India, Pakistan and cooperation along the Indus River system

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Abstract

Despite receiving accolades for being the example of cooperation, India and Pakistan’s peaceful management of their Indus River system remains largely unexamined. Scholars that do consider this case classify it as passive cooperation. To support their classification, they point to the Indus Waters Treaty’s allocation of the river system between India and Pakistan and suggest that it severed the interdependent relationship and need to cooperate. Consequently, this paper seeks to demonstrate that India and Pakistan remain interdependent in managing their Indus River system and for over 40 years, they have sustained active cooperation. To account for the maintenance of this cooperation the paper argues that it is necessary to consider the design of the Permanent Indus Commission, an institution established to manage the Indus River. The ability of Indian and Pakistani commissioners to communicate directly and hold regular meetings permitted them to perform the necessary standard and operating procedures for the functioning of the institution. The commission’s ability to monitor development of the river system has enabled it to ease member states’ fear of cheating and confirm the accuracy of all exchanged data. Finally, its conflict resolution mechanisms have permitted it to negotiate settlements to disputes as they arise.

Keywords: Cooperation over Indus River; Cooperation over international rivers; Design of river commissions; India and Pakistan relations; Indus River; Indus Waters Treaty; Permanent Indus Commission; Salal Dams; Baglihar Dam

1. Introduction

On 13 December 2001, suspected Pakistani-based militants attacked the Indian Parliament. In response, India cut diplomatic ties with Pakistan, halted all transportation and declared the Pakistani ambassador persona non grata. The adversaries deployed their troops along their shared border, placing them on high alert. April brought yet another military attack, this one against a Hindu temple in Jammu.
Domestic discontent intensified with increasing calls from India’s political and economic elite for retaliation. In May, the annual meeting of the Permanent Indus Commission (PIC), an institution established to manage the Indus River system shared between these states, was scheduled. Despite the impending threat of war, the Pakistani Indus Commissioner arrived in New Delhi, after a two-day flight from Islamabad via Dubai. The three-day meeting proceeded as scheduled. The commissioners exchanged data, negotiated the design of their hydrological infrastructure and planned tours of inspection. For more than 40 years, these adversaries succeeded in maintaining this cooperation.

Despite receiving many accolades for being the example of cooperation between adversarial states, India and Pakistan’s peaceful management of their Indus River remains largely unexamined. Existing studies of this case cover predominantly the negotiation period leading to the signing of the 1960 Indus Waters Treaty (IWT). Those scholars examining the post-1960 period argue that the IWT’s allocation of the Indus River tributaries—three tributaries going to India and three to Pakistan—has in effect severed the interdependent relationship between them and any cooperation that does exist is passive. Since this is the first study to examine this case from 1960 to 2007, the paper has two objectives. First, it seeks to demonstrate that India and Pakistan remain interdependent in the management of their Indus River system despite the allocation of tributaries. Moreover, the Indus River case is an example of active cooperation, because these riparian (states sharing a river) neighbours modified their policies to ease each other’s concerns. Second, the paper seeks to account for the ability to maintain this active cooperation. Drawing on insights from neoliberal institutionalism, an international relations theory, it argues that the PIC’s design has facilitated and maintained this cooperation. The ability of Indian and Pakistani commissioners to communicate directly with one another and to hold regular meetings enabled them to perform the necessary standard and operating procedures needed for the functioning of the institution. The commission’s ability to monitor development of the shared river system has permitted it to ease member states’ fear of cheating and confirm the accuracy of all exchanged data. Finally, its conflict resolution mechanisms have permitted the commission to negotiate settlements to disputes and prevent defection from cooperation. Before demonstrating this argument, the following section considers the existing literature on cooperation and conflict over international rivers.

2. Accounting for conflict and cooperation over international rivers

The existing literature on managing international rivers examines whether they increase the propensity for conflict among states. Scholars have found a positive relationship between shared rivers and militarized interstate disputes (Toset et al., 2000; Amery, 2002; Furlong et al., 2006; Gleditsch et al., 2006). Others found a link between water scarcity and militarized disputes (Hensel et al., 2006). Examining 1,831 events involving states’ interactions over shared rivers, the Basin At Risk (BAR) project discovered that the majority of interactions involved cooperation (Yoffe et al., 2003).

2 To punish Pakistan, India’s elite demanded the abrogation of the Indus Waters Treaty (Chandra, 2001; Verghese, 2002).
4 An interdependent relationship is a mutually dependent relationship that involves “reciprocal (although not necessarily symmetrical) costly effect” (Keohane & Nye, 1977: 9).
Scholars also investigated the forces leading to conflict and cooperation over shared rivers. Some suggest that conflict is likely when states construct hydrological infrastructure without a treaty and they have concerns over quantity issues, whereas cooperation is likely on issues of joint management, quality and economic development (Yoffe et al., 2003). Others argue that cooperation is likely when the river flows through non-adversarial states, the powerful state is located upstream and there is minimal dependence on the river; whereas conflict is likely when adversarial states are highly dependent on the international river and they face a water deficit (Hirsch, 1956; Mandel, 1992; Frey, 1993; Gleick, 1993; Lowi, 1993; Wolf, 1995). The Indus River has features that would lead us to expect conflict according to the existing literature. The river flows through enemy states with a rich history of conflict. These states are arid or semi-arid and highly dependent on the river. The upstream state, India, is the economically and militarily more powerful along the river. Contrary to the literature’s expectation of conflict, India and Pakistan have maintained cooperation for over 40 years.

The literature on managing international rivers also proposes a relationship between the design of institutions, or river commissions, established to manage shared rivers and states’ ability to cooperate (Priscoli, 1996; Bernauer, 1997; Dellapenna, 1999; Marty, 2001; Allan, 2002; McCaffrey, 2002; Nakayama, 2003; Yoffe et al., 2003; Giordano et al., 2005). Giordano et al. (2005) argue that if the commission has conflict resolution mechanisms, is flexible and capable of adjusting to change and is clear in its resource distribution and quality control, then it can facilitate cooperation. Priscoli (1996) posits that an institution needs not only flexibility to respond to change, conflict resolution mechanisms and an efficient and equitable allocation of water, but it also should oversee the multipurpose use of water and permit the involvement of local users to facilitate collaboration. Bernauer (1997) provides a framework for future research, calling for an examination of such things as the types of property rights, issues covered, legal framework, financial transfers, monitoring and openness of the institution. Missing in the literature, however, is an in-depth examination, with sufficient empirical evidence, that relates institutional attributes to states’ ability to manage their water disputes. This paper fills in the gap by identifying the main design features and providing the data to demonstrate their function. This is an important contribution since researchers discovered that treaties and agreements signed over international rivers tend to establish river commissions (Wolf, 1998; Conca, 2006; Conca et al., 2006).

