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Vinogradov, Sergei; Wouters, Patricia

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Adaptation regulatory regimes to address climate change challenges in transboundary water basins: Can multilateral regionalism help?

Sergei Vinogradov and Patricia Wouters

Correspondence
Email: s.v.vinogradov@dundee.ac.uk; p.k.wouters@aol.com

Global climate change threatens regional water security in complex ways. The transboundary waters flowing across Asia from their source in the Himalayan water towers are fragile resources, already adversely impacted by rising temperatures. China and India share many of the river basins originating across this region and both countries implement ambitious national development plans that use these resources. Global approaches to address climate change issues on transboundary waters have emerged, but require national and regional cooperative actions, supported by coherent regulatory regimes with adaptation at the core. In the absence of transboundary water agreements between them, how will China and India meet the difficult challenges of climate change on their shared freshwaters? This article considers the multilateral and bilateral regulatory regimes that govern China and India's transboundary waters in the context of global warming challenges. The findings suggest the emergence of an incomplete adaptation regulatory regime that has yet to coalesce, but which nonetheless shows some promise within a multilateral regionalism context. The hallmarks of an ideal transboundary water adaptation regulatory regime include two main components – comprehensive cooperation and basin-wide resilient management regime. Neither of these exist in the transboundary waters shared between China and India, but there is reason for hope.

1 INTRODUCTION

> *The impacts of climate change will be channeled primarily through the water cycle … Water-related climate risks cascade through food, energy, urban, and environmental systems. Growing populations, rising incomes, and expanding cities will converge upon a world where the demand for water rises exponentially, while supply becomes more erratic and uncertain.*[1]

Close to half of the world's population depends upon freshwater resources that cross international borders.[2] Most of these transboundary basins lack any regulatory frameworks,[3] which compromises inter-State cooperative actions, including international climate resilience measures. This, in turn, exacerbates the already problematic global response to climate change.[4] The latest global attempt to address the world's climate challenges ended with disappointment.[5] The United Nations (UN) Secretary-General asserted that '[t]he international community lost an important opportunity to show increased ambition on mitigation, adaptation and finance to tackle the climate crisis'.[6] Only a month

[1] World Bank, 'High and Dry Climate Change, Water, and the Economy,' (World Bank 2016) <https://www.worldbank.org/en/topic/water/publication/high-and-dry-climate-change-water-and-the-economy>.
[2] The Food and Agriculture Organization of the United Nations (FAO) provides the following details: just under half of the Earth's land surface is covered by international river basins, affecting 40 percent of the world's population; FAO, 'Transboundary Waters' <http://www.fao.org/land-water/water/water-management/transboundary-water-management/en/>.
[3] ibid. The FAO reports that 60 percent of the world's 263 transboundary river basins still lack frameworks for cooperative management.
[4] United Nations Environment Programme (UNEP), 'Transboundary Water Assessment Programme (TWAP) Vol. 6: Transboundary Waters Systems – Status and Trends: Crosscutting Analysis' (UNEP 2016).
[5] See, e.g., UN, 'An Important Opportunity Lost as COP25 Ends in Compromise, but Guterres Declares "We Must not Give up" (15 December 2019) <https://news.un.org/en/story/2019/12/1053561>.
[6] 'Secretary-General's Statement on the Results of the UN Climate Change Conference COP 25 (15 December 2019) <https://www.un.org/sg/en/content/sg/statement/2019-12-15/secretary-generals-statement-the-results-of-the-un-climate-

earlier similar concerns were raised with regard to the UN's Sustainable Development Goals (SDGs).[7] The UN claimed that '[a] narrow focus on growth, regardless of its true cost and consequences, is leading to climate catastrophe, a loss of trust in institutions and a lack of faith in the future'.[8]

Water resources are inextricably linked with, and influenced by, climate and weather patterns; water is at once part of the problem and part of the solution. Higher temperatures are expected to intensify the global hydrological cycle and to increase the frequency and magnitude of floods and droughts at the regional and basin levels.[9] Transboundary water governance must take full account of changing climatic conditions and their possible impacts. How riparian nations manage their shared freshwaters may impact not only their climate resilience,[10] but may result in adverse economic and social consequences both 'within and beyond the watercourse'.[11] Indeterminate transboundary water cooperation threatens not only regional peace and security, but also impedes effective international efforts to address risks associated with climate change.[12] Inter-State agreements may help to alleviate some of these problems, but in their absence, what solutions are available to help?

Devising an 'adaptation regulatory framework' at the transboundary level capable of addressing climate change presents considerable challenges, both in practical and normative terms.[13] In the first instance, a high degree of cooperation appears to be a prerequisite, referred to here as 'comprehensive cooperation'. This notion is intended to capture the high degree of practical engagement required to achieve an effective adaptive regulatory framework; cooperation that reaches across sectors and that spans international and subnational governance regimes.[14] As one report suggests, this 'demands attention at all levels and across all sectors and institutions and necessitates the involvement of many stakeholders with conflicting and competing needs across multiple physical, political and jurisdictional boundaries', in ways that would enable 'more efficient and effective adaptation, by pooling available data, models, scenarios and resources and enlarging the planning space for locating adaptation measures'.[15] In addition to this comprehensive cooperation, an

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change-conference-cop25>. One report claims that China and India hindered progress at the Madrid climate summit by expressing views that they had already 'done their fair share in cutting carbon pollution'. P Galey, 'Climate at Mercy of Politics in 2020, Experts Warn' (EurActiv, 13 January 2020).

[7] UNGA 'Transforming Our World: The 2030 Agenda for Sustainable Development' UN Doc A/ RES/70/1 (25 October 2015). The SDGs require reporting on transboundary water cooperation. For more details, see: A Rieu-Clarke, 'Can Reporting on Transboundary Waters Support Cooperation? Early Insights from Water Convention and the Sustainable Development Goals Reporting Exercise' (2020) 29 Review of European, Comparative and International Environmental Law.

[8] A Guterres, 'Progress toward Sustainable Development is Seriously Off-track' (Office of the UN Secretary-General, 4 November 2019) <https://www.un.org/sg/en/content/sg/articles/2019-11-04/progress-toward-sustainable-development-seriously-track>.

[9] D Wallace-Wells, '"The Devastation of Human Life Is in View": What a Burning World Tells Us about Climate Change' (edited extract from *The Uninhabitable Earth: A Story Of The Future* (Allen Lane 2019) (The Guardian, 2 February 2019).

[10] A Rieu-Clarke, R Moynihan and B O Magsig, *Transboundary Water Governance and Climate Change Adaptation: International Law, Policy Guidelines and Best Practice Application* (UNESCO Publishing 2015).

[11] CW Sadoff and D Grey, 'Beyond the River: The Benefits of Cooperation on International Rivers' (2002) 4 Water Policy 389.

[12] ibid 11. See also A Earle et al (eds), *Transboundary Water Management and the Climate Change Debate* (Routledge 2015); S Shrestha et al (eds), *Climate Change and Water Resources* (Routledge 2014).

[13] An adaptation regulatory framework is complicated, given the complex nature of adaptation – there is no 'one-size-fits-all' solution. See overview of the topic in UN Climate Change, 'What Do Adaptation to Climate Change and Climate Resilience mean?' <https://unfccc.int/topics/adaptation-and-resilience/the-big-picture/what-do-adaptation-to-climate-change-and-climate-resilience-mean>.

[14] ibid which notes: 'Successful adaptation not only depends on governments but also on the active and sustained engagement of stakeholders including national, regional, multilateral and international organizations, the public and private sectors, civil society and other relevant stakeholders, as well as effective management of knowledge.'

[15] See the extensive list of 63 lessons set out in United Nations Economic Commission for Europe (UNECE) and International Network of Basin Organizations (INBO), 'Water and Climate Change Adaptation in Transboundary Basins:

adaptation regulatory framework at the transboundary level, on the normative level, would need to be flexible and yet robust, capable of addressing changing circumstances, including extreme events, and implemented by joint institutions endowed with relevant operational powers.[16] This 'resilient water management' approach would use basin-wide planning that is coordinated with national adaptation plans, showing extensive efforts at integrating international, national and subnational considerations.[17] It is within this aspirational 'best practice' context that this article explores the governance regimes that apply to China and India's shared freshwaters, in a region where cross-border water cooperation is limited, unilateral action is dominant, and water-related climate resilience capacity is challenged on multiple fronts. As two of the world's largest countries, in terms of their populations and economies,[18] China and India are endowed with close to 20 percent of the Earth's transboundary waters,[19] most of which are not covered by legal agreements and thus almost exclusively subject to domestic control.

