Water Diplomacy: Making Water Cooperation Work
Project Report

Transboundary Water Cooperation over the Brahmaputra River

Legal Political Economy Analysis of Current and Future Potential Cooperation

The Hague Institute for Global Justice

August 2017

The Hague Institute for Global Justice

This publication is part of the Water Diplomacy: Making Water Cooperation Work project, led by The Hague Institute for Global Justice, in collaboration with Stockholm International Water Institute (SIWI), UNESCO Category II Centre for International Water Cooperation (ICWC), Uppsala University, University of Otago, University College Cork, and Tufts University Water Diplomacy Program.

Primary funding for this project is provided by The Hague Institute for Global Justice. This project is also financially supported by SIWI and the YEP Water Program/Netherlands Water Partnership.

Authors: Yumiko Yasuda (The Hague Institute for Global Justice; ICWC; SIWI; Uppsala University), Dipankar Aich (The Hague Institute for Global Justice), Douglas Hill (University of Otago), Patrick Huntjens (The Hague Institute for Global Justice), Ashok Swain (Uppsala University).

Citation: *Yasuda, Y., Aich, D., Hill, D., Huntjens, P., Swain, A. (2017) Transboundary Water Cooperation over the Brahmaputra River: Legal Political Economy Analysis of Current and Future Potential Cooperation. The Hague Institute for Global Justice.*

Photo credits:
Cover, pp. o, 56, 114: Yumiko Yasuda
Pp. 3, 26, 79, 83: Sumit Vij

Design: Juliane Schillinger, The Hague Institute for Global Justice

Acknowledgements

The authors would like to thank all interviewees and workshop participants for their kind contributions without whom this report would not have been possible. The research team appreciates the contribution of IUCN Asia for the research work in Bangladesh, India and Bhutan, as well as the multi-stakeholder workshop conducted for this project.

Many thanks to Archana Chatterjee and Brian Furze for their kind support to this research project. The authors would like sincerely thank Marian J. Neal for taking time to provide constructive feedback to the overall research leading to this report, and Rens de Man for his coordination of the workshop in Bangkok. We are grateful for the support by Josh Weinberg for his inputs to fieldwork in China, and for providing written feedback on an earlier draft of this report.

The Authors would also like to thank Bjørn-Oliver Magsig and Thom Almeida for their input to the legal analysis. We would also like to thank Juliane Schillinger for editorial and design support. Thanks also to Nick Chipperfield for carefully editing this report.

Contents

List of tables

List of figures

List of abbreviations

BBIN	Bangladesh, Bhutan, India, Nepal
BCIM	Bangladesh, China, India, Myanmar
BIMSTEC	Bay of Bengal Initiative for Multi-Sectorial Technical and Economic Cooperation
CSO	Civil society organisation
CWC	Central Water Commission, Government of India
DGPC	Druk Green Power Cooperation
DHI	Druk Holding and Investments
DHMS	Department of Hydro-Meteorological Services, Royal Government of Bhutan
DHPS	Department of Hydropower and Power Systems, Royal Government of Bhutan
E4L	Ecosystems for Life
GBM	Ganges, Brahmaputra, Meghna (Rivers)
GNH	Gross National Happiness
ICIMOD	International Centre for Integrated Mountain Development
IUCN	International Union for Conservation of Nature
IWRM	Integrated water resource management
JGE	Joint Group of Experts
JRC	Joint Rivers Commission
JWG	Joint Working Group
mcm	Million cubic meter
MoEA	Ministry of External Affairs, Government of India
MoU	Memorandum of understanding
MoWR	Ministry of Water Resources, Government of India
MW	Mega watt
NEC	National Environment Commission, Royal Government of Bhutan
NGO	Non-governmental organisation
PAC	Project Advisory Committee
RMB	Renminbi (¥)
RSPN	Royal Society for Protection of Nature
SAARC	South Asian Association for Regional Cooperation
Saci WATERs	South Asian Consortium for Interdisciplinary Water Resources Studies
SAFTA	South Asian Free Trade Area
SAWI	South Asia Water Initiative
UNFCCC	United Nations Framework Convention on Climate Change
UNWC	UN Convention on the Law of Non-navigational Uses of International Watercourses
USD	US Dollar ($)
ZOPA	Zone of Possible Agreement
ZOPEC	Zone of Possible Effective Cooperation
WWF	World Wide Fund for Nature

List of legal instruments

The purpose of this list is to provide names of legal instruments cited in this report. The list is divided into multilateral, bilateral, and national legal instruments. For legal instruments with long names, short names are provided unless otherwise indicated. In the interests of brevity, this report refers to short names in citations.

Multilateral instruments

South Asian Free Trade Area Agreement between Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka, 2004 [SAFTA Agreement]

Bilateral instruments India – Bhutan

Treaty of Friendship between India and Bhutan, 1949 [Treaty of Friendship]

Agreement between the Government of the Republic of India and the Royal Government of Bhutan concerning cooperation in the field of hydroelectric power, 2006 [India-Bhutan Hydropower Agreement]

India-Bhutan Friendship Treaty, 2007 [India-Bhutan Friendship Treaty]

Protocol to India-Bhutan Hydropower Agreement, 2009

Bilateral instruments India – China

Memorandum of Understanding between the Ministry of Water Resources, the Republic of India and the Ministry of Water Resources, the People's Republic of China on Strengthening Cooperation on Trans-border Rivers, 2013 [MoU on Strengthening Cooperation on Trans-border Rivers]

Bilateral instruments India – Bangladesh

Statute of the Indo-Bangladesh Joint Rivers Commission, 1972 [Statute of the Indo-Bangladesh JRC]

Agreement on sharing of the Ganges waters at Farakka and on augmenting its flows (with schedule), 1977 [Ganges Agreement]

Agreement on ad-hoc sharing of the Teesta waters between India and Bangladesh, 1983 [Teesta River Agreement]

Treaty between the Government of the People’s Republic of Bangladesh and the Government of the Republic of India on sharing of the Ganga/Ganges water at Farakka, 1996 [Farakka Barrage Treaty]

Framework Agreement on Cooperation for Development between Government of the Republic of India and Government of the People's Republic of Bangladesh, 2011 [Framework Agreement on Cooperation]

India-Bangladesh Trade Agreement, 2015

Protocol on Inland Water Transit and Trade within the India-Bangladesh Trade Agreement, 2015 [Protocol on Inland Water Transit and Trade]

Bilateral instruments Bhutan – Bangladesh
Agreement on trade between the Royal Government of Bhutan and the Government of the People's Republic of Bangladesh, 2014 [Bhutan-Bangladesh Trade Agreement]

National instruments
The Constitution of India, 1949

The Constitution of the Kingdom of Bhutan, 2008

Executive summary

The Brahmaputra River[1] is one of the largest rivers in South Asia, originating in the Tibetan area of China and flowing through four countries, including China, Bhutan, India and Bangladesh, before reaching the sea at the Bay of Bengal. The river provides an important source of livelihoods for the riparian populations, many of whom use the river for agriculture and fisheries. It also encompasses a huge potential for hydropower electricity generation with some dams planned or already operating within China, Bhutan and India. In some parts of the river, the use of its water resources has become the source of contention between different users, some of which involve multiple jurisdictions and countries. Sharing of water resources over several jurisdictions can potentially create conflict among various actors.

Currently, there are numerous cooperation initiatives taking place over the Brahmaputra River by different actors. Some of these initiatives, particularly those initiated by non-state actors (Track II, III), include the whole basin, while most Track I (government to government) initiatives remain bilateral, lacking a basin-wide approach. The context in which water cooperation takes place over the Brahmaputra is heavily influenced by socio-economic and political factors, as well as its biophysical and material contexts. However, literature that analysis influence of these factors on the Brahmaputra remains limited. Naturally, understanding these factors has the potential to contribute to further improving cooperation. Considering the gap in existing knowledge, this report focuses on understanding the factors that are affecting transboundary water cooperation over the Brahmaputra River.

As a way to understand factors affecting transboundary water cooperation, this research project developed the Multi-Track Water Diplomacy Framework (Huntjens, Yasuda et al., 2016). Each situation on water cooperation is identified as an "action situation", which is referred to as "the social space where participants with diverse preferences interact, exchange goods and services, solve problems, dominate one another or fight" (Huntjens, Yasuda et al., 2016, p. 23). This research focuses on eight action situations of water cooperation surrounding the Brahmaputra River including Track I, II and III types of cooperation. The key factors affecting each action situation that are analysed in this report include basin-wide contexts, some of which are situation-specific to a particular action situation, formal and informal institutions, and actors and agencies, i.e. actors' power to influence. These factors make up the key components of the analytical framework, and are used to structure this report. After a description of the basin-wide contexts (Chapter 3 and 4), from Chapter 5 onwards this report discusses different action situations of

[1] The Brahmaputra River has different names at different sections: It is called Yarlung-Tsangpo in China; the Brahmaputra in India; and Jamuna river in Bangladesh. The Manas River in Bhutan flows into the Brahmaputra at Indian section of the river. While recognizing different names of the river, this report uses Brahmaputra River, for the sake of simplicity.

cooperation, and analysis of key factors affecting each action situation. Following the analysis of existing cooperation, Chapter 13 focuses on an analysis of factors affecting possible future action situations, which we termed as the Zone of Possible Effective Cooperation (ZOPEC).

The first six chapters include an analysis of six bilateral cooperation situations among the four riparian states: China, Bhutan, India and Bangladesh. Cooperation between India and China (Chapter 5) is relatively new with the first MoU on flood season data sharing signed in 2002, which remains the key area of cooperation to date. The two countries have also established expert level mechanisms and cooperate on emergency situations. The relatively recent nature of this bilateral cooperation originates in the fact Chinese hydropower development in the upstream section of the river only commenced recently. This development is driven by China's increasing energy demand, while at the same time addressing climate change impacts (situation-specific context). China's energy plan includes the development of four hydropower dams in the upstream waters of the Brahmaputra River (formal institution). However, information regarding these plans was not publicly available until recently. Uncertainty about information regarding these dams, coupled with flood incidences in India and sensitivity between the two nations arising from border disputes, caused speculation and concern in downstream India (customary institution), which eventually requested additional hydrological data from China. While the two large influential nations have the potential to initiate or engage in basin-wide cooperation themselves, both nations primarily take a bilateral approach to transboundary rivers (actors and agency). However, India and China have policies to promote basin-wide approaches to river basin management in their domestic rivers. The application of these approaches to their transboundary rivers creates potential for improved collaboration within the Brahmaputra River basin.

Cooperation between India and Bangladesh (Chapter 6) has a longer history, starting more than half a century ago. The fact that these two countries share 54 transboundary rivers provides important context for the two countries to establish the Joint Rivers Commission (JRC). The current water sharing agreement is limited to the Ganges River. An agreement on the Tista/Teesta River, a tributary to the Brahmaputra, has been discussed for many years but has not been signed. Actors and their agencies play important roles in determining the way this cooperation takes place. There are two important levels of relationship: the relationship between India and Bangladesh, and relationships among states and the central government of India. The JRC statute plays a key role as a formal institution in establishing this cooperation, while customary institutions such as historical relationships between the two countries coupled with sentiments play in, influencing the way cooperation is perceived by each riparian. The two countries also cooperate in jointly developing and managing navigational routes. There are additional opportunities for improved cooperation over navigation and fish habitat conservation that are ongoing, as well as through building capacity for improved science-policy linkages.

