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Framework for co-operation

Ganesh Pangare

Bushra Nishat

Xiawei Liao

Shafi Sami

Gautam Bambawale

Golam Rasul

Taylor W Henshaw

Jayanto Bandyopadhyay

Anamika Barua

Ambuj Thakur

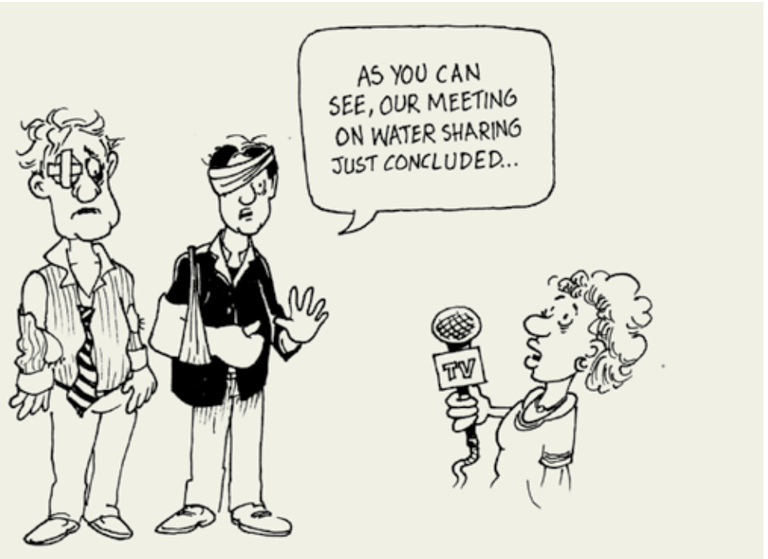
INTRODUCTION

Ganesh Pangare and Bushra Nishat

There are 263 transboundary water sources in the world that straddle or cross political boundaries of one or more sovereign states, constituting over 80 percent of worlds fresh water sources – rivers and aquifers

ACROSS THE globe, investments in infrastructure development such as roads, embankments, dams, barrages, diversions, irrigation schemes and power facilities, while bringing visible benefits at the local and national level, are also creating multiple burdens and risks to the river and millions of people who are dependant for their lives and livelihoods on the rivers, associated wetlands and aquatic resources. In the case of international/transboundary rivers like the Yarlung Tsangpo-Brahmaputra-Siang-Jamuna, these risks and burdens are made more complex by sovereignty implications and geopolitical dimensions. Countries and governments need to move towards a perspective of shared opportunities for positive regional benefits, while keeping in mind national and local needs and interests. Transboundary water management needs to harmonise water policies and standards and brings into focus issues at different levels and across sectors, encompassing not only technical but also social and economic implications. This is the reason it is important to understand, national as well as regional arrangements of all countries in a basin.

Development in the Basin has historically been piecemeal and undertaken on a project-by-project basis at the country level. Agreements between riparian countries in the region are mostly bilateral and may or may not have a holistic approach to water resources management. The complex geopolitics between riparian countries has been amplified by an incomplete basin knowledge base, the varying professional water resources management and technical capacities of the basin countries, and power asymmetry among the riparians. The absence of a basin-wide cooperative framework has translated into missed opportunities for regional economic growth, including in agriculture, hydropower development and trade, inland water transport, and disaster risk reduction.



Rustam Vania

This section is an inventory of the water management institutions, policies and transboundary agreements for the riparian countries of the Yarlung Tsangpo-Siang-Brahmaputra-Jamuna basin – China, India, Bhutan and Bangladesh and also looks at challenegs and opportunities in the region.

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International[1] and policy framework for transboundary water management

China

Taylor W. Henshaw

CHINA SHARES about 40 major transboundary watercourses with Afghanistan, Bangladesh, Bhutan, Cambodia, India, Kazakhstan, Kyrgyzstan, Laos, Mongolia, Myanmar, Nepal, North Korea, Pakistan, Russia, Tajikistan and Vietnam. Most transboundary waters are located in the southwest area of the country (including: Yarlung Tsangpo-Siang-Brahmaputra-Jamuna; Shiquan/Indus; and Lancang/Mekong). Among these transboundary rivers, 12 originate in China. China is located upstream on most of its shared transboundary rivers.

Transboundary water management needs to harmonise water policies and standards and brings into focus issues at different levels and across sectors

China was one of three countries to vote against the 1997 Convention on the Law of the Non-Navigational Uses of International Watercourses (UN Watercourses Convention). Although China is not a party to Multilateral Environmental Agreements on water, it supports the principle of exchanging data and information with its neighboring riparian states[2].

According to Feng and He[3] – "trans-boundary water is mainly the responsibility of Ministry of Foreign Affairs because it relates to the relationship among the riparian countries. Yet given that Ministry's lack of specific knowledge of water resources, it must always be assisted by other ministries related to water issues", most importantly Ministry of Water Resources (MWR), Ministry of Ecology and Environment (MEE), National Development and Reform Commission (NDRC), National Energy Administration (NEA) as well as Energy State-owned Enterprises (SOEs) who are involved with hydropower development on international rivers.

The leading unit, Division of International Rivers is set up under the Department of International Cooperation, Science and Technology of MWR whose mandates include:

"In charge of foreign affairs related to international rivers, research and formulate related policies, organize and coordinate negotiations related to international rivers."

Furthermore, in accordance with the 2002 Water Law, revised from the 1988 Water Law, which stipulates that "the state shall exercise a water resources management system of river basin management in conjunction with jurisdictional management". the South-western rivers, including the Yarlung-Tsangpo, sit under the jurisdiction of the Changjiang Water Resources Commission. To summarize, within the MWR, Changjiang Water Resources Commission has the mandate to manage domestic issues with respect to the Yarlung-Tsangpo River as a River Basin Organization, while the Department of International Cooperation, Science and Technology has the mandate to manage international/transboundary issues related to the Yarlung-Tsangpo.

In addition those two departments, China Renewable Energy Engineering Institute under the MWR and the National Energy Administration are involved in Hydropower Development Planning along international rivers; Ministry of Emergency Management, Department of Flood and drought prevention (MWR) and Department of Water Project Operation Management (MWR) are involved with dam operations along the international rivers; Bureau of Water Transport of the Ministry of Transport is responsible for transport activities on international rivers.

Although transboundary rivers seem to be not of major concern to China's water policy makers, since it is hardly discussed or seen in China's policies, reports, governmental mandates and so forth, China has a record of (mostly bilateral) formal institutions with its neighboring countries regarding all different aspects related to transboundary river cooperation, for example, hydrological data sharing, navigation, fisheries, water sharing, economic cooperation. It should be noted that China's transboundary river cooperation institutions are primarily bilateral and less multilateral and most of them

do not focus exclusively on transboundary watercourses but on a broader cooperation agenda. In the north, a number of Sino-Russian transboundary water accords are in place (including the 2008 China-Russia Agreement Concerning the Reasonable Use and Protection of Transboundary Waters). The least formal arrangements are in place with South Asian countries regarding especially the Indus and Yarlung Tsangpo - Brahmaputra river basins. However, there has been a long history on transboundary water cooperation between China and India, which dates back to the 1950s and the process is summarized by Feng et al[4] as below in Table 1.

Table 1. China-India cooperation on transboundar rivers[5]

Year	Events	Cooperation
1950	Diplomatic ties established in 1950; the prime ministers visited each other in 1954	Provisions of discharge data in 1955, and of hydrologic information (discharge, rainfall, and water level) in 1957.
1984	Agreement on trade in 1984. Indian prime minister visited China in 1988	In 1993, agreement on environmental cooperation signed, along with gradual restoration of Sino-Indian relations
1997	Protocol on Cooperation	In 2002, MOU and the Implementation Plan on the Yarlung-Tsangpo/Brahmaputra
2003	Declaration on the Principles of Relations and Comprehensive Cooperation in 2003; Joint Declaration in 2005	MOU in 2005 and Implementation Plan in 2008. The Expert Level Mechanism on Trans-border Rivers (ELM) established in 2006, and the Work Regulation in 2008. MOU in 2008 and Implementation plan in 2010.
2010	Joint Communique	MOU in 2010 and Implementation Plan in 2011 on the Langqen Zangbo/Sutlej River.
2013	Joint Declaration; Agreement on Border Defence Cooperation.	MOU in 2013 and the Implementation Plans upon the Yarlung-Tsangpo/ Brahmaputra in 2013 and in 2014. MOU on Strengthening Cooperation on Trans-border Rivers in 2013
2015	Joint Declaration	In 2015, MOU upon the Langqen Zangbo/Sutlej River.
2018	Informal summit of the top leaders	In 2018, MOU and Implementation Plan upon the Yarlung-Tsangpo/ Brahmaputra; the 11th meeting of the ELM held; China notified of emergency information on a landslide on the mainstream to India.

China has reached memorandums of understanding with India and Bangladesh on flood control and sharing hydrological data on the river. In 2002 China agreed to provide flood season hydrological data (water level, discharge and rainfall) at three stations located on the river from June 1 to October 15 every year. The MOU expired in 2007. Similar five-year MOUs were reached in 2008 and 2013. In 2013, China agreed to provide an additional 15 days of hydrological data (May 15 to October 15) each year on the River. The parties agreed to "further strengthen cooperation on transboundary rivers, cooperate through the existing Expert Level Mechanism on provision of flood-season hydrological data and emergency management, and exchange views on other issues of mutual interest." Both sides recognized that transboundary rivers and related natural resources and the environment are "assets of immense value to the socio-

economic development of all riparian countries" and the "cooperation on trans-border rivers will further enhance mutual strategic trust and communication as well as strengthen the strategic and cooperative partnership." A revised implementation plan (containing technical details of provision of information, data transmission methods and cost settlement) was executed in June 2014.