Some of the world's greatest river systems – the Yarlung Zangbo-Brahmaputra, Ganges, Indus, and Mekong, to name a few – have their sources in the Tibetan regions,[20] in the so-called 'Himalayan water towers'.[21] While China and India extensively use these transboundary waters,[22] they now become increasingly overexploited and fragile,[23] forming the very nexus of complex regional threats linked to food and energy security, endangered livelihoods and environmental degradation.[24] Competing demands of hydropower production, irrigation, commercial navigation, industrial uses and ecosystem services, put pressure on diminishing shared freshwater resources, while national development policies are implemented unilaterally. As key actors in this part of the world, China and India, through their transboundary water practices (albeit anchored in diverse traditions and practices[25]) could to a large extent determine and influence the region's climate change response.[26] What rules apply to their shared freshwaters, and what impact do these have on regional water-related climate resilience?

Lessons Learned and Good Practices' (UNECE 2015) vi. See also AD Tarlock, 'International Water Law and Climate Disruption' in SC McCaffrey et al (eds), *Research Handbook on International Water Law* (Edward Elgar 2019) 186.

[16] H Cooley and PH Gleick, 'Climate-Proofing Transboundary Water Agreements' (2011) 56 Hydrological Sciences Journal 711, 711.

[17] For a discussion of how water could be integrated under National Adaptation Plans under the international climate regime, Global Water Partnership (GWP), 'Addressing Water in National Adaptation Plans – Water Supplement to the UNFCCC NAP Technical Guidelines' (2nd Edition, April 2019).

[18] China's population approaches 1.5 billion; India's approaches 1.4 billion. China is set to become the world's largest economy; India is currently the fifth. 'The World's Top 5 Largest Economies' (Focus Economics, 27 January 2020) <https://www.focus-economics.com/blog/the-largest-economies-in-the-world>.

[19] Y Liu, 'Transboundary Water Cooperation on The Yarlung Zangbo/Brahmaputra – A Legal Analysis of Riparian State Practice' (2015) 40 Water International 354.

[20] This article does not address issues related to Tibet and Kashmir, contested territorial issues in the region. More generally see OB Hazarika, 'Riparian Relations Between India and China: Exploring Interactions on Transboundary Rivers,' (2015) 6 International Journal of China Studies 63.

[21] D Palmo, 'The World's Third Pole Is Melting. How Can Asian Countries Survive Without Tibetan Glaciers and Water?' (The Diplomat, 28 March 2019).

[22] P Wouters, 'International Law of Watercourses: New Dimensions' in Collected Courses of the Xiamen Academy of International Law Volume 3 (Martinus Nijhoff 2011) 347.

[23] P Wouters, H Chen and JE Nickum, *Transboundary Water Cooperation Principles, Practice and Prospects for China and its Neighbours* (Routledge 2018).

[24] AD Tarlock, 'Toward a More Robust International Water Law of Cooperation to Address Droughts and Ecosystem Conservation,' (2016) 28 Georgetown International Environmental Law Review 261.

[25] E Benvenisti, 'Asian Traditions and Contemporary International law on the Management of Natural Resources,' (2008) 7 Chinese Journal of International Law 273. See also P Wouters, 'The Yin and Yang of International Water Law: China's Transboundary Water Practice and the Changing Contours of State Sovereignty' (2014) 23 Review of European Community and International Environmental Law 67.

[26] D He et al, 'China's Transboundary Waters: New Paradigms for Water and Ecological Security Through Applied Ecology' (2014) 51 Journal of Applied Ecology 1159.

China, a predominantly upstream riparian nation,[27] is the source of most of Asia's major transboundary river systems, which flow into 19 countries and autonomous regions.[28] Although China possesses a vast territory[29] relatively rich in terms of available freshwater resources,[30] it nonetheless suffers from growing water scarcity.[31] In partial response to increasing water demands, China relies on its significant 'hydro-technocratic' legacy,[32] which traditionally involves constructing numerous dams and water storage reservoirs, both at home and abroad.[33] Some of China's transboundary waters are governed by agreements (primarily bilateral); most of these are with its northern neighbours,[34] with sparse engagements along the southern borders.[35] Other than the new cooperative initiatives related to the Lancang-Mekong basin, which are somewhat embryonic and based on soft instruments,[36] China has yet to develop water agreements covering the rivers flowing from the Himalayas.

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[27] Even upstream nations have downstream dependencies; see HA Munia, 'Global Analyses of Drivers of Water Scarcity Drivers in Transboundary River Basins' (PhD dissertation, Aalto University 2020) 14; see also JM Williams, 'Stagnant Rivers: Transboundary Water Security in South and Southeast Asia' (2018) 10 Water 1819.

[28] He et al (n 26) 1365.

[29] S Moore, 'Issue Brief: Water Resource Issues, Policy and Politics in China' (12 February 2013) <http://www.brookings.edu/research/papers/2013/02/water-politics-china-moore>.

[30] China's 22,000-kilometre land border is shared with 14 neighbours and two special administrative regions (Hong Kong and Macau). China's borders are crossed by some 40 major international watercourses (including tributaries). See P Wouters and H Chen, 'China's "Soft-Path" to Transboundary Water Cooperation Examined in the Light of Two Global UN Water Conventions – Exploring the 'Chinese Way' (2013) 22 Journal of Water Law 232; and Y Su, 'Contemporary Legal Analysis of China's Transboundary Water Regimes: International Law in Practice' (2013) 39 Water International 705.

[31] Y Feng and D He, 'Transboundary Water Vulnerability and Its Drivers in China' (2009) 19 Journal of Geographical Sciences 189.

[32] Williams (n 27) suggests that the dominant 'hydraulic mission' is perpetuated by 'hydrocracy' across Asia.

[33] D Palmo, 'Tibet's Rivers Will Determine Asia's Future' (The Diplomat, 1 November 2019) claims that China has built more than 87,000 dams, with more hydropower projects planned in the Tibetan plateau. Hazarika (n 20) describes China's ambitious South North Water Transfer Project (SNWTP) to transfer surplus water from the southern region in China to its northern areas. The author details India's fears about China's diversion projects, given past fatal floods in Arunachal Pradesh and Himachal Pradesh, traced to unannounced excess water releases by China (68). The author also reviews India's nationwide plan of Interlinking Rivers (ILR) to transfer the surplus waters from the north to the south, connecting some 37 major rivers via 30 links consisting of dams and canals (71). See also F Urban, G Siciliano and J Nordensvard, 'China's Dam-Builders: Their Role in Transboundary River Management in South-East Asia' (2018) 34 International Journal of Water Resources Development 747; and X Han, 'Approaches to Investment in Chinese Transboundary Waters,' in Wouters et al (n 23) 219.

[34] S Vinogradov and P Wouters, 'Transboundary Water Cooperation Between the Russian Federation and the Neighbouring States: Legal and Institutional Frameworks' in McCaffrey et al (n 15) 463; and S Vinogradov and P Wouters, 'Sino-Russian Transboundary Waters: A Legal Perspective on Cooperation' (2013) <http://isdp.eu/content/uploads/images/stories/isdp-main-pdf/2013-vinogradov-wouters-sinorussian-transboundary-waters-legal-perspective.pdf>.

[35] For a list of China's agreements with India see DJ Devlaeminck, P Wouters and Y Liu, 'List of China's Transboundary Water Agreements and Related Documents' (January 2020) <https://davidjdevlaeminck.com/research-resources/>. See also the timeline of Sino-Indian relation events in Y Feng, W Wang and J Liu, 'Dilemmas in and Pathways to Transboundary Water Cooperation between China and India on the Yaluzangbu-Brahmaputra River' (2019) 11 Water 2096.

[36] DJ Devlaeminck, 'Timeline of the Lancang-Mekong Cooperation (LMC) Mechanism' (January 2020) <https://davidjdevlaeminprismck.com/research-resources/>; R Kinna and A Rieu-Clarke, *The Governance Regime of the Mekong River Basin: Can the Global Water Conventions Strengthen the 1995 Mekong Agreement?* (Brill 2017); see also S Lee, 'Benefit Sharing in the Mekong River Basin' (2015) 40 Water International 139; G Siwakoti, 'Trans-boundary River Basins in South Asia: Options for Conflict Resolution' (International Rivers 2011) <https://www.internationalrivers.org/resources/trans-boundary-river-basins-in-south-asia-options-for-conflict-resolution-2445>.

India, with 85 percent of its territory located within transboundary river basins, shares them directly with six neighbouring nations – Bangladesh, Bhutan, China, Nepal, Myanmar and Pakistan.[37] India is an upper riparian country *vis-à-vis* Pakistan and Bangladesh, and a lower riparian with respect to Nepal, Bhutan and China. Many of South-Asia's largest transboundary watercourses cross India, including the Ganges-Brahmaputra-Meghna (Bangladesh, Bhutan, China, India and Nepal), the Indus (China, India, Pakistan and Afghanistan),[38] and the Kosi, Mahakali and Gandaki Rivers (India, Nepal).[39] At the domestic level, India as a federal State with a common law system, experiences frequent intra-State (subnational) water disputes.[40]

Despite sharing some important transboundary basins, China and India have yet to conclude a single water-related agreement;[41] and, tensions between the two countries have recently escalated at a shared river border in the Galwan Valley.[42] Thus, China and India have yet to agree even on basic transboundary water cooperative frameworks, a scenario that challenges their climate resilience capabilities.

