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# Seeing beyond negotiations: the impacts of the Belt and Road on Sino-Kazakh transboundary water management

Justin Brassett [a], Moldir Akmadi [b] and Troy Sternberg [c,d]

[a]Water Science, Policy and Management, Wadham College, University of Oxford, Oxford, UK; [b]Department of Sociology and Social Work, Al-Farabi Kazakh National University, Almaty, Kazakhstan; [c]Centre for International Studies, University of Oxford, Oxford, UK; [d]ISCTE – University Institute of Lisbon, Lisbon, Portugal

**ABSTRACT**

China's Belt and Road Initiative (BRI) and infrastructural development has led to growing concerns regarding the future of Central Asia's water resources. However, few attempts have been made to assess the impacts this will have on specific transboundary basins within the region. This article explores how the context of the BRI transcends its physical impacts within the Ili and Irtysh basins, creating a sanctioned discourse that forecloses the possibility of 'successful' negotiations at an official level. As such, pathways to transboundary water management that exist beyond the negotiations are shown to have greater plausibility and potential effectiveness.

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## Introduction

China's Belt and Road Initiative (BRI) has come under scrutiny regarding its impacts on transboundary water management, with attention increasingly turning to Central Asia to assess its growing infrastructural and political footprint as part of the Silk Road Economic Belt (SREB) (Brown & Svensson, 2017; Martens, 2018). Discussion of 'water futures' has highlighted how China's engagement presents risks to the fragile natural landscape of Central Asia (Davies & Matthews, 2021). This paper engages further with these discussions by exploring these impacts on Sino-Kazakh transboundary water management in the Ili and Irtysh basins.

Primarily, this paper contends that within the context of the BRI, solutions are explored beyond official negotiations over transboundary water between China and Kazakhstan. This is because the BRI has created a 'sanctioned discourse' that forecloses the prospect of successful transboundary water negotiations or the application of international water law. Therefore, working within the BRI to improve the management of the water–energy–food nexus and virtual water flows within the Ili and Irtysh basins presents itself as a more plausible solution for negotiators. However, successful implementation is challenged by the multitude of actors within both basins and the wider aims of the BRI itself.

**CONTACT** Justin Brassett justinbrassett@gmail.com

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This study's contribution to the literature is shown through it addressing the lack of basin-level analysis within discussions of Central Asian 'water futures' under the BRI and by accounting for national perceptions and discourses in addition to the purely physical impacts created by China's increasing involvement in the region.

### *Roadmap*

The paper begins by examining the existing research on the BRI and its impacts on Central Asia and transboundary water management, before addressing the lack of engagement between this area of the literature and existing studies of Sino-Kazakh transboundary negotiations. Both the English and Chinese language literatures are presented to expand understanding. Analysis of expert interviews and a literature review presents the impacts of the BRI: the physical risks, political dimensions and opportunities that it brings. The discussion assesses the plausibility of solutions for Sino-Kazakh transboundary water management, given the context of the negotiations and the perceptions that govern decision-making.

## The BRI and its impact on Central Asia and transboundary water resources

Since its official launch in 2013, the BRI has grown to encompass more than 60% of the world's population and 30% of global gross domestic product (GDP) (Huang, 2016). The BRI forms part of Beijing's global ambitions to place itself at the centre of new trade routes through the construction of large infrastructure projects along the old Silk Road land route (Figure 1). This has led to the integration of Central Asian countries within its SREB, although Kazakhstan's involvement is arguably the greatest, and its capital Nur-Sultan was chosen by President Xi for the official launch in 2013 (Laruelle, 2018). This can be explained through Kazakhstan's role as the 'buckle' in the Belt, with the dry port of Khorgos on the border with China opening up trade routes from China's eastern seaboard into Europe. However, recent work has begun to explore the physical impacts of the SREB as it traverses the fragile, semi-arid landscapes of north-west China and Central Asia (Chen et al., 2016; Tracy et al., 2017). This shows how the physical and social landscape of the region is often ignored, with infrastructure projects presenting significant environmental risks (Sternberg et al., 2017).

Water resources in Central Asia are susceptible to these risks, due partly to the natural geography but also to human factors such as environmental mismanagement, as exemplified by the Aral Sea disaster (Howard & Howard, 2016). As such, much attention has been given to the five countries within the Aral basin and their challenge of managing shared transboundary resources, whilst dealing with growing populations and climate change impacts leading to rising temperatures and declining runoff in the long term (Xenarios et al., 2019; Zhupankhan et al., 2018). Water insecurity in the region is the result of these pressures and their impacts on the interconnected water–energy–food nexus which has been characterized by inefficient management upon the break-up of the Soviet Union (Xenarios et al., 2018). Water security has been defined by Grey and Sadoff (2007, p. 545) as the 'availability of an acceptable quantity and quality of water for health, livelihoods, ecosystems and production, coupled with an acceptable level of water-related risks to people, environments and economies'. Thus, the presence of water in sufficient quantities to enable development and production is linked closely to the areas of energy and food security.