An Expert Level Mechanism (ELM) was established in 2006 between China and India to discuss interaction and cooperation on the provision of flood season hydrological data, emergency management and other issues as agreed regarding transboundary rivers. The ELM has held 11 meetings since its establishment, and only one annual meeting cancelled, in 2017 because of the border conflicts. Normal issues discussed in the agendas include reviewing previous bilateral cooperation and utilization reports on the provision of hydrological information, and discussion of the MOUs and the relevant implementation plans. Other issues agreed on by both sides (but without detailed information) include strengthening cooperation, exchanges on the situation of the projects on the Yarlung-Tsangpo - Brahmaputra, notification on blockages of the mainstream, and so on[6]. In general, the ELM is the normal channel and a technical decision supporting organization between China and India to facilitate transboundary

water cooperation. But it has a limited working scope, and its effects are restricted by the broader Sino-Indian diplomatic relations.

China has also entered into comparable MOUs with Bangladesh in 2006 and 2008. In a 2007 Joint Communique, the countries agreed "to cooperate in the field of water resources, utilize and protect the water resources of transnational rivers in the region keeping in mind the principles of equity and fairness." In 2008, China entered into hydrological data sharing MoU with both Bhutan and Bangladesh, providing that in flood season, China will provide hydrological information to Bhutan and Bangladesh from three hydrological stations along the main stream of the Yarlung Tsangpo.

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India

Taylor Henshaw

INDIA HAS entered into a number of transboundary water agreements, ranging from water allocation to hydropower development, with Pakistan, Nepal, Bangladesh, Bhutan, China and Nepal.

India-China Agreements

India has reached MoU with China on flood control and sharing hydrological data in the Yarlung Tsangpo. In 2002 China agreed to provide flood season hydrological data (water level, discharge and rainfall) at three stations located on the river from June 1 to October 15 every year. The MOU expired in 2007. Similar five-year MOUs were reached in 2008 and 2013. In 2013, China agreed to provide an additional 15 days of hydrological data (May 15 to October 15) each year on the river. The parties agreed to "further strengthen cooperation on transboundary rivers, cooperate through the existing Expert Level Mechanism on provision of flood-season hydrological data and emergency management (see below), and exchange views on other issues of mutual interest." Both sides recognized that transboundary rivers and related natural resources and the environment are "assets of immense value to the socio-economic development of all riparian countries" and the "cooperation on trans-border rivers will further enhance mutual strategic trust and communication as well as strengthen the strategic and cooperative partnership." A revised implementation plan (containing technical details of provision of information, data transmission methods and cost settlement) was executed in June 2014.

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India-Bhutan Agreements

The 1949 (and updated in 2007) India-Bhutan Friendship Treaty provides for perpetual peace and friendship, free trade and commerce, and equal justice to each other's citizens. The Treaty is the basis for present-day joint hydropower plants on Brahmaputra tributaries in Bhutan.

India's Hydropower Partnership with Bhutan

Bhutan and India have a reciprocal arrangement that sees a power-deficient India supply technical and financial assistance to resource-rich Bhutan to develop numerous hydropower projects for the benefit of both countries Bhutan relies on the export of power (which accounts for about 20-25 percent of GDP) for sustainable development, while India acquires much-needed energy to drive its rapidly growing economy.

Since 2007, cooperation between Bhutan and India has been enhanced through

agreements over long-term purchases and Indian financial support for hydropower projects in Bhutan, as well as the introduction of public-private partnership arrangements. India and Bhutan have signed memoranda of understanding to reach this installed capacity target. Ten hydropower projects have been planned for implementation over Bhutan's 10th and 11th Five-Year Plan cycles. The installed capacity additions by 2020 will tap a projected 42 percent of Bhutan's technically feasible hydropower resources.

In addition to hydropower development, India and Bhutan have cooperated to establish the *Comprehensive Scheme for Establishment of Hydrometeorological and Flood Forecasting Network on Rivers Common to India and Bhutan* (1979). This network consists of 35 hydrometeorological stations located in Bhutan. (These stations are maintained by Bhutan with funding from India). A Joint Expert Team (comprised of officials from both governments) tracks the progress of the network. The two countries have also formed a Joint Group of Experts on Flood Management. This entity discusses and assesses the probable causes and effects of the recurring floods and erosion in the southern foothills of Bhutan and adjoining Indian plains. It recommends remedial measures.

India-Bangladesh Agreements

India is not party to any agreements with Bangladesh on the Yarlung Tsangpo-Siang-Brahmaputra-Jamuna.

The Teesta, a tributary of the Jamuna, has been a longstanding issue between India and Bangladesh since 1952. India has constructed the Teesta barrage at Gazaldoba, West Bengal, upstream of the India-Bangladesh border, to provide water to northern parts of West Bengal. In 2010, during the 37th Indo-Bangladesh Joint River Commission, Bangladesh proposed a draft "interim agreement" and India offered a "statement

of principles" on sharing the Teesta waters. The two countries could not reach agreement in 2011. In March 2013 the President of India assured Bangladesh of India's commitment to a "fair, reasonable solution" on the Teesta and stated that consultations with stakeholders would take place.

India-Bhutan Agreements

An India-Bangladesh-Bhutan Working Group on Water and Power has been established for sub-regional cooperation on water resources management and hydropower development. The first meeting was held in April 2013. The parties agreed at that time to prepare a framework for trilateral cooperation. There has been no further reporting on the Working Group's progress.

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Bhutan

Taylor Henshaw

BHUTAN SHARES a 600 kilometer border with India on the east, south-west and west; and a 470 kilometer border with China on the north and northwest. Bhutan's international water agreements primarily focus on hydropower projects with India. The country also has flood forecasting and warning agreements with India and China. Ministry of Foreign Affairs (MOFA) is the designated ministry of the Royal Government of Bhutan which oversees the foreign relations of Bhutan. The Ministry has the Department of Multilateral Affairs which focusses on transboundary water management. As per Bhutan's National Water Policy[7]:

- Trans-boundary water issues shall be dealt in accordance with international laws and Conventions to which Bhutan is a signatory.
- Cooperation in information sharing and exchange, appropriate technology inwater resources development and management, flood warning and disastermanagement shall be initiated at the national, regional and global levels.

Bhutan was an absentee to the 1997 UN Watercourses Convention vote and has not ratified the Convention.

The Bhutan Water Policy recognizes the tremendous potential of hydropower for socio-economic development and export. The Policy states that transboundary water issues are to be dealt with in accordance with international law and conventions to which Bhutan is a signatory, while taking into consideration the integrity of the rivers and the legitimate water needs of riparian states. Cooperation in information sharing and exchange, appropriate technology in water resources development and management, flood warning, and disaster management are to be initiated at the national, regional, and global levels. The National Environment Commission is empowered to address matters of international water cooperation.

Flood Forecasting and Warning

In addition to hydropower development, Bhutan and India have cooperated to establish the *Comprehensive Scheme for Establishment of Hydrometeorological and Flood Forecasting Network on Rivers Common to India and Bhutan* (1979). This network consists of 35 hydrometeorological stations located in Bhutan. (These stations are maintained by Bhutan with funding from India). A Joint Expert Team (comprised of officials from both governments) tracks the progress of the network. The two countries have also formed a Joint Group of Experts on Flood Management. This entity discusses and assesses the probable causes and effects of the recurring floods and erosion in the southern foothills of Bhutan and adjoining Indian plains. It recommends remedial measures.

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Bangladesh

Taylor Henshaw

BANGLADESH HAS a dense network of rivers (about 405), *khals* (floodplain channels) and wetlands. The country shares 54 rivers with India and three rivers with Myanmar. The major rivers are the Ganges, Brahmaputra and Meghna (Nepal, Bhutan and China are also river system riparians). Bangladesh is downstream on all three major rivers. These rivers lead into the world's largest delta (and the Sundarbans mangrove forest).

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Bangladesh voted in favour of the 1997 UN Watercourses Convention but has not ratified it.

The 1999 National Water Policy contains policy for fostering international cooperation in water management. These provisions are:[8]

(a) Work with co-riparian countries to establish a system for exchange of information and data on relevant aspects of hydrology, morphology, water pollution, ecology, changing watershed characteristics, cyclone, drought and flood warning, and to help each other understand the current and emerging problems in the management of the shared water sources;
(b) Work with co-riparian countries for a joint assessment of all the international rivers flowing through their territories for better understanding of the overall basins' potentials;
(c) Work jointly with co-riparian countries to harness, develop, and share the water resources of the international rivers to mitigate floods and augment flows of water during the dry season;
(d) Make concerted efforts, in collaboration with co-riparian countries, for management of the catchment areas with the help of afforestation and erosion control for watershed preservation and reduction of land degradation;
(e) Work jointly with co-riparian countries for the prevention of chemical and biological pollution of the rivers flowing through these countries, by managing the discharge of industrial, agricultural and domestic pollutants generated by human action; and
(f) Seek international and regional cooperation for education, training, and research in water management.

The Ministry of Foreign Affairs (MOFA) formulates and executes the foreign policy of the Government of Bangladesh and represents the State to foreign governments and international organizations. While MOFA maintains liaison for any bilateral or international issues, it is the relevant ministries that guide MOFA on technical matters, in case of of transboundary water, this is Ministry of Water Resources (MoWR). Any MoU related to transboundary water resources is also signed by MOWR, but treaties and agreements are dealt by the Prime Minister's office with support from MOWR and have to be approved by parliament. In case of issues like inland navigation and energy (hydropower) the main minsitries are Ministry of Shipping and Ministry of Power, Energy and Mineral Resources respectively, however MoWR participates in related meetings and is consulted in decision making. Under MoWR, JRC is agency that is responsible for transboundary water resources management.

Joint Rivers Commission Bangladesh (JRC)

The Joint River Commission is a bilateral working group established by India and

Bangladesh in the Indo-Bangla Treaty of Friendship, Cooperation and Peace that was signed on March 19, 1972 and came into being in November, 1972. As per the treaty, the two nations established the commission to work for the common interests and sharing of water resources, irrigation, floods and cyclones control. JRC's main activities include carrying out comprehensive survey of the river systems shared by the two countries, formulate projects concerning both the countries in the fields of flood control and to implement them, to formulate detailed proposals on advance flood warnings, flood forecasting, study on flood control and irrigation projects on the major river systems and examine the feasibility of linking the power grids of Bangladesh with the adjoining areas of India, so that the water resources of the regions can be utilized on an equitable basis for mutual benefit of the people of the two countries.[9] JRC is also responsible for dealing with riparian countries of Bhutan, China and Nepal.

