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RECEIVED 26 September 2023

ACCEPTED 21 December 2023

PUBLISHED 23 January 2024

CITATION

Wouters P, Daza-Clark AM and
Devlaeminck DJ (2024) China's transboundary
hydropower development at home and
abroad: exploring the regulatory interface
between international water law and
international economic law.
Front. Clim. 5:1302103.
doi: 10.3389/fclim.2023.1302103

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China's transboundary hydropower development at home and abroad: exploring the regulatory interface between international water law and international economic law

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China, located upstream on most of the major transboundary waters shared with vast populations across Asia, is heavily invested in developing hydropower at home and abroad. Some of this hydropower development involves freshwaters that cross national borders raising complex issues in international law, a situation exacerbated by growing economic, environmental, and regional security pressures. In such a context, where conflicts-of-use are almost certain to arise, it is essential to understand the rules that apply so as to enhance opportunities for enhanced transboundary water cooperation. This paper examines the rules of international water law and international economic law that apply to transboundary hydropower development, with a focus on China as one of the key actors in this field. The aim is to examine the regulatory interface of relevant legal frameworks with a focus on China's approach to transboundary hydropower development at home and abroad. While international economic—and more specifically international investment law—is not directly concerned with international water law, host states and foreign investors must be informed, and take into account, the legal obligations governing transboundary waters. China's position as a major water user (at home) and significant investor (abroad) on transboundary waters, makes it a unique case study for exploring the rules of international law that apply in two different regulatory settings. The work examines the rules of law in each of these domains and reveals the inapparent linkages across these seemingly unconnected areas of international regulation.

KEYWORDS

international water law, international investment law, China, hydropower, transboundary hydropower

1 Introduction

China is a global leader in hydropower dam construction, with over 23,000 large hydropower dams and nearly 50,000 small hydropower dams (Sun et al., 2019; Perera et al., 2021). As of 2019, China has an installed capacity of 356 GW, the highest in the world. In comparison, Brazil is ranked second with 109 GW, while the United States is ranked third with 102 GW (IHA, 2020). China's installation of new hydropower capacity

is slowing, adding 4,170 MW of capacity in 2019, placing China second in the world, with Brazil first, installing 4,919 MW of new capacity in 2019 (Han, 2015; IHA, 2020). While much of this is hydropower on domestic rivers, some of China's dams are linked with transboundary basins, including the Heilong-Amur, Lancang-Mekong, Nu-Salween, and the Yaluzangbu-Brahmaputra. These border regions have significant transboundary hydropower potential that has yet to be exploited (Xiao et al., 2023; Xu et al., 2023). Transboundary waters shared across national borders are governed by the rules of international law that apply in this area—primarily rules of treaty and customary law, many of which are codified and progressively developed in the two global water conventions—the 1992 Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Water Convention, 1992), and the 1997 Convention on the Law of the Non-navigational Uses of International Watercourses (Watercourses Convention). Despite the fact that China is not a party to either of these global conventions, the rules of customary law contained in these instruments nonetheless govern China's uses of its transboundary waters. Further, China has concluded a number of transboundary water-related agreements, which apply in those particular contexts (Wouters and Chen, 2013; Su, 2014). China, primarily upstream on many of Asia's major transboundary rivers, shares these watercourses with 14 immediate neighboring states,¹ and three additional riparian states further downstream.² China and its neighbors have signed over 50 agreements (Devlaeminck et al., 2020), only two of which apply specifically to transboundary hydropower installations.³ The remaining agreements, however, contain general provisions that apply to specific watercourses, as agreed. China's upstream development of hydropower poses real challenges vis-a-vis transboundary water cooperation, especially with respect to its southern neighbors (Zhang, 2018), where mostly non-binding instruments prevail (Devlaeminck, 2022).

China's economic growth has increased its outward investment, from 2.7 billion USD in 2002 to 163 billion USD in 2022 (Wu, 2023). China's outward investment in Africa in particular has grown significantly, from 75 million USD in 2003 to 5.4 billion USD in 2018. China has also provided significant loans to China, ~153 billion USD from 2000 to 2019 (Fu, 2021). As China has continued to grow and with fewer opportunities to develop domestic hydropower, Chinese entities [largely State-Owned Enterprises (SOEs) or banks] have sought to capitalize on their significant experience in the domestic hydropower sector through involvement in hydropower projects abroad. Chinese overseas hydropower development is largely concentrated in Asia. In Southeast Asia, for example, Chinese entities have participated

as contractor, financier, regulator of Chinese entities abroad, or developer in ~280 hydropower projects (Urban et al., 2013). The first hydropower projects in Africa involving China were the Kinkon and Tinkisso hydropower projects in Guinea, constructed in the 1970's (Brautigam and Hwang, 2017). Since then, Chinese entities have invested ~15 billion USD in various forms of hydropower and related projects across 20 African states—see Appendix 1. Compared to the full cost of hydropower construction this amount is relatively small. China's Three Gorges Dam, for example, had a final cost of 29 billion USD (Brautigam and Hwang, 2017). Africa, however, has significant hydropower possibilities, currently exploiting only 11% of the continent's estimated 340 GWs of hydropower potential (Ruppert et al., 2021). With Africa's untapped hydropower potential and China's longstanding and increasing ties to the continent, this hydropower investment seems certain to grow. These Chinese financed hydropower dams are likely to impact local river systems, with some already raising alarms at China's investment practices in transboundary hydropower in Southeast Asia, arguing that they may violate rules of international water law (Phan, 2019).