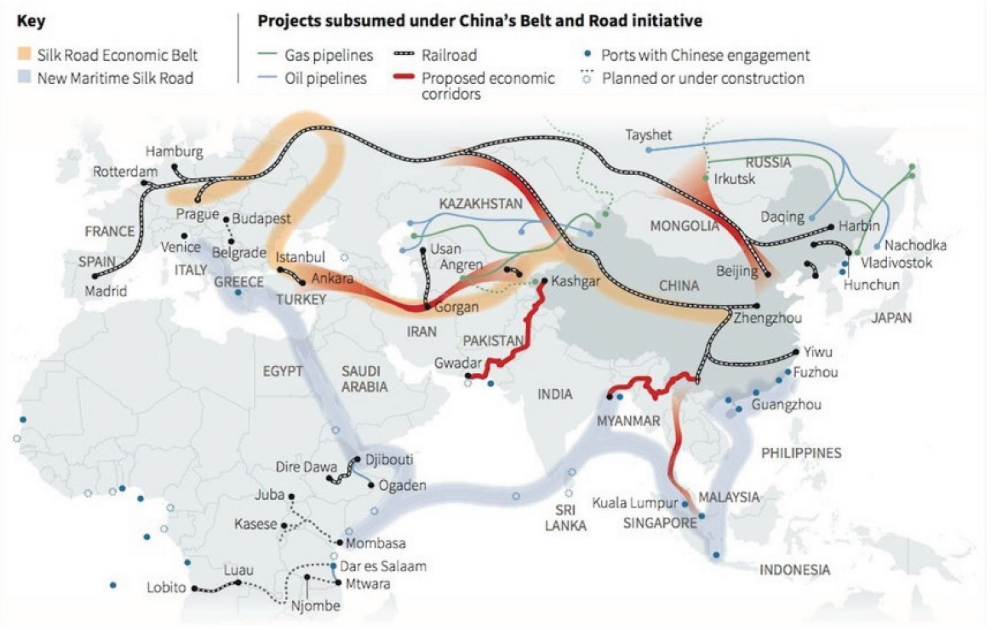



**Figure 1.** Route of the Silk Road Economic Belt (SREB) and Kazakhstan's strategic position within the Belt and Road Initiative (BRI). Source: Used with permission from the Mercator Institute for China Studies, 2017.

In Central Asia, water security in up- and downstream countries is often determined by conflicting interests within the hydropower and agriculture sectors and disputes over the timings of water storage and releases from dams. Meanwhile, agriculture is often the main water user, with high inefficiencies caused by dilapidated Soviet-era irrigation infrastructure and the growth of water-intensive crops such as cotton (Varis, 2014). Consequently, the issue of water security in Central Asia has been likened to solving a 'Rubik's cube' involving multiple external actors and stakeholders, with the BRI adding to the complexities already present in the region (Stucki et al., 2016). This has led to authors emphasizing the potential for transboundary water conflicts within Central Asia to derail the BRI and contribute to regional water insecurity (Brown & Svensson, 2017; Martens, 2018). Concerns have largely focused on the area of Chinese hydropower investments and the potential to exacerbate transboundary tensions through BRI infrastructure and funding in upstream countries such as Tajikistan and Kyrgyzstan (Duarte, 2018). Comparatively little attention has been given thus far to the relationship between China's agricultural investments in Central Asia and the possible impacts this may have on water security (Sternberg et al., 2020).

Explicit analysis of the BRI and its impacts on China's transboundary water policies and individual basins has grown in recent years, although discussions regarding Central Asia have been limited (Zhang & Li, 2017). Much of the literature has analysed China's policies in the Mekong, where multiple hydropower projects to turn the region into the 'battery' of Asia have angered downstream countries. Meanwhile, Simonov and Egidarev (2017) have explored the potential impact of the BRI on China's other transboundary rivers which it shares with Russia and Mongolia. The authors suggest that China's proposed industrial

transfers would exacerbate scarcity in regions such as the Kherlen basin, whilst also increasing pollution and demand in the Amur basin. Significantly, these issues have been opposed by the public but downplayed by national elites due to a desire to retain Chinese investment as part of the BRI's 'Steppe Road' economic corridor. Nevertheless, Chinese authors such as Zhang (2017) have argued that the SREB also has the potential to benefit transboundary water management in Central Asia through enhancing trade and cooperation. The resolving of water issues in the region is seen as crucial to advancing the BRI's soft power aims and reducing the influence of the European Union and United States within this area (Li, 2017; Zhao, 2017). Guo et al. (2016) also argue that the development of the SREB will incentivize better transboundary water management now that China and Kazakhstan share the same challenges, and Zheng (2018) sees wider coordination under the BRI as a platform for the two countries to build on. These perspectives propose that China's increasing political and economic engagement within the region could also positively impact upon the future of water management.

## Sino-Kazakh hydro-politics

The BRI's impacts on transboundary water management between China and Kazakhstan can be seen through the lens of 'critical hydro-politics', which emphasizes the role of power relations within transboundary water management. Its application is particularly relevant when these are categorized as asymmetrical, due to the dominance of an upstream riparian or stronger state which assumes the role of a 'hydro-hegemon' (Zeitoun & Warner, 2006). Consequently, much of the literature on the Sino-Kazakh dispute has focused on the formalized negotiations and China's role as the hegemon, due to its superior economic power and favourable geographical position upstream on the transboundary Ili–Balkhash basin (IBB – henceforth, the Ili basin) and Irtysh basin (Bohnenberger-Rich, 2015) (Figure 2).

The Ili basin covers an area of 115,000 km$^2$, distributed between the Ili-Kazakh Autonomous Prefecture in Xinjiang province in China and the Almaty region of Kazakhstan either side of the Khorgos border river. The Ili River originates in the Tianshan mountains of north-west China and contributes up to 80% of Lake Balkhash's inflow, supporting a large fishing industry within the delta ecosystem (Pueppke et al., 2018a, 2018b). The delta also provides suitable conditions for livestock farming amongst the *Phragmites australis* reeds, and the Almaty region also contains much of Kazakhstan's irrigated land at an estimated 575,821 ha (FAO, 2013). Meanwhile, the Irtysh basin covers an area of 1,643,000 km$^2$ and originates upstream in the Altai Mountains in China before passing through Kazakhstan and Russia. It is a major source of water for Kazakhstan, supplying water to 11 cities and 6.8 million people, including major industries in Karaganda and Pavlodar (TWAP, 2016). Although neither is termed a 'deficit' basin with regard to precipitation, both are classed as 'under stress' and at high risk of hydropolitical tension according to the Transboundary Waters Assessment Programme (TWAP) (2016).