Bangladesh-India Agreements

Cooperation between India and Bangladesh started with the first treaty 'India-Bangladesh Treaty of Friendship, Cooperation and Peace' signed in 1972. This paved the way for building further relations in various sectors including trade, water allocation and transportation. In December 1996 both the countries signed the *'Treaty on Sharing of the Ganges Waters'* at Farakka. The mutual agreement provided an arrangement for sharing of the Ganges waters at Farakka in a spirit of mutual accommodation and the need for a solution to the long-term problem of augmenting the flows of the Ganges. Additionally, there are around 100 MoUs between Bangladesh and India and some of

those relevant to the transboundary rivers. However, Bangladesh is not party to any agreements with India on the Brahmaputra-Jamuna River.

Indo-Bangladeshi Treaty of Friendship, Cooperation and Peace

Bangladesh and India signed the Treaty of Friendship, Cooperation and Peace in 1972 (consisting of a Preamble and 12 Articles), which provided a broad scope for bilateral relations. The Preamble specified "peace, secularism, democracy, socialism and nationalism" as the common ideals "to maintain fraternal and good neighbourly relations and to transform their border into a border of eternal peace and friendship". Over water resources, the parties agreed "to make joint studies and take joint action in the fields of flood control, river basin development and the fields of hydroelectric power and irrigation. While the Treaty's signature sparked other agreements, the governments declined to renegotiate or renew the Treaty when it expired in 1997.

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In Sepetember 2011, the "Framework Agreement on Cooperation for Development" between Bangladesh and India was signed by the two Prime Ministers. Article 2 states that "to enhance cooperation in sharing of the waters of common rivers, both Parties will explore the possibilities of common basin management of common rivers for mutual benefit". Article 2 of this agreement stipulates that "the Parties will cooperate in flood forecasting and control"; and "they will cooperate and provide necessary assistance to each other to enhance navigability and accessibility of river routes and ports".

Bangladesh and India have a long standing Protocol on Transit and Trade through inland waterways which was first signed in 1972

Protocol on Inland Water Trade and Transit (PIWTT)

Bangladesh and India have a long standing Protocol on Transit and Trade through inland waterways which was first signed in 1972. It was last renewed in 2015 for five years with a provision for its automatic renewal for a further period of five years. The Protocol allows mutually beneficial arrangements for the use of their waterways for movement of goods between the two countries, one of the waterways being the Jamuna. Bangladesh and India developing two stretches of Bangladesh inland waterways on a 20:80 cost sharing basis[10].

Bangladesh-China Agreements

In 2008, Bangladesh agreed to a "Memorandum of Understanding upon Provision of Hydrological Information of the Yarlung Tsangpo - Brahmaputra River in Flood Season by China to Bangladesh", with China. This document provides that, in flood season, China will provide hydrological information to Bangladesh from three hydrological stations along the main stream of the Yarlung Tsangpo.

India-Bangladesh-Bhutan Working Group on Water and Power

An India-Bangladesh-Bhutan Working Group on Water and Power has been established for sub-regional cooperation on water resources management and hydropower development. The first meeting was held in April 2013. The parties agreed at that time to prepare a framework for trilateral cooperation. There has been no further reporting on the Working Group's progress.

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Multilateral cooperation in the region

OVER THE last couple of years, a new area of cooperation between the countries have emerged. The first regional body, South Asian Association for Regional Cooperation (SAARC) was established in 1985. Along with SAARC, other sub-regional institutions have materialized. While most of them are trade and connectivity oriented, the evolving institutional mechanisms and the growing political will offer opportunities to include critical water-energy-food issues.

The Bangladesh, Bhutan, India, Nepal (BBIN) sub-regional initiative is envisioned to improve economic cooperation and connectivity among the four South Asian countries

South Asian Association for Regional Cooperation (SAARC)

The South Asian Association for Regional Cooperation (SAARC) was founded in Dhaka as a vehicle for political and economic cooperation. Currently, the member countries are Afghanistan, Bangladesh, Bhutan, India, the Maldives, Nepal, Pakistan and Sri Lanka. China is one of the nine observers at SAARC summits.[12] The SAARC maintains permanent diplomatic relations at the United Nations as an observer and has developed links with multilateral entities, including the European Union. The SAARC charter stipulates that decisions are to be unanimous and that "bilateral and contentious issues" are to be avoided.

The stated areas of cooperation of SAARC does not include water, and SAARC activities have been limited to 'soft areas of cooperation' such as holding seminars, workshops and trainings.[13] Although, SAARC Meteorological Research Centre and SAARC Disaster Management Centre (SDMC) promotes collective research on weather, meteorology and disasters (including floods).

Bangladesh, Bhutan, India and Nepal (BBIN) initiative

The Bangladesh, Bhutan, India, Nepal (BBIN) sub-regional initiative is envisioned to improve economic cooperation and connectivity among the four South Asian countries. This initiative allows to bypass some of the more complex political issues of SAARC and engage in direct discussions on connectivity in the four countries.[14]

The Initiative looks at land and inland waterways connectivity and energy, could be an effective sub-regional institutional mechanism for better water and hydropower cooperation. The first achievement of the BBIN initiative has been the Motor Vehicles Agreement to make cross border trade and transport in and through the northeastern region of India to and from Bangladesh, Bhutan and Nepal more efficient.[15]

Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC)

The Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) is an international organisation of seven nations of South Asia and Southeast Asia that are dependant on the Bay of Bengal. The BIMSTEC member states are Bangladesh, Bhutan, India, Myanmar, Nepal, Sri Lanka and Thailand. This sub-regional organization came into being on 6 June 1997 through the Bangkok Declaration. The regional group constitutes a bridge between South and South East Asia and represents a reinforcement of relations among these countries. The objective of building such an alliance was to harness shared and accelerated growth through mutual cooperation in different areas of common interests by mitigating the onslaught of globalization and by utilizing regional resources and geographical advantages.

Unlike many other regional groupings, BIMSTEC is a sector-driven cooperative organization. Starting with six sectors—including trade, technology, energy, transport, tourism and fisheries—for sectoral cooperation in the late 1997, it expanded to embrace nine more sectors—including agriculture, public health, poverty alleviation, counter-terrorism, environment, culture, people to people contact and climate change, in 2008.[16] Compared to SAARC, BIMSTEC has greater trade potential. Given the fairly harmonious relationship among member states of BIMSTEC, improving its performance is an achievable goal. The success of BIMSTEC does not render SAARC futile; it only adds a new chapter in regional cooperation in South Asia. Two decades since its inception, however, BIMSTEC's successes have also been minimal.[17]

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The Bangladesh – China- India- Myanmar (BCIM) Forum

Ambuj Thakur

THE BCIM Forum is a Track II initiative that evolved out of China's need to open up its land-locked Southwest frontier provinces of Yunnan, Sichuan and Guizhou to the huge markets of South Asia through the warm water ports of the Indian Ocean Region. The principal mover has consistently been the Yunnan Provincial Government, along with the Yunnan Academy of Social Sciences (YASS) playing a seminal role. This coincided with India's weighing its various options in developing its own land-locked Northeastern Region under the ambit of its Look East Policy. Moreover, countries like Bangladesh and Myanmar also wished to join the bandwagon of these to economic giants to open up their economies for greater investment and looking out for markets to sell their products. It began to take shape on a preliminary conference on *Regional Development in India and China* in New Delhi on 19th-20th November 1998, where representatives from the two countries met to deliberate on a wide range of issues of mutual cooperation. The term 'Sub-Regional Cooperation Zone of China, India, Myanmar and Bangladesh' was explicitly mentioned by the senior YASS academic, Che Zhimin, with emphases on win-win cooperation, multi-lateralism, multi-polarity, and developing the periphery[18].

BIMSTEC has greater trade potential. Given the fairly harmonious relationship among member states of BIMSTEC, improving its performance is an achievable goal

With such a background, the first conference between Bangladesh, China, India and Myanmar was convened in Kunming, Yunnan, on 15th-17th August 1999, where a whopping ninety delegates from the Chinese side participated against a total of 39 combined from the rest three countries. The agreement to create a coordinating forum for such deliberations was agreed upon and it was christened as 'The Kunming Initiative'. From 1999 to 2019, a total of thirteen meetings have been held in all the four countries on a rotational basis, with a major focus on the three T's – Transport, Trade and Tourism, respectively. With time other issues like border trade and management, information technology, transnational crimes, illegal immigration, sports, to name a few, were also taken up. But the overt stress was always on improving connectivity networks by tapping into the United Nations Economic and Social Commission for Asia and the Pacific's (UNESCAP) decades-old proposals of linking Asia through its Pan-Asian Highway and Trans-Asian Railway networks respectively. It found echo it an earlier article in Beijing Review written in 1984 by Pan Qi, a former Vice-Minister for Communications of China, to open up Southwest China to the rest of the world by developing connectivity networks[19].

One of the major outcomes of these deliberations was the successful organisation and completion of the BCIM Car Rally from Kolkata to Kunming in February 2013, covering a distance of nearly 3000 kilometres and traversing through one of the sections of the old Southern Silk Route with cities like Jessore, Dhaka, Silchar, Imphal, Mandalay, Ruili, Dali on the way. Way back in 2009, then Chinese President had called upon promoting Yunnan as a bridgehead for the markets of China, South Asia and Southeast Asia respectively, and this rally could be seen as a step in that direction. By 2013, the term bridgehead was replaced by *Qiaotoubao* or 'Opening Up' to be in tune with China's official policy of peace and development.