While there is a broad range of international legal rules that apply to the development of transboundary hydropower including climate change, biodiversity, and human rights, among others (Rieu-Clarke et al., 2023), this study focuses on two distinctive fields of international law: (i) the rules that govern the uses of shared freshwaters, referred to here as “international water law;” and (ii) the rules that govern foreign investment, “international investment law.” In considering these distinct sets of rules that govern transboundary hydropower development, this study has selected the rather unique case study of China for two main reasons. First, as set out above, China is primarily upstream on many of Asia's transboundary waters, where it continues to pursue hydropower development. Coverage of these transboundary rivers by agreements is mixed, making it an interesting setting for exploring the rules of international water law that apply. Secondly, China exports significant flows of foreign investments in the energy sector, to Africa, primarily through its State-owned Enterprises (SoEs). These SoEs hold a great deal of experience in hydropower infrastructure, including development at home. These factors together highlight why this would be a good choice to explore the complex legal regulatory regimes that cover these activities. The connection between the development of hydropower on transboundary watercourses and foreign investment in this activity would not seem to be readily apparent, but this study will illustrate that links exist, and more importantly, that such links could assist with a more holistic legal approach to the study of transboundary hydropower development globally. Following a short survey of China's approach to international water law and international investment law generally, the paper provides a more detailed overview of the rules that apply in each of these fields, focusing on transboundary hydropower. The paper concludes with some observations on how the rules of international law that apply to transboundary hydropower development at home and abroad might be better understood and linked so as to enhance opportunities for transboundary cooperation. Improved clarity and compliance with the rules of international law in this field can contribute to shared benefits across transboundary basins and support meeting the UN Sustainable Development Goals.

1 This includes Afghanistan, Bhutan, India, Kazakhstan, Kyrgyzstan, Laos, Mongolia, Myanmar, Nepal, North Korea, Pakistan, Russia, Tajikistan, and Vietnam.

2 This includes Bangladesh, Cambodia, and Thailand.

3 China has two agreements relating to a joint hydropower project with Kazakhstan: the 2010 Agreement on the Cooperation in the Construction of Joint Waterworks Dostyk on the Khorgos River and the 2013 Agreement on the Management and Operation of Dostyk Joint Hydro Unit on the Khorgos River.

2 China's approach to international law, international water law, and international economic law

China's engagement with the international legal system has greatly expanded since the founding of the People's Republic of China and accepting its seat at the United Nations (Xue, 2011). China has since signed some 23,000 bilateral agreements and 400 multilateral agreements (Wang, 2015). While some view China's engagement with international law with skepticism (Zhao, 2018), it appears to take an approach similar to other major powers (De Lisle, 2000; Cohen, 2019), and is not necessarily a disruptive force (Saul, 2019). China's approach to international relations has been guided by the Five Principles of Peaceful Co-Existence, which include: (1) Mutual respect for territorial integrity and sovereignty, (2) Mutual non-aggression, (3) Mutual non-interference, (4) Equality and mutual benefit, and (5) Peaceful co-existence (China-India, 1954). Through these principles China reiterates its commitment to be the "good neighbor" (Xue, 2011), further influencing its perspective on the joint governance of its transboundary waters, reframed in accordance with its views on international law (Wouters and Vinogradov, 2020). This approach is reflected also in China's Belt and Road Initiative, a global development programme started in 2013 with a strong focus on international infrastructure, investment, and development, including hydropower (Han and Webber, 2020). This policy initiative continues to evolve but remains a vital component of its international engagement, linked to China's national policy directions illustrated through its Five-Year Plans (FYPs). With respect to hydropower, China's most recent 13th and 14th FYP's each set forth aims and rather prescriptive measures to reduce reliance on fossil fuels (Neuweg and Stern, 2019; Energy Iceberg, 2020), thus increasing the need for alternate sources such as hydropower (Sun et al., 2019). Its 14th FYP also confirmed plans to build hydropower on the Yaluzangbu-Brahmaputra River (NPC, 2021).

China's practice in international water law can be examined through the legal analytical framework developed in this field, which includes five key elements that need to be considered in a transboundary water regime: scope (legal reach), substantive rules (equitable and reasonable use and the due diligence obligation to prevent causing significant harm), procedural rules (information sharing, prior notification and consultation), institutional mechanisms (joint bodies) and dispute prevention/settlement (Vinogradov et al., 2003). The two global water conventions cover each of these legal elements and provide frameworks for state practice in this field, including through the rules of customary law which these instruments have codified and progressively developed. This includes, in particular, the norms of equitable and reasonable utilization, the due diligence obligation to prevent significant harm, prior notification of planned measures and the obligation to conduct an environmental impact assessment.⁴ Thus, despite the fact that China is not a party to either of the two global water conventions, the customary rules of international

water law nonetheless apply. A review of China's state practice reveals that China was engaged in the negotiation of the 1997 Watercourses Convention, supporting most of its core principles (Wouters and Chen, 2013; Devlaeminck, 2020). One of the primary objections that China had regarding the Watercourses Convention was the compulsory nature of the dispute settlement mechanisms in its Article 33. This provision requires that, if after 6 months a dispute remains unsettled, it shall be sent to fact-finding at the request of any of the parties to the dispute. In line with the provisions of general international law, where dispute settlement can only proceed based on state consent, China felt that the Watercourses Convention removed the sovereign right of riparian states to determine what dispute mechanisms would apply in each case, and thus China could not agree. Ultimately, China adopts its own approach to transboundary water cooperation, on a case-by-case basis.

China has concluded a number of transboundary-water agreements, mostly bilateral, following a one-river one-country approach. Upon closer scrutiny, it appears that these agreements cover the five legal elements noted above, and embrace the primary rules of customary law reflected in the global water conventions, albeit in varying ways. China's "soft path" to transboundary water cooperation, aligns with China's approach to international law (based on the Five Principles) and comprised of hard and soft law (Wouters and Chen, 2013). China's transboundary water state practice varies across its regions, with more formal arrangements in the Northwest (Mongolia, Russia, and North Korea) and the Northeast (particularly with Kazakhstan), but more informal engagements in China's Southwest on the Lancang-Mekong and Yaluzangbu-Brahmaputra, where major hydropower potential is located. Furthermore, studies on the substantive provisions of China's transboundary water agreements have revealed varied approaches (Su, 2014).