Following this brief summary of China and India's transboundary waters situation, the article explores the normative regimes that govern their shared freshwaters, with a view to identifying elements that might contribute to an adaptation regulatory framework.[43] The study approaches this from two broad perspectives – the multilateral dimension, involving primarily global environmental transboundary-water related treaties, and the bilateral dimension, considering state practice. Particular attention is paid to China and India's watercourse agreements, exploring the extent to which they facilitate cooperative engagement, [44] and water governance.[45] The article's findings, presented

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[37] India shares 54 major rivers with Bangladesh, 16 major rivers with China, 6,000 rivers and rivulets with Nepal, six major rivers with Pakistan, eight major and minor rivers with Bhutan, and some more rivers with Myanmar. See Institute for Defence Studies and Analyses (IDSA), 'Water Security for India: The External Dynamics' (IDSA 2010) 10.

[38] SK Jain, PK Agarwal and VP Singh, *Indus Basin. Hydrology and Water Resources of India* (Springer 2007).

[39] UNEP, 'Freshwater Resources Under Threat: South Asia Vulnerability Assessment of Freshwater Resources to Environment Change' (UNEP 2009).

[40] C Dilleen, 'Water Scarcity and Global Politics Are Taking the World to the Precipice' (Australian Strategic Policy Institute, 28 January 2020) <https://www.aspistrategist.org.au/water-scarcity-and-global-politics-are-taking-the-world-to-the-precipice/>; A Singh and AK Gossin, 'Resolving Conflicts over Transboundary Waters: An Indian Perspective' (2004) 4 Land Use and Water Resources Research 2.1.

[41] A recent agreement is the 'Joint Statement between the Republic of India and the People's Republic of China on Building a Closer Developmental Partnership' (2014) <https://www.mea.gov.in/bilateral-documents.htm?dtl/24022/Joint+Statement+between+the+Republic+of+India+and+the+Peoples+Republic+of+China+on+Building+a+Closer+Developmental+Partnership>, which gives the Strategic Economic Dialogue broad parameters within which to explore new areas for economic cooperation (para 4). The Statement also provides: '[t]he Indian side expressed appreciation to China for providing flood-season hydrological data and the assistance in emergency management. The two sides will further strengthen cooperation through the Expert-Level Mechanism on the provision of flood-season hydrological data and emergency management, and exchange views on other issues of mutual interest' (para 17). Also in 2014, the two countries agreed the 'Implementation Plan between the Central Water Commission, Ministry of Water Resources, River Development and Ganga Rejuvenation, the Republic of India and the Bureau of Hydrology and Water Resources, Tibet Autonomous Region, the People's Republic of China upon Provision of Hydrological Information of the Yarlung Zangbu/Brahmaputra River in Flood Season by China to India' <http://fnvaworld.org/2014-july-implementation-plan-between-india-and-china-for-yarlung-tsangpo-and-brahmaputra-river/>.

[42] After a period of smooth relations, recent tensions led to battles in the border region, with 20 Indians reportedly killed in hand-to-hand combat; reports are divided on who provoked the conflict; see L Kuo, 'Satellite Images Show Chinese Construction near Site of India Border Clash' (The Guardian, 25 June 2020). The last clash in this region was the serious 2017 Doklam standoff, mitigated somewhat by the 2018 Wuhan summit; see I Lidarev, '2019: Reviewing a Passable Year in China-India Relations' (The Diplomat, 4 January 2020).

[43] Tarlock (n 15).

[44] See generally, S McCaffrey, *The Law of International Watercourses* (3rd edn, Oxford University Press 2019); C Leb, *Cooperation in the Law of Transboundary Water Resources* (Oxford University Press 2013).

[45] KA Thomas, 'The Ganges Water Treaty: 20 Years of Cooperation, on India's Terms' (2017) 19 Water Policy 724, 726. See also K Uprety and SMA Salman, 'Legal Aspects of Sharing and Management of Transboundary Waters in South Asia: Preventing Conflicts and Promoting Cooperation' (2011) 56 Hydrological Sciences Journal 641.

in the last part, suggest the potential building blocks of a yet inchoate adaptation regulatory framework.

2 THE MULTILATERAL DIMENSION

Multilateral environmental agreements[46] and international legal and institutional arrangements, including UN-related initiatives such as the SDG,[47] offer important opportunities for integrating climate concerns with effective transboundary water cooperation. China[48] and India[49] are parties to a large number of multilateral environmental agreements (MEAs).[50] Most relevant to the present discussion, and selected for more detailed discussion here are the Convention on Wetlands of International Importance (Ramsar Convention);[51] the Convention on Biological Diversity (CBD);[52] and the UN Framework Convention on Climate Change (UNFCCC).[53] China and India, as parties to these instruments, have opportunities to interact frequently through the institutional mechanisms and processes functioning under each – for example, at the regular meetings of the Conference of the Parties (COPs), and through other conventional activities, including the various committees and in national reporting. [54] In addition to providing cooperation platforms, these MEAs also provide complementary normative frameworks that support transboundary water cooperation. As just one example from the CBD, Article 3 includes the obligation to 'not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction'.[55] In line with the practice under most MEAs, the CBD has a dedicated programme of work, with some crossover with transboundary waters and climate change issues. For instance, a CBD COP Decision related to inland waters and

[46] RB Mitchell et al, 'What We Know (and Could Know) About International Environmental Agreements' (2020) 20 Global Environmental Politics 103. See also N Goeteyn and F Maes, 'Compliance Mechanisms in Multilateral Environmental Agreements: An Effective Way to Improve Compliance?' (2011) 10 Chinese Journal of International Law 791, 793, which highlights the 'increasingly elaborate' institutional arrangements emerging under MEAs, that 'continuously contribute to the establishment of the rule of law', revealing an emerging new body of norms and processes in this field.

[47] B Pisupati, 'Role of the Multilateral Environmental Agreements in Achieving the Sustainable Development Goals' (UNEP 2016) 10–12.

[48] For a list of China's MEAs see <https://www.informea.org/en/countries/CN/parties>. For more information, see International Environmental Agreements (IEA) Database Project <https://iea.uoregon.edu/summarize-membership/China?field_inclusion_auto_value=MEA>.

[49] For a list of India's MEAs see <https://www.informea.org/en/countries/IN/parties>.

[50] See also DB Magraw and P Udomritthiruj, 'Water and Multilateral Environmental Agreements: An Incomplete Jigsaw Puzzle' in McCaffrey et al (n 34) 166.

[51] Convention on Wetlands of International Importance Especially as Waterfowl Habitat (adopted 2 February 1971, entered into force 21 December 1975) 14583 UNTS 996. Ramsar provides the framework for the conservation and wise use of wetlands and their resources, including transboundary wetlands. Its Conference of the Parties meets every three years. See J Lee, 'The Governance of Wetland Ecosystems and the Promotion of Transboundary Water Cooperation – Opportunities Presented by the Ramsar Convention' in Wouters et al (n 23) 70.

[52] Convention on Biological Diversity (adopted 5 June 1992, entered into force 29 December 1993) 30619 UNTS 1760 (CBD). The CBD has 3 key objectives: the conservation of biological diversity; the sustainable use of the components of biological diversity; and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources. Its Conference of the Parties meets annually. S Brels, D Coates and F Loures, 'Transboundary Water Resources Management: The Role of International Watercourse Agreements in Implementation of the CBD' (Secretariat of the CBD 2008) Annex III (summarizing similarities between the UN water conventions and the CBD).

[53] United Nations Framework Convention on Climate Change (adopted 9 May 1992, entered into force 21 March 1994) 30822 UNTS 1771. UNFCCC is overall framework for intergovernmental efforts to tackle the challenge posed by climate change. Its Conference of the Parties meets annually.

[54] The former Director General of UNEP, Achim Steiner, observed that MEAs 'individually and collectively create an umbrella for drawing together the results of different international assessment and reporting processes, both regional and global. This calls attention to the overall effectiveness of convention goals and measures and may stimulate additional commitments.' A Steiner, LA Kimball and J Scanlon, 'Global Governance for the Environment and the Role of Multilateral Environmental Agreements in Conservation' (2003) 37 Oryx 227, 230.