The joint statement reiterated the necessity for developing connectivity among the four countries through railways, air, waterways and roads, as also the digital and energy sectors

Despite the institution of a Joint Working Group between the officials of the four countries and up-gradation of this initiative to an official Track I status, post-2013 it remained in cold storage for a long time due to the BCIM's coming under the ambit of the Belt and Road Initiative (BRI). It was only after the BCIM was dropped from the list of corridors in the Second BRI Meet in early 2019 that the decks were clear for the process to move ahead. In June 2019, on the sidelines of the 7th China-South and Southeast Asia Think Tank Forum and the South and Southeast Asia Commodity EXPO and Investment Fair in Kunming, the 13th BCIM Forum Meeting was held in the nearby city of Yuxi as a very low-key affair. The joint statement reiterated the necessity for developing connectivity among the four countries through railways, air, waterways and roads, as also the digital and energy sectors.

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PERSPECTIVES ON HYDRO-DIPLOMACY

Benefits from transboundary river cooperation

Ganesh Pangare and Bushra Nishat

COOPERATION OVER shared waters hinge on economics, legal frameworks, international law, international relations, geopolitics and hydrology. Transboundary water management is a long-term social, political and diplomatic effort and needs

to be revisited and adapted according to the prevailing situation. Hydro-diplomacy could increasingly play an important role in strengthening and securing international relations and regional stability provided that it demonstrates concrete results on the ground; results for water, food and energy security, for a green economy, for healthy ecosystems and climate resilience, for people's health and well being and equity.

Agreements or treaties between riparian countries are mostly bilateral and may or may not have a holistic approach to river management. The conventional approach to hydro-diplomacy has been mostly focussed on negotiations on formulating a formal agreement or 'treaty' between two governments. The details of this agreement are usually prescribed by diplomats, government delegates and bureaucrats based on international conventions and standards. According to IUCN[20], this approach presumes hydro-diplomacy takes place under the authority of sovereign governments. While formal agreements at the official level are absolutely necessary, this approach often disregards that water resources are managed at multiple scales, thus for these agreements to work on the ground and to be acceptable at the national or country level, involvement of water users at different levels including local communities are also essential. A wide spectrum of formal and informal agreements, concentrating on concrete actions and sustainable solutions based on local priorities need to be in place. This means an all-inclusive approach with participation and involvement of a broad range of stakeholders including local communities, local governments, technical agencies, economic and private sectors. These agreements would then become the practical building blocks that augment and improve the potential for national governments to reach high-level agreements encouraging an operational roadmap for improvement in water governance towards sustainable development at the basin level[21]. Hydro-diplomacy approaches have the potential to play a facilitating and bridge-building role to support and enable these agreements to be put in place at different levels and between governments. Hydro-diplomacy starts with national interests and needs to be embedded in effective processes from the initial dialogue to being able to progress all the way to a constructive and enforceable agreement and its joint implementation at national and regional levels between riparian interests.

Hydro-diplomacy could increasingly play an important role in strengthening and securing international relations and regional stability

How does hydro-diplomacy work? How can it become an effective tool? How can hydro-diplomacy be put into practice? The answers lie in addressing three key challenges:

a) building consensus,
b) building institutions for hydro-diplomacy; and
c) identifying and catalysing the processes necessary to mobilise hydro-diplomacy.

It is important to keep in mind that consensus building in hydro-diplomacy starts with national interests, including economic development, security, and concerns and needs of the local population. Consensus building then requires trust and political will, platforms for dialogue and transparency, knowledge and information, capacity and tools for integration of competing demands and for identifying mutual benefits. Institutions for hydro-diplomacy include "truly" representative river basin

organisations (RBOs) that involve different stakeholders. RBOs need to work alongside other regional platforms across sectors and with the drivers of change in different rivers and different basins. Agreements will work on the ground only if they involve water users and have their support and take into account local politics. In order to catalyse and mobilise hydro-diplomacy, it is necessary to have in place processes in national agendas and in international dialogues, and also processes that support interaction with stakeholders. Education of stakeholders, communication and capacity development, and strengthening of national institutions is required in order to make these processes effective. Platforms and partnerships for dialogue that work across sectors and constituencies and inform and backstop governments would need to be put in place. Effective governance at the national level, sound policies and laws that align with trans-boundary issues would also need to align with hydro-diplomacy processes. There would need to be a better understanding of the issues that countries and citizens want to solve and what their concerns are. Lastly, it would be necessary to drive the application of the existing international processes related to water.

Hydrodiplomacy stems from the need to negotiate where competing and even conflicting interests towards shared water resources are present. National institutions

involved in the management of water in transboundary rivers focus on their own national interests, often with consequences to the riparian needs and interests of the countries with whom they share the water resources. As pressures on water resources continue to increase with the prospect of climate change, population growth and fast developing technologies for water abstraction, water allocation and sharing between transboundary riparian states is likely to create frequent and more intense tensions. In response to this challenging reality, hydrodiplomacy could prove to be a crucial tool in ensuring that shared water resources are managed efficiently, sustainably and equitably.

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Water and Diplomacy

C M Shafi Sami

EXPERTS APPREHEND that in not too distant future almost half of world population will come under severe threat of water scarcity. Many ecosystems will be unable to cope with the rapidly growing demands of the basic needs, improvement of quality of life and economic development of an ever-increasing world population. As scarcity accentuates balancing the competing needs of societies will become a contentious issue between regions within many countries of the world. It will be an even more formidable task in case of international or trans-boundary water resources which are shared by two or more states. The enormity of the task can better be appreciated when we realize that there are 263 trans-boundary water sources in the world that straddle or cross political boundaries of one or more sovereign states, constituting over 80 percent of worlds fresh water sources – rivers and aquifers. Most of the water basins are shared by just two countries; others are shared by three or more countries – with the Danube River being shared by as many as 18 nations. As many as 145 countries of the world have territories within one or more trans-boundary water sources. More than 95 percent of the territories of as many as 33 countries lie within international river basins making them totally dependent on shared water resources. Trans-boundary water resources cover about half of the land surface of the earth and as much as forty to fifty percent of the total world population is dependent on shared water resources.

there is a strong belief that rather than causing open conflict, trans-boundary water can serve as stimulus for cooperation

On the other hand, there is a strong belief that rather than causing open conflict, trans-boundary water can serve as stimulus for cooperation. The need of water together with the prospect of sharing benefits from equitable use of these common water resources for sustainable socioeconomic development provides incentives for trans-boundary inter-state cooperation. According to the Food and Agricultural Organization, over the last millennium more than 3,600 treaties on international water resources have been negotiated with more than 200 such treaties being signed during the last century alone. Another significant aspect of cooperation in water sector is that once cooperation is forged the benefits of cooperation ensure that it becomes enduring and resilient. Nations deriving benefit from water treaties find it prudent to hold on to them and continue to draw its advantage. The most remarkable resilience has been demonstrated by the Indus Water Treaty signed in 1960 between India and Pakistan; it survived more than half a century's bitter hostility between the neighbors and withstood two bitterly fought wars between them.

For long the international community has deliberated on various theoretical approaches governing the utilization, share, management and quality control of the shared water resources. These have resulted in the formulation of four major doctrines over a period of time. The main characteristics of these are presented in easily understood simple terms.

The Doctrine of Absolute Territorial Sovereignty was propounded in 1885 by US Attorney General J. Harmon and is popularly known as Harmon Doctrine. It gave all riparian states full and unlimited rights to whatever it wished to do with the water course falling within its territory without any regard for the needs and concern of other riparian countries. In reality this doctrine gave exceedingly favorable dispensation to an upper riparian state; a country having absolute sovereignty over the portion of an international watercourse within its borders would be free to use or divert all of the water from an international watercourse, leaving none for downstream states. This doctrine was invoked by the US on the flows of the Rio Grande river as an upper riparian state vis- a-vis Mexico. Interestingly, the USA itself rejected this doctrine in 1950 during its dispute over the waters of Columbia River in which Canada was the upper riparian state with USA lying down stream. On the other extreme and diametrically opposed to the Harmon Doctrine is the Doctrine of Absolute Territorial Integrity which asserts that a lower riparian country has the right to demand uninterrupted natural flow of water from the territory of any upper riparian state. This doctrine held that an upstream state could do nothing to interfere with the natural flow of the river into a downstream state. The third doctrine that deserves mention is the Doctrine of Limited (Restricted) Territorial Sovereignty which seeks to strike a reasonable balance between the earlier two doctrines. This doctrine gives recognition of a state's sovereignty over the water resources in its territory but enunciates that all states have equal sovereignty over the common water resources and hence sovereignty of one state is not unfettered and is 'limited' by the sovereignty of another state. Simply put every state has the sovereign right to use waters lying within its territory provided its use does not prejudice the sovereign rights and uses of another state sharing the common watercourse. This doctrine guarantees reasonable water to all co-riparian states under reasonable conditions; the doctrine seeks to espouse the principle of equitable utilization and no harm done to other riparian states. The fourth doctrine is known as the Doctrine of Community of Co-riparian States or Community of Interests. It is an attempt to improve upon the concepts in the doctrine of limited sovereignty. It enunciates a common legal right of all co-riparian states on international water resources. The doctrine establishes a perfect equality of all riparian states in the use of entire water course and excludes any preferential privilege for any riparian state in relation to others.