The major cooperation mechanism between India and Bhutan (Chapter 7) is the development of hydropower dams, where India invests in hydropower dams in Bhutan and imports the majority of the electricity generated. Bhutan has a potential of 30,000 MW for hydropower generation countrywide (contextual factor), which Bhutan positions as a key driver for its economic development. While Bhutan only has diplomatic relations with a limited number of countries, its society and economy maintain a very close relationship with India. The relationship with India is formalized through the Friendship Treaty signed in 1949 (formal institution). The close relationship between the two countries is referred to as 'sweetheart deal' (customary institution). Historically, the Bhutanese monarchy played an important role in nurturing such relationships (formal institution). Bhutan has a policy on 'Gross National Happiness', and is known for its strong focus on environmental conservation. The challenge for the future lies in ensuring that hydropower development takes into account environmental and sustainability factors. India, as the main investor in Bhutanese hydropower dams and purchaser of the electricity generated from them, can potentially play a key role in supporting Bhutan in ensuring sustainability and balancing environmental conservation and hydropower development.

Bangladesh and Bhutan (Chapter 8) do not share a border (basin-wide context). Nevertheless, Bangladesh has been interested in investing in Bhutanese hydropower. However, it requires the consent from India as the required transmission line has to cross India, which lies between the Bangladesh and Bhutan. In October 2016, India informally agreed to the Bangladeshi investment in Bhutan. A trilateral MoU for the development of the Dorjilung hydropower dam was signed by Bhutan and Bangladesh, and Inda agreed to the content of the MoU in 2017. In addition to formal institutions such as the Bangladesh-Bhutan trade agreement and customary institutions including their historical relationships, the shift in India's attitude towards cooperation among smaller neighbours played an important role in catalysing this cooperation (actors and agency). This shift can potentially open doors for future multilateral cooperation among riparians, shifting some of the main power relationships among actors within the Brahmaputra River basin.

There are two MoUs between China and Bangladesh: one on technical cooperation on water conservancy, and one on exchanging hydrological data (Chapter 9). This research identified a limited level of cooperation between the two nations over the Brahmaputra River. There is, however, emerging cooperation over economic development between the two, including trade in defence equipment. While Bangladesh is located downstream of China, the impact of Chinese development upstream is relatively minor by the time it reaches Bangladesh. These situation-specific contexts make Bangladesh less concerned about Chinese activities than about Indian activities, which can have a more direct impact on Bangladesh. The two countries have incentives to maintain a generally good level of cooperation in terms of their respective relationships with India. For China, Bangladesh is an important strategic partner given its rivalry with India, and for Bangladesh,

keeping China on its side can potentially counteract the pressure it often receives from India (actors and agency). In the context of the Brahmaputra River, Bangladesh has the possibility to provide a port access to China, providing trade routes to China.

This research did not identify cooperation between Bhutan and China over the Brahmaputra River. However, Chapter 10 discusses some of the factors affecting the current and potential future relationship between the two countries. China became a neighbouring country to Bhutan after its annexation of Tibet in 1951. Bhutan has very close cultural ties with Tibet dating back to the 8th century when Tibetan armies invaded Bhutan. Since then, parts of the Tibetan population have migrated and integrated into Bhutanese society, thereby strongly influencing Bhutanese society (customary institutions). Bhutan also accepted some Tibetan refugees after China's annexation of Tibet. While the two countries have conducted several meetings over border issues, there is no official diplomatic relationship between them. In 2012, the two premiers had an official meeting for the first time on the sidelines of the United Nations Rio+20 conference on Sustainable Development, during which both governments indicated their willingness to establish diplomatic ties and to explore possibilities for future cooperation. For Bhutan, the relationship with China needs to be somehow balanced with its delicate relationship with India. Bhutan, a relatively small nation, is located between Asia's two superpowers (actors and agency). Bhutan has a close relationship with India based on their Treaty of Friendship (1949), and until its revision in 2007, Bhutan was guided by India on its foreign policy. Bhutan's shift from monarchy to democracy that started in 2007, made it possible for different groups to have different political preferences in society, which also allowed Bhutan to diversify its relationships with India and China. Analysing current factors, there is a trend for further improvement of the relationship between China and Bhutan, a view shared by many commentators. Yet it remains to be determined how this possible increase in future cooperation between the two countries could affect water cooperation over the Brahmaputra's tributaries.

In addition to the analysis of Track I bilateral cooperation, this report also analysed Track II and III cooperation processes related to the Brahmaputra River. Four main processes were identified: 1) Ecosystem for Life initiated by IUCN, 2) the Brahmaputra Dialogue initiated by Saci Waters, 3) the Abu Dhabi dialogue and the South Asia Water Initiative led by the World Bank, and 4) the Saleween-Brahmaputra landscape initiative facilitated by ICIMOD. This report analysed the first two initiatives as they have more direct relevance to cooperation over the Brahmaputra River.

Ecosystem for Life (E4L) (Chapter 11) was an initiative facilitated by IUCN that aimed to promote and facilitate better understanding of the management of shared natural resources between Bangladesh and India, which took place from 2010 until 2014. In doing so, the project created avenues for informing decision makers towards establishing a system of improved, integrated management of these ecosystems. One of its achievements is the management of fish *Hilsa*, an important

fish species for local economy that uses the entire stretch of the Brahmaputra and the Ganges River systems as its habitat, particularly related to its spawning patterns. The initiative resulted in the Department of West Bengal, an Indian state bordering Bangladesh, to impose a ban on *Hilsa* fishing during the same period as in Bangladesh, allowing sustainable harvesting of the fish.

Another initiative is the Brahmaputra Dialogue (Chapter 12), initiated by the South Asian Consortium for Interdisciplinary Water Resources Studies (Saci WATERS), the Indian Institute of Technology Guwahati (IITG) and the Institute of Water and Flood Management (IWFM) in Bangladesh. The dialogue started in 2013 between Bangladesh and India, and gradually expanded its geographic scope to include Bhutan and China. The initiative also started as Track III civil society dialogues, and gradually expanded its scope and participation as Track II and Track I.5 dialogue. While the initiative facilitated dialogue among different stakeholders from the riparian countries, it also facilitated dialogues among some of the riparian states within India. One reason why the Dialogue needed to take this approach stems from India's formal institutions whereby its law defines water as a matter managed by states, and there are some cases of inter-state water conflicts within different states in India (formal institutions). The Dialogue uses the Chatham House Rule as its guiding principle, which facilitates open discussions and understanding among participants (customary institutions). Regional Brahmaputra dialogues have not yet invited journalists to attend due to uncertainty and fear of possible misreporting by the media (informal institutions). The Dialogue facilitated trust building among participants, which, over time, resulted in openness among participants. Participants from China, India and Bangladesh also started their collaboration on developing a joint research proposal to conduct a vulnerability assessment for the entire basin. During the current phase of the dialogue (phase III), the initiative also aims to develop ideas for basin-wide institutions that facilitate cooperation. The multi-track nature of the Brahmaputra Dialogue has the potential to effectively engage decision-makers.

Based on the analysis of current action situations and the related cooperation over to the Brahmaputra River and emerging factors surrounding these action situations, this research analysed a potential future action situation, which is called Zone of Possible Effective Cooperation (ZOPEC), discussed in Chapter 13. ZOPEC is a combination of viable future action situations. The identification of ZOPEC was carried out by combining 1) analysis of existing action situations, 2) analysis of factors affecting current and potential future cooperation using the Multi-Track Water Diplomacy Framework, and 3) validation and input from participants during a stakeholder workshop, engaging representatives from all the riparian countries. The research identified ZOPEC as basin-wide cooperation among all the riparian countries in conjunction with economic cooperation and cross-sector cooperation. Such basin-wide cooperation can potentially allow the sharing of benefits from the river across sectors, (e.g. hydropower generation, navigation, fisheries), that allows the basin to be managed in such a way as to take into account the needs of ecosystems. Ample factors support this potential future picture. Compared to

other large river basins, the Brahmaputra River is relatively undeveloped, still allowing the river to be managed in an ecologically sustainable manner. There are several emerging economic cooperation initiatives in the region that aim to facilitate cross-border trade and cooperation (contextual factor). In addition, policies such as 'One Belt, One Road' in China (formal institutions) that aim to secure trade routes through land and sea to Asia, Africa and Europe, increases the importance of port access that Bangladesh is able to offer, giving more agency to the weakest downstream country (actors and agency). The emerging influence of China in South Asia, coupled with the development in the upstream section of the Brahmaputra, shifts the power balance within the basin states, shifting agency among the basin actors.

The analysis of six bilateral government-to-government cooperation action situations, and two cooperation processes led by civil society, concludes that contextual factors, formal and customary institutions, actors and agency all influence and shape the way current cooperation takes place. These factors also interact with each other when influencing action situations. The analysis also identified that these factors impact potential future cooperation action situations (ZOPEC), thus proving the usefulness of the Multi-Track Water Diplomacy Framework.

1. Introduction

The Brahmaputra is one of the most significant river basins in Asia, in terms of the enormous number of people who rely upon the basin for livelihoods, and due to the extraordinary biodiversity of the basin, with high numbers of endemic flora and fauna. The river flows from the upper levels of the Tibetan Plateau, at an altitude of some 5,000 meters, before entering India where it is joined by tributaries from Bhutan, and flowing through diverse terrain (Sharma, Gorsi, & Paithankar, 2016). Different sections of the river have different names: the Yarlung-Tsangpo in China; the Brahmaputra in India; and Jamuna River in Bangladesh. The Manas River in Bhutan flows into the Brahmaputra in the Indian section of the river. While recognizing the existence of a variety of names, this report refers to the river as the Brahmaputra River for the purpose of brevity.

Four countries – China, India, Bhutan, and Bangladesh – share various parts of the basin, and there are international dimensions to the management and distribution of its resources. Arguably, resource management of the whole basin is now at an important juncture, with increased trade-offs evident between different visions of how the basin should be utilised in the future. There are cooperative mechanisms in place that if fortified and broadened might provide a foundation for the sustainable management of the Brahmaputra. Yet significant challenges remain, emanating from historical differences between countries of the region, as well as current political outlooks and priorities.

There is significant discord between a variety of actors across the basin, and several unresolved issues that pose challenges to a basin-wide approach becoming institutionalised. Historically, there have been disputes between India and Bangladesh over the sharing of water from the Ganges, while more recently some of the more important tributaries of the Brahmaputra basin, most notably the Teesta, have been the source of political tension. India's relationship with Bhutan is seen by most commentators as being relatively harmonious, with a long tradition of cooperation, although this must be contextualised by the overwhelming disparity in size between the two nations, and the broader influence that India exercises over the smaller Himalayan kingdom's foreign policy. More recently, there have been emerging concerns about the use of the Brahmaputra between India and China that started to develop bilateral cooperation relationships.