[55] CBD (n 52) art 3.

biodiversity refers to climate change impacts on water and invites parties to strengthen coherence and collaboration at the national and multilateral levels to better address the interlinked challenges related to water and climate change.[56] Further, the CBD aligns its future work in this field with the 'ambitious goals' to 'protect and restore water-related ecosystems' set under SDG 6.6.[57]

In a similar vein, the Ramsar Convention contains provisions and processes that deal with activities that may affect transboundary waters. Its Article 5 requires parties to cooperate in the conservation, wise use and management of wetlands, including transboundary wetlands.[58] This duty is monitored through regular reporting and aided by various conventional institutional meetings and activities, which provide soft but supportive implementation mechanisms. Under Ramsar, China lists some 61 sites, and India has 36,[59] but they have not yet listed any transboundary Ramsar sites in common for both.[60]

It is worth mentioning that the International Court of Justice (ICJ) has considered the overlay of obligations across the Convention on Biological Diversity, the Ramsar Convention and international water and environmental law. In its series of decisions related to the San Juan River between Costa Rica and Nicaragua, the ICJ provided guidance on how the various rules of international law that applied to transboundary activities could be read together to achieve a regulatory continuum.[61] The Court's provisional measures invoked the institutional cooperative framework under Ramsar, calling for Costa Rica to consult with the Ramsar Secretariat, and to use its best endeavours to find common solutions with Nicaragua.[62] In its final decision on the merits, the Court provided more detail about the interplay of environmental obligations, including under CBD and Ramsar.[63] Taken together, the ICJ's collected views regarding the transboundary activities on the San Juan River offers new understandings on the range of duties related to transboundary harm – from treaty obligations under the CBD and Ramsar, to the requirement to conduct an environmental impact assessment,[64] and the duty to notify and consult in good faith with the potentially affected State.[65] The Court's most recent decision (on assessment of compensation) found a causal link

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[56] CBD 'Decision X/28, Inland Waters Biodiversity' UN Doc UNEP/CBD/COP/DEC/X/28 (29 October 2010) paras 2, 22–28.

[57] 'Inland Waters – Post 2020 Targets' (2020) <https://www.iucn.org/sites/dev/files/one_pager_post_2020_fw_final_002.pdf> stating that the CBD's post 2020 targets should prioritize the protection of ecosystems and their biodiversity.

[58] For more details see Lee (n 51) 78, observing that 'the Ramsar Convention can be a catalyst for cooperation based on environmental management goals and the sharing of benefits associated with healthy ecosystems'.

[59] 'Ramsar Sites Information Service' < https://rsis.ramsar.org/ris-search/?f%5B0%5D=regionCountry_en_ss%3AAsia>.

[60] 'List of Transboundary Ramsar Sites' (2019) <https://www.ramsar.org/sites/default/files/documents/library/list_of_transboundary_sites.pdf>.

[61] *Certain Activities Carried Out by Nicaragua in the Border Area (Costa Rica v Nicaragua) and Construction of a Road in Costa Rica along the San Juan River (Nicaragua v Costa Rica)* (Judgment) [2015] ICJ Rep 665 (*San Juan River* Judgment).

[62] *Certain Activities Carried Out by Nicaragua in the Border Area (Costa Rica v Nicaragua) and Construction of a Road in Costa Rica along the San Juan River (Nicaragua v Costa Rica)* (Provisional Measures) [2015] ICJ Rep 2011. See also the separate Declaration of Judge Greenwood (who supported the provisional measures ordered by the Court) and separate Opinion of Judge Xue (who voted against the provisional measures) 53.

[63] *San Juan River* Judgment (n 61) 100-120.

[64] The Court in *San Juan River* referred to its decision in *Pulp Mills on the River Uruguay (Argentina v Uruguay)* (Judgment) [2010] ICJ Rep 14, where the due diligence rule was elaborated, finding that 'it may now be considered a requirement under general international law to undertake an environmental impact assessment where there is a risk that the proposed industrial activity may have a significant adverse impact in a transboundary context, in particular, on a shared resource' (ibid 83, para 204); see *San Juan River* Judgment (n 61) 45, para 104.

[65] ICJ, 'Summary of the Judgement' (16 December 2015) <https://www.icj-cij.org/files/case-related/150/18870.pdf> 5. See also O McIntyre, 'The Proceduralisation and Growing Maturity of International Water Law: Case concerning Pulp Mills on the River Uruguay (Argentina v Uruguay), International Court of Justice, 20 April 2010' (2010) 2 Journal of Environmental Law 475.

between Nicaragua's actions (excavation of channels) and the environmental damage in Costa Rica.[66] The *San Juan River* ICJ decisions demonstrate how normative coherence might be achieved where different customary and conventional rules apply, illustrating how a series of regulatory regimes can be considered together to achieve coherent outcomes.

A third MEA relevant for this study, given its emphasis on adaptation, is the UNFCCC, as well as its Paris Agreement.[67] The primary aim of the UNFCCC is to reduce greenhouse gases emissions so as to limit the adverse impacts from climate change. As an instrument within the UNFCCC, the Paris Agreement aims 'to strengthen the global response to the threat of climate change' by, among others, '[h]olding the increase in the global average temperature to well below 2 °C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5 °C above pre-industrial levels' as well as '[i]ncreasing the ability to adapt to the adverse impacts of climate change and foster climate resilience'.[68] The Paris Agreement also introduces a global goal of on adaptation of enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change, with a view to contributing to sustainable development and ensuring an adequate adaptation response'.[69] With its focus on consensus-building, and its national bottom-up approach, the Paris Agreement uses soft measures to encourage mitigation outcomes.[70] This includes National Adaptation Plans (NAPs), which are nationally driven action programmes aimed at contributing to addressing the impacts of climate change.[71] NAPs help to strengthen resilience and reduce vulnerability to climate change.[72] Integral to these NAPs are measures promoting wise water use, including with respect to transboundary waters.[73] In this regard, experts consider that 'robustness and flexibility' are the best ways to address the uncertainties across the many sectors connected with water.[74] In transboundary basins, this means adopting a basin-wide approach to allocation issues, and preferably through a basin-wide mechanism[75] that could provide ongoing evaluations of best management practices to deal with adaptation needs.[76] Ideally, there would be effective enforcement measures across the basin so as to ensure compliance with adaptation regulatory management regimes.[77] Despite this call for best practice in the transboundary context, the reality on the ground is quite different, highlighting the 'critical role' that transboundary water cooperation plays in this regard.[78]

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[66] *Certain Activities Carried Out by Nicaragua in the Border Area (Costa Rica v Nicaragua) and Construction of a Road in Costa Rica along the San Juan River (Nicaragua v Costa Rica)* (Provisional Measures) [2018] ICJ Rep 15 para 72.
[67] Paris Agreement (adopted 12 December 2015, entered into force 4 November 2016) 55 ILM 740.
[68] ibid art 2.
[69] ibid art 7.
[70] Notably through its use of 'nationally determined contributions'; ibid art 4.
[71] The national adaptation plan (NAP) process was established under the UNFCCC's Cancún Adaptation Framework, which aims to enhance action on adaptation, including through international cooperation and coherent consideration of matters relating to adaptation. See <https://unfccc.int/process/conferences/pastconferences/cancun-climate-change-conference-november-2010/statements-and-resources/Agreements>.
[72] In UNFCCC, 'Summary of Measures Undertaken by Developing Country Parties in the Process to Formulate and Implement National Adaptation Plans as at 20 November 2019' (2019) <https://www4.unfccc.int/sites/NAPC/Pages/NAPProgress2019.aspx> China, under 'Reporting, monitoring and review' is listed as 'Designing/applying a monitoring and evaluation framework or system'. To date, it appears that neither China nor India have filed NAPs; see <https://www4.unfccc.int/sites/NAPC/News/Pages/national_adaptation_plans.aspx>.
[73] GWP (n 17) 53. See also I Timboe, K Pharr and JH Matthews, 'Watering the NDCs: National Climate Planning for 2020 (Alliance for Global Water Adaptation 2020) <https://www.wateringthendcs.org/> and <https://static1.squarespace.com/static/5e8397698c906c4df39838f5/t/5ec6d7cd9f34555fcdedb15f/1590089682847/Watering-the-NDCs-May-2020.pdf>.
[74] Timboe et al (n 73) 7.
[75] GWP (n 17) 54. A 'vulnerability assessment' at the transboundary basin scale is one recommended best practice.
[76] Timboe et al (n 73) 10.
[77] ibid.
[78] GWP (n 17) 54.

Notwithstanding the obvious connections between transboundary water resources and the normative horizon and practice of MEAs, the body of legal rules across these regimes is disjointed and fragmented.[79] Thus, while global environmental initiatives gain increasing importance, their impact in terms of enhancing joined-up climate-change resilient transboundary water governance is surprisingly insignificant.[80] However, there is another global normative platform that might offer support for improved international cooperation. Could the UN's work on the rules of international law that govern transboundary waters help to fill the climate resilience regulatory gaps?

