers, *Pollution of International Watercourses: A Search for Substantive Rules and Principles of Law* (Boston/The Hague: Martinus Nijhoff, 1984).

necessary for bringing other principles and rules of international water law to fruition. The principle of equitable and reasonable utilisation, for example, cannot be adequately implemented in the absence of cooperation; notification obligations and consultations yield information that is necessary to assess whether a respective use is equitable and reasonable and can be used to enhance joint management of the shared waters.

It is for these reasons that this book intends to add to the existing literature with insight into recent developments of treaty practice, highlighting noteworthy trends. The book is divided into three parts, which examine the evolution, current state and future trends of the rules of cooperation that apply to transboundary water resources management and development. Part I explores factors that motivate States to engage in cooperative behaviour. The global hydrologic cycle creates interlinkages among territories, people and the environment. Interdependence contributes to States' decisions to engage in international cooperation. At the same time, it is not the only determining factor of their behaviour; other factors, such as concerns for security and economic development as well as historic relationships, also intervene. Chapter 1 analyses why States choose to cooperate and why they enter into legal agreements as part of the cooperative process. It illustrates that the development of international relations and growing interdependence among States have changed the nature of sovereignty and international law, reflecting the increasing importance of international cooperation. Chapter 2 traces these developments with respect to international water law. Similar to what is happening in other domains, the development of this body of norms is characterised by an expansion of its normative reach, both geographically and in terms of the different subject areas that it has come to address.

Principles and norms that form the current legal basis of cooperation among riparian States of transboundary water bodies comprise the subject of analysis in Part II. Chapter 3 illustrates that legal principles reinforce one another and that individual principles in the area of international water law would not be complete without the others; that is, they cannot achieve their intrinsic value and objectives on their own. This is one reason for the argument made in Chapter 4 – namely, that it is not sensible to conceive of the general duty to cooperate and the specific obligations that derive from it as purely procedural norms. These rights and duties contain procedural as well as substantive normative elements. Chapter 5 emphasises this point by illustrating the large variety of measures that have been adopted by States with a view to achieving specific water management

objectives, including water quality control, protection of ecosystems and regulation of flow through cooperation. In the majority of cases, States have established and assigned water management responsibilities to joint mechanisms, which serve as a platform for cooperation and dialogue and have led, at times, to a widening and deepening of collaborative action among States. Joint mechanisms play an important role in the process of State cooperation: as structures that are designed to ensure regular interaction among States, they can contribute to preventing and settling disputes as well as to ensuring compliance with legal obligations.

The final part of the analysis, Part III, examines where the evolution of cooperation among States might lead in the future. Water availability is characterised by high regional and temporal variability, resulting in uneven access for individuals and communities – across not only basins but also regions and the planet. Climate change impacts on the global water cycle compound these effects and particularly harm poor States and regions already experiencing water stress, thereby causing increasing inequity regarding access to and availability of freshwater resources at the global level. Recent trends in legal development indicate that different areas of international law are responding to these challenges: the rights and interests of individuals and State cooperation relative to water are also increasingly considered at the regional and universal levels.[8] Issues concerning the existence of international cooperation obligations to satisfy vital human water needs are explored in Chapter 6. The focus of this chapter is to respond to the question of whether a prioritisation of vital human needs among different water uses, combined with the crystallisation of a human right to water, can be the source for additional or new international cooperation obligations. Chapter 7 addresses the emerging trends of international cooperation relative to climate change and the effects of its phenomenon on hydrologic variability. Climate change highlights the fact that States are connected not only through transboundary watercourses and aquifers but also through the atmosphere and the much larger global water cycle. Economic activity in one international basin can affect water availability in basins elsewhere. The increasing severity of water events, such as floods and droughts, requires preparedness and cooperation among riparian States for the design of adequate

[8] M. Tignino, '*Les contours du principe de la participation publique et la protection des ressources en eau transfrontières*' (2010) 7 *Vertigo*, http://vertigo.revues.org/9750; K. Bourquain, *Freshwater Access from a Human Rights Perspective* (Leiden: Martinus Nijhoff, 2008), p. 47; Boisson de Chazournes, '*Eaux internationales et droit international*', pp. 32ff.

adaptation measures. Climate change law promotes international cooperation for adaptation. This final chapter explores whether international water law, together with the legal framework for climate change, can facilitate advancing the regulation of equitable water utilisation beyond the basin level while also considering atmospheric water streams and global hydrologic interdependence.