Currently, transboundary management of the two basins takes place within the framing of the 2001 Sino-Kazakh Agreement on Cooperation in the Use and Protection of Transboundary Rivers, with a later agreement in 2011 focusing specifically on improving water quality (China–KZ, 2001, 2011). However, these agreements avoid placing any limits on withdrawals and evidence China's unwillingness to enter into a binding agreement on




**Figure 2.** Location of the Ili and Irtysh rivers along the Sino-Kazakh border. Source: Adapted from Freeworldmaps.net.

water allocation between the two countries (Baizakova, 2015; Stone, 2012). This demonstrates how lines between conflict and cooperation can be blurred and that the signing of legal agreements should not always be seen as positive (Zeitoun & Mirumachi, 2008). As such, Zheng (2021) shows how the current state of Sino-Kazakh negotiations is one of 'superficial cooperation', whereby the successful implementation of any policies is hindered by the safeguarding of China's national interests.

Nevertheless, weaker riparians still have the potential for agency within these hydropolitical relations, with multiple options to improve their bargaining power within negotiations (Cascão, 2008). For example, issue-linkage can allow a weaker riparian to improve its bargaining position by connecting water to other shared concerns in the basin where a greater advantage is held (Daoudy, 2009). Ho (2017) has explored this potential strategy for Kazakhstan within negotiations, arguing that it takes place through pairing discussions around water with the energy trade and border security where China needs Kazakhstan's cooperation. Consequently, contextualizing negotiations through comparison with China's wider transboundary water policies has demonstrated the preferential treatment that Kazakhstan has received when compared with other riparians (Biba, 2014; He, 2015; Zhang & Li, 2018). However, Kukeyeva et al. (2018) have argued that the closer engagement between the two countries under the BRI has intensified existing power asymmetries and led to a reluctance to discuss sensitive issues and jeopardize Chinese investment in Kazakhstan.

Mirumachi and Allan (2013) have also demonstrated that transboundary negotiations must be seen as part of wider political and economic contexts that dictate the ways in which risks and benefits are perceived by riparians. Therefore, within critical hydropolitics the creation of a 'sanctioned discourse' presents one of the key ways in which hydro-hegemony is preserved (Zeitoun & Warner, 2006). This allows those in power to create a dominant narrative that legitimizes certain forms of decision-making and places limitations on the political feasibility and visibility of other solutions (Jägerskog, 2003). For example, a 'sanctioned discourse' can be created regarding the need for transboundary negotiations to secure more water, when in fact food security can be achieved instead by accessing the global grain market to trade in virtual water as a politically safe and invisible solution (Allan, 2002).

The virtual water concept has been introduced as a way to account for the embedded nature of water flows within agriculture that are hidden away within the products we consume (Allan, 1993; Hoekstra & Hung, 2005). Expanding this concept to the area of water footprints and the accounting of virtual water flows between regions has shown how the water and agricultural sectors can become more sustainable. This recognizes the significance of blue, green and grey water and the relative contribution of irrigated agriculture to these virtual water flows. Within the context of the BRI, studies have begun to explore the impacts of China's agricultural investments on the virtual water trade, demonstrating that alleviating China's own water scarcity may come at the expense of countries who are net exporters (Wang et al., 2021; Zheng, 2018). Consequently, the export of water-intensive products from inefficient water users such as Kazakhstan may lead to negative impacts on regional water security (Liu et al., 2021). Studies show how the Ili basin is characterized by high efficiencies on the Chinese side of the border due to investments in drip irrigation over the years, in contrast to the low efficiencies and decaying Soviet-era infrastructure on the Kazakh side (Nurtazin et al., 2019; Pueppke et al., 2018b). However, assessment of the impacts of the virtual water trade and the BRI on Sino-Kazakh hydro-politics has been limited.

## Methodology

Interviews with 22 experts on Sino-Kazakh BRI relations investigated transboundary water management in the Ili and Irtysh basins. Introductions to interviewees were provided through existing contacts in universities in Kazakhstan or by targeted emails to authors of recent articles and reports on the topic. The interviews lasted between 30 and 60 min and were conducted online following a semi-structured approach, with questions varying depending on the area of expertise for the participant. This method was chosen to ensure that interviewees could determine the direction of discussions and begin to develop links between the areas of transboundary water management and Sino-Kazakh relations under the BRI. The range of nationalities, areas of expertise and occupations also allowed the views of a variety of stakeholders in the region to be inferred and provided contrasting perspectives for analysis.

Interview data were supported by discourse analysis of a comprehensive range of literature on transboundary water negotiations and Sino-Kazakh relations under the BRI. These insights are brought into both the findings and discussion sections to explore how negotiations are presented from an official point of view and the national perceptions

that influence decision-making and discussion of the issue in both Kazakhstan and China. Reviewed sources ($n$ = 70) included academic articles and grey literature (non-governmental organization (NGO) reports, media articles, policy documents) related to the BRI and bilateral agreements between China and Kazakhstan. Data were selected through targeted searches across academic and news databases using keywords such as 'China Kazakhstan transboundary water'. These sources were then grouped into categories, as shown in Table 1. Significantly, the analysis also included literature published in Chinese and perspectives from the Russian and Kazakh language media which are not present in other similar studies and thus present a more balanced assessment of the topic (cf. Davies & Matthews, 2021; Martens, 2018). This is essential to transboundary water disputes due to its emotive nature and the presence of competing narratives and discourses both between and within riparian states (Feitelson, 2002).