As regards the rules of international economic law that govern foreign investment activities, China has been active developing trade and investment relations. While international economic law does not directly govern the use of shared water resources, global economic governance provides incentives that affect policy and decision making, with potential effects on the uses and management of water resources (Daza-Clark, 2017; also see: Baltag et al., 2023). The race to exploit natural resources and industrialize them, or on the other hand, protect them from trade liberalization by imposing trade restrictions and barriers, is at the heart of economic regulation or dysregulation. Water resources are not immune to this phenomenon, and for this reason the rules of international water law and international economic law often intersect. Over the past 20 years China's investments in Africa have increased substantially; nearly 100% of the 160 billion USD in loans to African Governments were granted by state financiers to fund mining, roads, and energy projects (The Economist, 2022). Two-thirds of these loans were destined to the development of infrastructure; "[f]rom 2007 to 2020, Chinese infrastructure financing for sub-Saharan Africa was 2.5 times as big as all other bilateral institutions combined" (The Economist, 2022). Africa is home to 17% of the world's population, and yet only accounts for 4% of global energy production (IHA, 2021). The vast presence of natural resources in Africa enables the realization of renewable energy generation, yet access to electricity

⁴ This has been confirmed in a series of case law and by scholars. See: McIntyre, 2011; Leb, 2013; McCaffrey, 2019.

across the continent is limited and uneven (IHA, 2021). If this infrastructure gap is going to be bridged, African states need foreign direct investment, especially given the significant costs involved in hydropower infrastructure. At the same time, foreign investors require guarantees against political (and regulatory) risk, given the important sunk costs that these projects impose on lenders and investors. Foreign investors' assets and contractual rights may be protected under the domestic law of the beneficiary (host) states, under their contracts, or under international investment agreements (IIAs). For many foreign investors the system has proven to be effective in enforcing standards of treatment such as non-discrimination; fair and equitable treatment, and no expropriation without compensation, among others (Daza-Clark, 2022). This is because the dispute settlement mechanism agreed in IIAs, allows foreign investors to sue their host states directly—investor state dispute settlement (ISDS)—without an obligation to exhaust local remedies. The importance of the wording of these provisions cannot be understated, due to its broad scope which gives room to somewhat inconsistent interpretations of the provisions (Arato et al., 2020).

In the context of transboundary hydropower projects, governmental action may modify the terms of hydropower infrastructure agreements between the foreign investor and the host state, for example, by imposing higher environmental standards on the use of water resources. Against this backdrop, this paper observes that the Chinese perspective on international investment and trade law has been rather different to China's approach vis-a-vis international water law and international law, more generally (Daza-Clark, 2022). China joined the World Trade Organization in 2001, after a lengthy negotiation that required major changes in Chinese economic policy.⁵ As regards investment promotion and protection, China has signed 37 International Investment Agreements (IIA) with African countries so far; the first being with Ghana in 1989 (UNCTAD, 2023). In contrast to China's approach toward general international law and water law agreements, China has embraced economic integration more openly. Notably, China has progressively loosened its narrow investment treaties in the past 15 years, offering wider investment protection against measures such as expropriation and fair and equitable treatment (Lindmark et al., 2022). Regarding dispute settlement, contrary to its transboundary water agreements, China has adopted binding dispute settlement mechanisms, consenting to compulsory third party dispute settlement for investment disputes (Lindmark et al., 2022). An important aspect of Chinese investment abroad is that China has provided the much-needed economic resources to develop infrastructure projects in African countries, including roads, energy, and telecommunications, among others. Many of these infrastructure projects are financed through governmental loans, interstate aid, and direct investment. In most cases the lender is the Chinese government, while the developer and operator will be a SOE, as such likely to be protected under the respective IIA—see Appendix 1. This will be discussed in more detail below.

⁵ China's status as a Working Party was established under the GATT in 1987, albeit concerned only trade in goods. In 1995, China became a WTO Working Party member.

3 China's transboundary hydropower at home: exploring the rules of international law that apply to transboundary water resources

China is not party to either of the global water conventions, instead governing its transboundary water resources through a series of bilateral agreements, rules of customary law, and non-binding instruments with its neighbors. These rules and instruments embody the five key elements of transboundary watercourse agreements (Wouters et al., 2005; Wouters, 2013). China's agreements assist with addressing what some have referred to as its "upstream dilemma"—where the geography of being upstream adds considerable pressure in balancing how China develops its own water resources while taking into consideration the needs of its downstream neighbors (Wouters and Devlaeminck, 2018). One significant aspect of this upstream dilemma is the management of the uses of its transboundary waters, including hydropower. Of the watercourse agreements China has concluded with its neighbors, only two are concerned with hydropower. These agreements between China and Kazakhstan—the 2010 *Agreement on the Joint Construction of the China-Kazakhstan Friendship Joint Water Diversion Project on the Khorgos River* and the 2013 *Agreement on the Management and Operation of the Dostyk Joint Hydro Unit on the Khorgos River*—cover the joint construction and operation of shared works. The project, built on a portion of the river that forms the border, is jointly owned by China and Kazakhstan, each sharing the cost of construction (China-Kazakhstan, 2001, Art. 1). Construction of the project, coordinated by a China-Kazakhstan Construction Commission (China-Kazakhstan, 2010, Art. 5), "should not cause [...] a negative impact on the environmental conditions of the two countries" [China-Kazakhstan, 2010, Art. 4(1)]. The subsequent 2013 Agreement provides a series of responsibilities for operation and maintenance, notably requiring a minimum flow from the hydropower dam of 1.7m³ per second so as to protect the ecosystem of the river [China-Kazakhstan, 2013a, Art. 1(3)]. Although China's other water agreements do not specifically relate to transboundary hydropower resources, they do apply more broadly to transboundary water resources as defined in their provisions on scope. The 2001 *China-Kazakhstan Agreement on Cooperation in the Use and Protection of Transboundary Rivers*, for example, applies to the "transboundary river," defined as "all rivers and river flows that cross state borders or are located along the border" between the two countries (China-Kazakhstan, 2001, Art. 1). The 1994 *China-Mongolia Agreement on the Protection and Utilization of Transboundary Waters* applies to "transboundary waters," defined as "lakes, rivers, streams and other water that straddle or rest on the boundary line," with specific mention of "Halaha River, Kerulen River, Bor Nor Lake and the Bulgan River" (China-Mongolia, 1994, Art. 1). The 2008 *China-Russia Agreement on the Rational Utilization and Protection of Transboundary Waters* applies to the "utilization and protection of transboundary waters" which it defines as "any river, lake, stream or marsh located on or passing through the border" between the two countries. Thus, each agreement, through the provisions on "scope" would apply to hydropower as a use of a transboundary river. As such, the choate