The UN has codified and progressively developed a system of legal rules that govern the uses of transboundary waters in two complementary instruments – the 1997 UN Convention on the Law of Non-navigational uses of International Watercourses (Watercourses Convention)[81] and the 1992 UNECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Water Convention).[82] Both include substantive and procedural rules that may contribute to developing adaptation approaches. These include provisions concerning the development and use of shared freshwaters in ways that are equitable and reasonable, supported by cooperative procedures and joint bodies. These three elements – the duty to cooperate, the rule of equitable and reasonable use, and institutional mechanisms – are the hallmarks of an adaptation regulatory framework.

Despite the fact that neither China nor India are party to the UN global water conventions, each nation was actively involved in the development and negotiation of the Watercourses Convention.[83] The Water Convention, also developed under the auspices of the UN but in a pan-European regional context, is now open for global accession;[84] it provides useful guidance and offers best practices to address water-related issues.[85] The two UN water frameworks enable climate-proofing practices, primarily through the 'comprehensive cooperation' approaches promoted under each, which include both substantive and procedural norms.[86]

Both China and India each expressed their views on various provisions in the changing draft of the UN Watercourses Convention. Each stressed the importance of national sovereignty, including within the context of the Convention's bedrock principle of equitable and reasonable use,[87] and the

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[79] Magraw and Udomritthiruj, (n 50) 184; MA Young, 'Fragmentation and International Environmental Law' in L Rajamani and J Peel (eds), *Oxford Handbook of International Environmental Law* (2nd edn, Oxford University Press fc) <https://ssrn.com/abstract=3441535>; see also O McIntyre, *Environmental Protection of International Watercourses under International Law* (Routledge 2016); and J Lee, *Preservation of Ecosystems of International Watercourses and the Integration of Relevant Rules: An Interpretative Mechanism to Address the Fragmentation of International Law* (Brill/Nijhoff 2014).

[80] Feng et al (n 35).

[81] United Nations Convention on the Law of Non-Navigational Uses of International Watercourses (adopted 21 May 1997, entered into force 14 August 2014) 1997 36 ILM 700 (Watercourses Convention).

[82] Convention on the Protection and Use of Transboundary Rivers and Lakes (adopted 17 March 1992, entered into force 6 October 1996) 1936 UNTS 269 (Water Convention).

[83] Three countries voted against the UN Resolution adopting the Watercourses Convention; Burundi, China and Turkey, all upper riparians; India (middle riparian) abstained; Bangladesh (a lower riparian country) voted for; Pakistan abstained. Of the other South Asian States, Nepal voted for and Bhutan was absent. Only two Asian States acceded to the Convention (Vietnam and Uzbekistan) of the current 53 States that endorse the Watercourses Convention (37 parties, 16 signatories). See < https://treaties.un.org/pages/ViewDetails.aspx?src=IND&mtdsg_no=XXVII-12&chapter=27&lang=en>.

[84] Only a handful of Asian States have signed up to one or both legal framework instruments – Azerbaijan, Kazakhstan, Russia, Turkmenistan, Uzbekistan, and Vietnam. Russia and Kazakhstan each have bilateral transboundary water agreements with China; China has participated in meetings related to the Water Convention.

[85] A Tanzi et al (eds), *The UNECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes: Its Contribution to International Water Cooperation* (Brill/Nijhoff 2015). For a recent look at the Watercourses Convention, see: G Eckstein, 'The Status of the UN Watercourses Convention: Does It Still Hold Water?' (2020) 36 International Journal of Water Resources Development 429.

[86] A Tanzi, 'The Economic Commission for Europe Water Convention and the United Nations Watercourses Convention: An Analysis of their Harmonized Contribution to International Water Law' UN Doc ECE/MP.WAT/42 (2015). See also Tarlock (n 14).

[87] UNGA 'Summary Record of the 15th Meeting, Fifty-First Session, 6th Committee' UN Doc A/C.6/51/SR.15 (8 October 1996) 7. China characterized the Convention's draft provision (Article 5) as 'the cornerstone [which] sets forth

rules related to the protection and preservation of the environment of transboundary waters.[88] As one example, India suggested that national territorial integrity be considered as a factor under the approach in Article 6, which provides the approach for determining an equitable and reasonable use.[89] China, on the other hand, expressed its concerns that the draft Convention appeared to favour downstream riparian nations, and challenged the 'no-harm' rule in Article 7.[90] China also disagreed with the compulsory dispute settlement provisions under Article 33, which China considered had no place in a framework instrument.[91] While in the end, China voted against the UN resolution adopting the UN Watercourses Convention,[92] it nonetheless supported the principle of equitable and reasonable use, as did India.[93] One can argue that this norm is at the core of the adaptation provisions in both water conventions – the co-relative entitlement and duty to share in the beneficial uses of transboundary waters. How this balance is to be achieved is set forth in Article 6 of the Watercourses Convention, which provides an indicative list of factors to be considered in the determination of equitable and reasonable use, to be evaluated on a case-by-case basis. Among these factors are 'geographic, hydrographic, hydrological, climatic, ecological and other factors of a natural character',[94] which are integral to the overall evaluation. The effective implementation of the

a general principle … establish[ing] a proper balance between the rights and responsibilities of each watercourse State'. India also endorsed the principle, albeit reiterating the importance of a riparian State's sovereignty over the waters that crossed its territory. The Indian representative stated: 'The protection, planning, and development of water resources should be based on the needs of the population of the territory through which the river first flowed, in accordance with the principles of optimal, reasonable and equitable distribution of water resources. … The principle of the sovereign equality of States required that, while they had the freedom to engage in any activity, States should refrain form injuring the interests of other States.' See UNGA 'Summary Record of the 28th Meeting, 46th Session, 6th Committee' UN Doc A/C.6/46/SR.28 (26 November 1991) 12; and also UNGA 'Summary Record of the 29th Meeting, 31st Session, 6th Committee' UN Doc A/C.6/31/SR.29 (29 October 1976) 6.

[88] For more see O McIntyre, 'Benefit-Sharing and Upstream/Downstream Cooperation for Ecological Protection of Transboundary Waters: Opportunities for China as an Upstream State' (2015) 40 Water International 48. See also O McIntyre, 'Environmental Protection and the Ecosystem Approach' in McCaffrey et al (n 34) 126.

[89] UNGA 'Summary Record of the 28th Meeting' (n 87) 4, 9 and 12; see also UNGA, 'Summary Record of the 16th Meeting, Fifty-First Session, 6th Committee' UN Doc A/C.6/51/SR.16 (9 October 1996) 12; UNGA, 'Summary Record of the 17th Meeting, Fifty-First Session, 6th Committee' UN Doc A/C.6/51/SR.17 (9 October 1996) 5. On the factors relevant to determining equitable and reasonable use (Article 6), India proposed that the contribution of water made by a riparian State should be included for consideration. However, this proposal, consistent with the International Law Association's (ILA) Helsinki Rules, did not find its way into the final draft articles of the Watercourses Convention; see Helsinki Rules on the Uses of Waters of International Rivers, in International Law Association (ILA), 'Report of the Fifty-Second Conference of the International Law Association' (ILA 1966) 484.

[90] UNGA '99th Plenary Meeting, Fifty-First Session' UN Doc A/51/PV.99 (21 May 1997) 6. China refused to support the original formulation of the provision, considering it an 'obvious imbalance' between the interests of upstream and downstream riparian nations that could compromise the broad acceptance and implementation of the draft Convention.

[91] China could not agree to compulsory dispute settlement measures; States are free to choose their preferred methods on case-by-case basis. See ibid. In the Working Group of the Whole, five countries voted against the draft provision on dispute settlement (Article 33) – *China*, Colombia, France, *India* and Turkey; see UN Working Group of the Whole Record UN Doc A/C.6/51/NUW/L.4/Add.1 (4 April 1997).

[92] DJ Devlaeminck and X Huang, 'China and the Global Water Conventions in Light of Recent Developments: Time to Take a Second Look?' (2020) 29 Review of European, Comparative and International Environmental Law.

[93] Draft Articles on the Law of the Non-Navigational Uses of International Watercourses, in International Law Commission (ILC) 'Yearbook of the International Law Commission 1994, Volume II' UN Doc A/CN.4/SER.A/1994/Add.l (Part 2). See also S McCaffrey, 'The International Law Commission Adopts Draft Articles on International Watercourses' (1995) 89 American Journal of International Law 395, 399; see also P Wouters, 'The Legal Response to International Water Conflicts: The UN Watercourses Convention and beyond' (1999) 42 German Yearbook of International Law 293.