Before demonstrating the argument, the next section examines the Indus River system.

3. India, Pakistan and the Indus River

Covering over 1,165,000 km², the Indus River system is one of the largest rivers in the world (Swain, 2002, 2004). Consisting of the main Indus, two western tributaries and five eastern tributaries, this river system is shared between China, India, Pakistan and Afghanistan. The rugged terrain surrounding the river in China and Afghanistan has thus far prohibited or minimized these states’ ability to develop the river within their borders. As a result, only India and Pakistan are dependent on the river system and they have developed it extensively. For Pakistan, the Indus River is the only source of water that brings

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6 For instance, Marty notes that the lack of data on the function and operation of institutions minimized his ability to draw conclusions on the relationship between design and cooperation (Marty, 2001: 379).

7 Although Salman (2008: 108) does note that Afghanistan and China are “asserting their rights to an equitable and reasonable share” of the Indus tributaries flowing through their territory.
to life its otherwise arid land. As for India, the waters of the Indus River provide the economic foundation for its relatively arid northwestern provinces, which have become the country’s breadbasket.

The Indus River dispute originates from the decolonization process, when the international border separating western Pakistan from India bisected the river system and the region’s canals. The consequences for Pakistan were perilous, because India in effect held all the cards (Michel, 1967). Not only did India control the waters entering canals that Pakistan depended on, but India also became the upstream state along the Indus River system before it enters Pakistan. After eight years of intense negotiations that were mediated by the World Bank, the adversaries signed the IWT in 1960. The IWT allocated the Indus tributaries between India and Pakistan. India received three tributaries—Ravi, Sutlej and Beas—while Pakistan also received three tributaries—main Indus, Jhelum and Chenab (Indus Waters Treaty, 1960). The tributaries allocated to India became known as the eastern tributaries and those allocated to Pakistan as the western tributaries.

Scholars have argued that the allocation of these tributaries between India and Pakistan has in effect severed the interdependent relationship between them and the cooperation that does exist is minute and passive. However, in spite of the allocation of these tributaries, these riparian states remain mutually dependent in managing, sharing and developing the Indus River system. Although it is fare to note that Pakistan is somewhat more dependent because the Indus River is its only source of water, but India remains dependent on Pakistan.

Interdependence continues between these riparian states because the treaty protects India’s rights to use, consume and develop the western tributaries allocated to Pakistan. India can develop the hydropower potential of these tributaries (Annexure E, IWT), use their water to meet Jammu-Kashmir’s domestic—household, municipal, industrial and irrigation—requirements and develop the tributaries for navigation, flood protection, floating of timber and fishing (Article III and Annexure C, IWT). Even though the IWT allocated to India the eastern tributaries, it remains dependent on Pakistan to discard all its agricultural runoff generated from the development of these tributaries and any excess, unused or flood waters (Article IV, 4 and 5, IWT; Article IV, 8, IWT).

Pakistan also continues to depend on rivers—the western tributaries—flowing from Indian controlled Jammu-Kashmir to meet all its needs. Pakistan depends on India for flood warnings and the treaty protects the allocation of the data (Article VI, 1, IWT). When India constructs hydrological infrastructure along any of the western tributaries, it can affect the quality, quantity and natural flow pattern of the waters Pakistan completely depends on. Interdependence also exists along the eastern

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8 From 1947 until 1971, Pakistan consisted of two wings: western and eastern Pakistan. In 1971, eastern Pakistan became Bangladesh.

9 In 1951, David E. Lilienthal, former chairman of the Tennessee Valley Authority and the Atomic Energy Commission, visited India and Pakistan to examine the Indus River dispute. This visit was made with the blessing of the US government and the knowledge of the World Bank. Upon his return, he wrote an article about the dispute, which drew the interest of the US government and the World Bank’s president. By 1952, the World Bank was mediating the negotiations and General Raymond Wheeler, former Chief of the US Army Corps of Engineers, headed the Bank’s team. For analysis of these negotiations, see Michel (1967), Gulhati (1973) and Alam (1998).

10 For an analysis of the treaty, see Salman & Uprety (2002). Some individuals have called for the renegotiation of the Indus Waters Treaty (for a discussion of this issue, see Wirsing & Jaspurro, 2007).


12 The treaty does provide that if both states agree, they can cooperate in the construction of engineering works along the shared rivers (Article VII, 1c, IWT).
tributaries because, before they make their final departure from India, minor tributaries originating in Pakistan feed them. The treaty protects the rights of Pakistani farmers, residing along the eastern tributaries, to develop the water to meet their needs (Articles II and III, Annexure B, IWT). Consequently, despite the IWT, India and Pakistan continue to confront an interdependent relationship that involves the need to communicate and negotiate over the management of their shared river system.

Whether one classifies India and Pakistan’s management of the Indus River system as an example of active cooperation depends on the definition used. If cooperation is understood to exist when states develop international rivers in an integrated and holistic manner that respects the relationship between the water, soil, vegetation and species within the entire basin, then this case cannot be classified as that of cooperation. It cannot be questioned that India and Pakistan opted to avoid an integrated river basin approach recommended by economists, water experts and environmentalists. Yet, India and Pakistan’s desire to avoid this approach is not the exception, but the norm. Generally, states are less likely to accept an integrated approach because it impinges on their political sovereignty and the amount of cooperation required to arrive at an integrated development is beyond the capacity of states to achieve. Thus, it is difficult to use this definition as a measure of whether India and Pakistan have maintained active cooperation over the Indus River.

If, however, cooperation is understood to exist when states “adjust their behaviour to the actual or anticipated preferences of others” (Keohane, 1984: 53) as they develop their shared river to meet domestic needs, then the Indus River is an example of active cooperation. This study takes this definition of cooperation one step further and requires states to incur some losses in the process of adjusting their behaviour. As will be evident shortly, India and Pakistan have adjusted their behaviour in accord with each other’s preferences and incurred losses in the process.