body of rules they embody provide legal parameters for how China constructs new hydropower and operates existing hydropower on transboundary waters.

3.1 Customary and treaty rules governing China's uses of transboundary waters

The global water conventions, and most notably the Watercourses Convention, which China was actively involved in negotiating over the close to two decades of its iteration, are relevant to the discussion here as framework instruments that have codified and progressively developed the rules that apply to the uses of transboundary waters. The Watercourses Convention, Arts. 5–7, set forth the cornerstone substantive rules of equitable and reasonable use, and the due diligence obligation to prevent significant harm, both rules of customary law that apply to all riparian watercourse states, including China. Article 5 of the Watercourses Convention provides that states “shall in their respective territories utilize an international watercourse in an equitable and reasonable manner” with a view to “attaining an optimal and sustainable utilization thereof and benefits therefrom” (Watercourses Convention, 1997, Art. 5). In determining this, states are to take into consideration the indicative but not exhaustive factors set out in Art. 6, including the natural characteristics of the watercourse, the effects of the use, conservation and protection of the watercourse, and available alternatives, among others. All “relevant factors are to be considered together and a conclusion reached on the basis of the whole,” with the further stipulation that “no use of an international watercourse enjoys inherent priority over other uses” [Watercourses Convention, 1997, Art. 6(3) and 10]. The overarching rule of equitable and reasonable use is supplemented by the obligation to protect the ecosystems of the transboundary watercourse (Watercourses Convention, 1997, Art. 20). Aligned with China's contributions during the drafting and adoption of the Watercourses Convention, China's treaty practice reveals its support for the customary rule of equitable and reasonable use (Wouters and Vinogradov, 2020). A short summary of China's state practice shows that its agreements use a variety of provisions to convey this approach. For example, the 2001 *China-Russia Treaty of Good-Neighborliness and Friendly Cooperation* provides that “the contracting parties shall carry out cooperation in [...] the fair and rational use of water resources along the border areas” (China-Russia, 2001, Art. 19). The 1994 *China-Mongolia Agreement* obliges the parties to cooperate in various fields “for the purpose of protection and equitable and rational use of transboundary waters,” requiring that “any development and utilization of transboundary waters should follow the principle of fairness and equability without impeding any reasonable use of transboundary waters” (China-Mongolia, 1994, Art. 4). The 2001 *China-Kazakhstan Agreement* provides that the states will “adhere to the principles of equity and rationality” and that the parties will not limit each other in their “rational use and protection” of the transboundary water resource (China-Kazakhstan, 2001, Art. 2). This is echoed in the 2013 *China-Kazakhstan Joint Declaration*

on Further Deepening Comprehensive Strategic Partnership where the states indicate they will “use transboundary water resources fairly and reasonably” (China-Kazakhstan, 2013b, para. III). The Watercourses Convention provides an indicative list of factors to be considered together, but each situation requires case-specific assessments and equitable and reasonable use is a moving target (Rieu-Clarke et al., 2015). In this context, the evaluation of the equitable and reasonable use of transboundary hydropower is a complex and imprecise exercise, requiring a case-by-case evaluation. China's treaties provide little guidance on how this assessment should be conducted, but the additional rules of due diligence and procedural norms can help with this exercise.

The due diligence obligation to prevent causing significant harm, as set out in Art. 7 of the Watercourses Convention, also a rule of customary international law, provides that in “utilizing an international watercourse in their territory” states shall “take all appropriate measures to prevent the causing of significant harm to other watercourse States” (Watercourses Convention, 1997). This applies to both harm flowing downstream such as flood and pollution, as well as harms that can flow upstream such as harms to fish migration patterns as well as legal harms such as the foreclosure of future uses (Salman, 2010). The International Court of Justice (ICJ) has elaborated on the connection between the substantive and procedural rules, demonstrating the evolving nature and connectivity of these norms (McIntyre, 2010, 2011). China's transboundary water treaties recognize this due diligence obligation, with some variation in approach across its treaty practice; some focus on downstream harm, while others take a more balanced approach. The 2001 *China-Kazakhstan Agreement* provides that the “Parties shall undertake appropriate measures and shall make efforts to prevent or mitigate serious harm caused to a State Party as a result of flooding disasters and man-made accidents” (China-Kazakhstan, 2001, Art. 3). By comparison, the 1994 *China-Mongolia Agreement* obliges the two nations to “develop and utilize transboundary waters in a way that should not be detrimental to the other side” (China-Mongolia, 1994, Art. 4); the 2008 *China-Russia Agreement* indicates that the parties will “take all necessary measures to prevent significant harm caused by transboundary impact” [China-Russia, 2008, Art. 2(4)]. Given that China and its transboundary hydropower installations are primarily upstream, these provisions obligate China to take due diligence in the construction and operation of its hydropower, such as adopting best practice, including, for example, conducting environmental impact assessments, giving prior notification of planned measures and exchanging information. Specific mention of hydropower related risks, such as those from flooding or man-made accidents, may provide specific guidance for China on operation of transboundary hydropower under these treaties.