In addition to complexities arising from relations between nations in the basin, there are also intra-national rights to be balanced, as well as complementary and alternative visions of appropriate ways to manage ecosystems and their water needs to be understood and assessed. In light of all of these issues, it is clear that a dialogue process that seeks to find common ground and agreement on ways forward is of enormous value to a range of stakeholders in the basin.

For better governance of this complex river basin, it is necessary to understand the political-economic context of the basin, to understand various actors' relationships, and to identify factors affecting current and potential future

cooperation over the Brahmaputra. Most scientific analysis surrounding the Brahmaputra focuses on its biophysical conditions[2]. The limited number of studies that analyse socio-economic perspectives to some extent do not cover the entire Brahmaputra basin[3].

This report provides a unique analysis of the transboundary water cooperation that currently exists on the Brahmaputra River. To understand the manner in which water governance occurs in different parts of the basin, we focus upon eight specific action situations of transboundary water cooperation. Some of these are focused upon relations between two countries (such as between upper and lower riparian countries), whilst others look at multi-track processes facilitated by Civil Society Organisations (CSO). Taken together, these action situations illustrate the complexities and potential of cooperation in different parts of the basin. At the same time, there are different variables evident in each of these action situations, which also demonstrate the importance of understanding specificities. In addition to these eight existing cooperation action situations, the analysis takes a basin-wide approach, and conducts an analysis of potential cooperation at the basin level.

We take a legal political economy approach that helps us to analyse the role and perspectives of the many stakeholders within the region. After identifying and analysing the range of stakeholders based on variables in our framework, key informants were interviewed. In addition, a multi-stakeholder dialogue, which sought to forge closer understanding between our interviewees, refined our understanding of these perspectives. This dialogue process also suggested a range of alternative pathways that could engender cooperation, including inland water transport, energy trading and flood control.

In light of all of the different stages of research and reflection that have been involved in the preparation of this report, we see tremendous potential for a range of cooperative mechanisms in the Brahmaputra basin. At the same time, there is no 'one size fits all' approach to cooperation in different parts of the basin. As such, while this report does provide detail concerning the general situation in the Brahmaputra basin with regards to the potential for and current constraints on water cooperation, our main focus is on specific action situations and their context.

---

[2] Scientific journal search using Brahmaputra River as key word results in articles such as followings: Coleman, J. M. (1969). Brahmaputra River: channel processes and sedimentation. *Sedimentary Geology, 3*(2-3); Sarin, M. M., Krishnaswami, S., Dilli, K., Somayajulu, B. L. K., & Moore, W. S. (1989). Major ion chemistry of the Ganga-Brahmaputra river system: Weathering processes and fluxes to the Bay of Bengal. *Geochimica et cosmochimica acta, 53*(5); Thorne, C. R., Russell, A. P. G., & Alam, M. K. (1993). Platform pattern and channel evolution of the Brahmaputra River, Bangladesh. *Geological Society, London, Special Publications, 75*(1).

[3] Following reports analyse the political economy perspective of the Brahmaputra River, with a limited geographic scope: Samaranayake, N., Limaye, S., & Wuthnow, J. (2016) *Water Resource Competition in the Brahmaputra River Basin: China, India, and Bangladesh*. Arlington; Prasai, S., & Surie, M. D. (2013) *Political Economy Analysis of the Teesta River Basin.* New Delhi.

In so doing, we examine the factors that might facilitate enhanced cooperation in each of these cases, or what we call the Zone of Effective Cooperation (or ZOPEC).

2. Methodology

2.1 Research background and objectives

Management of water is an important item on the global agenda in the 21st century (United Nations, 2015). Although one could argue whether water could be a cause of war, there are many conflicts and tensions related to water among various groups as well as between states (Wolf, 1998). In case of transboundary freshwater bodies, effective cooperation among riparian states is often a challenge. While it is an important topic of concern, and a great amount of research has been conducted on transboundary rivers, very little literature specifically focuses on identifying key determinants for shifting water conflict into cooperation in the context of transboundary rivers. Understanding such determinants will not only contribute to the existing academic body of knowledge, but will also have potential for contributing to practical management for transboundary waters.

With this background in mind, the objective of this research is to analyse the key determinants contributing to the development of mechanisms for the cooperative management of the shared ecosystems of the Brahmaputra region. Through the analysis of these factors, the research also aims to identify the zone of possible effective cooperation (ZOPEC) among key stakeholders in the basin.

Based on the research objective, this research aims to address two main research questions:

- What are the key factors affecting water cooperation in transboundary context of the Brahmaputra River?
- What is the zone of possible effective cooperation among basin stakeholders?

2.2 Development of conceptual and analytical framework

To conduct this research, the Multi-Track Water Diplomacy Framework (Huntjens, Yasuda et al., 2016) was developed as a conceptual framework to understand factors affecting water cooperation [4]. As there is no single method for understanding what effective cooperation entails, this framework was developed based on existing literature and adopts different schools of thought on understanding effective cooperation, creating building blocks for the conceptual framework.

To analyse key concepts in the research, each building block of the conceptual framework is developed into analytical framework. Variables are developed to determine ways to analyse different aspects of effective cooperation, based on

[4] Some of the conceptual and methodological discussions in chapter are derived from Huntjens, P., Yasuda, Y., Swain, A., Man, R. de, Magsig, B., & Islam, S. (2016). *The Multi-track Water Diplomacy Framework: A Legal and Political Economy Analysis for Advancing Cooperation over Shared Waters*. The Hague Institute for Global Justice.

existing literature. Key aspects of existing political economy analysis are also used as a way to determine key variables.

The framework consists of five analytical components. These are: 1) Action situation, 2) Basin-wide context and situation specific context, 3) Formal and customary institutions, 4) Actors/agency, and 5) Outputs, outcomes and impacts. For each component, relevant dimensions, variables and indicators were developed to determine factors affecting cooperation. To facilitate field interviews, indicative questions were developed; these are listed in Annex I. The conceptual framework is illustrated as Figure 1 and includes the following components:

1) Action situations

The term action situation is defined as "a situation in which two or more individuals are faced with a set of potential actions that jointly produce outputs and outcomes" (Ostrom, 1999). In this framework, an action situation is the key component that describes the status of water cooperation. As the main purpose of this research is to identify key factors affecting cooperation, all components of the analytical framework are designed to explain the action situation.

2) Basin-wide context and situation specific context

This analytical component provides a description of challenges facing specific river basin. It includes biophysical material characteristics of the river, key socio-economic characteristics, the nature and extent of development and past and ongoing water cooperation. Among all the variables, context that is specific to the particular action situation is called situation specific context.

3) Formal and customary institutions

While there are many different definitions of the term 'institutions', this framework adopts definition by Calhoun (2002) and defines institutions as "deeply embedded patterns of social practices or norms that play a significant role in the organization of society" (Calhoun, 2002, p. 233).

The framework distinguishes two types of institutions: formal and customary.

- Formal institutions: institutions that are adopted through a formalized process. Examples include constitutional rules, codified laws, rules adopted by organizations and policies.
- Customary institutions: institutions that are embedded in organizations or groups without a formalized process. Examples are norms and culture (Huntjens, Yasuda et al., 2016).

4) Actor-Agency

Actors related to water cooperation include all types of stakeholders including government, political leaders, non-governmental organizations, civil society actors, religious organizations, academia, researchers and privates sector. Agency refers to the ability of an actor to exert influence (Ali-Khan & Mulvihill, 2008). In analysing

actors and agency, the framework reviews the existence of actors, an actor's influence and their type of leadership. Understanding and analysing power relationships provides key insights in understanding agency.

5) Output, outcome, impact

Outputs are direct results of action situations. For example, cooperation between two countries may result in an MoU for data sharing. Such MoUs are an example of an output. Outcome is the change in actors' behaviour due to cooperation or output. In the context of water cooperation, there are different types of outcome that can favour different factors. For example, water cooperation can result in an outcome where actors manage a river with optimal ecological outcomes. Water cooperation can also result in actors managing the river with economically optimal outcomes. Impact includes facts on the ground and actual impacts as results of cooperation, policy decisions, and agreements (Huntjens, Yasuda et al., 2016).

Our analysis does not assume that policies or decisions relating to the Brahmaputra are made independently of the political, social, and economic environment in which they are embedded. Rather, we seek to understand the contextual factors that underline specific action situations, and view the interaction between structure and agency [5] as dynamic and contingent rather than static and predictable. In attempting to understand the nature of institutional frameworks for water sharing, we argue for a broad approach that encompasses formal and customary institutions. Similarly, our stakeholder analysis approach is premised upon the idea that there are a variety of constituents, and that these occur and interact on a variety of scales. Specific action situations, such as a negotiation or a multi-stakeholder dialogue, will involve particular interactions of this structure-agency dynamic. Outputs from this interface, such as a decision, a project approval or similar will be the consequence of the interaction between these various actors and institutions.

In an ideal situation, the outcomes or impacts that occur because of the dynamic structure-agency interface in particular action situations will lead to optimal outcomes. We can think about what might constitute an optimal outcome in a variety of different ways: these may be ecologically optimal, economically optimal, or may reflect the preferences of the riparian populations to the greatest extent possible.

[5] Scholars such as Anthony Giddens (1984) and Alexander Wendt (1987) argue that social structure is both the medium and outcome of action. Actors have preferences which they cannot realize without collective action; based on these preferences they shape and re-shape social structures, albeit also through unintended consequences and over a longer period of time; once these social structures are in place, they shape and re-shape the actors themselves and their preferences. In other words, the constitution of agents and structures are not two independent sets of phenomena, meaning that structures should not be treated as external to individuals (Huntjens, Yasuda et al., 2016).