Pakistan has consented to India’s construction of four large multipurpose dams—Salal I, Salal II, Uri and Lower Jhelum dams—along the Indus River system and within miles of the ceasefire line separating Indian controlled Jammu-Kashmir from Pakistani controlled Azad-Kashmir. These structures provide India with a defensive and offensive military advantage during wars because the dams permit India to withhold the waters in the Indus tributaries and assure its military’s safe passage into Pakistan. Alternatively, the dams’ stored waters can be released to submerge the on-coming Pakistani military and obstruct their entrance into Jammu-Kashmir. These dams have also enabled India to control Pakistan’s only source of water and threaten the sustainability of its agricultural sector (Noshab & Mushtaq, 2001). As a result, by conceding to India’s construction of these hydrological infrastructures, Pakistan has in effect given its consent “to develop the very structures that could one day harm her.”

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13. Pakistan, for example, has constructed an earthen dam along an eastern tributary—the Ravi River—allocated to India under the IWT (Lok Sabha, 1988) (Lok Sabha is the lower house of the Indian parliament).
14. For a critique of existing definitions of cooperation and conflict over international rivers, see Zawahri (forthcoming).
16. There are also technical and practical limitations to an integrated approach that plague its application even among friendly states; see White (1998), Marty (2001) and Conca (2006).
17. Author’s interview with V. G. Hegde, Legal Officer, Legal and Treaties Division, Ministry of External Affairs, Government of India, New Delhi, India, 14 May 2002.
During this period, Pakistan has also been accepting India’s agricultural runoff generated by its development of the Indus River. Since the drainage system is unlined, highly polluted waters have filtered into the region’s aquifers, contaminating otherwise fresh water. Pakistani farmers, lacking alternative sources of water, have used this drainage water to irrigate their crops, which has increased waterborne disease among the region’s inhabitants and decreased the soil’s fertility. Children living near these drains have developed skin, eye and abdominal diseases. Blood samples from people living near the Hudiara drain have revealed high levels of lead. The Pakistani government has incurred significant domestic losses, as residents protest against the government’s acceptance of this drainage water.

Finally, the eastern tributaries—Ravi and Sutlej—allocated to India under the IWT meander in and out of the Indo-Pakistani border before making their final departure from India. As noted previously, the IWT allocates to Pakistanis residing in this region rights to domestic and non-consumptive use, but Pakistan cannot fully develop the tributaries before their final exit from India (Article II, 2, IWT). Despite its desperate need for fresh water in this region, Pakistan has restrained itself from developing these tributaries.

For its part, India modified the design of the hydrological infrastructure it has constructed along the western tributaries to ease Pakistan’s concerns. The design of the Salal I and II dams, Uri I dam, Baglihar dam and Wular Barrage/Tulbul Navigation project were all modified to ease Pakistan’s fears. Because of this modification, India incurred some costs. In the case of Salal I and II dams, the new design decreased the structures’ life expectancy and their capacity to generate hydropower. India has also restrained itself from developing the Indus River system beyond the permissible boundaries imposed by the IWT, despite incurring losses. Consider the fact that since the 1980s India has been facing water shortages in its northwestern provinces. These provinces have been fighting bitter court battles over a limited supply of water in the eastern tributaries (Dhillion, 1983). Since 90% of this water is in use, a reallocation of existing supplies is required. But, a reallocation is heavily contested because it threatens the existing economic foundation of provinces dependent on agriculture. This issue has been so contentious that it fuelled discontent within predominantly Sikh Punjab and provided fertile feeding ground for insurgence movements. There is, however, a simple remedy for this shortage. Within six months, India can build a canal to divert waters from the Chenab River, a western tributary allocated to Pakistan, and into the Ravi River, an eastern tributary allocated to India. Since this diversion of water is prohibited under the IWT, India has restrained itself from building the canal despite incurring losses. Thus, it can be concluded that the nature of cooperation between India and Pakistan over their Indus River system is behaviour altering and that both states have accepted losses as they cooperated. Drawing on neoliberal institutionalism, the next section considers the rise, role and function of institutions in facilitating and maintaining this cooperation.

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18 See for example, The Hindu, Cleaning the Indus, 10 July 2003.
19 For example, owing to the modifications, the Salal dams confront a significant problem with siltation, which has diminished the structures’ capacity to generate hydropower. See “Hydro scene of Jammu and Kashmir” (National Hydro-electric Power Corporation, 1999).
20 Indira Gandhi was assassinated by a Sikh bodyguard, in retaliation for her orders to storm the holy Golden Temple in Punjab. Among the grievances of the Sikh separatists who sought refuge in this temple was the reallocation of the eastern tributaries against the advantage of Punjabi farmers.
4. Institutionalized cooperation

As they follow nature’s rules and disregard manmade borders, rivers impose interdependent and vulnerable relationships on their states (Priscoli, 1998; Priscoli & Llamas, 2001), because certain upstream activities influence the downstream state, while some downstream activities influence the upstream state. Owing to these relationships, a state’s ability to meet its food and energy needs, respond to floods and droughts, manage its drainage system or allocate its domestic water budget may be compromised by the action of its riparian neighbour (Zawahri, 2008b). To minimize the potential losses from these relationships, states need to communicate (Priscoli, 1996, 1998) in order to exchange hydrological data, maintain drainage systems, dredge silt deposits and distribute their water budget. To facilitate this communication, states tend to establish institutions, or river commissions. These institutions can be formal or informal, but regardless of their formality, all interstate institutions have a design delimiting or defining their capabilities. This design may be laid out in a formal agreement or may simply be a shared understanding. But, once in existence, an institution’s design or attributes has a direct impact on states’ ability to facilitate and maintain cooperation (Stein, 1990; Mitchell, 1994; Bernauer, 1995; Priscoli, 1996). To appreciate why, it is necessary to consider neoliberal institutionalist theory.

According to neoliberal institutionalists, states concerned with their self-interest and behaving rationally, must overcome their mutual fear of cheating in order to cooperate. Even when riparian states are adversaries with a rich history of conflict, they have an interest in cooperating in order to manage the interdependent and vulnerable relationships. To collaborate and minimize losses, states need to reduce their uncertainty about riparian neighbours’ compliance and incentives to cheat. To overcome this collective action problem, neoliberal institutionalists argue that states need an institution to monitor members’ activities, make commitments more credible, sanction defectors, lower transaction costs and gather information (Keohane, 1984; Keohane & Martin, 1995, 2003).