Upon collection of all relevant data, in-depth analysis then took place through the use of NVivo software to allow all interview transcriptions and literature to be coded and to draw connections between different topic areas. The results and discussion sections were structured based on this process. Within the results and discussion sections, assertions made or supported by participants are shown through the use of the following codes; P($n$) denoting the 17 interviewees and C($n$) denoting five correspondents who were not interviewed but provided data which have been included in the analysis. A full list of interviewees is provided in Table 2, along with their area of expertise and reference number. More information on official negotiations would strengthen findings, yet these are unavailable from the ministry or official participation. There was a lack of accurate hydrological data available on both sides of the border due to the sensitive and securitized nature of transboundary discussions (Mirumachi & Allan, 2013).

## *Case study selection*

The BRI and transboundary water management in Central Asia is often presented regionally and thus lacks appreciation of the specific contexts of China's engagement with each host country and their basins. Here the Ili and Irtysh transboundary basins were selected

**Table 1.** Categories of literature reviewed.

| Category of literature | Number of cited sources[a] | Reference |
|---|---|---|
| English language journal articles on the Belt and Road Initiative (BRI) and Sino-Kazakh relations | 10 | Bitabarova (2018) |
| English language journal articles specific to Sino-Kazakh transboundary water relations | 20 | Ho (2017) |
| Journal articles and non-governmental organization (NGO) and policy reports relevant to transboundary water management under the BRI | 22 | Howard and Howard (2016) |
| Media articles on Sino-Kazakh relations and the Ili and Irtysh basins (mainly in Russian and Chinese) | 8 | Kutubaeva (2021) |
| Chinese-language BRI policy documents and bilateral agreements with Kazakhstan | 4 | China–KZ (2018) |
| Chinese-language journal articles on transboundary water management under the BRI and Sino-Kazakh negotiations | 6 | Zheng (2018) |

Note: [a]Additional literature was also reviewed, which is not directly cited within this paper.

**Table 2.** Interviewees consulted.

| # | Nationality | | Area of expertise | Code |
|---|---|---|---|---|
| **Interviewees** | | | | |
| 1 | Greek | Former regional development consultant | Water resources management in Central Asia | P1 |
| 2 | German | Academic | Water resources management in the Ili basin | P2 |
| 3 | American | Academic | Water resources management in the Ili basin | P3 |
| 4 | Russian | Member of environmental non-governmental organizations (NGOs) for transboundary water and Green Belt and Road Initiative (BRI) | BRI and the environment and transboundary water management in Central Asia | P4 |
| 5 | British | Consultant in water sector management | Water resources management in Kazakhstan | P5 |
| 6 | American | Journalist | Water resources management in the Irtysh basin | P6 |
| 7 | Russian | Journalist | Water resources management in the Irtysh basin | P7 |
| 8 | Russian | Academic | Perceptions of the BRI and the environment | P8 |
| 9 | Kazakh | Academic | BRI and perceptions of China in Kazakhstan and Central Asia | P9 |
| 10 | Kazakh | Academic | Perceptions of China in Kazakhstan | P10 |
| 11 | Kazakh | Researcher/development consultant | BRI and perceptions of China in Kazakhstan and Central Asia | P11 |
| 12 | Kazakh | University staff | Local perceptions of the BRI, environment and China | P12 |
| 13 | Dutch | Regional consultant | BRI and transboundary water resources | P13 |
| 14 | Kazakh | Academic | Sino-Kazakh transboundary water negotiations | P14 |
| 15 | Uzbek | Member of CAREC Institute and former regional consultant | Transboundary water resource management in Central Asia | P15 |
| 16 | Chinese | Academic | China's transboundary water management | P16 |
| 17 | Chinese | Academic | Sino-Kazakh transboundary water negotiations | P17 |
| **Participants who provided correspondence or data** | | | | |
| 18 | Kazakh | Academic | Water resources management in the Irtysh basin | C1 |
| 19 | Kazakh | Academic | Water resources management in the Ili basin | C2 |
| 20 | Japanese | Academic | Water resources management in the Ili basin | C3 |
| 21 | Chinese | Academic | Perceptions of China in Central Asia and Kazakhstan | C4 |
| 22 | American | Former legal practitioner in Central Asia | Sino-Kazakh transboundary water negotiations | C5 |

for their strategic position on the SREB. Longstanding concerns surrounding the construction of major upstream infrastructure projects to develop Xinjiang have increased under the BRI (Hagt, 2003; Guo et al., 2016; Krasnoyarova et al., 2019). Diversions are estimated to consume up to 40% and 50% of the Ili and Irtysh's flows, respectively; any further increases have the potential to seriously damage downstream ecosystems (Hao, 2017; Zhou & Wang, 2017). We set out to explore how changing political and physical landscapes have impacted these two basins.

## Findings: the impacts of the BRI

### *Physical impacts of the SREB/BRI*

Discussions regarding the Sino-Kazakh dispute focus on the need for a binding agreement on water allocation within the negotiations, with fears that new developments upstream as part of the SREB will result in catastrophic impacts for water security in Kazakhstan. However, these assumptions are challenged by findings from the interview data.