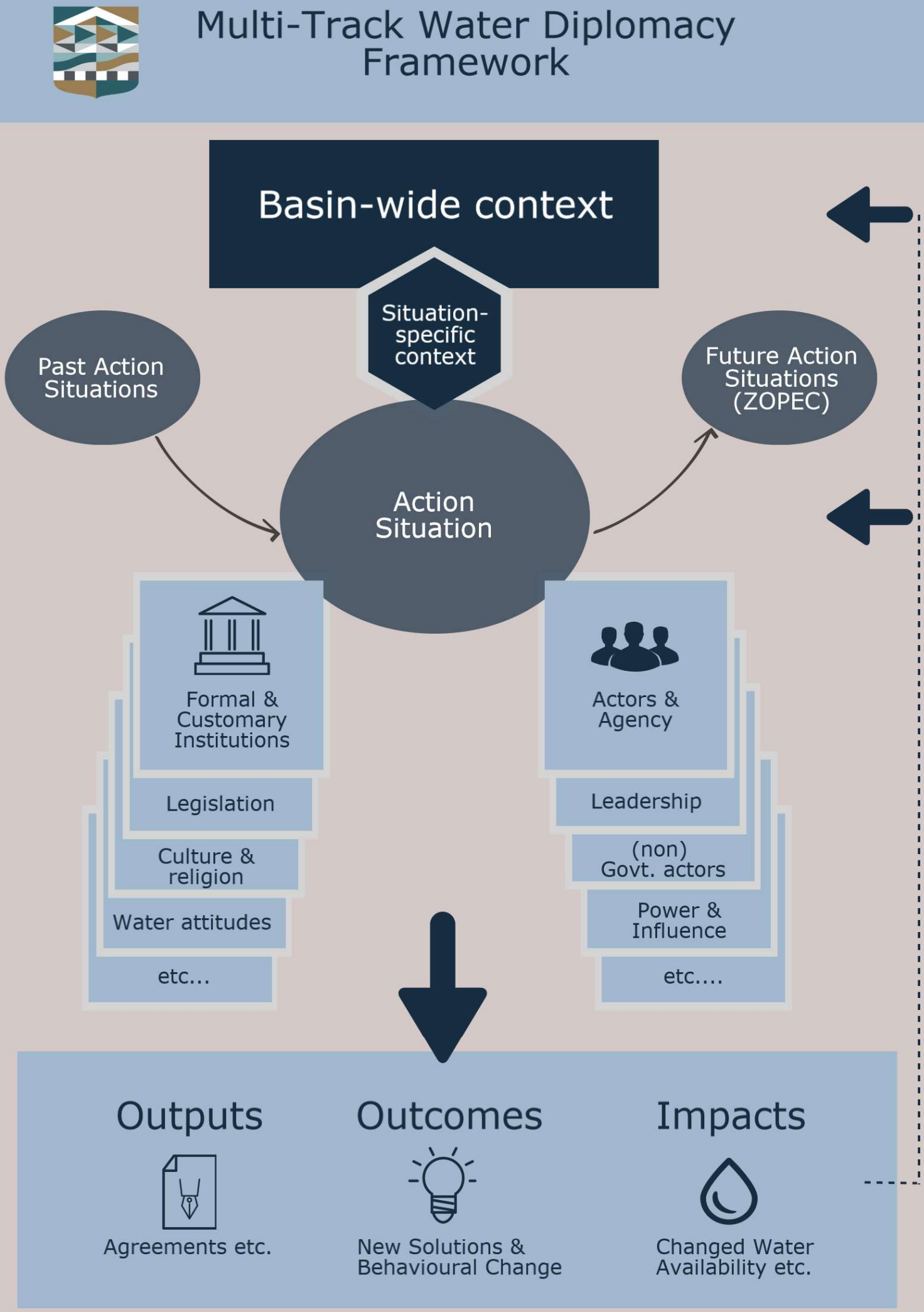

Figure 1: Conceptual framework for understanding factors affecting water cooperation at multiple levels (local to transboundary). Source: Huntjens, Yasuda et al. (2016).

2.3 Data collection and analysis

This research uses three types of data as a basis for data triangulation as illustrated in Figure 2. Interviews were conducted between March and September 2016. Literature and existing information were collected throughout the research period until October 2016.

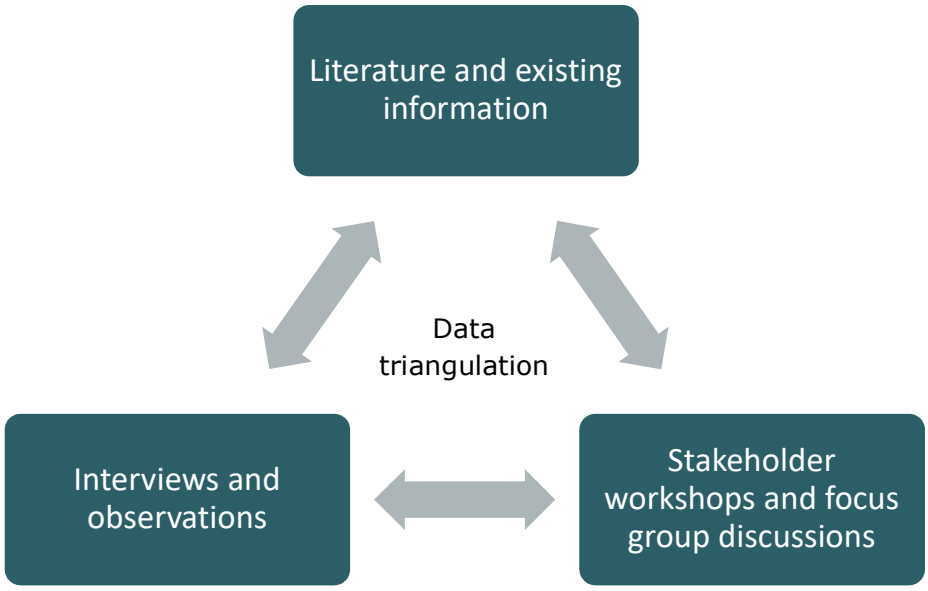

Figure 2: Data triangulation for this research.

2.3.1 Literature and existing information

A review of literature and existing information regarding case study basins was conducted throughout the research. The main sources of information include: academic articles; reports/articles from previously conducted studies; websites; government documents; laws and policies; newspapers/media; maps; scientific data about water, ecosystem and biodiversity; and other grey literature.

2.3.2 Interviews and observations

Semi-structured interviews were conducted with key informants in each case study area. Interviewees were drawn from various sectors, including government agencies, research institutes, media, NGOs and civil society. Interviewees who could provide insights as 'key informants' were selected for interview. Identification of these interviewees took place through a combination of existing contacts and identification of new contacts in the field, adopting a snowball sampling method. Where permitted, interviews were either audio recorded or notes were taken by the responsible researcher. Recorded interviews were transcribed.

The period of field research was, primarily, March-April 2016 for Bangladesh, April-May 2016 for China, June 2016 for India, and July-August for Bhutan. Additional interviews were conducted on an ad hoc basis. A focused review of literature was conducted before and after the field interviews for each country. The research team recognizes that developments emerge in the basin that may have occurred after the field research period of this study thus may not have been captured in this report. Details of the interviews are described in Annex II.

Interviews were analysed and used in two different ways, adopting inductive and deductive approaches. Deductively, interview data was analysed against different variables within analytical framework. Inductively, interview data was analysed to identify recurring themes repeatedly expressed by interviewees to identify important factors affecting effective cooperation, an approach adopting the concept of grounded theory (Glaser & Holton, 2004; Tischer, Meyer, Wodak, & Vetter, 2000). MaxQDA was used as analytical software for this analysis. The choice of this software was based on its functionality, and that it made it easy to share analysis among research team members. To ensure that there is no biased approach for analysis by each researcher engaged in the progress, the research team also conducted an inter-coding exercise where different researchers analyse the same interview data separately, compare results, and discuss next steps for better understanding and adjustment of the codes. The analytical framework and its variables were adjusted based on some of the initial analysis of the research data.

In addition to interviews, the research took advantage of any opportunities of observing ongoing activities in the case study area relevant to the subject of this study.

The research team also developed an ethical protocol for using data obtained from interviews and field observations. Due to the sensitivity of the subject, all interviews are cited anonymously unless the interviewee specifically preferred to be cited by name.

2.3.3 Stakeholder workshop

To validate findings, and to gain further inputs, a stakeholder workshop was held in Bangkok on 8-9th of November 2016. Bangkok was chosen for the workshop as it is a neutral location outside the basin, and because it is a destination that is relatively easy to obtain travel visas from all participating countries. A total of 27 participants joined the workshop including three participants from Bangladesh, five from Bhutan, five from China, five from India, two from regional organizations, and seven from the organizing and research teams. During the workshop, preliminary findings from this report's analysis was presented and discussed. The first day was dedicated to discussions about the status of cooperation over the Brahmaputra River and factors affecting cooperation. On day two, areas of possible future cooperation, leading to identification of Zone of Possible Effective Cooperation (ZOPEC), were discussed.

2.4 Report structure

As presented in section 2.1, this research adopts multi-track water diplomacy as its analytical framework. Following the logical steps of analysis, the research first conducted analysis of basin-wide context that includes biophysical characteristics, socio-economic contexts, political characteristics, alterations to the river and interdependencies among riparians. Chapter 3 discusses these basin contexts. Another key factor of the basin-wide context is the status of conflict and cooperation that also consists of action situation of transboundary water cooperation. Since these cooperation action situations make up the core units of analysis within this research, they require special attention and are thus discussed separately in Chapter 4.

From Chapter 5 to Chapter 12, this report analyses different action situations of water cooperation on the Brahmaputra River. Each chapter uses components of the analytical framework as a chapter structure and has two main sections. The first section discusses the action situation that involves the status of the specific cooperation, outputs, outcome and impact. The second section discusses factors affecting the cooperation (action situation) and discusses formal institutions, customary institutions, actors and agency.

After the analysis of eight action situations, the Zone of Possible Effective Cooperation (ZOPEC) is analysed in Chapter 13. This analysis also uses multi-track water diplomacy framework as its analytical core, and adopts the same structure as previous eight chapters. Chapter 14 discusses key findings from this research and concludes this report.

3. Basin-wide context

The first component in the analytical framework, and the starting point of the analysis, is to understand the basin-wide context and challenges related to specific transboundary basin risks and opportunities. These factors include biophysical characteristics and their alterations, socio-economic characteristics related to the river, interdependencies among riparian states and political contexts. This section provides overview of this basin context related to the Brahmaputra River basin. Figure 3 below provides an overview of the basin area.

Figure 3: The Brahmaputra River basin area. Source: Mahanta et al. (2014).

3.1 Physical geography of the Brahmaputra River

The Brahmaputra River originates in the Tibetan Plateau in China, flowing into the northeastern part of India before entering into Bangladesh where it meets the rivers Ganges and Meghna before flowing into the Bay of Bengal. The physical geography of the Brahmaputra is extremely complex, with large variation between different parts of the basin. There are a range of different aspects to the physical geography of the basin that are typically analysed in terms of hydrological, morphological, climatological, ecological, and biodiversity characteristics. The catchment area includes some of the world's highest rainfall areas, with the annual average river runoff at 510,000 mcm, draining an area of 580,000 km^2 (Dhar &

Nandargi, 2000, p. 771). While all Himalayan basins can be said to have similar characteristics, what is most striking about the Brahmaputra basin is its seasonal variability in flow, with differences particularly stark between the monsoon (June-September) and lean (October-May) seasons (Chowdury & Ward, 2004). This seasonal variation is particularly significant because at some times of the year, the major flow into the Brahmaputra originates from within India caused by heavy rainfall; whereas at other times, some of it comes from the autonomous region of Tibet in China, originating from glacier melt (Iyer, 2015).