China's transboundary water treaties place a strong emphasis on *procedural rules*, particularly information sharing and technical cooperation. A closer look at these provisions, however, leave questions as to how prescriptive these requirements are regarding hydropower construction and operation. The 2001 *China-Kazakhstan Agreement*, for example, provides that the states are to share information but that the content, quantity, and timing of such information sharing is to be determined by the parties (China-Kazakhstan, 2001). Article 3 of the 1994

China-Mongolia Agreement also provides for information sharing, indicating that the parties will conduct “technological exchanges” in support of equitable and reasonable utilization, including exchange of “technical materials, information and maps within the framework of cooperation” (China-Mongolia, 1994). China also has an agreement with the Mekong River Commission (MRC) from 2002 to share information from two hydrological stations in the lower Lancang River during the flood season—Yunjinghong and Manan. This agreement was expanded in 2020 to provide for year-round information on an hourly basis from those same hydrological stations (MRC, 2020), and there is currently discussion on the sharing of information in real-time (Siow, 2023). As these stations are downstream from the cascade of dams that China has built, however, the information they provide on these hydropower installations is limited.

Articles 11 and 12 of the Watercourses Convention provide procedural rules requiring a process of consultation and prior notification for planned measures that may have significant adverse impacts, including, for example, those arising from hydropower construction. China’s treaties provide limited obligations of prior notification. Those that do provide for prior notification, however, will impact the construction of hydropower on those rivers. The 1964 *China-North Korea Protocol on the Borderline*, for example, requires states to notify when they undertake works that may impact navigation, the flow, or banks of the river (Wouters and Chen, 2013). Others, such as the 2009 *China-Vietnam Provisional Agreement on Border Affairs* requires prior agreement for activities that are likely to cause negative impact (Wouters and Chen, 2013). While consultations are a fundamental aspect of the prior notification process, China’s treaties do not link prior notification and consultation. Instead, some of China’s treaties utilize consultation as a method of *dispute settlement*. This is also achieved through *joint institutions*. These treaties have established four joint institutions, including the: (1) China-Kazakhstan Commission on the Use and Protection of Transboundary Rivers, (2) China-Kazakhstan Commission on Cooperation in the field of Environmental Protection, (3) China-Russia Joint Commission on the Reasonable Utilization and Protection of Transboundary Waters, and (4) the China-Mongolia Joint Commission on Transboundary Waters (Wouters and Chen, 2013). These institutions hold regular meetings, discussing issues relevant to the implementation of related agreements. However, given the limited emphasis on hydropower installations in China’s treaties, it is unclear whether hydropower development expressly falls within their mandates, although it would seem logical given the extensive technical cooperation provided for in this case.

3.2 The role of non-binding instruments—an emerging trend on China’s transboundary waters

Apart from China’s transboundary water treaties, there is a growing trend in the region to use non-binding instruments,

also known as soft law, to guide regional cooperation. This seems most prominent in the southern reaches where there are few water-related agreements. This is also where China’s hydropower has come under close scrutiny. China has constructed 11 hydropower dams on the upper reaches of the Lancang-Mekong, which some have pointed to as a contributing factor of regional drought over the past few years (Eyler and Weatherby, 2020). On the Yaluzangbu-Brahmaputra, China has constructed six run-of-the-river hydropower dams and as outlined in the 14th FYP, has plans for a large hydropower project close to the border with India (Zhang and Donnellon-May, 2021). This has caused significant mistrust in downstream India. Here China has utilized non-binding instruments to govern its transboundary waters, including the Lancang-Mekong Cooperation (LMC) on the Lancang-Mekong River and a series of Joint Declarations on the Yaluzangbu-Brahmaputra. While these instruments are non-binding, they nonetheless represent the political commitments of states in the region, providing an important incremental first step in transboundary cooperation. Furthermore, these engagements can interact with more formal international legal regimes, and play a bridging role, helping to catalyze and strengthen cooperation supporting the crystallization of customary international law. In addition, they can support international law by filling gaps and assisting in the interpretation of binding instruments (Shelton, 2009). With growing hydropower capacity in the region and few binding agreements, how might China contour its state practice in the region? The Lancang-Mekong example provides some insights on this.

Governance of the Lancang-Mekong, for a number of historical reasons, has occurred between the four downstream riparian states (Cambodia, Laos, Thailand and Vietnam) most recently through the 1995 *Agreement on the Cooperation for the Sustainable Development of the Mekong River Basin* which established the MRC. China is not party to this agreement, but is a “dialogue partner” and has shared information with the MRC, as earlier mentioned. In 2015, China established the LMC, a multilateral initiative counting all Lancang-Mekong states as members that takes a project approach. While water is just one of the issue areas covered by the LMC, a recent study has illustrated that it in some ways resembles the key elements of transboundary water agreements, reflecting accepted customary law in the field (Devlaeminck, 2022). This is done through a general recognition of relevant international law, as well as key terms such as “sustainable water resources management and utilization,” limited mention of minimizing transboundary harm, strong support for information sharing, and dialogue via leaders’ meetings, foreign ministers’ meetings and various working group meetings (Devlaeminck, 2022). On the Yaluzangbu-Brahmaputra, China has several joint declarations to share information with India and Bangladesh, such as the 2010 *China-Bangladesh Joint Statement* (China-Bangladesh, 2010) which emphasizes information sharing to prevent disasters, and the 2005 *Memorandum of Understanding upon provision of Hydrological Information of the River Brahmaputra/Yaluzangbu* where China provides hydrological data during the monsoon season (May 15th to October 15th) to India in exchange for payment. This