When asked about the potential physical impacts of the SREB, Russian and Chinese experts on China's transboundary water policies suggested that new large-scale diversion projects in the Ili and Irtysh basins are unlikely to be planned (P4, P16). Instead, the physical impacts of the SREB were seen as a continuation of the ongoing pressures exerted as a result of increased population growth and development in Xinjiang. This has been taking place since the early 1990s before the advent of the BRI, but these policy aims have been subsumed within the SREB to promote the development of China's poorer western regions. These assertions are supported by studies within the literature showing that the expansion of agriculture upstream has placed greater stresses on the quantity and quality of water arriving in the Kazakh portions of the Ili basin (Nurtazin et al., 2019; Thevs et al., 2017). Recent analysis of land-use cover change also reveals the expansion of irrigated cropland in the Chinese part of the basin (Qi et al., 2019). As such, future scenarios for the Ili basin are shown to be highly dependent on the extent to which China continues to develop agriculture upstream (De Boer et al., 2021).

Nevertheless, interviewees conducting research in the Ili basin also claimed that limits to the availability of irrigated land in both sides of the basin had already been reached and that further agricultural expansion is therefore unlikely, with high levels of salinization being recorded (P3, C3). As a result, the BRI may be responsible for increased agricultural withdrawals in recent years in the Ili basin, but the likelihood of this continuing unabated is challenged. Researchers emphasized that a greater issue for Kazakhstan is the timing of flows rather than their quantity. This is due to the alterations to flood cycles and resultant impacts on fisheries and food production in the Ili Delta downstream (P3). Therefore, although local Kazakhs would often blame China for the lack of water, this was not necessarily reflective of the true impacts on the basin (P2).

Similarly, interviews with journalists working on the Irtysh basin showed how it is often claimed by local people that new developments upstream in China are causing flooding and low water levels across the border, even though these impacts are downstream of Kazakh hydropower stations which may also be responsible (P7). Meanwhile, an expert on Kazakhstan's water resources conceded that water quality along the river remains a significant issue, although it is unclear whether this has increased as a result of the SREB and there are many polluting industries within Kazakhstan as well (P1). This demonstrates how although China's withdrawals may cause genuine harm to downstream ecosystems and communities, many of these causes are historical and are not necessarily attributable to the BRI or related to the quantity of water that is being withdrawn.

Further findings based on interviews with researchers in both the Ili and Irtysh basins show that China's upstream policies are also only part of the problem. For example, water shortages in the Ili basin are also caused by a lack of institutional and sectoral coordination on the Kazakh border that greatly exacerbate any decreases in runoff caused by China

(P3). Likewise, in the Irtysh, poor sectoral communication from hydropower companies and a lack of regulation leads to downstream flooding and pollution that harms fisheries and affects agriculture (C1, P6). The inefficiency of the Kazakh agricultural sector and the irrigation losses caused by decaying infrastructure were also cited as a major concern in both basins. Clearly, China's upstream withdrawals have the potential to greatly affect downstream users and limiting future increases will be vital to achieving Kazakhstan's water security needs. However, the BRI is one of many factors affecting the basin, and focusing solely on its contribution and securing an agreement on water allocation within the negotiations, can obscure risks which arise from inefficient water use or poor intersectoral coordination.

### *The sanctioned discourse and the foreclosing of negotiations*

Analysis of the official bilateral declarations released by both countries since the official advent of the BRI in 2013 demonstrates the political and economic impacts of the BRI, suggesting that these have impacted on transboundary water management through foreclosing the prospect of 'successful' negotiations. This is due to the increased formalization of transboundary relations and the subordination of the water issue to other areas perceived to be of greater importance in terms of Sino-Kazakh cooperation. Within the agreements, cooperation to strengthen the SREB is now always given priority, with clauses relating to transboundary water always placed below other areas such as security, the energy trade and developing the transport and agricultural sectors (China–KZ, 2015, 2018). Meanwhile, researchers on Sino-Kazakh relations under the BRI suggested that Kazakhstan's increasing economic dependence on China is shown by the intertwining of its own national development projects such as '*Nurly Zhol*' with the SREB (China–KZ, 2015, pp. 9, P11). Nevertheless, it can be argued that Kazakhstan has acknowledged this arrangement and accepts that trade-offs will arise when negotiating bilaterally with China, with water now being seen within this perspective.

Since the formation of the Joint River Commission in 2003 and the signing of the 2011 Water Quality Agreement, bilateral agreements have always been resoundingly positive about China's actions and when water is mentioned the Commission is praised for its progress (China–KZ, 2015). There are also frequent appraisals of China's data-sharing and the success of the Khorgos Friendship Diversion Project, despite it offering a negligible contribution to overall flows in the Ili basin. Therefore, as negotiations have progressed under the BRI, formalized cooperation has arguably increased, but still without any tangible impact on securing binding limits on upstream withdrawals. This is shown by the fact that an agreement on water distribution first developed in 2010 has still not been finished a decade later and has gradually disappeared from bilateral statements after repeatedly being said to 'be in progress' (China–KZ, 2013, 2018). However, it is also clear that Kazakhstan has long been aware of these potential trade-offs and the likely impacts of closer bilateral relations for its transboundary water resource. A legal expert with experience of previous negotiations on the Irtysh suggested that everyone involved was aware that it was a 'lose–lose situation' (C5). Other interviewees with experience of transboundary water negotiations within Central Asia also suggested that Kazakhstan prioritizes institutional resources towards the Aral Sea basin where it has a greater chance of securing a positive outcome (P1, P4, P15). Thus, it is argued that Kazakhstan approaches

these transboundary negotiations from a position of pragmatism, with an acceptance that they are unlikely to lead to a change in water allocation but will also not jeopardize wider economic and political relations with China.

These impacts of the BRI have produced a 'sanctioned discourse' regarding the two rivers. Although the risks to transboundary water resources are clearly present, the issue is deprioritized by Kazakhstan to preserve relations with China. Therefore, as confirmed by a Kazakh expert on the negotiations, the discourse presented to the public through official bilateral declarations and state media announcements is that the negotiations on the Ili and the Irtysh basin are successful and a sign of the growing cooperation between the two countries (China–KZ, 2013, p. 14). As such, the BRI has arguably foreclosed the prospect of official negotiations delivering a favourable outcome for Kazakhstan, yet also ensures that these negotiations will still be presented as a success by both countries.