An institution’s ability to perform these functions is dependent on its capabilities or design. Although scholars are certain that institutional design matters (Mitchell, 1994; Young, 1999), there is little consensus as to which features are important for cooperation when states confront a collective action problem (Bernauer, 1995; Young, 1999; Koremenos et al., 2001). This study argues that when states are attempting to manage interdependent and vulnerable relationships, such as managing an

21 A vulnerable relationship “requires, in addition to dependence, a politically realistic possibility of being cut off, a lack of alternatives, and the expectations of significant impacts from doing without” (Lipschutz & Holdren, 1991: 124).
22 For more information on the vulnerability of the poor and the ethical dimension of floods and droughts, see Priscoli & Llamas (2001) and Priscoli (2005).
23 Consider the institutions managing the: Columbia, Danube, Elbe, Euphrates & Tigris, Ganges-Brahmaputra, Jordan, La Plata, Mekong, Niger, Nile, Rhine, Rio Grande and Colorado, Rio de la Plata and Senegal rivers. These institutions can also be located within a state to manage domestic rivers that cross jurisdictions, for an examination of both intra and inter-state institutions see Priscoli (1996).
24 An informal institution rises spontaneously and is not the product of a written agreement, whereas a formal institution has a written agreement on its existence (Puchala & Hopkins, 1982). An example of an informal institution is the Picnic Table Talks established by Israel and Jordan to manage the Yarmouk River (Wolf, 1995).
25 For additional information on neoliberal institutionalism theory see Stein (1990) and Keohane & Martin (1995, 2003).
26 Mitchell (1994) suggests that an institution needs the ability to monitor and sanction cheaters, while Young (1999) argues that it needs clear decision-making rules, monitoring, conflict resolution mechanisms and clarity over the expected behaviour from states.
international river, the following combination of institutional attributes are important for long-term cooperation: direct communication between members, regular meetings of the institution, the ability to monitor members and conflict resolution mechanisms.

In order for members of an institution to perform the necessary standard and operating procedures for the functioning of an institution, they must have the capacity to communicate directly with one another. Direct communication enables members to schedule upcoming meetings, compile the agenda before meetings, exchange information outside of meetings and schedule maintenance work. To permit the commissioners to coordinate their activities and perform the necessary tasks for managing the river, such as dredging silt deposits or fixing a metering station, they require regular meetings. These meetings are also important to enable the commissioners to negotiate the design of hydrological infrastructure.

In addition, the ability to monitor is needed to assist in overcoming fear of cheating (Bernauer, 1997). Monitoring is the capacity of an institution to travel throughout the river system to gather information on member states’ activities along the shared hydrological system. The capacity to ask for and be granted permission to inspect any site permits members to confirm the accuracy of exchanged data, detect potential cheating and provide assurances that the necessary maintenance work is completed. Monitoring also permits members to collect information on the intentions, preferences and actions of their riparian neighbour in developing the shared river system.

To maintain cooperation an institution needs mechanisms to manage disputes that inevitably arise when states are confronted with managing an interdependent relationship27. Without a set procedure on steps to be taken to negotiate a settlement to disputes, states might opt to cheat, which could lead to deterioration in bilateral relations and/or defection from cooperation. However, conflict resolution mechanisms can guide members through periods of high tension and assist them to maintain cooperation. Thus, the combined ability to meet regularly, communicate directly, monitor and draw on conflict resolution mechanisms enables riparian states to maintain long-term cooperation. As will be evident, the PIC is an example of this effectively designed institution.

5. The commission for managing the Indus

Article eight of the IWT lays out the creation of the Permanent Indus Commission (Article VIII, IWT). This commission was established to implement the IWT and facilitate cooperation in the river’s development. According to the treaty, an Indian and a Pakistani commissioner head the institution and they are expected to be high-ranking government engineers (Article VIII, 1, IWT). In each state, the PIC office consists of the commissioner, a team of engineers and secretaries. The office in each state focuses full-time on managing riparian disputes over the Indus River system, while other government agencies oversee the river’s development, such as its hydropower potential, irrigation system and flood management.

The PIC’s design has enabled it to achieve its objective28. To facilitate the commissioners’ work, they meet at least once a year, alternating their meeting between the two countries. Their work year begins

27 Priscoli (1996) and Giordano et al. (2005) note the importance of conflict resolution mechanisms.

28 For a comparison of the PIC’s institutional design with that of the Joint Technical Committee established to manage the Euphrates and Tigris rivers, see Zawahri (2006).
annually on 1 May and ends on 31 March. On 1 June, the PIC must submit to its member states an annual report summarizing activities carried out during the preceding work year. To write and finalize their report the commissioners meet annually at the end of May. In addition to this mandatory meeting, which has never been missed, the PIC must convene when either commissioner submits a request for a meeting. From 1960 to June 2007, the PIC held 99 meetings (Government of India Press Release, 2008).

During their meetings, the commissioners exchange data and information on the progress of their projects. They plan and organize tours of inspection and maintenance work. Issues from previous meetings are discussed and, if resolved, they are, in the words of the commissioners, “disposed”. Decisions are made by unanimous agreement, “the two commissioners have to agree or disagree in regard to a particular matter after discussions” (Rahim, 1990: 208). In fact, when the commissioners disagree it is acknowledged in their report and the issue continues onto the agenda of future meetings until it is either resolved or the commissioners decide to initiate the conflict resolution mechanisms.

Since its creation, the PIC has served as a regular channel of communication between the riparian states and it is responsible for furnishing and exchanging all information. In between meetings, the Indus Commissioners communicate directly with one another via telephone, fax, radio and telegram. This communication system is used to exchange daily hydrological data—river discharge data, extraction from reservoirs or canals and deliveries from canals—and prepare the agenda for upcoming meetings. The combination of direct communication and regular meetings has enabled the commissioners to carry out the necessary procedures for the functioning of the institution and the management of the river system. Moreover, as Iyer (1999: 1509) noted, “the working relationship between the engineers at the commission level is very cordial”.