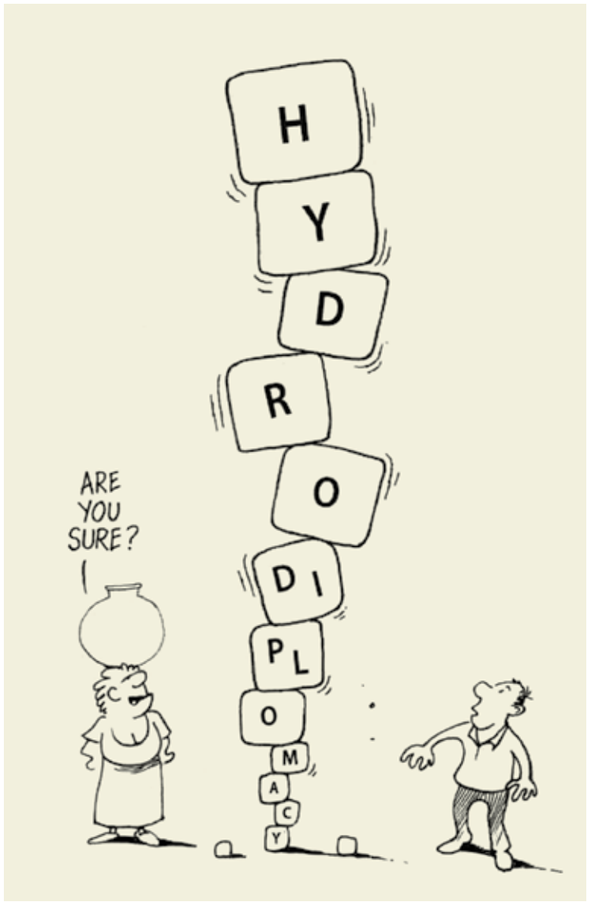
There is now an explicit recognition that all riparian states are entitled to the use of international water course in an equitable and reasonable manner

There is now an explicit recognition that all riparian states are entitled to the use of international water course in an equitable and reasonable manner. Another important principle has now achieved international recognition that riparian states have an obligation not to cause significant harm to the other riparian states and all riparian states shall exercise due diligence in the utilization of international water resources. Although these principles have generated interminable debates on how exactly to determine reasonableness, equity, significant harm and due diligence, these concepts are indeed important milestones in achieving good governance of international water courses. Some of these norms and principles are contained in the 1966 Helsinki Rules on the Uses of the Waters of International Rivers and the 1997 UN Convention on Non-navigational Uses of International Water Courses.

Diplomacy, the medium of inter-state interactions, has a pivotal role in balancing the competing interests of states

The 1997 UN Convention represents an important step towards the strengthening of the rule of law in international waters. Of particular importance is the principle embodied in this Convention requiring a state to utilize the watercourse, in its territory, in a manner that is equitable and reasonable vis-à-vis the other states sharing that water course. Another crucially important provision is the obligation imposed on a state not to cause any significant harm to other states sharing an international water course. The Convention also puts an obligation on a state undertaking any project to notify other states of planned activities to allow the other states to assess if there would be any a significant adverse effect; the intention is to obviate such adverse effects. These are very positive and important principles which will promote good governance in this increasingly critical area of international relations.

Conflict or cooperation on international waters - clearly there are two contradictory and clashing prognoses before us. Whether it is averting the threat of conflict or harnessing the prospects of cooperation the challenge before the world is formidable. The quality of governance of trans-boundary waters will play a role of paramount importance in determining which of these two courses mankind will opt for. As decisions relating to utilization, share, management and quality control of the international water fall within the jurisdictions of more than one country, the governance encompassing these elements will bring into play inter-state interactions. Diplomacy, the medium of inter-state interactions, has a pivotal role in balancing



Rustam Vania

the competing interests of states. One also has to reckon that the dynamics of water negotiations is in a state of flux as it moves from zero-sum attitudes to positive-sum integrative win-win approaches, from right based volumetric sharing to the creation and sharing of benefits derived from water resources. This development will create more economic opportunities and simultaneously bring into play additional political challenges. Synthesizing and harmonizing the complex mix of economic opportunities and political challenges will thus impose pronounced demands on diplomacy.

There is a growing feeling among experts that these principles and laws need to be more concrete and precise. Simultaneously with harmonizing inter-state interests, in clearer and unambiguous terms it will be of vital importance to concretize and crystallize principles and laws relating to the regimes of these precious resources and to create institutional mechanism that will have the capacity of enforcement as well as conflict resolution. On all these counts diplomacy will be called upon to play a role of crucial and overwhelming importance in the days ahead.

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Recollections of India – China Cooperative Exchanges on the Brahmaputra

Gautam Bambawale

INDIA IS the lower riparian on the Brahmaputra which originates in the highlands of the Tibet Plateau, flows eastwards in China and then makes what is described as a "great bend", enters India and flows westward. The mighty Brahmaputra in India is used for irrigation, transportation and power generation and has a central role in a complex ecosystem[22]. Through history, monsoon flooding of the river has caused misery and loss to several generations.

When the Government of India discovered in 2007 that China was building a series of cascading dams on the middle reaches of the Brahmaputra at Zangmu, Dagu, Jiacha and Jiexiu the first reaction from Beijing was to deny such claims. Little realizing that modern satellite cartography available commercially could clearly pick up the construction activity underway, the denials then gave way to statements that these were all run-of-the-river dams which would not lead to large scale storage of water. India and China first concluded and signed a Memorandum of Understanding (MOU) for Sharing of Hydrological Data on the Yarlung Zangpo/Brahmaputra in 2002. This MOU provides for the annual meeting of an Expert Level Mechanism (ELM) whose job it is to assess how the mechanism of data sharing has been working. Fairly regular meetings of this ELM have taken place over the years although not each and every year. However, the ELM has resulted in Indian and Chinese water experts getting into the habit of talking and cooperating with each other. I, for one, believe that this habit is much more than many other nations do with China on trans-boundary rivers. I have had the good fortune of participating in a few of these ELMs and I vouch for the fact that while at the start the two delegations would view each other with some suspicion, over time this has changed, and the two sides do have a cooperative attitude when they meet. The MOU has been extended beyond its original 5-year period and continues to be an area of cooperation for India and China.

India and China first concluded and signed a Memorandum of Understanding (MOU) for Sharing of Hydrological Data on the Yarlung Zangpo/ Brahmaputra in 2002

When I was India's Ambassador to China in 2017-18, we had one experience which depicts how cooperation can indeed play a positive role in saving lives and property when there are blockages on the Yarlung Zangpo in Tibet, China. The ELM had a meeting in China in mid-March 2018. I remember being informed by my colleagues who attended the meeting that it had been a relatively pleasant one and the two delegations had got to know each other relatively well. Later that summer, late one evening one of our Embassy officers received a call from a contact in the Chinese Ministry of Water Resources to inform us that there had been a blockage of part of the river in the middle reaches in Tibet, China. The information was being shared since the blockage was leading to the formation of a kind of lake. The pressure from the water could burst the blockage and could lead to a large mass of water flowing down the river into India. Such a flood could potentially have damaging consequences in our country. On my instructions, the Indian Embassy in Beijing immediately relayed the information shared by China to our own Ministry of External Affairs as also our Ministry of Water Resources as well as the Cabinet Secretariat. This last action was essential since there were at least two separate State Governments involved namely Assam and Arunachal Pradesh. Hence, informing the Cabinet Secretary was essential, since he and his Secretariat could convey the news to the States in India.

Surely, a few days later the water at the blockage site had sufficient pressure to blow off the blockage, which had occurred due to a landslide. That mass of water began moving down the Brahmaputra. It would reach India within two days especially the areas in India which are settled and fairly low lying.

Then began a vigil for all of us involved on the Indian and Chinese sides. We began to received almost hourly updates from the Chinese Ministry of Water Resources on where the flood had reached and what was the flow of water at places where they had measuring stations. This information was immediately relayed to India. I recollect one instance where the Cabinet Secretary of India held a video conference with me in Beijing and the Chief Secretaries of the two States of India involved. Based on the data received from the Chinese side, our own hydrologists were able to project by extrapolation how high the flood would be in different parts of India. Based on these projections, in turn, a fair number of people living in low lying areas on the banks of the Brahmaputra were evacuated by our authorities.

Such cooperation is not merely possible but also implementable when the personnel involved clearly understand the potential for saving lives, crops, habitations.

Now, it was our turn to share with China what steps we had taken based on the information shared by them. When I did so and informed about the thousands of people evacuated, and how we were possibly saving lives due to this cooperation between India and China, I found my Chinese interlocutors feeling very satisfied with the scope and level of cooperation the two countries had achieved.

Within two days, as the experts had predicted, the flood had reached India and the level of the Brahmaputra swelled significantly. However, the flood peak was in line with what our hydrologists had predicted and was not of a magnitude to create too much damage. The lower lying areas, particularly in Assam, were flooded but there was no loss of life due to the evacuations of the populace which had already been effected. The flood peak passed down the river in a few hours and with it so did the crisis. All of us dealing with the issue heaved a sigh of relief, but we also had a feeling of satisfaction with what we had achieved. The next day as the Indian Ambassador to China I wrote out a letter to the Chinese Ministry of Water Resources outlining and highly appreciating the level of cooperation we had been able to reach.

Suspicion must be replaced by a desire to cooperate

What are the lessons from this particular incident that I took away with me? They are:

(a) Cooperation on trans-boundary rivers between nation states, increases welfare of people in all the cooperating countries.
(b) Such cooperation is not merely possible but also implementable when the personnel involved clearly understand the potential for saving lives, crops, habitations. Suspicion must be replaced by a desire to cooperate.
(c) Big countries need to take a large-hearted approach to trans-boundary river cooperation.
(d) Sharing of information must be a two-way street. It cannot just be the upper riparian sharing data and information with the lower riparian. Indeed, the lower riparian also needs to share with the upper riparian how such data has been utilized.
(e) We need more cooperation rather than less on major river systems across the globe.

Based on these recollections, I do hope that India and China can consider expanding their cooperation on trans-boundary rivers such as the Brahmaputra.