Historically, the Brahmaputra and its tributaries shift course frequently, as we see in many other braided[6] river systems. Flooding is part of the flow variability of the major rivers in the Brahmaputra basin, and carries the largest amount of silt of any river system in the region. The monsoonal flow causes an annual inundation of flood plains, transporting high sediment loads and providing crucial ecosystem services (Bandyopadhyay, 2009, p. 59). This flooding also has potentially significant consequences for people living in different parts of the basin in terms of loss of assets or even fatalities. This is a particularly acute in the Indian state of Assam (Dhar & Nandargi, 2000). There is evidence that the timing and intensity of flooding is exacerbated by climate change (Bhattachaiyya & Bora, 1997; Nepal & Shrestha, 2015); including significant potential for glacial lake outburst floods in the upper reaches of the basin where many glaciers are shrinking, such as in Sikkim and in Bhutan (Bajracharya, Mool, & Shrestha, 2007). It is also an area of high seismicity, increasing the propensity for landslides and erosion, with impacts for drainage systems (Prasad, 2014).

The basin is split between four different countries. Table 1 illustrates the percentage of the total basin found in each of the four countries.

Table 1: Percentage of the basin area by country. Source: SANDRP (2013).

Country	Percentage of total basin
PRC (Tibet)	50.5
India	33.6
Bhutan	8.1
Bangladesh	7.8

Understanding the physiographic profile of the Brahmaputra basin

There are tremendous physiographic changes that occur in the basin as it descends from the High Tibetan Plateau to river valleys and plains before finally draining into the delta.

[6] Note that while the Brahmaputra displays many characteristics we associate with braided river systems, some consider it to be multi-channel rather than braided.

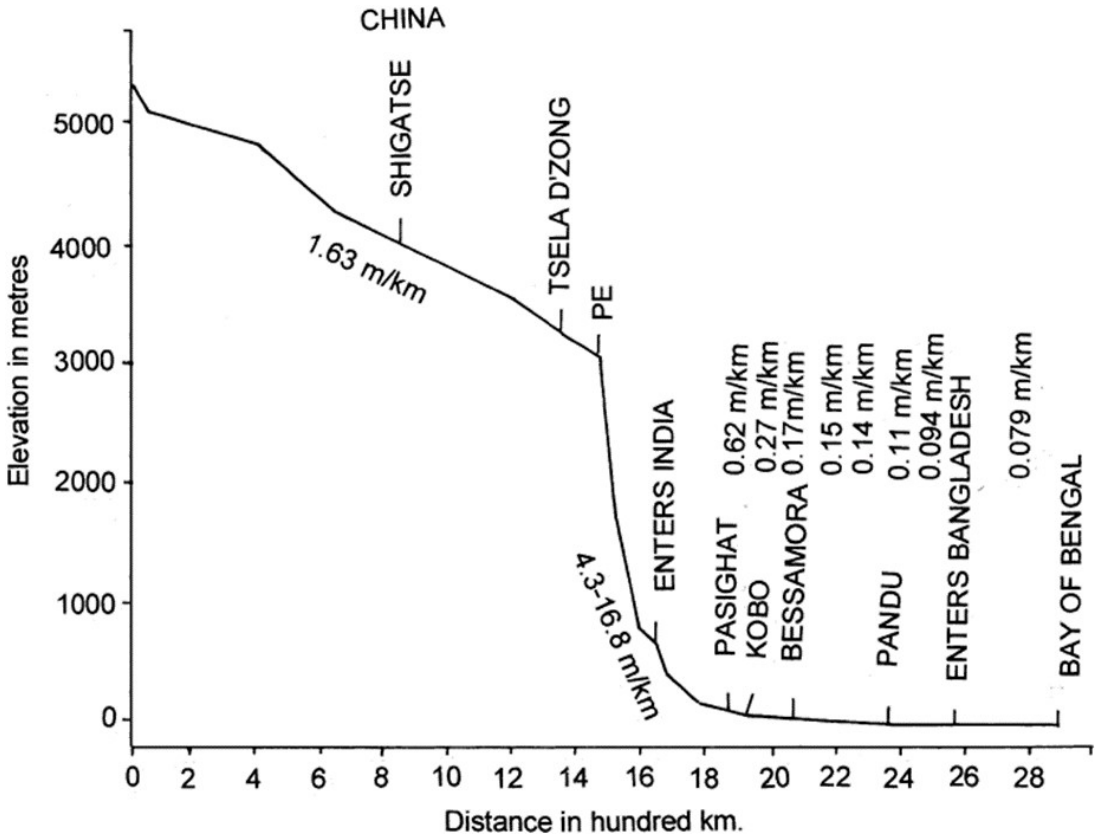

Figure 4: Graphical representation of physiographic profile of the basin. Source: Mahanta et al. (2014).

The changing topography of the Brahmaputra basin is so dramatic that it moves through at least six different ecological zones. Table 2 below demonstrates this.

Table 2: Physiographic profile of Brahmaputra basin. Source: National Institute of Hydrology, Roorkee (n.d.).

Nature of Topography	**Area (km²)**	**Geographical location**
High Tibetan Plateau	293,000	Southern part of Tibetan province of China
High Himalayan Mountains	137,050	Part of Himalayan Kingdom of Bhutan and three states of India: Arunachal Pradesh, West Bengal (Paschimbanga) and Sikkim
Brahmaputra Valley	56,200	Assam (state of India)
Lower (Assam) Mountainous region	37,200	Three Indian states Assam, Nagaland and Meghalaya.
Plains	56,550	Two plains districts in West Bengal and in Bangladesh
Coastal Region	Negligible	Coastal region of Bangladesh

In addition to the complexity of management and water sharing that comes from the basin being split between these four countries, there is the added complexity that arises from the fact that the basin is divided between many states within India. Table 3 illustrates the dimensions of the basin within India.

Table 3: Dimensions of Brahmaputra basin within India. Source: Mahanta et al. (2014).

Name of State	**Drainage area**
Arunachal Pradesh	81,600 (41.88%)
Assam	70,700 (36.33%)
Meghalaya	11,800 (6.10%)
Nagaland	10,900 (5.57%)
Sikkim	7,300 (3.75%)
West Bengal	12,700 (6.47%)
India Total	**195,000 (100)**

The main river and its tributaries flows through some of the world's most highly bio-diverse regions, with large numbers of endemic species of flora and fauna. The range and variety of plant life varies enormously throughout the basin, in large part because of its complex mountain topography. This results in diverse bioclimatic zones including: near tropical, subtropical, lower temperate, upper

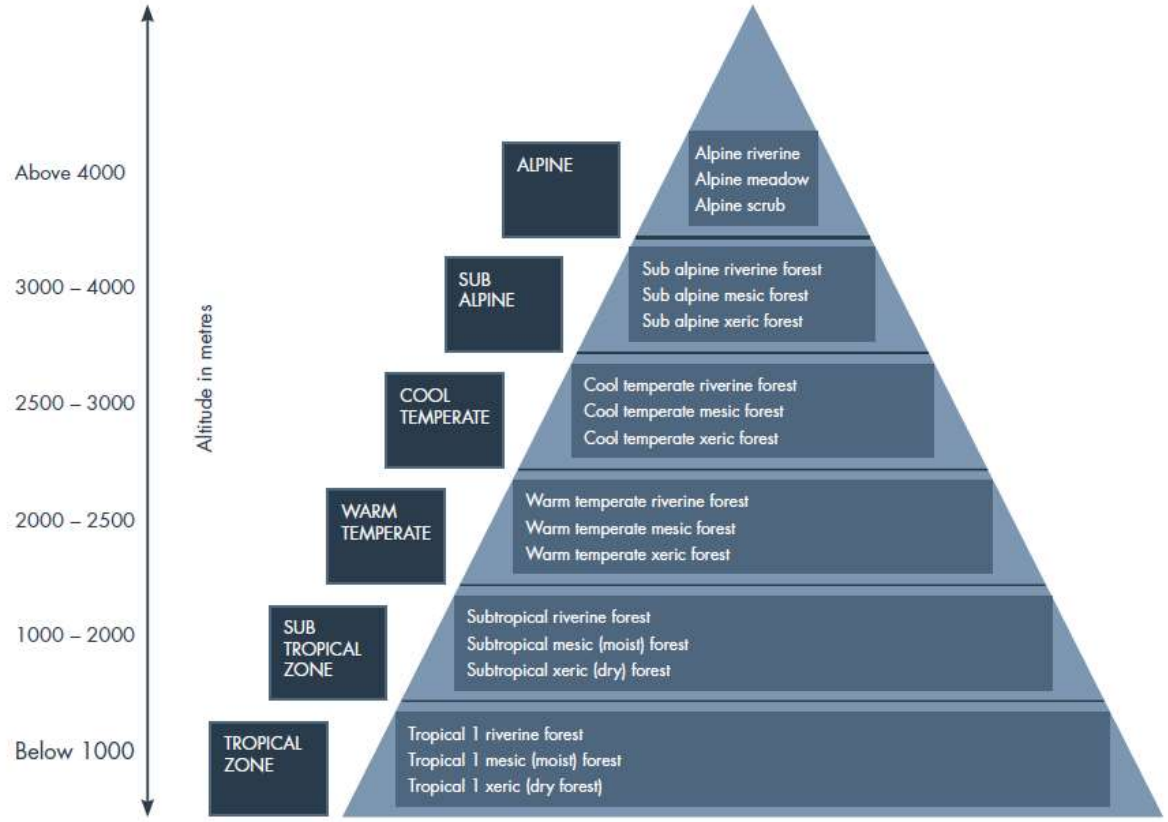

Figure 5: Bioclimatic zone of eastern Himalaya including forest type. Source: Chettri et al. (2010).

temperate, subalpine evergreen, alpine evergreen, and alpine shrubs and meadows (Chettri et al., 2010). The topography also leads to high levels of species endemism, with significant genetic differences amongst populations, island conditions leading to reproductive isolation (Chettri et al., 2010). Viewing the Brahmaputra as part of a broader array of ecosystem services entails considering the functions in terms of climate regulation, soil, groundwater recharge, and biodiversity (Hill, 2016; Rasul, 2001).

Figure 5, which relates to the eastern Himalayas in general, gives a sense of these bioclimatic zones in terms of forest zones.

3.2 Socio-economic situation related to the Brahmaputra

Additional to being unique in terms of its biodiversity, the Brahmaputra basin also supports a range of livelihoods. This river system offers huge hydropower potential, fertile agricultural lands, and substantial aquatic resources that support approximately 400 million people and their livelihoods (WWF, 2017). Water supports the entire agricultural system, which is the main livelihood option of the people of the region. Agriculture necessitates 90 per cent of the total amount of withdrawn water from the basin. Agro-ecological practices vary considerably in different parts of the basin, with accompanying variations in livelihood profiles of different communities. Table 4 gives a sense of this variation with regards to the mountainous areas of the Brahmaputra basin.