To overcome member states’ fear of cheating, every five years the commissioners conduct a general tour of the entire river system to inspect and ascertain “facts connected with various developments and works” (Article VIII, 4 (c), IWT). In addition to these mandatory tours, each commissioner can request a special tour to inspect any site along the river system. The Pakistani commissioner, for example, can request a special tour of construction sites inside India and the Indian commissioner must grant this request. Similarly, the Indian commissioner can request a special tour of construction sites within Pakistan, which must be granted. In the first 28 years of its existence, the PIC conducted 85 tours of inspection (Sharma, 1990). In March 2007, the commission conducted its 106th inspection tour of the river system (Government of India Press Release, 2008). These inspections permit for transparency in managing the shared river system and enable members to confirm the accuracy of all exchanged information and data. As neoliberal institutionalists argue, monitoring provides assurances against cheating because, if adversaries suspect cheating, they are able to invoke mechanisms to gather the necessary information to confirm or deny their suspicions. Alternatively, the lack of monitoring power could lead member states to defect from cooperation when they suspect cheating.

Concomitant with its ability to monitor, the PIC also has conflict resolution mechanisms that provide the means to manage disputes as they arise. When a disagreement occurs, it is first introduced in the PIC and the commissioners initiate the negotiation process. As Indian’s former minister of irrigation and power, Dr K. L. Rao, noted in parliament, “it is always very difficult to arrive at conclusions all at once in

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29 This information was confirmed during the author’s interview with G. Parthasarti, former High Commissioner to Pakistan, New Delhi, India, 10 May 2002.
one meeting. So, a series of meetings are held and so far, the Indus Commission has been working quite smoothly” (Lok Sabha, 1964: 10,058).

Over the years, the commission negotiated the size of agricultural land that India is permitted to irrigate from the western tributaries. For Pakistan, this is an important issue because it directly influences the quality and quantity of water in these tributaries. The more land India is able to irrigate in Jammu-Kashmir, the lower the quantity and quality of water Pakistan receives. The dispute over whether it would be 280,000 or 260,000 hectares, was discussed from 1960 until its resolution in 1982. According to the 1982 resolution, India can irrigate up to 260,000 hectares. The commissioners also negotiated the nature by which flood warnings are delivered to Pakistan. In their 1989 agreement, they conceded to deliver them via broadcast, telephone and wireless services. The commissioners’ role has also been to assure the riparian states’ compliance with the IWT as they develop the shared river system.

Consequently, they have negotiated, modified the design and overseen the construction of several major hydrological infrastructures built along the Indus River system during the past 46 years. These infrastructures include the Uri I (480 MW), Lower Jhelum (105 MW), and Salal I and II (combined 690 MW) dams in Jammu-Kashmir.

Since its formation, the PIC has maintained India’s drainage systems, which collect the agricultural runoff and deliver it into Pakistan. To appreciate the importance of these drains, consider India’s breadbasket, Punjab. Because the Indus River irrigates over 90% of landlocked Punjab and one-quarter of its land is waterlogged, upstream India is highly dependent on downstream Pakistan’s maintenance of the drainage systems to prevent further waterlogging and salinization of otherwise fertile soil within Punjab (Dhillion, 1983). The PIC was also responsible for the arreangments of wireless stations (Lok Sabha, 1964).

When the commission is unable to resolve an issue, several conflict resolution mechanisms are available. First, the issue is sent to member states’ foreign secretaries for bilateral negotiations (Article VIII, 1, IWT). During these negotiations, the Indus commissioners assist the foreign secretaries and negotiate the technical details. Once resolved, the agreement is sent to the PIC for implementation. If, however, the foreign secretaries fail to resolve the issue, the second conflict resolution mechanism is to appoint a neutral expert (Article IX and Annexure F, IWT). A third path is to appoint a court of arbitration consisting of seven judges (Article IX and Annexure G, IWT). To date the states have resolved most of their questions within the PIC. However, one issue was resolved at the foreign secretaries’ level, one difference was settled by a neutral expert, and the foreign secretaries are currently negotiating another issue. As will be evident shortly, during all stages of negotiations, within the different conflict resolution mechanisms, the PIC commissioners are always involved and they draw on the PIC’s institutional capacity to facilitate the negotiations. For instance, if during the negotiations, the commissioners need to inspect the disputed project, they draw on the PIC’s monitoring capacity to carry

31 Author’s interview with A. C. Gupta, India’s Commissioner to the Permanent Indus Commission, New Delhi, India, 13 May 2002.
32 It is important to note that the IWT does identify the type of questions or differences that should be resolved by the neutral expert and/or the court of arbitration. For further information, see Salman (2008).
out the inspections. To illustrate the operationalization of the conflict resolution mechanisms, the next section considers the Salal dams, Wular Barrage/Tulbul Navigation project and Baglihar dam.

India first envisioned the multipurpose Salal dams in the mid-1960s and in 1970, it presented their design to the PIC. The Salal project involved the construction of two dams, a diversion canal and a powerhouse across the Chenab River about 30 miles from the ceasefire line (Reddy, 1976). After five years of negotiations and several visits to the construction site, the commissioners were unable to resolve questions over the dams’ location, height, sluice gates and water storage. The Pakistani commissioner was concerned that the dams would permit India to control the river’s flow, thereby threatening Pakistan’s irrigation canals (Reddy, 1976; Lok Sabha, 1978). Pakistan also feared that the dams would give a strategic advantage to India, permitting it to flood the oncoming Pakistani military during war33.

In 1975, the commissioners sent their questions concerning the issue to their foreign secretaries. Several rounds of fast-track negotiations took place in Islamabad and New Delhi34. Two tracks of negotiations occurred during these meetings, one between the Indus commissioners and their team of engineers and the second between the foreign secretaries. In between the formal meetings, the Indus commissioners held four additional meetings and they drew on the PIC’s institutional capacity to inspect the construction site (Government of India, 1975–76: 20). At the 21 October 1976 meeting, the foreign secretaries initialled an agreement35. On 11 April 1978, a formal agreement over the Salal dams was signed. In this agreement, India conceded to lower the height of the spillway gates to 9 metres, not to deplete the reservoir’s dead storage36 capacity and to permanently plug all sluice gates within one year of the reservoir’s filling (Lok Sabha, 1978; Grover & Arora, 1999). The modification of the dams’ design was intended to minimize India’s ability to flood downstream Pakistan or impose a drought upon it.