The method applied in the research is a combination of the analysis of primary resources, the decisions of international courts and tribunals and the secondary literature complemented by discussions with practitioners. The core of the analysis rests on the examination of international water treaties concluded among States since 1900: 219 agreements were analysed relative to their role in the overall context of cooperative basin management, and the principles and rules of cooperation included in their text. For the latter, the assessment of the treaties' text followed the question of to what extent these instruments establish cooperation duties for States. Cooperation obligations were grouped into different categories and their occurrence was quantitatively assessed. A detailed description of the methodology of this analysis and a table of the treaties that were evaluated are provided in the Annex. Some of the treaties analysed were superseded by later instruments; nevertheless, reference is made to them to demonstrate the wealth of possibilities and ways in which States can regulate the various aspects of water resources management. Regarding earlier treaties, the research drew heavily on the writings of international scientific and expert bodies – the ILC, the International Law Association (ILA) and the Institute of International Law (IIL) – for their interpretation. These entities conduct comprehensive analyses of treaties and State practice in the process of elaborating codifications of universal norms of international water law.

The treaty analysis primarily focused on agreements with the explicit objective of protection, management or development of transboundary waters and thus on water treaties in a strict sense. Yet, because the law of transboundary water resources is neither a separate nor a self-contained system of rules and because it interacts with other domains of public international law, rules from these other areas that are relevant to the cooperative management of shared waters were also analysed. This was done specifically in regard to human rights law and the international climate change regime within the context of Part III. International environmental law rules and multilateral environmental agreements (MEAs) were also considered in the analysis relative to how they apply to shared water resources. Decisions of international courts and tribunals and the

writings of legal scholars were examined to complete the analysis of the current state of international water law and with respect to interpretation of norms.

The research analyses international water law from the perspective of natural resource utilisation. Navigational uses are therefore considered herein only as they impact the condition of water resources, such as through pollution or changes in flow characteristics. Navigational uses and rights related solely to the right of passage over the territory of another State by taking advantage of the specific surface texture of water are not analysed. Another area of law related to transboundary waters that is not considered herein is boundary law. International water bodies had interconnected land and communities long before the demarcation of State territories. However, rivers in particular are frequently perceived as natural geographic lines of separation and were often used to mark political boundaries. Although the focus of the present research is the analysis of principles and rules that regulate the legal relationships among States, this divider function of watercourses as political boundaries is not analysed; on the contrary, it is rather the contribution of international water law to the dilution of boundaries that constitutes the primary focus. For similar reasons, the role of international water law in dispute settlement is considered only as a tool of cooperation that assists in overcoming, managing or preventing disputes among States and the differences concerning their interests and positions.

It is recognised that cooperation among States also takes place outside of the formal setting of international agreements and international law; the role of treaties – as one of many instruments or simply one step in the process of State cooperation – has been taken into account. Secondary literature on international waters cooperation was reviewed and discussions with practitioners were conducted to complement the analysis using insights from current State practice.

Finally, certain clarifications are required regarding the use of words and definitions applied in this volume. The term 'water resources' is used in a wide sense; it refers to freshwater primarily in its liquid but also in its solid (i.e., ice) and gaseous (i.e., atmospheric water) states. Bodies of water that cross or form international boundaries and are therefore situated on or traverse the territories of more than one State are referred to as 'transboundary water bodies'.[9] The historical distinction among

[9] Art. 2 (b), 1997 *UN Watercourses Convention*.