memorandum expired in June 2023 and is currently being renegotiated (China-India, 2023). Much of this cooperation is facilitated by a joint institution, the Expert Level Mechanism, established in 2006, which held its most recent meeting in June 2023 (China-India, 2023). While information-sharing is certainly helpful in mitigating potential impacts from hydropower development, challenges in implementation are bound to arise as in these basins we need to rely on customary international law for rules that apply to China's transboundary hydropower stations. What is unique about China's non-binding instruments, particularly the LMC, is an emphasis on "mutual benefits" and its project-based approach. How might soft instruments better distribute benefits from hydropower? First elaborated on in the *1961 Treaty Relating to Cooperative Development of the Water Resources of the Columbia River Basin* between Canada and the USA, benefit sharing helps to redistribute the costs and benefits of cooperation on transboundary watercourses (Paisley, 2002). While LMC projects at present do not directly share benefits between the riparians, they may play a supporting role in this endeavor through the development of policy and guidance on how to share benefits. This is particularly true in the context of hydropower, as the LMC has undertaken a series of hydropower related projects including technical standards for hydropower, technology sharing, capacity building, hydropower safety and green hydropower (Huang and Devlaeminck, 2023). This plays out in the context of the Belt and Road Initiative projects, such as grid connecting projects between Yunnan and Laos. In the Yaluzangbu-Brahmaputra, however, there is no such institution and non-binding instruments relate directly to information sharing. Without such a broad scope as found in the LMC, how might these states move toward greater cooperation in the context of growing hydropower capacity?

3.3 Summary

This section has surveyed the rules of international law that govern the uses of transboundary waters shared by China, specifically through the lens of international water law. As with many shared watercourses across the region, the normative legal framework that applies to China comprises treaty-law, international customary law, and non-binding instruments (soft-law). The baseline of applicable rules include the duty to cooperate, the duties and entitlements of equitable and reasonable use, and the due diligence obligation to take all reasonable measures to prevent causing significant harm (i.e., environmental impact assessment, as just one example), the procedural rules of prior notification and exchange of information, and the duty to peacefully avoid and resolve disputes. In the context of transboundary hydropower development these rules, coupled with China's transboundary water-related state practice (treaties, customary law and soft-law), means that this activity must be considered within this normative framework. These rules provide the parameters for the legally acceptable approach to hydropower development on transboundary waters, from the perspective of international water law (Rieu-Clarke et al., 2023).

4 China's engagement in transboundary hydropower abroad: exploring the rules of international economic law that apply to foreign investment

China's economic integration activities, such as trade and foreign investment are mainly regulated under the general rules of international economic law. Within this area of law, international investment law applies to the protection of foreign investment, provided the parties have concluded an agreement to this effect. It is important to note, as China is the most developed economy in the China-Africa relationship, it is China that will most likely export capital into Africa. Thus, the treaties concluded by China with African states will most likely protect Chinese investment in Africa, not least SOEs. Chinese state (and non-state) owned companies may conclude public private partnerships (PPP) with African governments and their state-owned institutions. These contractual arrangements may subject potential disputes to the application of domestic or foreign laws (e.g., English Law) as agreed by the parties in the agreement. In terms of dispute resolution, the contracts may also contain international arbitration clauses, outside the national territory of the state in which the investment is made, such as the International Center for the Settlement of Investment Disputes (ICSID) and the International Chamber of Commerce (ICC), among others. Notably, in purely contractual/commercial arbitration clauses the disputing parties are entities, either private, or public albeit acting in a commercial capacity, whereas in an investment treaty arbitration, the respondent is a sovereign state. The difference is relevant because in the second instance (investor-sovereign state dispute), while the investor may be challenging a politically motivated or abusive measure, they may also be challenging a regulatory measure prompted by environmental, health, or safety considerations, which include transboundary cooperation guided by the customary rules of equitable and reasonable utilization and the due diligence obligation to prevent causing significant harm, among others. Such situations have put a great deal of pressure on the ISDS mechanism, labeling it undemocratic (Johnson and Guven, 2017).

Before exploring this issue further, it seems important to set the scope and extent of IIAs concluded between China and several African states. One issue to bear in mind is the fact that African states have diversity in terms of their openness to attract and protect foreign investment. Likewise, they are also quite different regarding the natural resources, products, and service sectors they wish to develop through foreign direct investment. Chinese entities have invested ~15 billion USD in various forms across hydropower and related projects in 20 African countries. As illustrated in Appendix 1, China has participated in 48 hydropower projects developed across 20 African countries, all of which have been financed by Chinese financial institutions, mainly through lending agreements; chief among them is the Export-Import Bank of China (Eximbank).⁶ In most cases, governments are mainly borrowers,

⁶ Other financiers are the Ministry of Finance and Commerce (MOFCOM); development banks such as Eximbank, Industrial and Commercial Bank of

in other cases, Chinese and African SOEs would form a PPP. In addition to any guarantees or insurance agreed between borrower and lender, China has concluded 37 IIAs with African states, 20 of which are currently in force (UNCTAD, 2023). Due to the broad definition of investment in IIAs, potentially all hydropower projects would benefit from the protection of the IIA, where the African state and China have an IIA in place. More generally, a majority of IIAs between China and African states were negotiated between 1989 and 2005, placing the bulk of IIAs' standards of protection within the first generation of investment treaties. For example, this means the slight minority of IIAs only allow the use of the ISDS mechanism in cases of a disputes involving the amount of compensation for expropriation, narrowing the scope of the tribunal's jurisdiction. The *China-Gabon BIT (1997; Article 10)* and *China-Cameroon BIT (1997; Article 9)* each provide irrevocable consent to any dispute relating to the amount of compensation for expropriation, but specify that other disputes shall be submitted to the procedure with the consent of both parties. The *China-Uganda BIT (2004; Article 8)*, the *China-Sierra Leone BIT (2001; Article 9)*, the *China-Mali BIT (2009; Article 9)*, the *China-Madagascar BIT (2005; Article 10)*, the *China-Equatorial Guinea BIT (2005; Article 9)*, the *China-Democratic Republic of the Congo BIT (China-DRC, 2011; Article 12)*, the *China-Cote d'Ivoire BIT (2002; Article 9)*, and the *China-Congo BIT (2000; Article 9)* do not contain such a formulation and so investors will be able to pursue claims for other standards of protection such as fair and equitable treatment (FET).