[94] Watercourses Convention (n 81) art 6(1)(a). The list of factors includes social and economic factors and consideration of alternative uses. The weight to be given each factor will depend upon its importance considering the other factors, and 'all relevant factors are to be considered together and a conclusion reached on the basis of the whole' (ibid art 6(3)). On desalination as an alternative use, see RB Larson, 'Innovation and International Commons: The Case of Desalination Under International Law' (2012) Utah Law Review 759.

approach provided under Articles 5–7 of the Watercourses Convention requires a high level of transparency and cooperation between the riparian nations.

This summary of the multilateral dimension within which China and India's transboundary water climate change situation might be considered leads to the following observations. First, the MEAs which they are party to provide significant opportunities and institutional mechanisms for building the type of 'comprehensive cooperation' needed to address climate change issues in transboundary water regimes, even in incremental ways. Notable aspects of MEA practice are particularly relevant in this regard: (i) the blended soft law/hard law interface, and the evolving lawmaking functions; (ii) the sophisticated conventional institutions, which include facilitative compliance mechanisms. These approaches have fostered a remarkably high level of compliance observance, in some cases even exceeding treaty requirements.[95] Second, despite the soft nature of many of the MEA provisions, these have led to concrete action on the ground, such as the global proliferation of NAPs under the UNFCCC, which have included resilient water resource management strategies.[96] The UN water conventions complement these efforts through providing guidance on best practices that promote cooperative and adaptive approaches. Integral to these are the cornerstone principles of the duty to cooperate and the rule of equitable and reasonable use, both endorsed by China and India in their contributions to the formulation of the UN Watercourses Convention.

The next section considers the bilateral dimension of the transboundary water practices of China and India, with a view to assessing the extent of their cooperative activities and also their approach to transboundary water governance.

3 THE BILATERAL DIMENSION

The 'Panchsheel Treaty', which endorsed the so-called 'Five Principles of Peaceful Coexistence',[97] serves as a backdrop for China and India's bilateral transboundary water-related activities.[98] This principles-based approach, anchored in the notion of State sovereignty, is reflected in the treaty practice examined below. In spite of their quite different legal traditions,[99] each country follows the same 'one-country-one treaty' approach to transboundary water diplomacy.[100] China has concluded boundary and water utilization agreements mostly with its four northern neighbours – Kazakhstan, Mongolia, North Korea and Russia.[101] Apart from the emerging soft cooperation on the Lancang/Mekong (functioning in tandem with the lower riparians formal legal agreement on the

[95] Goeteyn and Maes (n 46) 801.

[96] In China, the 'Red Line' approach included in China's Five-Year Plan includes measures to address water management challenges; see GWP, 'China's Water Resources Management Challenge: The "Three Red Lines"' (2015) <https://www.gwp.org/globalassets/global/toolbox/publications/technical-focus-papers/tfpchina_2015.pdf>.

[97] The Five Principles include: (i) mutual respect for each other's territorial integrity and sovereignty; (ii) mutual non-aggression; (iii) mutual non-interference with the internal affairs of the other party; (iv) equality and mutual benefit; and (v) peaceful coexistence.

[98] Agreement Between the Peoples Republic of China and the Republic of India on Trade and Intercourse between the Tibet Region of China and India (adopted 29 April 1954) <http://www.mea.gov.in/bilateral-documents.htm?dtl/7807/Agreement+on+Trade+and+Intercourse+with+Tibet+Region>. These have been reaffirmed by President Xi; J Xi, 'Carry forward the Five Principles of Peaceful Coexistence to Build a Better World through Win-win Cooperation' (People's Daily Online, 10 July 2014) <http://en.people.cn/n/2014/0710/c90883-8753393.html>.

[99] See Benvenisti (n 25); and T Wang, 'International Law in China: Historical and Contemporary Perspectives' (1990) 221 Collected Courses of the Hague Academy of International Law 195.

[100] Wouters and Chen (n 30); Uprety and Salman (n 45).

[101] At the time of the founding of the People's Republic of China in 1949, most of its borders were not demarcated, explaining why some transboundary water agreements are found in border treaties; see H Xue, 'Chinese Perspectives on International Law: History, Culture and International Law' (2011) 355 Collected Courses of the Hague Academy of International Law 41, 82.

Mekong),[102] the southern transboundary watercourses originating in China have no international water agreements.[103]

India's transboundary water practice shows a variety of approaches. From the detailed 1960 Indus Waters Treaty (with Pakistan),[104] to the more general 1996 agreement on the Ganges[105] (with Bangladesh);[106] and the four bilateral treaties with Nepal[107] (the 1954 Kosi Agreement, the 1959 Gandak Agreement,[108] the 1991 Tanakpur Memorandum of Understanding[109] and the 1996 Mahakali Treaty).[110] There are also some arrangements with Bhutan, China and Nepal related to hydrological data exchange and the development of various hydro-electric projects.[111] China and India have established a Strategic Economic Dialogue, which provides a forum for addressing water-related issues,[112] as well as some agreements and institutional arrangements on data sharing that continue to increase.[113] Despite this, lingering tensions between India and China over their shared transboundary waters have recently escalated.[114]

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[102] There is emerging basin-wide cooperation on the Lancang/Mekong, including increased exchanges; see 'China Pledges Mekong River Data-Sharing, Details Unclear' (Reuters, 24 August 2020); see also MF McPherson, 'China's Role in Promoting Transboundary Resource Management in the Greater Mekong Basin (GMB) (Harvard Kennedy School, March 2020); Lancang-Mekong Cooperation, 'Phnom Penh Declaration of the Second Mekong-Lancang Cooperation (MLC) Leaders' Meeting "Our River of Peace and Sustainable Development"' (10 January 2018); Mekong Agreement between the four lower riparians: Agreement on the Cooperation for the Sustainable Development of the Mekong River Basin (adopted 5 April 1995) < http://www.mrcmekong.org/assets/Publications/policies/agreement-Apr95.pdf>.

[103] The Shiquan/Indus River (China, India and Pakistan), the Lancang/Mekong (China, Myanmar, Thailand, Cambodia, Laos and Vietnam) and the Yaluzangbu/Brahmaputra River (China, Bangladesh and India) are not covered by any transboundary agreement.

[104] Treaty between India and Pakistan Regarding the Use of the Waters of the Indus (adopted 19 September 1960, entered into force 1 April 1960) 419 UNTS 125 (Indus Waters Treaty).

[105] Thomas (n 45) 726. See also, more generally, SMA Salman and K Uprety, 'Shared Watercourses and Water Security in South Asia: Challenges of Negotiating and Enforcing Treaties' (2018) 3 Brill Research Perspectives in International Water Law 1.

[106] Treaty Between the Government of the People's Republic of Bangladesh and the Government of the Republic of India on Sharing of the Ganga/Ganges Waters at Farakka (adopted 12 December 1996) (Ganges Treaty); see I Hossain, 'Bangladesh-India Relations: The Ganges Water-Sharing Treaty and Beyond' (1998) 25 Asian Affairs: An American Review 131; and C Sadoff et al, 'Ten Fundamental Questions for Water Resources Development in the Ganges: Myths and Realities' (2013) 15 Water Policy 147, 155.

[107] Amended Agreement between his Majesty's Government of Nepal and the Government of India Concerning the Kosi Project (adopted 19 December 1966); Treaty between His Majesty's Government of Nepal and the Government of India concerning the Integrated Development of the Mahakali River Including Sarada Barrage and Pancheshwar Project (adopted 12 February 1996).

[108] Agreement between His Majesty's Government of Nepal and the Government of India on the Gandak Irrigation and Power Project (adopted 4 December 1959).

[109] The Treaty between His Majesty's Government of Nepal and the Government of India concerning the Integrated Development of the Mahakali River including Sarada Barrage, Tanakpur Barrage and Pancheshwar Project (adopted 12 February 1996, entered into force 5 June 1997) (India-Nepal Treaty) art 11.

[110] Uprety and Salman (n 40); see also SP Subedi, 'Hydro-Diplomacy in South Asia: The Conclusion of the Mahakali and Ganges River Treaties' (1999) 93 American Journal of International Law 953.

[111] IDSA (n 37). India's upstream water management affects Pakistan, Bangladesh and Nepal, with recurring concerns downstream.

[112] India has asked China to enhance its data-sharing cooperation on the Brahmaputra and Sutlej rivers. See 'Why India Needs to Buy Better Water Data from China' (10 January 2020) <https://www.thethirdpole.net/en/2020/01/10/why-india-needs-to-buy-better-water-data-from-china/>. The data-sharing is facilitated through the India-China Expert Level Mechanism on Transborder Rivers, under the India-China Strategic Economic Dialogue, which covers seven thematic areas; see JT Karackattu, 'India-China Strategic Economic Dialogue: Another Positive Step' (IDSA, 3 October 2011).

[113] Feng et al (n 32).