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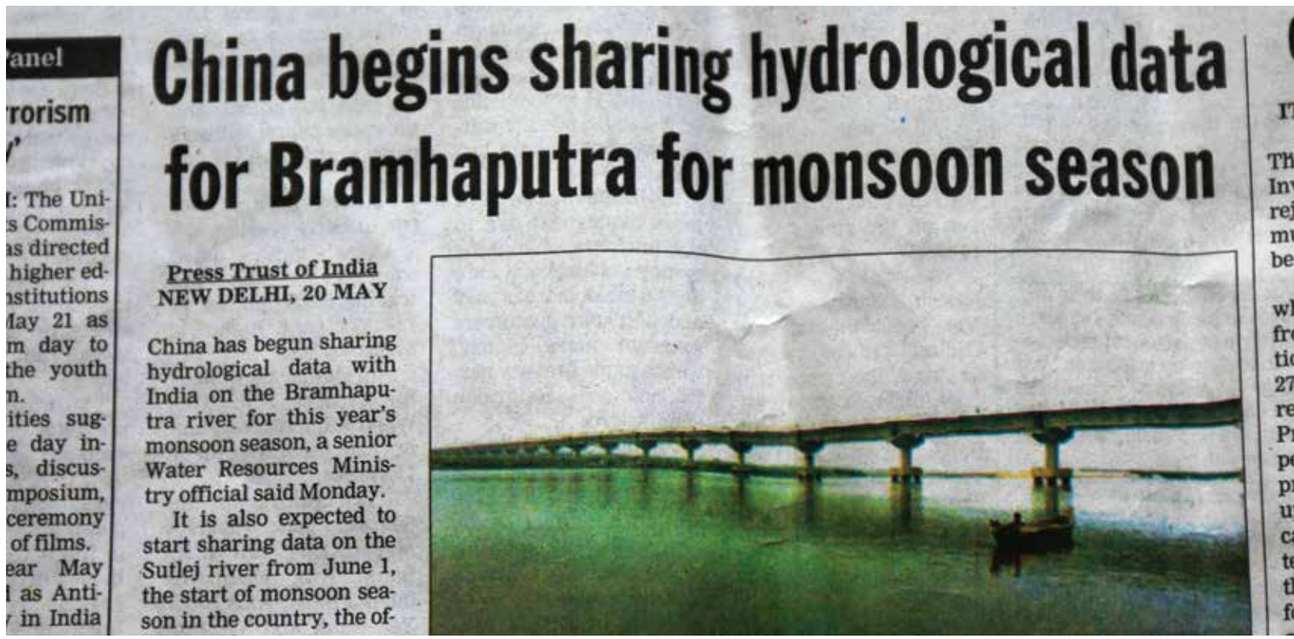

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China begins sharing hydrological data for Bramhaputra for monsoon season

Press Trust of India
NEW DELHI, 20 MAY

China has begun sharing hydrological data with India on the Bramhaputra river for this year's monsoon season, a senior Water Resources Ministry official said Monday.

It is also expected to start sharing data on the Sutlej river from June 1, the start of monsoon season in the country, the of-

Framework for cooperation in the GBM Basin[23]

Golam Rasul

THE EASTERN Himalayan countries of Bangladesh, Bhutan, India and Nepal, along with the Tibet Autonomous Region of China, are interconnected by the river systems of the Ganges (or Ganga), the Brahmaputra (known as Yarlung Tsangpo in China and Jamuna in Bangladesh) and the Meghna. Together these three river systems are often referred to as the Ganges-Brahmaputra-Meghna (GBM) basin, covering an area of 174.5 million hectares. At present about 700 million people live in the GBM basin, comprising more than 10 percent of the world's population. The average annual water flow in the GBM basin is estimated at around 1160 billion cubic meters. The GBM basin is geographically connected and has a high level of economic complementarity and interdependence. It is also closely linked hydrologically, and these links lead to a high degree of interdependence and call for cooperative governance of water resources.

These river systems are rich in water, land, and forest resources. They provide fertile agricultural flood plains and feed into one of the most productive estuarine ecosystems in the world, the Sundarbans, which sustains the lives and livelihoods of millions. Despite such richness in natural resources, the region is one of the poorest in the world. Rapid population growth, the fast pace of urbanisation together with economic development have increased the pressure on this finite resource. Water resources in

the region are distributed very unevenly over time and space. About 84 percent of the rainfall occurs between June and September and 80 percent of the annual river flow takes place in the four months between July and October. Huge amounts of water during the monsoon period trigger floods and other hazards, whereas in the dry season the water is insufficient to meet the requirements for irrigation, navigation, and maintaining minimum environmental flow in the rivers. While the need for water has increased rapidly, water supplies have become more erratic as a result of both poor management and climatic effects.

The Need for Better Cooperation

Upstream-downstream interdependencies and geographical linkages necessitate the development of a shared and integrated river system through collaboration among the riparian countries

In the GBM basin, the abundant water during the monsoon leads to hazards such as flooding and other natural disasters. At the same time, the GBM basin is very rich in water resources, but this potential has remained largely untapped. Upstream-downstream interdependencies and geographical linkages necessitate the development of a shared and integrated river system through collaboration among the riparian countries. Such collaboration could deliver a number of benefits. The high precipitation in the summer monsoon season (June to September / October) renders the Eastern Himalayan countries vulnerable to natural hazards such as floods and landslides. The Ganges-Brahmaputra basin is one of the most flood-prone regions in the world. The loss of human life is highest in Bangladesh (on average around 6000 people per year) and the number of people affected by floods is highest in India (more than 22 million per year). While floods cannot be completely avoided, the damage can be minimized through the joint efforts of governments and those living in the major river basins. For example, the lead time for flood forecasting can be increased substantially through exchange of real time data on river flow from upstream areas of the basins.

The fundamental problem with water governance in the GBM basin lies in the seasonal concentration of rainfall and spatial variation in its distribution, as well as unreliability in water supplies. These characteristics of water availability mean that water should be stored when it is abundant and redistributed when and where required within a framework of regional understanding and cooperation. Literature on potential sites for storage reservoirs in India and Nepal, for example, reveals that there is great potential for storage of monsoon water in the GBM basin.

Potential for Transboundary Cooperation

Although there are challenges, the opportunities for collaboration are also growing as civil society and other non-state actors emerge, and new forces for cooperation.

Hydropower generation. Abundant rain-fed and snow fed water resources and topography with a favourable relief for hydropower generation provide an excellent opportunity for generating an enormous amount of hydropower in the basin. The energy requirements of the region could be met, and the surplus exported. For example, the theoretical hydropower potential of glacial rivers in Nepal is estimated to be 83,000MW, in Bhutan 21,000 MW, and in north-east India about 58,971MW.

It is estimated that the GBM river systems have about 200,000MWof hydropower potential, of which half or more is considered feasible for harnessing. Alongside this, establishment of an inter-country power grid could facilitate the integration of different power systems and the export of excess hydropower from Nepal and Bhutan to India and Bangladesh. Besides hydropower, the GBM river systems offer a huge potential for the development of water resources for irrigation, navigation, transportation, fisheries, tourism and ecosystems.

Water transportation is another area for potential improvements. The Ganges, the Brahmaputra, and the Meghna rivers flow into Bangladesh from three directions and merge into a single outlet that constitutes a vast water network. This provides an opportunity to develop an integrated water transport system. Two countries in the basin, Bhutan and Nepal, are landlocked and this is an obstacle to their industrial growth and overall economic development. It is technically feasible for Nepal and Bhutan to gain direct access to the sea. Regional cooperation for the development of waterways has gained momentum in South Asia. Recently, the government of India declared 106 additional waterways and amended the bilateral navigation protocol between India and Bangladesh to allow third countries to use their waterways. Waterways along the Brahmaputra and Ganges Rivers could provide a basis for sub-regional connectivity for South Asia, connecting Bangladesh, Bhutan, the north-eastern states of India, and Nepal to the sea via the Ganges-Brahmaputra-Meghna basin. Nepal could be directly connected to the ports of Haldia and Kolkata through India's National Waterway 1, Bhutan could be connected through the Manas River to the Brahmaputra at the Jogighopa confluence, and north-east Indian states could be connected to many ports on the Brahmaputra through National Waterway 2. In view of these opportunities, the prime ministers of India and Nepal made the decision to develop the inland waterways for the movement of cargo within the framework of trade and transit and are now working to operationalize the agreement.

Waterways along the Brahmaputra and Ganges Rivers could provide a basis for sub-regional connectivity for South Asia, connecting Bangladesh, Bhutan, the north-eastern states of India, and Nepal to the sea

There are also potential political benefits. Transboundary water resources have become a contentious issue in the GBM region, as in other parts of the world. With the right perspective, transboundary water resources can become a source of understanding of regional cooperation, and peace. Through cooperative development of water resources, current tensions between neighbouring countries can be reconciled to a great extent and this would bring political benefits to all the countries involved through building trust and increasing regional security and economic growth.

Challenges. Although the potential benefits of collaborative development of the transboundary water resources in the Eastern Himalayan region are huge, there are a number of challenges that must be met and impediments to overcome before these benefits can be realised. For optimal development, a river basin needs to be managed through an integrated basin-wide approach. Transboundary water resources in the Eastern Himalayan region are generally seen from a national perspective, with a focus on problems of sharing water rather than expanding the benefits through

joint resource development. This narrow perspective often leads to bilateralism and encourages unilateral and fragmented decisions, with transboundary water resource development seen as a 'zero sum game' in which the gains of one country must mean losses for another, and negotiations become deadlocked. Moreover, transboundary water resource management has become a purely diplomatic matter, with little space for civil society, nongovernmental organisations, private sector, and other stakeholders, who are directly and indirectly involved in water management. This is a major obstacle to cooperative development of transboundary water resources.

However, there has been a positive shift in the region towards cooperative water management. Although slow, efforts are ongoing to resolve differences over water issues. The Bangladesh-India Ganges Treaty states that both countries will work together to augment the river flows in the upstream and share such waters. This provision opens a path for regional cooperation to harness the water resources of the GBM basin. Efforts are also ongoing in the Koshi basin. Bangladesh has agreed in principle to allow transit from Bhutan, India and Nepal to use the Mongla and Chittagong ports. A waterway transit for Bhutan to Mongla port is under consideration. The cooperation between Bhutan and India on hydropower development is also a very good start. Similarly, the

signing of the Mahakali treaty between India and Nepal and the treaty for sharing Ganges water between Bangladesh and India have opened up opportunities for collaboration in regional water resource development.