### *The BRI and opportunities beyond negotiation*

A key point drawn from the interview findings is that a lack of success in official transboundary water negotiations does not mean that solutions cannot be pursued elsewhere. In fact, the SREB also provides new opportunities which have the potential to impact water management beyond official negotiations.

The concept of the food–water–energy nexus was discussed by several researchers and consultants working within transboundary water management in Central Asia during interviews. They emphasized the lack of coordination between sectors and the need for the agriculture, energy and water sectors to be integrated within both basins (P1, P3, P15). Chinese involvement in all three sectors is increasing, leading to the potential for shared benefits to be realized and a greater incentive for China to ensure sufficient flows of water. A Chinese academic researching transboundary water reported that there are growing signs that China is investing in more hydropower projects on the Kazakh side of the border in both basins, with the Dostyk and Moinak dams recently constructed on the Khorgos and Charyn rivers (both tributaries of the Ili) and another on the Turgusun (a tributary of the Irtysh) (P17) (cf. Yau, 2020). Meanwhile, researchers in the Ili and Irtysh basins posited that China's growing investments in agriculture in both the livestock sector (Ili) and the wheat sector (Irtysh) also suggest that the water–energy–food nexus could become a catalyst for greater coordination for the benefit of both countries (P3, P15). Therefore, solutions to transboundary water management will have to take into account the impacts of the BRI across the nexus rather than focusing purely on water allocation on its own.

Within the nexus, interviewees emphasized the need for BRI investments to address inefficiencies within the agricultural sector, as it remains the primary water user in both the Ili and Irtysh basins (P15, P16). It was argued that virtual water savings could be achieved through ensuring that lower amounts of embedded water are associated with Kazakhstan's agricultural products, leading to more 'crop per drop'. Benefits might then be delivered to the semi-arid Ili basin where Soviet-era irrigation systems are still in use and lead to highly inefficient use of an increasingly scarce resource (P3). In the Irtysh basin, the high water consumption of agriculture and the low levels of modernization in the industry have limited the cost-effectiveness of agriculture in the basin, which is 2.3 times less than that of the Murray–Darling basin in Australia (C1). Therefore, BRI

investments in agricultural modernization within the basin could increase efficiency and improve water security for Kazakhstan, placing less pressure on its transboundary water resources. However, researchers also had concerns regarding the contrasting aims of the BRI and the impacts this may have on the nexus. For example, investments within agriculture must be seen within the wider context of the growing attractiveness of Kazakhstan as a wheat exporter to China under the BRI and the potentially negative impacts of this virtual water trade (P16). In addition, concerns were also raised regarding the impacts of the growing beef trade on the nexus within the Ili basin, suggesting that this could lead to unsustainable use of land and water (P2, P3).

Another application of the virtual water concept as part of the BRI could be the development of greater cropping efficiency. A member of the Central Asia Regional Economic Cooperation Program (CAREC) Institute argued that SREB infrastructure was critical for the region as a whole to access new foreign markets and create an incentive to shift away from water intensive cotton to more efficient and valuable exports (P15). This is relevant to the Ili basin, where low value water intensive crops such as rice and alfalfa are currently being grown when the land could be suitable for higher value fruits. Thus, an expert on the nexus in the Ili basin suggested that new infrastructure such as the dry port at Khorgos could potentially improve water use efficiency in the Kazakh lower valley. It was argued that this would provide the incentive to shift production away from low-value crops to more valuable exports such as wine and apples, with the latter synonymous with the Almaty region, yet rarely exported (P3).

Opportunities presented by the SREB suggest that the BRI could impact on transboundary water management through increasing the efficiency of water allocation and usage in the Ili and Irtysh basins. If implemented correctly, this could improve resilience to climate change impacts and promote greater cooperation for future developments in agriculture or infrastructure.

## Discussion

Analysis finds that the BRI's impacts are felt most strongly from a political perspective, through the creation of the sanctioned discourse which limits the effectiveness of formal negotiations. Nevertheless, opportunities are also shown to exist beyond these negotiations, with the BRI providing a new platform for intersectoral cooperation. The discussion contributes to the existing literature on the impacts of the BRI on transboundary water management in Central Asia by examining the case study of the Ili and Irtysh. This builds on existing arguments regarding the context of hegemony and incorporates an understanding of evolving perceptions under the BRI. Their influence on the negotiations is shown to determine the plausibility and effectiveness of solutions for transboundary water management in the Ili and Irtysh basins.

### *Hegemony and negotiation*

The primary reason for the ineffectiveness of official negotiations in securing a more equitable allocation of water for Kazakhstan is the power asymmetry that exists between the two countries. China's hydro-hegemony is enshrined within the initial 2001 agreement which includes the clause requiring neither party to 'limit the other party in the

rational use and protection of the water resources', paving the way for upstream development in Xinjiang (China–KZ, 2001). The plausibility of any solutions therefore depends largely on the context of China's transboundary policies. Consequently, China's unwillingness to accept the United Nations Watercourse Convention (UNWC) and determination to counter its perceived 'upstream bias' has effectively curtailed the prospect of international water law as a means to resolve the dispute. (Biba, 2014; He, 2015; Wouters & Chen, 2013; Zhang & Li, 2018; Zhong et al., 2016).