[114] The Donglang/Doklam standoff brought troops to the border between the two countries in 2017; while things have cooled down, tensions remain. During this period China stopped sharing hydrological data, claiming that the monitoring stations were being repaired; see also 'Unquenchable Thirst: A Growing Rivalry between India, Pakistan and China over the Region's Great Rivers May Be Threatening South Asia's Peace' (The Economist, 19 November 2011).

Given the requirements of an adaptation regulatory framework, the bilateral transboundary water relations between China and India will be examined in light of their cooperative measures and adaptive capacity. Several general observations can be made at the outset. First, both countries endorse the normative rule at the heart of adaptation – the rule of equitable and reasonable use. Further, both countries embrace the use of institutional mechanisms in the cooperative management of their shared freshwaters. Second, despite these similarities, China and India adopt divergent approaches to treaty design. China's watercourse agreements contain rather general provisions, espousing a predominantly principles-based approach.[115] By contrast, India has been quite detailed and used more prescriptive terms to set forth the practical implementation of the principle.[116] For example, India and Pakistan agreed on a detailed regime on the allocation of the waters and uses of the Indus basin, through the 'equal' division of the six major rivers of the system; with the primary use of the three Eastern rivers accorded to India, and the three Western Rivers to Pakistan.[117] A similar prescriptive approach has been chosen for the Ganges, shared by India and Bangladesh.[118]

A third observation relates to the central role of joint bodies in both countries' treaty practice, which are responsible, in China's case, for mostly technical matters, including data exchange and project specific topics. [119] China's bilateral agreements with Russia, Mongolia and Kazakhstan are cases in point.[120] China has established several joint bodies,[121] such as the Sino-Mongolian Joint Transboundary Waters Commission,[122] the Sino-Russian Joint Border Commission,[123] the Sino-Kazakh Joint Border Commission,[124] as well as the Sino-Kazakh Commission on Cooperation in the Field of Environmental Protection.[125] None of China's transboundary water agreements provide for compulsory dispute settlement, preferring instead consultations or diplomatic negotiations, [126] which is consistent with its traditional approach to inter-State controversies generally.[127] Where no treaty

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[115] China-Mongolia, Agreement on the Protection and Utilization of Boundary Waters (1994); China-Kazakhstan, Agreement on Cooperation in the Use and Protection of Transboundary Rivers (2001); China-Russia, Agreement on Management and Protection of Transboundary Waters (2008) (all on file with authors). These treaties are discussed further in Wouters and Chen (n 30).

[116] The Ganges Treaty (n 106) adopts a detailed water-sharing approach, with provision to accommodate the lean season flows at Farakka from January to May each year.

[116] CWC, 'World Water Day 2009 Theme Paper on Transboundary Waters' (Government of India Ministry of Water Resources, Central Water Commission 2009) 15 (on file with author). (CWC Theme Paper).

[117] Indus Waters Treaty (n 104) art II.

[118] Ganges Treaty (n 106).

[119] Wouters and Chen (n 30) 237, including the China Kazakhstan, China-Russia and China-Mongolia agreements. See also data exchange arrangements with the Mekong River Commission: 'MRC and China Renew Pact on Water Data Provision and Other Cooperative Initiatives' (Mekong River Commission, 19 July 2019) <http://www.mrcmekong.org/news-and-events/news/mrc-and-china-renew-pact-on-water-data-provision-and-other-cooperation-initiatives/>; and MRC-LMC, 'Memorandum of Understanding between the Mekong River Commission Secretariat and the Lancang-Mekong Water Resources Cooperation Center' (2019); and with India and Bangladesh: Memorandum of Understanding Concerning the Provision of Hydrological Information of the Brahmaputra/Yaluzangbu River in Flood Season by China to Bangladesh (2008); Memorandum of Understanding upon Provision of Hydrological Information of the Yaluzangbu/Brahmaputra River in Flood Season by China to India (2008).

[120] These agreements include procedures for future developments. See Wouters and Chen (n 30), specifically China-DPRK, Protocol on Borderline (1964), China-Vietnam, Provisional Agreement on the Settlement of Border Affairs (1991) (on file with the authors).

[121] Wouters and Chen (n 30).

[122] China-Mongolia Agreement (n 115) art 10.

[123] China-Russia, Sino-Soviet Border Regime agreement (1991) (on file with the authors) art 50.

[124] China-Kazakhstan, Border Regime Agreement (1994) (on file with the authors) art 49.

[125] China-Kazakhstan, Agreement on Protection of Water Quality of Transboundary Rivers (2011) (on file with the authors) art 5.

[126] Y He, 'China's Practice on the Non-Navigational Uses of Transboundary Waters: Transforming Diplomacy through Rules of International Law' in Wouters et al (n 23) 180. The author suggests that China's 'responsive' diplomacy be replaced by 'preventive' diplomacy in order to improve its transboundary water cooperation.

[127] J Pan, *Towards a New Framework for Peaceful Settlement of China's Territorial and Boundary Disputes* (Martinus Nijhoff 2009) 80.

exists, China prefers consultations related to the proposed measures, including, for example, with respect to several hydropower facilities being constructed upstream of India.[128] Institutions can provide a functional mechanism for consultations, negotiations and dispute prevention – procedures that facilitate water diplomacy.[129]

India, by way of comparison, has endowed its institutional mechanisms with dispute prevention capacity, which in the case of the Indus has proven to be rather robust.[130] Under the Indus Waters Treaty, the Permanent Indus Commission acts as 'the regular channel of communication on all matters relating to the implementation of the Treaty'.[131] It has proven to be a relatively successful mechanism for the ongoing cooperative management of the Indus, despite the numerous, mostly political, challenges it has had to face. Importantly, the decisions in the *Baglihar*[132] and *Kishenganga*[133] controversies, which are discussed below, show how the Indus Waters Treaty has been interpreted to incorporate contemporary norms and best practice, including the requirement for environmental flows.[134]

A final observation is that China and India have yet to conclude a transboundary water-related treaty between them. Each nation continues to implement their own national development agendas that include numerous hydro-power projects on their transboundary waterways.[135] These may have certain climate-related aspects, which remain largely unaddressed in their cross-border water management practices.[136] India challenges China on its claims that most of its dams are 'run-of-the-river', and questions the quality of shared information.[137] The recently intensified Sino-India border controversies do little to smooth the troubled waters between these two riparian nations.[138]

The transboundary water practice surveyed here suggests that both China and India have divergent treaty practice but share views on two important elements that could contribute to an adaptation framework. In the first instance, each country shows a willingness to cooperate, albeit in a bilateral context and primarily through institutional mechanisms. Second, both countries endorse the principle of equitable and reasonable use, although this is captured in different ways. China appears predisposed towards a broader conceptual idea of equity, while India prefers a more detailed interpretation and application of the rule, through specific commitments and procedures, including compulsory third-party dispute settlement provisions.

4 AN INCHOATE ADAPTATION REGULATORY FRAMEWORK?

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[128] China's President Xi proposed a five-point formula for information sharing on the Brahmaputra; see VK George, 'PM Wants India-China Body on Brahmaputra Dams' (Hindustan Times, 28 March 2013).

[129] T Meshel, 'Inter-State Fresh Water Dispute Resolution: Some Reflections on River Basin Organizations as Arbitral Institutions' (2020) Yearbook of International Environmental Law 1, 10, where she observes that RBOs can 'breathe life' into the 'community of interests'.

[130] Indus Waters Treaty (n 104) art IX; SMA Salman, 'The Baglihar Difference and Its Resolution Process – A Triumph for the Indus Waters Treaty?' (2008) 10 Water Policy 105; see also K Uprety, 'The Kishenganga Arbitration: Reviving the Indus Treaty and Managing Transboundary Hydropolitics' (2015) 14 Chinese Journal of International Law 497.

[131] Indus Water Treaty (n 104) art VIII(4).

[132] Baglihar Hydroelectric Plant, 'Expert Determination' <http://mowr.gov.pk/wp-content/uploads/2018/06/11._Baglihar_Expert_Determination.pdf> (on file with the authors).

[133] The PCA award was issued in 2013, following an interim decision on planned measures. *Indus Waters Kishenganga Arbitration (Pakistan v India)* (Final Award) (20 December 2013) PCA Case No 2011-01. In its final award, the PCA permitted India's construction of the Kishenganga dam, on the condition that environmental flows be maintained

[134] Tarlock (n 14) 196.

[135] See Urban et al (n 33); Williams (n 27) claims that China and India share similar 'techno-political' approaches to water management.

[136] D Magee, 'The Dragon Upstream: China's Role in Lancang-Mekong Development' in J Öjendal et al (eds), *Politics and Development in a Transboundary Watershed: The Case of the Lower Mekong Basin* (Springer 2012) 171; R Hukil, 'India-China: A Water War over the Brahmaputra?' (Institute of Peace and Conflict Studies 2014).