As in many other parts of South Asia, there is considerable variation between and within households with regards to the extent of poverty. Many people within the basin pursue multiple livelihoods, and this diversification helps to provide security against external shocks and seasonal downturns in employment. There is also significant social stratification within the basin, which often can be understood according to ascribed categories such as class, caste and gender. The unevenness of development in the Brahmaputra basin remains a significant issue and even in those parts that have much higher levels of GDP per capita, there are still many people who suffer chronic poverty and deprivation (Hill, 2013). These issues are often exacerbated by population growth, land fragmentation, environmental degradation and, increasingly, through the effects of climate change. The control and utilisation of water is central to livelihoods throughout the region.

The dependence upon surface water compared to groundwater for irrigation varies considerably in different parts of the basin. In the upper parts of the basin, surface water is the overwhelming source of irrigation for agriculture. In contrast, in the lower parts of the basin, such as in West Bengal and much of Bangladesh, groundwater is far more relied upon in addition to surface water (Rogaly, Harriss-White, & Bose, 1999). Indeed, agricultural intensification in the lower parts of the basin, and the introduction of high yielding variety seeds in the *boro* season (dry season rice cultivation), have led to a thriving water market (Shelley, Takahashi-Nosaka, Kano-Nakata, Hague, & Inukai, 2016). Groundwater in the lower parts of the Brahmaputra basin are now at a point of over extraction, which places

Table 4: Agro-climatic farming systems. Source: Chettri et al. (2010).

Major Agro-farming systems	Specialised practices	Specialised crops/products
Specialised pastoralism	Purely livestock based, high altitude transhumance subsistence livelihoods	Sheep, yak, cattle, and milk products
Mixed Mountain Agro pastoralism	Livestock, agriculture, and agroforestry based mid Hill livelihoods	Cereals, maize, potatoes, vegetables, goats, cattle, and milk products
Cereal-based hill farming systems	Agricultural-based low and mid Hill livelihoods	Rice, maize, cereals, potatoes, vegetables, goats, cattle and milk products
Shifting cultivation	Livelihoods based on rotational agroforestry with/and burnt practices	Rice, maize, cereals, vegetables and spices
Specialised commercial system	Livelihoods based on monoculture and other commercial crops	Tea and large cardamom

additional pressure upon competition over surface water. In addition to being very important for agriculture, the rivers of the Brahmaputra basin also support fishery, navigation, transportation, and energy production.

Recent changes to development prospects of different parts of the Brahmaputra

Historically there were a range of flows of trade, people, goods and services across different parts of the Brahmaputra basin that connected parts of present-day India, Myanmar, China and beyond (Cederlöf, 2013). In contrast, British colonialism and then the postcolonial period led to different parts of the basin becoming rather isolated from each other. In the contemporary period, this continuing isolations means that different states within northeast India are quite isolated from their neighbours in terms of infrastructure and connectivity. Additionally, these northeastern Indian states are poorly connected to neighbouring countries, including Myanmar and China.

In recent years, a range of initiatives, frequently led by China or India, have attempted to increase connectivity between different parts of the basin. As Kurian (2014) outlines in extensive detail, some of these are aimed at forging closer links with southeast Asia, whilst some of them want to foster growth within the region. In terms of transport times, access to markets and the harnessing of natural resources, many commentators believe that a greater integration of the different parts of the Brahmaputra will be beneficial (Ganguly & Stoll Farrell, 2016). The harnessing and utilization of the basin's water resources are seen as a key

component of this. Efforts to increase connectivity are a major driver towards forging cooperation in the action situations we examine throughout this report (Hill, 2016).

3.3 Alterations to the river

Currently, there are a number of existing and future plans to alter the river that affect the ecosystem and the river's geomorphology. One of the main alterations is the development of hydropower dams. There are some hydropower dams built and planned in China, Bhutan, and the Indian part of the Brahmaputra basin. Another potential alteration to the river is the Indian Rivers Inter-link project, first proposed in the 1850s, which would divert water between different rivers, including the Brahmaputra and its tributaries, to alleviate water shortages in the country (Ministry of Water Resources, 2016c; The Guardian, 2016). However, the current Modi government approved the plan in 2016[7] (Doshi, 2016a). There are similar debates in China, with some plans mooted to divert water from the upper reaches of the Brahmaputra River to eastern China to alleviate its water shortages. Whether or not this will ever occur remains an open question as this is still a debate without any concrete plans or commitments.

In addition to these plans to alter the flow and direction of rivers in the Brahmaputra basin, there is also increased attention being given to river dredging to improve the navigability in the section of the river that is located within Bangladesh. Although sections of some rivers in the basin are still used for navigation, most of it is far less than in the past. During the 19th century, the Brahmaputra was used for navigation by a regular steamer service operating between Kolkata and Agra as well as between Kolkata and Assam (Mishra & Hussain, 2012). However, navigation gradually declined partly due to India-Pakistan war in 1965, as well as India's shift in its policy on transport from navigation to rail and road transport as its means to connect with north-eastern states (Mishra & Hussain, 2012; RB2, 2016). This reduction in navigation has meant reduction in river dredging, which has caused siltation in the river, causing river widening and erosion of the river banks in some parts of the Brahmaputra River, and intensifying flood problems. Siltation is also caused by some of the land conversion alongside of the river, including slush and burn agriculture practices conducted in upstream of the river (RB2, 2016). In addition to man-made causes, earthquakes in Assam in 1897 and 1950 caused disruptions in river beds of the Brahmaputra, severely affecting drainage (Mishra & Hussain, 2012). To tackle the problem, in 2016 the Assam government declared its plans to dredge the river, partly supported by the World Bank (PTI, 2016b; PTI, 2016c).

3.4 Political context

[7] Details of this plan are discussed in Chapter 6.

The region's political context, particularly in the context of its international relations, has been shaped by historical events, and continues to evolve. Areas in South Asia were largely ruled by various European countries from the 17th century, including the Netherlands, France and the United Kingdom. India and Bangladesh were part of the British Raj rule until 1947, when India and Pakistan, (including Bangladesh, former East Pakistan), became independent. Bangladesh eventually gained independence in 1971. Bhutan was also the target of British attacks between the 18th and 20th centuries. Bhutan was strongly influenced by Tibet from the 8th century onwards when Tibetan armies invaded Bhutan (Mathou, 2003). China became Bhutan's neighbouring country when it annexed Tibet in 1951. Bhutan's foreign policy has been marked by stronger ties with its southern neighbours, particularly India. India and Bhutan signed a Treaty of Friendship in 1949, and the first visit of India's Prime Minister Jawaharlal Nehru to Bhutan in 1958 initiated their "special relationship" (Inoue et al., 2004; Treaty of Friendship, 1949). India has been the largest donor to Bhutanese economic development, and is its largest trading partner (Inoue et al., 2004). It is important to note that since signing of initial Treaty of Friendship in 1949, Bhutan has relied on India almost exclusively for its foreign relations, although this has shifted with the revision of the Treaty in 2007 (Treaty of Friendship, 1949; India-Bhutan Friendship Treaty, 2007).

India is also Bangladesh's largest trading partner (Inoue et al., 2004). Geographically, India is located in the middle of South Asia, having borders with Bhutan and Bangladesh, as well as Nepal, China, Pakistan and Myanmar. With its size and population, India has a strong influence within South Asia.

China is a relatively new partner in the geopolitical context of South Asia. With its new economic 'One Belt One Road' policy that aims to connect China with Asia, Africa, and Europe via land and sea routes, (Verlare & van der Putten, 2015), China has started to expand its economic routes and trade relationships with its South Asian neighbours. Currently, China has unsettled border disputes with Bhutan and India. At present, China and Bhutan do not have an official diplomatic relationship, however, they held an official meeting in 2012 during which leaders from both countries indicated their interest in establishing diplomatic ties (Krishnan, 2012). China is also gradually starting to expand its political and economic ties with Bangladesh. The increasing influence of China in South Asia, including in areas where India has had predominant influence over other nations, is changing the geopolitical context of the region.

3.5 Interdependency

As discussed in previous sections, Bhutan and Bangladesh are currently relatively economically dependent on India. Additionally, Bhutan is, to some extent, a politically dependent on India as the country has limited diplomatic ties with other nations.

In terms of the use of the Brahmaputra River, development and activities by upstream riparians would obviously influence downstream nations, through changes to water quantity and quality, and to the river's geomorphology.

3.6 Chapter conclusion

This chapter has highlighted the key factors in the basin-wide context related to the Brahmaputra River, following the dimensions of the analytical framework. Complex and dynamic biophysical characteristics of the river, influenced by past and ongoing alteration activities such as hydropower development, the building of barrages for water intake, and riparian activities that intensify siltation of the river, all have implications for cooperation and potential activities that riparian nations can jointly undertake. Political and economic relationships, interdependencies among riparian nations, and the changing geopolitical situation discussed in this chapter, are also important aspects that can influence transboundary water cooperation. In Chapters 5-13, specific cases of cooperation are analysed as 'action situations'. Aspects of the basin context that are specific to action situations will be further discussed in detail in each chapter, highlighting how they affect specific cooperation situations.

4. Overview of cooperation along the Brahmaputra River

Cooperation takes many forms. These range from cooperation between communities and civil society groups, conducted formally and informally, through to national level cooperative mechanisms and ultimately, national-to-national mechanisms. Borrowing the concept of diplomacy that often facilitates cooperation, we use the term 'track' to describe a wide range of cooperation that exists in the region. Track I diplomacy refers to official discussions involving high-level political leaders. Track II diplomacy refers to unofficial dialogues and problem-solving activities aiming to build relationships and new ways of thinking to inform official processes, often lead by influential academics, religious leaders, NGO leaders and civil society actors. Track III diplomacy refers to people-to-people diplomacy undertaken by individuals and private groups. Multi-track diplomacy refers to diplomacy using several tracks simultaneously (United States Institute of Peace, 2011). This chapter provides an overview of transboundary water cooperation that exists over the Brahmaputra River, identifying the various existing tracks of diplomacy.