However, the concept of counter hydro-hegemony and the agency of Kazakhstan as the weaker riparian shows that a range of options are available beyond official water negotiations (Cascão, 2008). Thus, it has been shown that the Kazakh state has become aware of its strategic role in China's political aims and has sought to orientate its transboundary policy within this wider context (Deng, 2012; Ho, 2017). Nevertheless, in contrast to the literature, it is argued that despite Kazakhstan's position being strengthened by these linkages, under the BRI these attempts are no longer direct examples of counter hydro-hegemony. Instead, they are better seen as a conscious acceptance of China's hegemony on the basis of achieving better overall political and economic outcomes for Kazakhstan. Furthermore, the interview findings also showed that there is little evidence that any issue-linkages have succeeded in bringing about material improvements to Kazakhstan's water allocation. Although negotiations involving trading oil for water were mentioned as being the most plausible option, an expert on Kazakh water negotiations argued that this depended heavily on oil prices and no longer held strong bargaining power (P1). Similarly, attempts to leverage wheat exports are also unlikely to succeed given that previous attempts to exchange wheat for water were rejected by China in 2007 (P1, P9). Therefore, although issue-linkage may evolve as part of counter hegemonic strategies for Kazakhstan, it is argued that the acceptance of the BRI suggests that this is not the approach that is being taken.

In contrast, this paper has chosen to engage with an alternative concept within critical hydropolitics and to explore how power relations under the BRI have materialized through the creation of a sanctioned discourse as a way to preserve hydro-hegemony (Zeitoun & Warner, 2006). This means that any moves that Kazakhstan could make within the public sphere of negotiations are largely suppressed to preserve good relations with China. Therefore, official bilateral negotiations for Kazakhstan and other BRI host countries will always take place within this framework. As such, focusing on negotiations and the use of international water law is arguably misguided, as they are situated within this context of Chinese hydro-hegemony that has been strengthened further by the BRI. Kukeyeva et al. (2018) echo this assessment and have argued that this could lead to the Ili and the Irtysh becoming 'casualties' of the BRI. This also corresponds with concerns regarding the future of other transboundary basins within Central Asia and the BRI's 'Steppe Corridor' where environmental concerns are similarly downplayed by host countries (Simonov & Egidarev, 2017).

However, it is also important to note that hegemony does not automatically equate to negative outcomes for a basin (Cascão & Zeitoun, 2013). In fact, a more optimal allocation of water could result for both countries if the hegemon perceives this to be beneficial. Consequently, evaluation of Chinese perceptions is also important as Central Asia's transboundary waters present a great 'soft power' opportunity for the BRI (Li, 2017; Zhao, 2017; Zhang, 2017). Hao (2017) and Zheng (2018) also see harmonious relations

between China and Kazakhstan over their transboundary waters as crucial to the progress of the SREB. Therefore, whilst scenario modelling by authors such as De Boer et al. (2021) is valuable in exploring the worst case scenarios should China 'turn off the tap', it can be argued that any assumptions of endless agricultural expansion are in fact less likely because of the BRI (cf. Trilling, 2021). Meanwhile, greater formalized cooperation in other sectors under the BRI could also create opportunities for more informal diplomacy as part of transboundary water negotiations. This could improve the implementation of policies agreed within the negotiations and these new channels could be used to facilitate greater coordination with other sectors such as energy and agriculture for the benefit of water management.

### *Perceptions and plausibility*

The influence of perceptions is another factor which has determined the plausibility of the solutions that can be considered by both riparians, through demonstrating the value of 'invisible' solutions such as the virtual water trade in resolving politically costly negotiations (Allan, 2002; Jägerskog, 2003). Similarly, in this case study, the more visible area of official negotiations are still presented as the effective solution by both states, although 'invisible' solutions are in fact being pursued.

This dynamic can be partly attributed to the divergent perceptions of China which are present within Kazakhstan and Central Asia (Chen, 2015; Koch, 2013). As Peyrouse (2016) has shown, populations are largely divided into the elite 'Sinophiles' and the local population who can be seen as 'Sinophobes', a dynamic which has arguably increased as a result of the BRI (Vakulchuk & Overland, 2019). These assertions in the literature were confirmed by multiple interviews with experts on perceptions of China and the BRI in Kazakhstan and can be applied also to the area of transboundary water negotiations (P8–P11). Analysis shows that on the one hand, the Sinophilia of the elite produces a willingness to uphold the 'sanctioned discourse' regarding the transboundary rivers and eschew an aggressive stance within negotiations on water. On the other, the presence of Sinophobia within the population explains how heightened risk perceptions are created regarding China's upstream impacts and the risks that the SREB poses to Kazakhstan. Kazakh experts fall on both sides of this divide, with those from government ministries emphasizing China's willingness to cooperate on environmental issues, while academics are heavily critical of the negotiations and see the fate of Lake Balkhash as mirroring that of the Aral Sea (Kiselyova, 2021; Kutubaeva, 2021). Significantly, there has also been a noted resurgence in anti-China protests post-pandemic with these also being linked to fears for the future of Lake Balkhash as a result of China's upstream withdrawals (Goble, 2021; Shaku, 2021). Bilateral negotiations taking place within this context lead to the Kazakh government having to tread a fine line between ensuring that it does not offend its more powerful neighbour but also not appearing to give in completely to China's demands. Therefore, publicly pursuing an improved water allocation through negotiations is likely to remain an important part of state attempts to show that the situation is under control.