[137] Palmo (n 33) suggests that China's claims that its dams are run-of-the river 'are largely untrue'.

[138] China and India have yet to agree some 4,000km of their shared boundary, resulting in lingering conflicts along the border.

One of the main challenges in international water law is how to address cross-cutting issues such as the impacts of climate change within a transboundary basin. The multifaceted nature of water resources management generally, regulated across sectors and governance regimes, complicates things even further. This study has attempted to explore the multilateral and bilateral regulatory regimes that might contribute to devising an adaptation regulatory regime capable of climate-proofing transboundary water basins. Most of the best practice in this specific field, as referred to above, remains embryonic and highly aspirational; calling for a basin-wide normative framework with adaptation at its core that is implemented through comprehensive cooperation, and supported by enforcement measures.[139] Clearly, the reality on the ground has yet to realize this ideal. The World Bank has referred to the regional 'flexible geometry' and ingenuity needed to address regional climate change challenges.[140] This could be achieved, in part, through the 'multilateral regionalism' presented in this this study. The multilateral engagements by China and India, relevant to the transboundary water and climate change discourse, contribute to identifying and consolidating adaptation measures, such as under the NAPs. The cogent hallmarks of 'multilateral regionalism' in this context include the many strands of cooperation emerging from multilateral practice, including support for resilient water resources management, with adaptation at its core.

In this light, the China-India case study, examined in both the multilateral and bilateral regulatory dimensions, offers some useful insights. Both countries are parties to MEAs that provide structured cooperative mechanisms, including supportive (non-judicial) compliance review bodies and procedures.[141] These have been characterized as primarily soft instruments, which nonetheless have resulted in some cooperative lawmaking and prompted concrete actions on the ground. Perhaps the best example are the NAPs, which now feature in many national government strategies tackling climate change. This type of evolutive practice under the mostly soft measures espoused in MEAs bodes well for countries such as China and India, who both safeguard their national sovereign interests in the face of considerable national development imperatives and challenges. China would also feel comfortable with the absence of compulsory dispute settlement provisions under the MEAs, which instead provide for non-adversarial and supportive compliance measures. The multilateral dimension also shows the potential influence of global initiatives of the UN, in its two global water conventions and the SDG reporting requirements. For China and India this offers guidance on how transboundary cooperation might be advanced, including in a tailor-made Asian approach. Both countries have endorsed the customary and convention rule of equitable and reasonable use, the implementation of which has been elaborated in Article 6 of the UN Watercourses Convention. Here we find the important balancing mechanism for the norm, requiring that all relevant factors to be 'considered together and a conclusion reached on the basis of the whole'.[142] The list of factors is extensive, including the natural conditions of the watercourse; these are to be balanced in the broad context of alternative uses, conservation measures, and existing and potential uses. The evaluation of an equitable and reasonable use can change over time, thus requiring ongoing reconsideration and adjustment as needed, consistent with the reiterative process that is integral to an adaptation regulatory framework paradigm.

China and India have embraced institutional mechanisms and procedures as part of their transboundary water governance practices, which serve as important conduits for information exchange and opportunities for advancing incremental cooperation between them. China and India

[139] Timboe et al (n 73) 7, 10. See also GWP (n 17) 54.
[140] See World Bank (n 1) 40, suggesting that regional solutions will require ingenuity: 'There is no one-size-fits all solution, and regional plans will require a flexible geometry which can adapt to the topology of the hazard, and local realities and characteristics.'
[141] Goeteyn and Maes (n 46) 825 state that 'MEA compliance mechanisms are not dispute settlement procedures aiming to reach an independent judicial verdict by legal analysis and interpretation of facts'.
[142] Watercourses Convention (n 81) art 6(3).

have demonstrated their reliance on joint bodies both in the multilateral and bilateral domains. This bodes well for building the type of cooperative practices required for the type of climate-resilient goals needed in their transboundary freshwaters. Clearly, a fully functioning adaptation regulatory regime is some way off, especially given current tensions between the two nations,[143] highlighting the importance of political will as an essential component for improved relations. Nonetheless, technical cooperation has proven quite effective in many transboundary water regimes.

6 CONCLUDING REMARKS

China and India continue their bilateral interactions, *inter alia* through high-level exchanges between the leaders of both countries.[144] China's President Xi proclaimed recently that 'India is a country with which China has been friendly for thousands of years … China has never, and will not, use so-called military or other means to try and hem in India.'[145] However, while China actively pursues its global foreign policy goal to be the 'good neighbour', it is clear that national interests will always come first.[146] Equally, India continues to pursue national advancement agendas, which includes the use of its transboundary waters.[147] How these two riparian nations develop their transboundary water resources will impact economic, social and environmental welfare across Asia;[148] their actions will influence regional climate resilience, peace and security.[149] In this context, wise water use is an integral part of improving climate change resilience – 'climate change is water change'.[150] Achieving effective Sino-Indian transboundary water cooperation thus becomes a necessary prerequisite to tackling the impending climate crisis, at least at the regional level.[151]

Finding opportunities to establish an adequate regulatory framework between China and India, given the transboundary water State practice examined here, will be a challenging, but not impossible, task. It is important that China and India find a regional fit for their cooperation, one that evolves in line with their own experiences and approaches and is supported by political will. This article reveals the core elements of a regulatory continuum that could be further developed in this regard, with improved transboundary water cooperation and an adaptive regulatory framework at its core. Multilateral platforms – such as MEAs, shared experiences in various UN initiatives, including participation in the drafting of the UN Watercourses Convention, reporting under the SDGs – taken together with Sino-Indian bilateral agreements and practices can combine to reveal a 'multilateral regionalism' that contributes to an adaptive regulatory regime that has yet to coalesce. While clearly the strongest foundation would be established through a general bilateral watercourse agreement between China and India, the areas of common ground identified here could provide opportunities

[143] A recent EurAsian Times article reviews the most recent sixth round of meetings between Chinese and Indian Senior Commanders, where they agreed to stabilize issues along their disputed borders. 'India-China War Highly Unlikely; Beijing Only Testing Indian Resilience – Experts' (EurAsian Times, 26 September 2020).

[144] At the 11th BRICS Summit, 'PM Modi Meets Chinese President Xi Jinping in Brazil; Discusses Trade and Investment Issues' (Economic Times, 14 November 2019).

[145] 'Chinese Premier's India Trip Helps Build Mutual Trust, Deepen Cooperation' (Xinhuanet News, 23 May 2013).

[146] According to President Xi, '[n]o foreign country should expect us to make a deal on our core interests'. Xi said that China will adhere to an 'open, cooperative and "win-win" development model with due consideration for both domestic and international situations. China will pursue its development by seeking a peaceful international environment while safeguarding and promoting world peace.' See 'Xi Vows no Compromises over China's Sovereignty' (Shanghai Daily, 30 January 2013).

[147] Hazarika (n 20) 70.

[148] E Kavalski, *Asian Thought on China's Changing International Relations* (Palgrave Macmillan 2014).

[149] D Tan, 'Avoiding Hydro Wars,' (China Water Risk 2014). China's proposal to construct a series of dams on the Brahmaputra is contested by India; see also P Siddhanta, 'Brahmaputra: Panel Alert on China Projects' (The Indian Express, 15 April 2013).

[150] L Bharati and D Freund, 'A Risky Water Future for Western Nepal' (The Third Pole, 22 March 2020).

[151] M Kaneti, 'China's Climate Diplomacy 2.0 – Why Did China Move from Laggard to Leader on Climate Change?' (The Diplomat, 2 January 2020); see also C Zhang, 'The Climate Change Promise of China's Belt and Road Initiative – China Cannot Afford to back a Belt and Road that Damages the Environment' (The Diplomat, 18 January 2018).

for improved transboundary water cooperation. It remains to be seen whether China and India's shared commitment to multilateral environmental agreements and mutual interest in infrastructure could help to oil the wheels of cooperation in the spirit of their 70-year old Panchsheel agreement.

Sergei Vinogradov is Senior Lecturer at the Centre for Energy, Petroleum and Mineral Law and Policy, University of Dundee and visiting Professor at the China Institute of Boundary and Ocean Studies (CIBOS), University of Wuhan, where he teaches and supervises graduate students. Dr Vinogradov has presented his research around the world and provided expert advice to a range of United Nations bodies, the World Bank and national governments.

Patricia Wouters is founding Director of The International Water Law Academy at the China Institute of Boundary and Ocean Studies (CIBOS), University of Wuhan, China (http://www.iwla.whu.edu.cn/), a new global initiative and graduate programme aimed at contributing to scholarship and knowledge in the field of international water law and transboundary cooperation. Professor Wouters continues her research in this field, and actively supports young scholars in advancing their academic work.

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