4.1 Track I: Bilateral cooperation

Currently, track I transboundary water cooperation along the Brahmaputra river takes the form of bilateral cooperation. Figure 6 illustrates all the possible forms of bilateral cooperation within the basin. The next section of this report analyses these relationships in detail. Each type of cooperation is discussed as an 'action situation' following the analytical framework, and indicated as 'AS' in the diagram below. As an example, AS1 denotes action situation 1, which refers to the cooperation between India and China. A solid line in Figure 6 represents cooperation directly related to the Brahmaputra, and a dotted line represents the

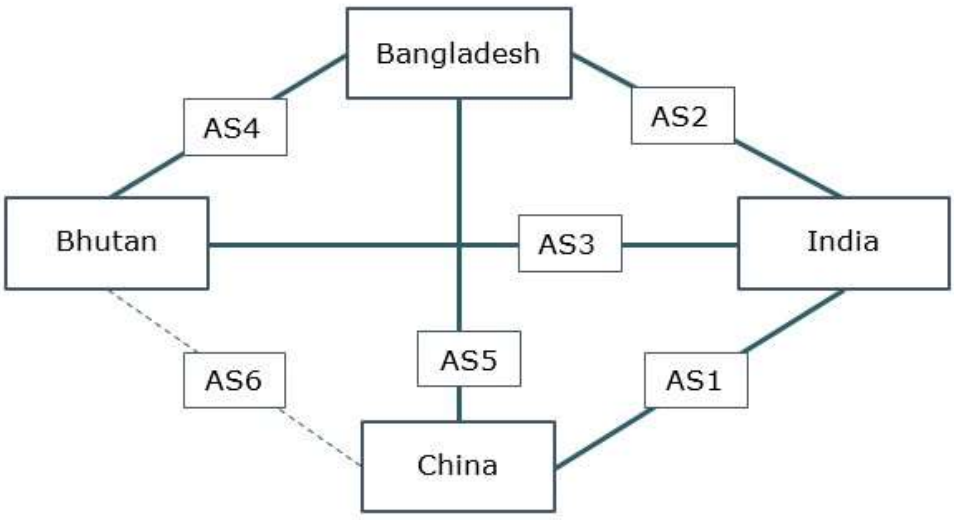

Figure 6: Diagram illustrating bilateral relationships within the Brahmaputra basin.

existence of interests and potential for future cooperation, although no cooperation currently exists. In summary, bilateral cooperation related to the Brahmaputra exists among all the riparian countries except between Bhutan and China.

China and India (AS1)

The Chinese and the Indian government currently have two MoUs related to the Brahmaputra River. One of them is on providing hydrological information during the flood season (15th May to 15th October), which was initially signed in 2002 and has been renewed twice (Central Water Commission & Bureau of Hydrology and Water Resources, 2014; Ministry of Water Resources, 2014). As hydrological stations are located in remote areas where the Chinese government needs to station staff expressly for the purpose of collecting data for India, India pays approximately 850,000 Chinese Yuan a year to cover the cost of this data collection (Central Water Commission & Bureau of Hydrology and Water Resources, 2014). Another MoU was signed in 2013 with aim of strengthening cooperation on transboundary rivers through an Expert Level Mechanism between the two countries (MoU on Strengthening Cooperation on Trans-border Rivers, 2013). The topics of discussion among experts primarily focuses on technical issues including how to monitor and share information, and how to build hydrological models (CH13, 2016).

India and Bangladesh (AS2)

There are 54 transboundary rivers shared between India and Bangladesh. As a way to manage these rivers, and to jointly study shared river systems between the two countries, the Joint Rivers Commission (JRC) was established in 1972 with the purpose of carrying out comprehensive surveys of the river, and to jointly address critical issues related to the river's management (Statute of the Indo-Bangladesh JRC, 1972). In 1996, the Ganges Treaty was signed through the work of the JRC. The JRC has also been negotiating an agreement for sharing the water of the Tista/Teesta River, a tributary of the Brahmaputra. However, final agreement is yet to be signed (BA6, 2016; BA7, 2016). On data sharing, India provides flood season data of the Brahmaputra River to Bangladesh. The two countries also cooperate on navigation of the Brahmaputra River (Protocol on Inland Water Transit and Trade, 2015).

India-Bhutan (AS3)

The earliest cooperation between India and Bhutan dates back to 1955, when India's Ministry of External Affairs (MoEA) sponsored a scheme for the purpose of flood warning measures in India. Another area of cooperation is flood data collection. Currently, a network of 32 hydro-meteorological stations called 'Comprehensive Scheme for Establishment of Hydro-meteorological and Flood

Forecasting Network on rivers Common to India and Bhutan' is in operation. These stations are located in Bhutan and are maintained by the Royal Government of Bhutan with funding from India (Ministry of Water Resources, 2016b). A Joint Group of Experts (JGE) on flood management discusses and assesses the probable causes and effects of the recurring floods and erosion in the southern foothills of Bhutan and adjoining plains in India and is situated to recommend to both governments appropriate and mutually acceptable remedial measures (Ministry of Water Resources, 2016b). Another key cooperation between Bhutan and India is the development of hydropower dams, where India invests in its development and purchases the electricity generated in return. The first cooperation of this kind started in 1961, and in 2006, both governments signed an agreement to jointly develop a minimum of 10,000 MW of hydropower (Embassy of India to Russia, 2006).

Bhutan and Bangladesh (AS4)

There is no specific cooperation related to the Brahmaputra River's water between Bhutan and Bangladesh. However, both countries are starting their cooperation over hydroelectric power generation. This cooperation takes place in a form of Bangladeshi investment in Bhutanese hydropower generation. As India lies between these two countries, it is inevitable to gain India's consent regarding the transmission of electricity over its territory. In October 2016, India informally agreed to the investment from Bangladesh to Bhutan in the form of Dorjilung hydropower project with capacity of 1125 MW (Lamsang, 2016). As of October 2016, Bhutan and Bangladesh had already signed tripartite MoU for this collaboration, but were awaiting India's commitment (Lamsang, 2016; BT2, 2016).

China and Bangladesh (AS5)

In 2015, Bangladesh and China signed an MoU under which China provides flood season data to Bangladesh (Siddique, 2015). This is the same data that China provides to India for which India pays China (Central Water Commission & Bureau of Hydrology and Water Resources, 2014), whereas Bangladesh receives the same data free of charge. According to the Economic and Commercial Counsellor's Office of the Chinese embassy in Bangladesh, China and Bangladesh signed an MoU in 2007 on technical cooperation on water conservancy. Based on this MoU, the two countries collaborate on dykes and the design of some sections of the Brahmaputra, and conduct joint research on sedimentation (Economic and Commercial Counsellor's Office, 2007).

Bhutan and China (AS6)

This research identified no formal cooperation on the Brahmaputra River between Bhutan and China (BT3, 2016; BT5, 2016; BT8, 2016). In geographical terms, few

of the tributaries of the Brahmaputra flow from China to India. China and Bhutan became neighbouring countries following China's annexation of Tibet, which has close ties with Bhutan. Bhutan and China do not have official diplomatic relations. However, there have been ongoing border talks between two countries since the 1980s (Mansingh, 1994); and in 2012, the countries held their first official meeting where the countries' respective leaders indicated interest in beginning a diplomatic relationship (Gupta, 2014; Krishnan, 2012).

4.2 Track I: Multilateral cooperation

There are no specific cooperation mechanisms over the Brahmaputra River at the multinational level. However, the Bangladesh, Bhutan, India, Nepal (BBIN) sub-regional cooperation agreement has established a Joint Working Group (JWG) on water resources management and (hydro-)power, where cooperation over the Brahmaputra River could potentially be discussed.

4.3 Track II and III cooperation

Within the Brahmaputra basin, there is some track II and III water diplomacy work undertaken by various institutions. The following section provides an overview of the main past and ongoing activities.

Ecosystems for Life (AS7)

The Bangladeshi-Indian initiative 'Dialogue for Sustainable Management of Trans-boundary Water Regimes in South Asia' is an attempt to develop a neutral platform among key elements of civil society for discussing the management of the Ganges, Brahmaputra and Meghna (GBM) rivers shared by both countries. The Ecosystems for Life (E4L) project commenced in 2010 and received its entire USD 6.4 million budget from the Ministry for Development Cooperation of the Netherlands. Through IUCN-facilitated collaborative deliberations, the Project Advisory Committee (PAC) chose to focus on five major thematic areas: food security; water productivity and poverty; impacts of climate change; environmental security; trans-boundary inland navigation; and biodiversity conservation.

The E4L project used four tools to achieve its goal and objectives: 1) creation of formal dialogue opportunities; 2) facilitating joint research; 3) development of a shared knowledge base on water related resources; and 4) capacity-building through training, exposure visits, communication, publications and dissemination.

Brahmaputra Dialogue (AS8)

The Brahmaputra Dialogue was a process of dialogue over the Brahmaputra River, originally initiated in 2013 by the South Asian Consortium for Interdisciplinary

Water Resources Studies (Saci WATERs) in collaboration with the Indian Institute of Technology Guwahati and the Institute of Water and Flood Management under the Bangladesh University for Engineering and Technology. Phase I of the dialogue (2013-2014) focused on Track III dialogue between India and Bangladesh. Phase II (2014-2015) included Bhutan and China in a dialogue that allowed for multi-country stakeholder participation. The phase III (2015 - 2017) will bring together the four riparian countries of the Brahmaputra basin – Bangladesh, Bhutan, China and India – for a dialogue on the co-management of the river basin. Dialogue participants are extended to allow the nature of the dialogue to cover tracks I.5, II and III (Saci WATERs, 2016b).

The Third Pole

The Third Pole is a multilingual platform with a purpose of exchanging information and promoting discussion about the Himalayan watershed and the rivers originating from the Himalayas. It is registered as a non-profit organisation based in New Delhi and London, with editors based in Kathmandu, Beijing, Dhaka and Karachi. This is primarily a web-based network engaging with an international network of experts, scientists, media professionals and policy makers, and share knowledge and perspectives across the region. According to its homepage, the platform's "aim is to reflect the impacts at every level, from the poorest communities to the highest reaches of government, and to promote knowledge sharing and cooperation within the region and internationally" (The Third Pole, n.d.).

ICIMOD

The International Centre for Integrated Mountain Development (ICIMOD) is a regional intergovernmental knowledge sharing and learning centre serving the eight regional member countries of the Hindu Kush Himalaya: Afghanistan, Bangladesh, Bhutan, China, India, Myanmar, Nepal, and Pakistan. The organization is based in Kathmandu, Nepal. ICIMOD aims to support mountain people to understand the challenges globalization and climate change impose on the increasing influence on the stability of fragile mountain ecosystems and the livelihoods of mountain people, enabling them to adapt, and make the most of new opportunities, while addressing upstream-downstream issues (ICIMOD, n.d.). In partnership with regional partner organizations, ICIMOD supports regional transboundary programmes, facilitates the exchange of experience, and serves as a regional knowledge hub. In 2014, through facilitation of ICIMOD, China, India and Myanmar signed a cooperation framework for the Brahmaputra-Salween landscape. This framework is aimed to serve as a guiding document that directs bilateral and multilateral cooperation within the landscape (ICIMOD, 2014).

ICIMOD has also been involved in capacity building workshops that seek to bring stakeholders from various parts of the Ganges Brahmaputra Megna basins

together. As one example, ICIMOD has partnered with the Monash Sustainability Institute (Australia) to convene a series of such workshops with funding from AusAID on the Teesta and Kosi basins, which brought in stakeholders from India, Nepal, Bangladesh and Bhutan

Abu Dhabi Dialogue/SAWI

The Abu Dhabi Dialogue is a process of dialogue that aims to foster cooperation in the management of rivers originating from the Himalayas, engaging participants from Afghanistan, Bangladesh, Bhutan, China, India, Nepal and Pakistan. The first dialogue took place in 2006 in Abu Dhabi, and was hosted by the International Institute of Strategic Studies with the support of the UK Foreign and Commonwealth Office (SAWI, n.d.a). From 2007 onwards, the dialogue was facilitated by the World Bank, which has also established the South Asia Water Initiative (SAWI), a multi-donor trust fund managed by the World Bank and supported by the governments of Australia, Norway, and the UK to promote regional cooperation in water management (SAWI, n.d.b). Six regional dialogues and six country dialogues were held since 2006. These dialogues included various stakeholders including government and non-government actors, and had different topics of discussion including climate change impact, physical and social vulnerability, livelihoods and emerging constrains in the development. The dialogue also initiated a workshop on transboundary water management and international water law, as well as capacity development in state-of-the art technical institutional approaches in transboundary water management (SAWI, n.d.a).