A Framework on Transboundary Cooperation in GBM Basin

There is a strong case for a framework for the cooperative development of transboundary water resources in the basin in order to support the realisation of such benefits. Key aspects of the framework are presented below

- Promote a multi-purpose basin-wide approach for optimum use of Himalayan water resources in an integrated manner. The starting point could be cooperation in flood control, as flooding is a common issue for all countries in the region. Greater efforts need to be made to engage policy makers and other key stakeholders, including the private sector, think tanks, research organizations and civil society on the future interactive challenges of water, energy and food security on the regional level, possible regional approaches, and the potential benefits of integrated management of transboundary water resources at the basin level.
- Shift the focus from sharing water to sharing the benefits of water. Link water sector strategies with broader national and regional development goals, including shifting the focus from hydro-diplomacy to a hydro-economic perspective.
- Build trust: a concerted effort is required to build trust and confidence so that negotiations and discussions can start. Mistrust is partly due to poor understanding of the benefits and costs of collaborative development and there is a need to promote joint research on transboundary water management issues. A concentrated effort and multi-track diplomacy are necessary to overcome the existing mistrust and build common understanding of the benefits of cooperation and the costs of non-cooperation. One of the reasons for mistrust has to do with the sharing of costs and benefits. Mechanisms for sharing the costs and benefits of co-operatively developed transboundary water resources need to be established following international standards. Dispute-resolution mechanisms and institutional arrangements also need to be developed to settle disputes among the riparian countries.
- Facilitate multi-track diplomacy, with efforts made to facilitate cross-border exchange among civil society organisations, NGOs, academic and scientific communities, and government officials.
- Undertake joint research by the Eastern Himalayan countries to produce credible information and knowledge, explore development potential and options, and assess risks, costs, and benefits of cooperative management to support sound decision making.
- Establish a mechanism and institutional arrangements to coordinate, facilitate and strengthen cooperation in water, hydropower, and flood management in the GBM basin. Water management institutions in the region are generally weak and lack the technical, financial and human capabilities needed to develop and implement comprehensive plans for transboundary water cooperation. Building the capacity of national and regional institutions and establishing a basin-level coordination committee is critical to promote better water governance.

Shift the focus from sharing water to sharing the benefits of water. A concerted effort is required to build trust and confidence so that negotiations and discussions can start

- Explore joint projects for development of transboundary water resources for short, medium and long-term measures based on mutual understanding and priorities. Joint investments in regional public goods for mutual benefit will be vital. There is a need to develop mechanisms for sharing costs and benefits in an equitable manner in the provision of regional public goods, particularly along transboundary rivers and in regional infrastructure development.
- Establish a basin-wide data bank and system for timely sharing of meteorological, hydrological, economic and environmental data and information among the countries sharing the basin.

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Interdisciplinary Governance of the Transboundary Brahmaputra River System

Jayanta Bandyopadhyay

THE YARLUNG Tsangpo- Brahmaputra trans-boundary river system is characterised by wide diversity in climate, geology, demography, administration, politics, culture, etc. which provide conditions for potential cooperation as well as disputes among the riparian countries. There have been some analytical studies on the scope of water diplomacy in the Brahmaputra river system[24]. However, the Brahmaputra is a complex river system and needs much more analytical attention. As a result, the available studies have not yet been of effective use in generating a comprehensive approach to governance of this river system.

Based on the trans-boundary status of the Brahmaputra sub-basin, this chapter outlines some of the governance challenges, potential or present or even just perceived by some analysts. n order to understand these challenges objectively, knowledge of the characteristic environmental features, like precipitation pattern, hydrological profile, geomorphological dynamics, population, land use, irrigation, hydropower potential, etc. is necessary. In addition, the human interventions like structures built, or planned by the riparian countries, will have to be considered.

Important in-situ services of the flows of the Brahmaputra sub-basin include navigation and fishery, which provide livelihood options to many people

Precipitation: Spatial and Temporal Variations

Based on the annual precipitation, the area of the Brahmaputra sub-basin can be divided in four clear climatic zones. The Yarlung Tsangpo stretch mainly passes through semi-arid areas in Southern Tibet in which the annual precipitation is about 400. As it travels round Namcha Barwa and starts the descent along the south aspect of the Himalaya, the annual precipitation gradually increases. After entering India near Tuting, Yarlung Tsangpo gets the name Siang, which reaches the plains of Assam at Pasighat (150 m), where the annual precipitation goes up to about 4000 mm. However, the most of

the extreme precipitation events have been reported in the mountainous catchments of neighbouring Lohit and Dibang rivers The tributaries from the rain rich south aspect of the Himalaya, from Subansiri to Teesta, make large additions to the flow of mainstream Brahmaputra. Thus, the river system has areas of low water availability, as in Tibet, and areas of high but seasonal water availability, as in the south aspect of the eastern Himalaya. The result is high flows or floods, erosion and sedimentation during the summer monsoon, together with shifting of the braided river flows. Important in-

situ services of the flows of the Brahmaputra sub-basin include navigation and fishery, which provide livelihood options to many people. Scarcity of flow in the lean season seriously affects irrigation for paddy in Assam and Bangladesh. Further, with summer paddy getting increasing importance in food security in Bangladesh, the pre-monsoon scarcity of water in Brahmaputra has also becme an identity of the Brahmaputra sub-basin as much the monsoon floods.

It is in the above background, that the challenges in the governance of this trans-boundary sub-basin will be analysed. It needs to be stressed that flows in the Himalayan rivers are subject to high level of uncertainty[25], which itself can often produce trans-boundary disputes. Impacts of global warming and climate change will only increase this uncertainty. Further, with the political sensitivity and ecological complexity of the sub-basin, the traditional approach to governance based on engineering structures

alone, will be inadequate. Water science has become highly interdisciplinary now. Knowledge based on extensive data is now guiding the design of governance institutions. For future interventions to be successful the role of interdisciplinary knowledge will be central. Within the available space for this chapter, all challenges in trans-boundary governance cannot be discussed.

Firstly, the China-India relations on the various structural interventions made or planned by China on Yarlung Tsangpo have got wide media coverage which need some clarity. Secondly, what is seen by this author as the primary governance agenda for the Brahmaputra sub-basin as a whole will be presented.

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China-India Relations and the Yarlung Tsangpo Projects

Dam projects on the Yarlung Tsangpo have been the subject of many journalistic writings all over the world and some analysts have even warned of a 'Water War' between China and India over the shared rivers, especially the Brahmaputra. The commissioning of a series of dams by China built around Zangmu on the Yarlung Tsangpo very much fuelled such reports. Some of these writings even predicted the drying up of the Brahmaputra in Assam as a result of dam construction by China. Indeed, in the context of two most populated countries with ambitious plans for rapid economic growth, competition for enhanced access to limited sources of water is a possibility, leading to prospects of serious conflicts, as perceived by SAWI[26]. On the other hand, depending on the high level of objectivity in diplomacy, the competition can be replaced by cooperation[27]. The rise of the 'Water War Narrative' has been the result of lack of hydrological clarity on a complex river system, since many such writings depend on very weak database and do not distinguish between the cartographic and hydrological continuity of the Yarlung Tsangpo. It needs to be stressed that at Zangmu, the flow of Yarlung Tsangpo would be a small part of the total flow of the Brahmaputra at downstream of Bahadurabad in Bangladesh (about 6-7 per cent). The situation can easily be addressed by diplomats with more openness and more willingness to gather technical information on the part of the protagonists of the Water War Narrative. Commenting on the improbability of Water Wars over dams on Yarlung Tsangpo, Ho[28] has commented that "The difficulties in managing the Brahmaputra, and the fact that both China and India suffer from water scarcity, have led to predictions that the two countries will fight over water in the future. Despite these predictions, armed conflict in the Brahmaputra is unlikely in the current context." Instead, she has raised the question "Why are China and India unable to establish robust mechanisms for cooperation on the Brahmaputra River, and how, with little institutionalized cooperation in the Brahmaputra, have both sides managed to keep their riparian relations from creating open conflicts?" Indeed, future governance of the Brahmaputra has to respond to this question urgently. However, this is a localised governance issue for the sub-basin.

Cooperative Governance for the Whole Sub-basin

The greater issue in the sub-basin is to generate an informed and comprehensive governance response to the monsoon floods, to reduce vulnerability and enhance socio-economic advantages. The governance institution should involve all sub-basin countries: China, India, Bhutan and Bangladesh.

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In a period when the scarcity of water has become a global problem, the Brahmaputra sub-basin finds annual monsoon floods as a major problem. In the context of the complexity of the climate process in the Himalaya, the meteorology of flood producing rainfall events in Brahmaputra is still at a stage of evolution[29]. All tributaries from the Himalaya have historically recorded anomalous rainfall and produced floods. The catchments of tributaries Luhit, Dibang, Siang and Subansiri face such precipitations more frequently and flood moderating structures were planned on them without being followed. The impact of monsoon floods in downstream Bangladesh is also quite heavy. The four sub-basin countries have to address the flood moderation with a sense of urgency, for which Bangladesh and India may be the prime mover. China should be a good source of knowledge especially in view of the experiences from the Yellow river[30], once devastated by floods and sedimentation. Thus, one important dimension of this sub-basin would be cooperative governance and exchange of engineering knowledge among the four countries. Managing flood producing precipitation at the location where it falls would be the role of storage structures in the uplands, thus reducing the potential damage in the downstream parts. Such a participatory process will also help much needed reduction in suspicion of NGOs, professionals and politicians in Bangladesh about upstream designs, as identified by Ahmed[31]. Thus, urgency exists in pushing forward the idea of cooperative governance of the Brahmaputra sub-basin for developing a basin wide strategy for the governance of monsoon floods.