Taking into account these perceptions and China's unwillingness to cooperate within formalized negotiations, improvements to virtual water efficiency in Kazakhstan are seen as a plausible solution. This argument has been developed by Chinese authors such as Xie

and Jia (2018), who see this as a win–win for both countries and a way of easing tensions within negotiations. However, although this could in theory decrease the water usage required for growing crops on the Kazakh side of the border, any improvements must also be seen within the wider context of the virtual water trade within the BRI. Under the current scenario, Kazakhstan is a net exporter of virtual water and exports an increasing amount of wheat and other agricultural products to China despite a vast disparity in water efficiency (Liu et al., 2021; Zhang, 2019). This suggests, that even if efficiency gains were to be made within Kazakhstan, a continued increase in the volume of trade would still lead to an imbalanced and unsustainable virtual water trade. However, until the agricultural sector can modernize effectively within Kazakhstan and drastically cut its virtual water component to the same level as China's, exports to support China's food security will continue to jeopardize its own water security. As such, despite the politically plausible and attractive nature of this 'solution' for Chinese authors (cf. Guo et al., 2016; Xie & Jia, 2018; Zhang, 2017), its actual ability to support sustainable water management within the basin is likely to be compromised by a lack of integration with higher level BRI policies regarding the agricultural trade.

Although the BRI certainly incentivizes and increases opportunities for intersectoral cooperation within the nexus, the realities of cooperation are challenged by the multitude of actors and competing interests within each basin. For example, BRI investment has turned towards the beef trade within the Ili basin, funding the expansion of extensive feedlots supplied by irrigated alfalfa and fodder. This is in turn encouraged by the Kazakh state, who see the development of their 'elite bull' breeding programme as crucial to the success of exporting high value meat products to China (Baranowski et al., 2020). Seemingly little thought has been given to the potential consequences for the basin as a whole if irrigation and land use change continue as part of the expansion of the livestock trade. In this way, investments as part of the BRI may incentivize activities in the energy and food sectors which are harmful to water security.

The nexus and the virtual water trade are therefore impacted by contradictions within the BRI and its primary focus on supporting China's growth. In a scenario whereby all actors in the basin are supportive of the BRI, the modernization of agriculture and alteration of cropping patterns could lead to improved water efficiency. However, the reality suggests that many rural populations in the Ili and Irtysh basins are likely to be resistant to any perceived Chinese interference over their land (Serrikaliyeva, 2019). Likewise, cotton is an indispensable part of the Xinjiang Production and Construction Corps (XPCC) plans to develop Xinjiang and maintain high employment rates (Zhang & Li, 2018). As such, local perceptions and conflicting ambitions within China's regional governance may restrict implementation. These challenges show that focusing purely on technical market solutions such as the virtual water trade or the nexus can fail to recognize existing power relations and the political support of all actors required for implementation (Allouche et al., 2015; Biba, 2016). Thus, within the multifaceted 'Rubik's cube' of water management in Central Asia, destabilization of the nexus can quickly result due to the numerous linkages and competing interests at play (Stucki et al., 2016).

Discussion of any potential solutions beyond negotiations is hindered by their 'invisible' nature. The continued opacity and securitized nature of the actual negotiations and infrastructural development upstream in Xinjiang continues to place limits on the conclusions that can be drawn from studies on this topic. Despite BRI rhetoric promoting

sustainability and harmonious development, contradictory aims which prioritize China's own economic development mean that unilateral solutions to secure water remain a possibility within the context of the sanctioned discourse. This contributes to continued suspicion of any infrastructural development upstream on the Irtysh and Ili basins which may be perceived as diverting the headwaters of either river (Dangwal, 2021; Deng & Tan, 2021).

## Conclusions

Analysis of the impacts of the BRI on the Ili and Irtysh basins suggests that solutions to transboundary water management are found beyond the area of official negotiations. The explicit incorporation of the BRI and assessment of plausible solutions provides a valuable update to the literature on Sino-Kazakh transboundary water management. Previous analysis by Bohnenberger-Biba (2014) on the context of Chinese hydro-hegemony and Kukeyeva et al. (2018) on the risks presented by the BRI is therefore developed through application of the concept of the sanctioned discourse. This has demonstrated the impact that perceptions have had on determining the course of the negotiations and water management under the BRI.

Findings from the case study also contribute to the wider discussion regarding 'water futures' in Central Asia as part of the BRI, demonstrating the value of moving beyond a regional approach and exploring the specific impacts that are present at basin level (Davies & Matthews, 2021). A number of key points can be derived from this study which may be applicable to other transboundary basins in Central Asia. Primarily, the non-infrastructural impacts of the BRI are shown in many cases to be more significant, with direct impacts from large infrastructure or diversion projects not necessarily presenting the greatest risks. Instead, the political, social and economic impacts should be incorporated for a more nuanced understanding of the risks presented by the BRI. This demonstrates the value of discourse analysis and the evaluation of national perceptions in revealing the motivations behind each country's stance within negotiations.

The BRI's growing engagement across multiple sectors such as the agriculture and energy sectors shows the need to assess how the nexus is affected by development in other sectors which may impact on water allocation and usage. Exploring the links within the nexus can expose the contradictions that are often inherent within the BRI. For example, high-level goals such as achieving food security for China and developing industrial and agricultural sectors within host countries may lead to impacts which outweigh the benefits of any improvements to water use efficiency within transboundary basins themselves. However, this requires the analysis to move beyond monolithic assumptions regarding the BRI and China's transboundary water policies, to appreciate the multitude of actors and decision-makers involved (Zhang & Li, 2018).

The study emphasizes the importance of assessing transboundary water management within the new context of the BRI and shifting the focus of decision-making away from negotiations based purely on international water law. Nevertheless, negotiations are shown to be significant in upholding the sanctioned discourse and demonstrate how power relations determine the solutions that are deemed plausible within a basin.

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## ORCID

Justin Brassett http://orcid.org/0000-0002-3039-2573
Moldir Akmadi http://orcid.org/0000-0003-0789-3684
Troy Sternberg http://orcid.org/0000-0002-2203-5226

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