Although they have yet to resolve this issue, the Wular Barrage/Tulbul Navigation project (WB/TN project)37 is another example of these states invoking the conflict resolution mechanism to manage a highly contentious matter. This project involves the construction of a 134 metre barrage, two under-sluices and a 12-metre wide navigation lock at the outfall of Wular Lake in the northern Kashmir Valley city of Ningli on the Jhelum River. As a former Indian High Commissioner to Pakistan during this period said, “this was an important project and there was great pressure to complete it”38. India hoped to achieve several objectives. First, it sought to improve the navigation for 22 km between two cities, Baramullah and Srinagar, from October to February, and facilitate the transportation of fruits and timber (Noorani, 1994). Second, the barrage would permit the regular discharge of water and therefore ensure that the two lower hydropower plants—the Lower Jhelum and Mohara—can operate year round and at full capacity. Finally, India sought to build a large hydropower plant, capable of generating 900 MW, immediately below the barrage.

If completed, the WB/TN project represents a potential threat for Pakistan because it would permit India to withhold the Jhelum River’s flow for 20 to 30 days (Nasrullah, 1994). This means that India can artificially impose floods or droughts on millions of hectares of Pakistani farmland. India would also

33 Author’s interview with Jagat S. Mehta, former foreign secretary, New Delhi, India, 20 March 2002.
34 These negotiations took place on: 15–19 May 1975, 4–8 and 19–21 October 1976.
35 Author’s interview with Jagat S. Mehta, former foreign secretary, New Delhi, India, 20 March 2002.
36 Dead storage capacity “means that portion of the Reservoir Capacity which is not used for operational purposes” (Annexure E, 1c, IWT).
37 Pakistan refers to this project as the Wular Barrage, while India calls it the Tulbul Navigation Project.
38 Author’s interview with G. Parthasarti, former high commissioner to Pakistan, New Delhi, India, 10 May 2002.
control the waters entering Pakistan’s Triple Canals project, threatening hundreds of thousands of hectares of farmland in Pakistan’s Punjab and Sindh provinces. This could also threaten Pakistan’s Mangla dam’s ability to generate hydropower. Since Mangla contributes 50% of Pakistan’s total hydropower production, this could have negative consequences for the entire country. As with the Salal dams, the barrage’s completion would give a military advantage to India, enabling it to flood the oncoming Pakistani army or secure the Indian army’s safe passage into Azad Kashmir (Nasrullah, 1994).

India began constructing the WB/TN project in 1984, and since it envisioned it as work on a “natural reservoir” and outside of Pakistan’s concern, the Indus Commissioner did not feel obligated to introduce the issue into the PIC (Srinath, 1986). In February 1985, Pakistan learned that India was building this project. By the time of Pakistan’s discovery, India had completed a significant portion of the project. The Pakistani Indus Commissioner sent a request for information to his Indian counterpart. The PIC discussed the barrage in May, July and December 1986. The major question between the commissioners was whether the project involved storage work, as the Pakistani commissioner argued, or whether it was only a navigation project, as the Indian commissioner argued. India continued with construction of the project until July 1987, when, after completing more than 40% of the project, it conceded to Pakistan’s request to halt construction (The Hindu, 1987; Ali, 1989). Meanwhile, discussions continued in the PIC throughout 1988. But the commissioners were unable to resolve several questions and by March 1989 they moved the issue to the foreign secretaries.

The foreign secretaries, along with the Indus Commissioners, held seven rounds of negotiations and on the last round, held in October 1991, they reached a compromise (Government of India, 1992–93: 21). According to this understanding, India conceded that the barrage involved storage and agreed to use its allotted storage capacity under the IWT. India also modified the structure’s design, agreeing to keep 6.2 metres ungated and maintain a fixed crest level. However, the parties could not agree on a related dispute that was incorporated into the negotiations, the Kishanganga dam; India wanted to build the dam and Pakistan wanted assurances that it would not be built (Noorani, 1994). From 1992 until 1998, all negotiations over the barrage were halted (Dixit, 1998). But, in 1998 the foreign secretaries agreed to restart the negotiations where they ended in 1992. The project remains under negotiation between the foreign secretaries and the Indus Commissioners.

For the first time, the PIC and the foreign secretaries with the PIC’s assistance were unable to resolve questions over the design and construction of a dam along a western tributary, the Chenab River. The argument over the 450 MW Baglihar dam began in 1990 when the issue was taken up in the PIC. After years of negotiations over the structure’s design, in 2003 the commissioners sent the issue to the foreign secretaries for further negotiations. With the participation of the PIC commissioners, the foreign secretaries negotiated on such things as the structure’s storage capacity, the dam’s height or freeboard, spillway gates and power intake level. As with the Salal dams and WB/TN project, the Pakistani Commissioner feared that, as it currently stands, the Baglihar dam’s design would increase

39 Author’s interview with A. C. Gupta, India’s Commissioner to the Permanent Indus Commission, New Delhi, India, 13 May 2002.
40 Author’s interview with Z. Hasan, former secretary, Ministry of Water Resources, New Delhi, India, 1 June 2002.
41 The author interviewed several experts involved in this dispute, but since they asked to remain anonymous, their names are withheld.
42 A freeboard “is the vertical difference in elevation provided between the maximum reservoir level during a routing of the design flood and the dam crest” (Lafitte, 2007: 14).
India’s capacity to control the Chenab River’s flow and deprive Pakistani farmers of water during sowing season (Akhlaque, 2003; Wirsing & Jasparro, 2007). Yet, for energy poor India, the US$1 billion Baglihar project is important for meeting its insatiable electricity needs and pacifying discontent within Jammu-Kashmiris. Despite the fact that Jammu-Kashmir has a hydropower potential of 7,487 MW, India is generating only 1,361.45 MW, most of which is sent to the central grid and distributed to other regions within India. Politically and economically, India needs to increase its development of Jammu-Kashmir’s hydropower potential.

After several rounds of negotiations at the foreign secretaries’ level and with the PIC’s direct involvement, little progress was made. Unlike the WB/TN project, India refused to stop or slow down construction of the dam until a compromise was reached (Lafitte, 2007). In fact, according to reports, by 2005 a substantial portion of the project—60% of the powerhouse and 35% of the reservoir—was competed (Naseer, 2005). As provided under the treaty, when a stalemate in negotiations is reached, there is an option of referring the issue to a neutral expert. After a contentious meeting, on 15 January 2005 Pakistan formally initiated the neutral expert mechanism by notifying the World Bank that a difference arose.