The China-Ghana BIT provides that the host state will review the expropriation measure if the investor alleges that the expropriation is "incompatible with the laws of the Contracting State" [*China-Ghana BIT, 1989, Art. 4(3)*]. Slightly newer formulations of IIAs concluded by China seemingly include provisions that protect the host state's right to regulate. For instance, the 2005 China-Madagascar BIT provides that measures for reasons of security, public order, health, ethical and environmental protection, shall not be regarded as legal or de facto obstacles to the FET [*China-Madagascar BIT, 2005, Art. 3(2)*]. The 2011 China-Democratic Republic of the Congo BIT provides for more detailed provisions on expropriation, widening the powers of arbitral tribunals to decide on regulatory expropriation. Article 6 sets out a definition of indirect expropriation and states the factors which identify a compensable indirect expropriation from a non-compensable legitimate regulation. The BIT also stipulates that "[e]xcept in rare circumstances, such as the measures adopted severely surpassing the necessity of maintaining corresponding reasonable public welfare, non-discriminatory regulatory measures adopted by one Contracting Party for the purpose of legitimate public welfare, such as public health, safety and environment, do not constitute indirect expropriation" (*China-DRC, 2011, Art. 6*).

It is known that hydropower is the preferred type of energy project among Chinese companies (*Global Data Energy, 2019*). This is because China has a wealth of know-how on dam and hydropower development, which has been tested in China and other riparian states in the Mekong Basin, for instance. Most of the hydropower projects in Africa that are supported by Chinese

investors are in the construction phase or at early stages of operation; as such, it is early days to know whether these projects will operate and develop free of disputes. According to UNCTAD's data, China has initiated 17 ISDS cases between 2007 and 2020, three of which are against African countries. These disputes arose from measures adopted by the host states in the sector of services and natural resources. Contrary to its transboundary water agreements, where no binding dispute settlement clauses have been agreed upon, China has embraced a strong dispute settlement mechanism—ISDS—or arbitration in its BITs that can enforce the treatment promised to its SOEs.

As stated in Section 2, international investment law does not govern the use of shared water resources directly, but governmental measures under either regulatory framework, i.e., economic or transboundary waters, are likely to have ripple effects over the other. In the Sino-African context, these connections are important, as suggested above, Chinese SOEs are likely to adopt the Chinese approach to transboundary water governance during the development of hydropower infrastructure. The Chinese hydropower development in the Mekong Basin is an illustrative example, with some authors already pointing to China's investment in transboundary hydropower, particularly the Sambor Dam in Cambodia which is currently in the planning stages, as a violation of the substantive and procedural rules such as prior notification (*Phan, 2019*). It is possible that China's approach to transboundary waters and hydropower investment would be replicated in the African context. This scenario has important implications for both water and economic governance. For one thing, IIAs are premised on the principles of stability and predictability of the regulatory environment of the country, these premises can trump water management adaptability. For instance, African states may be required under international water law to alter the water flow criteria of a hydropower project; they may agree to free water flows in order to alleviate drought in downstream states;⁷ governments could also surrender to community pressure against the challenges of hydropower development projects. All these governmental measures illustrate the need for regulatory adaptability, which can be trumped by the provisions of IIAs (*Daza-Clark, 2017*), leading to "regulatory chill" (*Tienhaara, 2011*). Under an IIA dispute settlement mechanism, contracting states consent to investor-state arbitration, placing the decision on the legality of the host state's measure—as a breach of the IIA provisions—under the jurisdiction of the arbitral tribunal.⁸ By way of example, in 2020, the Kenyan High Court annulled a contract between Kenya State-Owned Railway Company and China Road and Bridge Corporation for the construction of the Standard Gauge Railway. The Court established that the contract was procured against Constitutional and domestic procurement laws. The dispute came after it was denounced that the financier, China Exim Bank, had requested among other conditions that the developer was a company acceptable to them (*IISD, 2021*). One could draw parallels between the Pulp Mills case, before the ICJ in a dispute between Argentina and Uruguay, under the *1975 Statute of the River Uruguay*, signed by the two states for

China and the China Development Bank; and SOEs such as Sinohydro, China Gezhouba Corporation Group (CGGC), China Machinery Engineering Corporation (CMEC), and China Three Gorges Corporation.

7 In 2020 the Itaipu Hydroelectric Dam released water flows to downstream Argentina to relieve the lack of water available for human consumption.

8 ISDS may also be found in infrastructure contracts and in domestic laws regulating foreign investment.

the optimal and rational utilization of the river which constitutes the joint boundary between the two countries. While the ICJ found that Uruguay had breached its obligation to notify Argentina about the project, it did not order Uruguay to cancel the project, once it could be ascertained that the Pulp Mills would not cause harm to Argentina. The Pulp Mills dispute illustrates the consequences that breaches of international water obligations, by the riparian state, could have not only on projects but directly vis-à-vis the investor, who is developing it under the assurance that it complied with domestic legislation.