'international rivers', navigable waterways of international concern and other rivers is not used here;[10] the definitions denoting different types of transboundary water bodies follow the legal definitions developed by the ILC. A 'watercourse' is a 'system of surface waters and groundwaters constituting by virtue of their physical relationship a unitary whole and normally flowing into a common terminus'.[11] This definition includes rivers, lakes, aquifers, glaciers and canals as long as they are interrelated with one another.[12] An 'aquifer' is defined as 'a permeable water-bearing geological formation underlain by a less permeable layer and the water contained in the saturated zone of the formation', which may or may not be linked to watercourses.[13] When two or more aquifers are hydraulically connected, they form an 'aquifer system'.[14]

The ILC discussed the use of the terms 'system' and 'basin' when it elaborated the legal definitions applicable to transboundary water bodies. The term 'watercourse system' was rejected by States as not being 'distinguishable to any appreciable extent from the "drainage basin" concept'.[15] The 'drainage basin' concept recognises land–water linkages and the importance of terrestrial plants, soils and minerals for aquatic ecosystems. An 'international basin' is the 'geographical area extending over two or more States determined by the watershed limits of the system of waters, including surface and underground waters flowing into a common

[10] Within the context of regulating navigation on Europe's great rivers, navigable rivers with access to the sea were declared 'international rivers'. This definition, which can be traced back to Article 108, 1815 Final Act of Vienna, does not include connected aquifers and lakes. See *Territorial Jurisdiction of the International Commission on the River Oder*, judgment, PCIJ (1929), Ser. A.23 No. 16, p. 25; L. Caflisch, '*Règles Générales du Droit des Cours d'Eau Internationaux*' (1989), 219 *RCADI* 30f.; S. McCaffrey, *The Law of International Watercourses – Non-Navigational Uses*, 2nd edition (New York: Oxford University Press, 2007), p. 41.

[11] Art. 2 (a), 1997 *UN Watercourses Convention*.

[12] ILC, 'Draft Articles on the Law of the Non-navigational Uses of International Watercourses and Commentaries Thereto and Resolution on Transboundary Confined Groundwater' (1994), II(2) *YBILC* 90.

[13] Art. 2 (a), *Draft Articles on the Law of Transboundary Aquifers* (hereinafter 2008 ILC *Draft Articles*) UN Doc. A/RES/63/124. This definition, which was adopted by the ILC, is interesting from a legal perspective because, as a consequence, it unites divisible resources – the geological rock formation – and indivisible resources – freshwater – under one legal regime.

[14] Art. 2 (b), 2008 ILC *Draft Articles*.

[15] ILC, 'Second Report on the Law of the Non-navigational Uses of International Watercourses, by Mr. Jens Evensen, Special Rapporteur' (1984) II(1) *YBILC* 105.

terminus'.[16] This concept acknowledges that land and water, as well as terrestrial and aquatic fauna and flora of the catchment area, constitute an interdependent 'ecosystem'.[17] Although 'basin' is the preferred notion of the ILA, State practice is not uniform regarding its use in water treaties. It has therefore not become a concept of customary law and applies only when States determine its applicability by treaty.[18]

In this book, the term 'water system' or 'water body' is used as the general term when referring to the interconnected system of water resources flowing in a transboundary basin, including the glaciers that might be their source. The two terms are applied equally to surface water bodies, watercourses, and aquifers. When analysis is more specifically concerned with one or another of these systems, the ILC terms and definitions of 'watercourse' 'aquifer' and 'aquifer system' are used. When the more complex land–water linkage is considered, the term 'ecosystem' or 'basin' is used. The more precise terms are employed particularly when it is necessary to refer to legal differences that result from applying the different definitions. Depending on whether the definition of 'watercourse' is used for cooperative management of an international river or the 'river basin' concept, the substance of obligations related to resource protection may differ. For example, whereas the first concept would focus on the quality of the shared waters, the second would apply also to the quality of the ecosystem interacting with the waters. Regarding participants in water resources management, in many cases, it would not make a significant difference whether the basin concept or the system concept is applied; the geographic space covered by these two concepts is congruent in most cases.[19] Therefore, for purposes of simplification – and despite legal nuances that might apply – the terms 'riparian', 'system' and 'basin' States[20] are used here without distinguishing among them.

[16] Art. II, 1966 *Helsinki Rules*, reproduced in ILA, *Report of the Fifty-Second Conference Held at Helsinki, August 14th to August 20th, 1966* (London: ILA, 1967), pp. 484f. For aquifer systems, the recharge zone is equivalent to the drainage basin.

[17] *Ibid*., pp. 472 and 485. [18] Caflisch, '*Règles Générales*', p. 29.

[19] McCaffrey, *The Law of International Watercourses*, p. 37.

[20] Art. III, 1966 *Helsinki Rules*: 'A "basin State" is a State the territory of which includes a portion of an international drainage basin'.