According to the IWT, the World Bank’s role in facilitating the conflict resolution mechanism is to compile a list of individuals capable of performing the function of a neutral expert (Annexure F, Part 2, 4(b) (ii), IWT). Consistent with the IWT’s procedures, the Bank delivered to India and Pakistan a list of three experts. From the list, a Swiss expert, Raymond Lafitte, was selected by the riparian states. Formally appointed on 12 May 2005, Lafitte promptly initiated his investigation by meeting with the riparian states in Paris on 9 and 10 June 2005. During the meeting, an agreement was reached that the riparian states would present their position to the neutral expert through a written memorandum followed by replies and rejoinders. After an exchange of memos, four additional meetings were held between the states and the neutral expert (Lafitte, 2007: 2). Accompanied by the Indus Commissioners, the expert also visited the Baglihar dam’s construction site and the dam’s model in Roorkee (Parsai, 2005). During these meetings and visits, the Indian and Pakistani delegations consisted of high-ranking government officials—including ministers of water and power, water commissioners and lawyers—and the Indus Commissioners (Parsai, 2005; Lafitte, 2007). Eighteen months after the initiation of investigations, on 12 February 2007, Lafitte delivered his decision to the Indian and Pakistani embassies in Switzerland.

The neutral expert was asked to deliver decisions on six points of differences that existed between the riparian states over the Baglihar dam’s design. Pakistan disagreed with the structure’s maximum flood discharge capacity, arguing that it should be 14,900 cubic metres per second (m³ s⁻¹) instead of India’s calculation of 16,500 m³ s⁻¹. Pointing to the capricious nature of flood analysis and the possibility that climate change may increase future floods, Lafitte determined it “prudent” to use the 16,500 m³ s⁻¹. To minimize India’s ability to regulate the river’s flow, Pakistan insisted that the Baglihar required an ungated spillway. Drawing attention to its need to regulate floods and manage heavy sedimentation that would

43 This is at a 60% load factor.
44 Author’s interview with Yogendra Prasad, Chairman and Managing Director of the National Hydroelectric Power Corporation, Ltd, Faridabad, India, 9 May 2002.
45 According to the IWT, it is also possible for India and Pakistan to appoint jointly a neutral expert without the World Bank’s involvement. If they do select this option, they must notify the Bank of the appointment. The IWT also notes that should the states disagree in the selection of a neutral expert and fail to concur on a third party to make the selection, the World Bank itself can select the expert (Annexure F, Part 2, 4, IWT).
46 For an excellent analysis of this issue see Salman (2008).
otherwise decrease the structure’s useful life, India argued that a gated spillway\(^{47}\) is essential. After a statistical analysis of 13,000 existing spillway gates, Lafitte argued for the need to incorporate the latest available technology and standards that were not present at the time of the IWT’s negotiation. Given the new knowledge, Lafitte agreed with India’s need for a gated spillway. This decision, however, produced another disagreement: where should the gated spillway be located? Pakistan insisted that, as currently designed, the gated spillway was not at the highest level, as specified by the IWT. Lafitte argued that “sound and economic design and satisfactory construction and operation” confirm the position selected by India (Lafitte, 2007: 13)\(^{48}\).

Consistent with concerns about India’s increasing ability to control the Chenab River, Pakistan disagreed with the Baglihar’s 37.5 million cubic metres (MCM) of pondage, or live storage capacity used to generate power, arguing that it should be 6.22 MCM instead. Lafitte determined that the structure’s pondage should be decreased to 32.5 MCM and the dead storage should be increased by 1 metre above its original design. The neutral expert also settled the two remaining issues, the freeboard’s height and power intake levels, with slight modifications to their design. The Baglihar originally had a freeboard 4.5 metres high but, after consulting the latest technology, Lafitte decided that India should lower the freeboard by 1.5 metres. Finally, Pakistan argued that the intake level for the turbines was not at the highest level as specified under the IWT. The neutral expert determined that the height should be increased by 3 metres (Lafitte, 2007).

The neutral expert’s decision, according to the IWT, is binding on both states (Annexure F, 11, IWT). India and Pakistan have agreed to comply with the decision (Embassy of India Press Release, 2007; Pak Tribune, 2007; Salman, 2008) and in the process both must modify their behaviour in order to cooperate. India conceded to make modifications to the Baglihar dam and incur economic losses; the total additional costs for the modifications are estimated at approximately US$1,000 million\(^{49}\) (Parsai, 2007). Pakistan’s acceptance of the structure presents a potential loss because it increases India’s ability to control the Chenab River’s flow.

It is important to note that the decision to refer a difference to a neutral expert does not constitute a threat to the IWT, nor to the states’ ability to maintain cooperation (Salman, 2008); it is rather a mechanism available to resolve a highly contentious issue and enable the states to select the negotiation path in order to prevent defection from cooperation. Thus, based on the previous discussion it can be concluded that the PIC has been instrumental in managing the Indus River between its member states and its design has permitted it to carry out its function successfully. But, how does this river commission perform during the deterioration of bilateral relations between its member states? The next section considers this issue.

6. Examining the PIC’s resilience

Consistent with this study’s attempt to understand the relationship between the design of a river commission and cooperation over international rivers, the following considers the commission’s ability to sustain cooperation. This test involves examining “the ‘resilience’ of institutions when faced with a deterioration of overall relations among the participants” (Keohane, 1993: 33). That is, examining a

\(^{47}\) As the Baglihar dam is designed it consists of sluice (five openings) and chute (three bays) spillways (for more details see Lafitte, 2007: 6-8).

\(^{48}\) Lafitte (2007: 13) does recommend that the outlets composing the sluice spillway be lowered slightly to protect the Indian city of Pul Doda against flooding.

\(^{49}\) As of February 2008.
commission’s ability to continue functioning in managing disputes and facilitating cooperation when the political relations between member states deteriorate. If member states cease all diplomatic relations and place their military on high alert in preparation for war against one another and the institution continues operating, then the institution can be classified as resilient. On the other hand, if the institution’s ability to perform its function varies with the overall political environment between member states, in that its meetings are terminated or the institution fails to manage disputes, then it does not pass the resilience test. The following examines the PIC’s ability to remain resilient during the 1965 and 1971 wars.