If one could appreciate for a moment, a hypothetical scenario in which Uruguay was found in breach of its obligations under the Treaty of Uruguay, and, assuming the worst, it would have been ordered to cancel the Pulp Mills project—what remedies would the Swedish foreign investor have had, as a result of Uruguay's failure to meet its transboundary obligations? The discussions between Uruguay and the foreign investor behind the well-known case are not known to the public, but this scenario raises two questions: First, whether and if so, to what extent the developer would have been responsible for the failure of its host state to comply with its transboundary obligations under the Treaty of Uruguay? Second, to what extent must the foreign investor exercise due diligence in order to ensure that its host state complies with its responsibilities under international water law, whether under treaty or customary law?

A survey of the economic or political influence that China may exert over African states when seeking economic integration is outside the scope of this paper. However, the proposed scenario, where the developer and the lender are closely connected, or perhaps even in practice the same agent, as in the case of China's government and Chinese SOEs could lead to important questions on liability and accountability. In first instance, under international water law, substantive and procedural obligations in connection to the use of transboundary water fall on the riparian state undertaking the project. Failure to comply with such obligations under the global water conventions, regional African agreements, or under customary international law would engage the responsibility of the riparian state in principle, and possibly the developer/foreign investor. The extent of liability in the case of a Chinese SOE may have implications for the home state under the rules of international law that cover state responsibility, codified and progressively developed in the *2001 Draft Articles on State Responsibility for Internationally Wrongful Acts*. This, however, is dependent on whether or not SOEs are “state organs,” if they are empowered to exercise governmental authority, or if they are under the government's direct control (ARSIWA, 2001, Art. 4, 5, and 8). This assessment must be done on a case-by-case basis. While some bodies have assessed that Chinese SOEs are not state organs, there is some debate as to whether or not they can exercise governmental authority or if they are under state control (Du, 2022).

4.1 Summary

In summary, while the rules of international economic law do not directly regulate the use and protection of international

watercourses, its governance rules influence the actions of states through economic incentives arising out of the generation of new markets and the creation of trade corridors. Among these rules of economic governance, international investment law is of particular interest to this study. The protection of foreign investors through international investment agreements and an effective dispute resolution mechanism—ISDS—may have two contrasting effects: first, the attraction of capital, much needed for the development of African countries and untapping its sustainable energy potential; second, protection against sudden changes in policy or regulation, which may create a regulatory chilling effect. In the context of China as lender and as owner of the construction entities of the hydropower infrastructure, this connection brings interesting questions from a legal perspective, where the lender has strong interest in the feasibility and cost-effectiveness of the project, and the developer is likely to follow its home-country approach to international law.

5 Observations and concluding remarks

China's involvement in transboundary hydropower at home and abroad raises a host of strategic, security, economic and foreign policy issues, each within the domain of national sovereign states, albeit within an interdependent global setting. Recent large-scale international meetings such as the 2023 UN Water Conference have highlighted the pressing transboundary water-related challenges facing the global community—from the catastrophic adverse impacts of climate change (floods and droughts), to economic downturns, social unrest and growing nationalism. These global concerns are addressed, in part, by international law, as interpreted and implemented by sovereign nations. In this study examining China's activities on transboundary waters at home and abroad, it appears that this practice is guided broadly by its adherence to the Five Principles of Peaceful Co-existence, supplemented by its state practice.

In examining the interface of international water law and international investment law in the context of hydropower development on transboundary watercourses by China at home and abroad the following observations can be made:

- (i) All transboundary waters are governed by the rules of international water law, comprised of norms of customary and treaty law. China appears to follow the major tenets of international water law (the duties of equitable and reasonable use; due diligence obligation to prevent causing significant harm; procedural rules, institutional mechanisms, dispute prevention), with nuanced approaches to applying these rules in different watercourses;
- (ii) China is major player in the development of hydropower infrastructure in Africa, both as a lender to African governments and as a developer of dams and electricity, in its capacity as foreign investor. The rules of international investment law and the investment agreements concluded between China and African countries will certainly provide protection to Chinese investors and SOEs' hydropower

projects. While international investment law is not concerned directly with the legal regime governing transboundary waters, its rules are designed to deter governments from significant and unpredictable legislative changes, including regulatory adaptability to tackle extreme hydrological variability. This could affect the terms of the hydropower infrastructure agreement between the developer and the host state, which, in turn, could affect the host state's international duties on its transboundary waters;

- (iii) The rule of due diligence applies in each regulatory domain and could be considered as one of the key legal elements in this field pertaining to both. These combined due diligence obligations converge to require adopting and implementing best practice in the construction and maintenance of hydropower projects on transboundary waters, including a balancing of competing interests, implemented through procedural norms, such as environmental impact assessment, exchange of information and technical cooperation. Foreign investors are required to observe a higher duty of care, through due diligence, principles of corporate social responsibility, and other soft law conventions applicable to the activities of corporations abroad.

Hydropower projects on transboundary waters will continue to play an important role in responding to energy and sustainable development imperatives across the globe. Clarity on the rules of international law that apply in this context provides necessary support for the peaceful management of shared resources in this domain. Understanding the interface between the two regulatory regimes examined here contributes to a more holistic approach in this complex field.

Data availability statement

The original contributions presented in the study are included in the article/Supplementary material, further inquiries can be directed to the corresponding author.

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Author contributions

PW: Writing—original draft, Writing—review & editing. AD: Writing—original draft, Writing—review & editing. DD: Writing—original draft, Writing—review & editing.

Funding

The author(s) declare that financial support was received for the research, authorship, and/or publication of this article. The authors would like to thank the Irish Research Council - New Foundations Scheme (NF/2022/39188305) for their support in publishing this article.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Supplementary material

The Supplementary Material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/fclim.2023.1302103/full#supplementary-material>

online at: <https://investmentpolicy.unctad.org/international-investment-agreements/treaty-files/8366/download> (accessed July 24, 2014).

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