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Fostering a Spirit of Cooperation among the Brahmaputra River Basin Riparians

Taylor W. Henshaw and Anamika Barua

THE SOUTH Asia Water Initiative (SAWI) is a multi-donor Trust Fund supported by the UK, Australia and Norway and managed by the World Bank. SAWI supports a rich portfolio of activities designed to increase regional cooperation in the management of the major Himalayan river systems in South Asia to deliver sustainable, fair and inclusive development and climate resilience. It does this through four complementary outcome areas: strengthening awareness and knowledge on regional water issues; enhancing technical and policy capacity across the region; dialogue and participatory decision processes to build trust and confidence; and scoping and informing investment designs. Its work, structured across three river basins (Indus, Ganges and Brahmaputra) and the Sundarbans Landscape, spans seven countries: Afghanistan, Bangladesh, Bhutan, China, India, Nepal and Pakistan.

Part of the South Asia Water Initiative's (SAWI) early engagement on the Brahmaputra Basin included leading study tours for high-level and technical delegations to the Yellow River Basin in China (2014) and the Mississippi River Basin in the USA (2015), where participants discussed pressing Brahmaputra governance issues and learned practical management approaches from basin organizations facing similar water resource management challenges. Notably, the delegations recommended that a "Brahmaputra Forum" be formed at the national level in each riparian country and at the basin level. While the national forums would explore local and national solutions to basin challenges; the regional forum would focus on working toward a "joint response mechanism" for issues such as navigation, hydropower investment and food management. For such a dialogue to be effective, they expressed, the process would need to increasingly extend to higher levels of stakeholders and be nimble enough to deliberate on emerging windows of opportunity for cross-border cooperation.

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During this period, the policy research institute South Asia Consortium for Interdisciplinary Water Resources Studies (SaciWATERs), with The Asia Foundation and supporting partners, started a dialogue process in the Brahmaputra Basin, of which SAWI was largely an early observer. The first phase of the dialogue process (2013-14) included six consultation meetings in Bangladesh and India at the Track III diplomatic level (CSOs, NGOs and academics/ researchers). An initial status report on water management practices and policies for the Brahmaputra Basin concluded that "the innumerable channels and tributaries, varied topographical and climate regimes, and multiple water uses across countries unequal in size and power dynamics have made a straightforward management strategy seemingly impossible; concerns and voices of legitimate stakeholders have largely been neglected in previous basin dialogues and forums; basin dialogue is only bilateral in nature; and negotiations are largely formed by virtue of adversarial positional bargaining." A Track III Bangladesh-India joint dialogue meeting reflected on the country-level consultations and called for movement in diplomatic participation from Track III to Track II, to include more influential non-government stakeholders, including prominent ex-bureaucrats that interact regularly with government officials, and to bring in stakeholders from all four riparian countries to enable a more holistic conversation on Brahmaputra management issues.

In phase two of the dialogue (2014-2015), SAWI was a behind-the-scenes influencer, helping to heighten riparian government awareness of and confidence in the dialogue process, and to secure participation. For the first time, Track II stakeholders from India (Arunachal, Assam and Delhi) and Bangladesh and Track III stakeholders from Bhutan and China came together in a multi-country dialogue to share ideas, knowledge and experience for good governance of the Brahmaputra Basin. The importance of a multi-country dialogue process on the basin was reinforced, with a call to action to move the process from Track III and Track II modes to Track I½ mode (where government and

non-government actors deliberate together) and to create a single dialogue platform with participation from all four riparian governments.

The potential for formal collaboration between SAWI and this dialogue process was identified at a Brahmaputra regional workshop in Dhaka in 2015, where SaciWATERs presented findings from the first two phases of operation and expressed need for support to sustain the dialogue and expand its reach. For SAWI, partnering with SaciWATERs on a third phase was an opportunity to advance the recommendations coming out of the study tours with a credible partner, building on the dialogue's early achievements, and to disseminate evidence generated through SAWI's basin modeling and analytical activities. SAWI funded and helped implement the demand-driven third (2016-2017) and fourth (2018-2020) phases of the dialogue, aimed at providing the means, mandate and resources necessary to facilitate formal and informal knowledge exchange and interaction among key basin stakeholders, fostering a spirit of cooperation to develop and manage the basin optimally, holistically and sustainably.

These country meetings helped identify key people and institutions that can play an important role in advancing the dialogue and further understanding of country-specific views and opinions on potential co-management of the basin

Combined Track III, II and I½ country-level dialogue meetings took place in Bangladesh (June), China (July), India (August) and Bhutan (September) in 2016. Discussions were structured around three themes: knowledge sharing and review of water resources management legal instruments from international experience; economic opportunities that would help address issues of poverty and food and energy security; and disaster management, such as flood risk management and bank erosion control. These country meetings helped identify key people and institutions that can play an important role in advancing the dialogue and further understanding of country-specific views and opinions on potential co-management of the basin.

A regional workshop in Singapore in October 2016 aimed to lay the groundwork for political commitment to a basin-wide multi-purpose institutional framework for managing and developing the Brahmaputra Basin. The small event drew senior government participation from Bangladesh, as well as high- and mid-level stakeholders from Bhutan, China and India, marking a breakthrough in track diplomacy in the basin, and signifying the quality and importance of the dialogue process. Convening this level of participation required a sustained effort by SAWI and SaciWATERs, including several rounds of national-level consultations with high-level stakeholders (including across the multiple Indian states that share the Brahmaputra Basin).

The momentum in the third phase led to the Brahmaputra River Symposium (BRS), held in Delhi in September 2017. The BRS brought together 150 delegates, including, for the first time, prominent stakeholders from all four basin riparian countries (including senior government officials from Bangladesh, Bhutan and India and academic institutions with close ties to government agencies in China) exemplifying the strides this dialogue process has made in terms of credibility and importance. The Symposium delegates identified several recommendations to combat the challenges of developing and managing the Brahmaputra Basin. The recommendations focused on generating and sharing knowledge to close the science-policy gap and inform evidence-based decision making in the basin, strengthening institutions, and integrating investments. One of the major outcomes was consensus among the delegates that this dialogue process has the potential to navigate the geopolitical complexity hindering good governance in the basin, and that it must be sustained to rally stakeholders, from community to cabinet, in each of the four basin countries to champion the movement.

Preparing and organizing the BRS involved holding meetings in China with academics acting as advisors to government to ensure there was strong Chinese representation at the Symposium. SAWI engagements in India were instrumental in the strong Indian presence at the event, including the Commissioner, Brahmaputra and Barak Basin Wing, Ministry of Water Resources, River Development and Ganga Rejuvenation.

The call to action agenda set at the BRS sparked the fourth phase of the Brahmaputra Dialogue, which was launched in May 2018. This phase has seen the dialogue process institutionalized, with a consortium of institutions connected to government in each riparian country taking facilitation roles—IIT-Guwahati (India), Institute of Water Modeling (Bangladesh), Bhutan Water Partnership (Bhutan) and Yunnan University (China)—in collaboration with a range of partners working to advance sustainable Brahmaputra Basin water resources management.

Significantly in the fourth phase, a regional workshop on south-south cooperation and the climate-water-energy nexus was held in Shanghai, jointly organized by Shanghai Institute for International Studies and IIT-Guwahati. This workshop was the first multilateral international workshop held within China under the Brahmaputra Dialogue. Feedback from workshop participants noted that the forum continues to strengthen the built network of government officials, academicians, researchers, NGOs, CSOs and media toward co-management of the basin.

Because the international experience demonstrates that the efficiency and effectiveness of an international institutional framework largely depends on the social and political characteristics prevailing within a basin, first-of-their-kind institutional and power mapping exercises were carried out on the Brahmaputra Basin. Through literature reviews and one-on-one interviews with key institutional stakeholders, the institutional mapping is helping further understanding of the complex, multi-tiered management (roles and responsibilities) and policy landscape of the Brahmaputra Basin at the domestic and international levels. The power mapping is identifying power relationships and the influence of various institutions in devising policies and programs related to (cross-border) water resources management in each of the riparian countries. This work will enable the dialogue process to identify the most relevant institutions, key actors and other stakeholders, and their interactions and locus of control for future dialogue participation, and to improve coordination and make the dialogue more effective.

Dialogue processes on international river basins are closely linked to the geopolitics of the region, and political development in any of the riparian countries could hinder opportunities for dialogue. The Brahmaputra Dialogue has managed political sensitivity risk through the manner in which workshops and discussions are structured. Country-level workshops are held so participants can speak candidly about national and transboundary basin management issues. The regional event discussions are focused on thematic areas that are of common interest to all riparians and relatively apolitical (such as disaster risk management, inland water transport and the water-energy-food nexus).

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Outcomes

THE EARLY phases of the dialogue process comprised a small group of stakeholders at the Track III and II diplomatic levels. The dialogue has since morphed into an expanded and engaged group up to Track I½. To achieve this transformation, riparian country-level workshops and meetings—supported by informal one-on-one follow-ups with key stakeholders—established the political connection, commitment and momentum long needed for dialogue breakthroughs.

The nature of the dialogue discourse is evolving beyond technical management issues, opening up thinking toward common understanding across sectors and geographies, and on policy viewpoints. Events are starting to serve as a marketplace of ideas, bringing together the producers and consumers of knowledge, and Brahmaputra Basin knowledge partnerships are emerging.

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The dialogue is working through and with a range of partners, which has expanded over time and is central to SAWI's long-term sustainability strategy. The dialogue process is now institutionalized across the basin, with a consortium of institutions connected to government in each riparian country taking facilitation roles.

While various CSOs are engaging on the Brahmaputra through multiple activities, they are working largely in isolation of one another. A CSO meeting in Guwahati, India, in November 2018 was held to bring the major CSOs together to discuss convergence of activities and identify gaps that need to be filled, potentially through future activities under the dialogue. The first-of-its-kind meeting has stemmed fruitful and ongoing discussions on identifying CSO synergies and areas for collaborative work.

This first multilateral international workshop on the Brahmaputra in Shanghai in 2018 marked the Brahmaputra Dialogue's full active engagement in all four riparian countries. It also showed China's increasing interest in regional cooperation in the basin, which will be critical to move the dialogue process forward, with legitimacy.

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