6.1. The 1965 war

As the Annual Report for India’s Ministry of External Affairs sums up, “The year 1965 witnessed Indo-Pak relations descending to the lowest ebb” (Government of India, 1965–66: 18). Throughout the turbulence and warfare of 1965, the PIC held meetings in January, February and May 1965. Tension between member states was felt on 21 May 1965, when India’s Indus commissioner crossed into Pakistan to attend the annual meeting. Pakistani border police refused to permit him and his team of engineers to travel via the Lahour Road, forcing them to return to New Delhi (Lok Sabha, 1965). The meeting, however, was rescheduled and held on 28 May in Karachi.

During the 1965 meetings, the commission was productive despite the ongoing tension between its member states. According to the annual report summarizing activities from 1964 to 1965, the commissioners disposed 10 of the 19 items they discussed 50. The disposed items included completion of the first general tour of inspection, supply of hydrological and meteorological data, exchange of data on water deliveries made via canals, swapping of data on river discharge and drainage systems and preparation of various reports on the commission’s activities (PIC Annual Report, 1965). As for activities conduct from 1965 to 1966, the commissioners discussed 11 items and eight were disposed. The disposed items during this year included exchange of hydrological and meteorological data, river discharge data, data on the delivered water via canals and information on the drainage system (PIC Annual Report 1966). In the 1966 report, the commission does note that its activities “were hampered by the grave happenings in the later part of the year. However, its meeting in March 1966 was held in a cordial atmosphere” (PIC Annual Report, 1966). The commission did not conduct any tours of inspection in 1966. During this period, India occupied parts of Pakistan and vice versa. In 1967, the commission conducted a special tour of inspection of India’s Hudiara drain inside Pakistan and India, but it did not undertake any general tours. The general tours of inspection resumed in October and December 1967. The fact that the institution remained functional despite the deterioration in bilateral relations between its members is an indicator of its resilience.

6.2. The 1971 war

On 3 December 1971, a civil war broke out between western and eastern Pakistan. The same day, western Pakistan attacked India for its support of eastern Pakistani separatists. On 6 December 1971, India recognized eastern Pakistan as independent Bangladesh. In retaliation, Pakistan severed all

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50 The commissioners always discuss tours of inspection and since it is an “issue of continuing nature” it can never be disposed, as a result, it is not included in the calculation of issues disposed or discussed (PIC Annual Report, 1965).
diplomatic relations with India. Despite the signing of the Simla Agreement in July 1972, bilateral relations remained tense until May 1975 when the states’ foreign secretaries began negotiations towards the normalization of relations. By June 1976, India and Pakistan had restored diplomatic relations and exchanged high commissioners.

Despite the war and lack of diplomatic relations between 1971 and 1975, the PIC continued to hold its meetings, although their number declined. The commission held one meeting in 1971, 1972, 1973 and 1974. This is less than previous and succeeding years in which the commission held three to four meetings per year. Despite this decrease in the frequency of their meetings, the commissioners continued to dispose of issues on their agenda. In the 1970–71 work year, of the 14 issues discussed, the commissioners disposed of five. The commission completed two tours of inspection along the Ravi and Sutlej tributaries, exchanged all data and the Indian commissioner supplied information on hydropower plants along the Indus River (PIC Annual Report, 1971). In the 1971–72 work year, of the five issues discussed three were disposed. The commissioners exchanged all data, India supplied information on the storage works along the western tributaries of the Indus River and the commissioners signed their reports (PIC Annual Report, 1972). In their annual report the commissioners’ note, “The Commission is happy that a spirit of goodwill, understanding and co-operation was maintained in its work during the early part of the year. Its activities were, however, hampered by the grave happenings in the later part of the year” (PIC Annual Report, 1972).

The annual report for the 1972–73 work year differs from previous years in that it does not summarize the issues the commissioners discussed during their meeting (PIC Annual Report, 1973). It simply notes that the commissioners met, discussed issues and finalized their annual report. Similarly, the annual report for the 1973–74 work year does not specify the number of issues discussed. However, according to the report the PIC commissioners carried out tours of inspection along the Ravi, Chenab and Jhelum tributaries. These tours were conducted in October, November and December 1974, and they were considered part of the general tours of inspection that the PIC is required to complete every five years. The report does include a statement missing from the previous report: “The Commission is happy that, during the year under report, its work was marked by a spirit of goodwill, understanding and cooperation” (PIC Annual Report, 1974). Thus, one may conclude that the PIC has remained resilient despite the deterioration in bilateral relations between its members.

7. Conclusion

The argument in this study sought to make several contributions. First, contrary to existing classifications of India and Pakistan’s management of their Indus River system as that of passive cooperation, these states have maintained active cooperation. Over the years, India has altered its behaviour to ease Pakistan’s concerns and Pakistan altered its behaviour to appease India. As was demonstrated, this behaviour-altering cooperation also involved the states’ willingness to accept losses as they modified their behaviour in accord with one another’s preferences.

Second, the paper sought to account for the maintenance of this cooperation. Drawing on neoliberal institutionalist theory, it argued that the PIC’s design has facilitated and maintained this cooperation. To allow the commissioners to perform their daily work, they have the capacity to communicate directly
with one another and they hold meetings on a regular basis. The commission also has the capacity to monitor the river’s development, which has allowed it to overcome states’ fear of cheating. Since managing an international river involves continuous disputes, member states need conflict resolution mechanisms to draw on once a problem arises. The Indus commissioners have several mechanisms available to resolve disputes. This institution has enabled India and Pakistan to manage peacefully their Indus River system for over 40 years.

Finally, as Bernauer (1995: 351) noted, “If the degree of success in international collaboration can be influenced by the institutions we establish and operate, we can be more successful if we know how to design institutions that produce the desired effect”. This introduces the policy implication from this argument. As this paper demonstrated, institutional design matters; in other words, the capabilities vested in an institution, or a river commission, can assist riparian states to cooperate. More specifically, if the commission meets regularly, has monitoring power, conflict resolution mechanisms and direct communication between its members, then it is likely to assist states in overcoming obstacles to cooperation. This is an important contribution, because existing scholarship has demonstrated that states tend to establish commissions to manage their international rivers (Wolf, 1998; Conca et al., 2006). Since the capability vested in these commissions has an impact on their ability to perform their function, states need to invest more effort in negotiating their design.

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