Following a performance review in 2012, the parties to the trust fund agreed to continue supporting SAWI for a further five years, with increased investment and the specific objective 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 (SAWI, n.d.b). A new trust fund was formally established in December 2012.

4.4 Chapter conclusion

The Brahmaputra River currently encompasses different types of water cooperation including Track I, II and III. This report analyses factors affecting all Track I bilateral cooperation including Bhutan and China, where cooperation does not currently exist. Including the analysis of factors affecting non-cooperation may also facilitate further understanding of why cooperation takes place among certain countries and not among others.

With regards to Track II and III cooperation, this report analyses two action situations related to civil society facilitated cooperation which had stronger focus on the Brahmaputra River compared to other initiatives. These action situations are the Ecosystem for Life project facilitated by IUCN, and the Brahmaputra

Dialogue facilitated by Saci WATERs. Selection of these action situation is based on approach of grounded theory, whereby interviewees repeatedly referred to these action situations. They are discussed in Chapter 11 and 12, respectively.

5. Action situation 1: India-China cooperation

5.1 Action situation, outputs and outcomes

There are two MoUs between India and China, one of which covers the provision of hydrological information on the Brahmaputra River during the flood season (currently 15 May to 15 October)[8]. The initial MoU on provision of hydrological information on the Brahmaputra River in flood season by China to India was signed in 2002 and expired in 2007. This MoU was renewed twice, in 2008 and in 2013 (Ministry of Water Resources, 2014). According to the MoU's implementation plan, which was originally signed in 2013 and renewed in 2014, hydrological data is collected from three stations: Nugesha, Yangcun, and Nuxia. Data is collected twice a day, between 15th of May and 15th of October (Central Water Commission & Bureau of Hydrology and Water Resources, 2014). While dry season flow data is often a key concern for many transboundary rivers, according to an interviewee from a government agency, the reason for providing data during the summer is because most water flowing into the Yarlung-Tsampo from China originates from snow melt in Tibetan areas, mostly during the summer season (CH13, 2016). The hydrological stations are located in remote areas and the Chinese government needs to station their staff purely for the purpose of measuring hydrological data to be sent to India. Therefore, the Indian government pays approximately 850,000 Chinese Yuan (approximately USD 120,000) a year to cover the costs of human resources (Central Water Commission & Bureau of Hydrology and Water Resources, 2014). This is in contrast to China's similar agreement with Bangladesh (IND4) who obtains the data for free (discussed further in Chapter 9). India uses information obtained from China in the formulation of flood forecasts by the Central Water Commission (CWC).

In addition to the MoU related to hydrological data, India and China signed an MoU in 2013 on strengthening cooperation on transboundary rivers. The MoU seeks to achieve this through an existing Expert Level Mechanism between the two countries, the provision of flood-season hydrological data and emergency management (MoU on Strengthening Cooperation on Trans-border Rivers, 2013). The Expert Level Mechanism consists of delegations of technical experts from research institutes, the government and the foreign ministry. Since 2006, approximately twenty meetings were held among experts. The topic of discussion varies each year, but revolves mostly around the issue of hydrology information sharing, discussing how to monitor and share information, and how to build hydrology models (CH13, 2016).

The Indian government attempted to establish further mechanisms to monitor Chinese activities in the Brahmaputra River, but without success. In 2013, during a bilateral meeting at the BRICS summit, the Indian prime minister proposed to

[8] The second agreement is on hydrological data sharing in 2005 on the Sutlej-Langqen Zangbo River by China to India in the Indus basin.

the Chinese premier the establishment of a joint mechanism to assess the type of construction activity taking place in the Tibetan Autonomous Region (Ministry of External Affairs, 2013). The Hindu, an Indian newspaper, reported that India, concerned about Chinese approval of three further hydropower dams on the Brahmaputra River, suggested China either establish a water commission, an inter-governmental dialogue, or a treaty to deal with water issues between the two countries (PTI, 2013). However, the same newspaper reported that China indicated existing cooperation mechanisms related to the Brahmaputra were adequate (Amano, 2015; PTI, 2013). This opinion was echoed by a Chinese interviewee (CH13, 2016). According to Amano (2015), India has also asked China to provide dry season data, but this request has not been met.

The two countries also cooperate on emergency response. CH13 (2016) indicated that China was closely monitoring a lake created by an earthquake, which would affect India in the event of its collapse. Referring to this cooperation, the Sino-Indian Joint Communiqué 2010 from the Chinese premier's visit to India states: "The two sides noted the good cooperation between China and India in the field of trans-border rivers. The Indian side appreciated the flood-season hydrological data and the assistance in emergency management provided by the Chinese side. The two sides reiterated that they will promote and enhance cooperation in this field" (Ministry of External Affairs, 2010).

On the subject of transboundary water cooperation in general, China tends to take a bilateral approach rather than a multilateral one (CH1, 2016; CH3, 2016; CH8, 2016; CH14, 2016). Referring to this approach, one of the interviewees said that different rivers have different issues, thus one cannot take the same approach (CH13, 2016). The main rationale for this approach is that many of the transboundary rivers flowing through China traverse only two countries, and thus do not require China to take a multi-lateral approach (Wouters & Chen, 2013; CH14, 2016). The exception to this approach is the Mekong River where China has recently established the Lancang-Mekong Cooperation Mechanism which had its first leaders' meeting in 2016 (Mekong River Commission, 2016; State Council Information Office, 2015).

Among Chinese interviewees, there were two divergent opinions related to the status of China-India cooperation. One school of opinion was that cooperation is working effectively, particularly considering that there is a territorial dispute between China and India (CH14, 2016; CH21, 2016). One of the interviewees said that current cooperation is sufficient in addressing the existing issues, indicating that compared to other basins such as the Mekong River, the Brahmaputra River (particularly on the Chinese side) is sparsely populated, development is limited, and thus the current level of cooperation is adequate (CH13, 2016).

Others expressed the view that current cooperation is insufficient, given concerns from downstream countries over the development in upstream areas of the Brahmaputra (CH8, 2016). Some interviewees acknowledged that concerns raised from other countries would be an important incentive for China to move towards

cooperation (CH3, 2016; CH15, 2016), referring to the 'responsive' nature of China's transboundary water approach (He, 2015).

Indian interviewees also emphasized the importance of boundary issues. For example, three of them asserted that the three other riparian countries had thus far been unable to establish mutual cooperation with the Chinese government. Furthermore, they argued that the issues associated with trans-boundary rivers are complicated by ongoing border and land disputes between India and China. One particular case is Arunachal Pradesh, located in the border area of the two countries, and currently under India's administrative control, which China claims (IN4, 2016; IN6, 2016; IN7, 2016).

By recognizing that transboundary rivers are an important asset to the development of all riparians, Indian interviewees indicated that the MoU signed between India and China in 2013 shows that both countries agreed to strengthen communication and strategic trust (IN4, 2016; IN6, 2016). IN6 (2016) indicated that information sharing must improve further if Indian apprehension over Chinese activity on the Brahmaputra is to be reduced.

Interviewees had different perceptions of payments made to China by the Indian government. Some interviewees said that China does not need money from India, and suggested that this was a rumour created by the media (CH1, 2016; CH6, 2016; CH7, 2016). Other interviewees said that it is understandable that China demands payment from India, given the relationship between the countries (CH3, 2016; CH8, 2016). Amano (2015) indicates that data was initially provided free of charge but China subsequently requested payment.

Views of Indian interviewees regarding the current status of cooperation were primarily centred on the lack of trust and possible lack of cooperation despite the signing of a series of MoUs. One of the government interviewees pointed out that an ecologically sound management system of rivers does not currently exist in the region (IN13, 2016). Another interviewee suggested that this is coupled with the lack of trust influencing policies for sharing existing data or information and knowledge in the region at an official level (IN4, 2016). IN6 (2016) indicated that Indo-China mistrust causes India to take its own steps because – as IN13 (2016) indicated, "whatever happens upstream, we don't know what the impact will be downstream."

Output, Outcome and Impacts

Specific outputs from this cooperation are the two MoUs discussed in this section: the MoU on flood season data sharing and the MoU signed in 2013 on strengthening the cooperation on trans-border rivers. Outcomes from this cooperation include China providing flood season data to India, information exchange in the event of emergency, and discussions through an expert panel. The research did not identify any outcome from this cooperation in terms of optimally managing the river economically or ecologically. Specific impacts from this cooperation were not

observed from this research. While many interviewees indicated a lack of trust particularly through territorial disputes between the two countries (CH7, 2016; CH8, 2016; CH11, 2016; CH14, 2016), none of the interviewees mentioned whether the cooperation resulted in easing uncertainties or distrust between China and India.

5.2 Factors affecting the cooperation

This section discusses key factors that affected the existing cooperation, following the key components of the analytical framework. An overview of these factors is illustrated in Figure 7.

5.2.1 Contextual factors

China is located at the most upstream of the Brahmaputra river and approximately 50 per cent of the total catchment area is within China. The river originates from the glacier mass of Chema-Yung-Dung in the southern Tibet with an elevation of 5300 m (Mahanta et al., 2014). The area is remote from large cities of China and the river was left undeveloped until five to ten years ago (CH1, 2016). Since then there has been some plans for hydropower dam development. The first hydropower dam built on the river was the Zangmu (藏木) dam with a capacity of 510 MW, located 140 km southeast from Lhasa and approximately 500 km from the border of India (Amano, 2015; PTI, 2015b). According to the energy plan in the Chinese 12th five-year plan (planning for the period 2010-2015), there are three more hydropower dams planned within the river: Da gu (大古), Jie Xu (街需) and Jia Cha (加查) dams (Samaranayake, Limaye, & Wuthnow, 2016; State Council, 2013; CH17, 2016). Locations of these dams are illustrated in Figure 8. CH13 (2016) indicated that two to three run-of-the-river hydropower dams are being constructed in the region and CH17 (2016) indicated that Da Gu and Jia Cha dams are being constructed. However, none of the interviewees could provide clear information about whether these dams were under construction, and similar information was not available on public websites. This research identified limited clarity on information regarding plans and actual construction of the hydropower dams on the Brahmaputra within Chinese territory. This finding was echoed by a report published in 2016 by the CNA, which suggests China to publicize clearer information in English as a way to reduce misperceptions about Chinese dam buildings by other riparian countries and stakeholders (Samaranayake et al., 2016, p. 90). Amano (2015) also points out that China was denying the hydropower development on the Brahmaputra River until 2010.

India-China bilateral cooperation

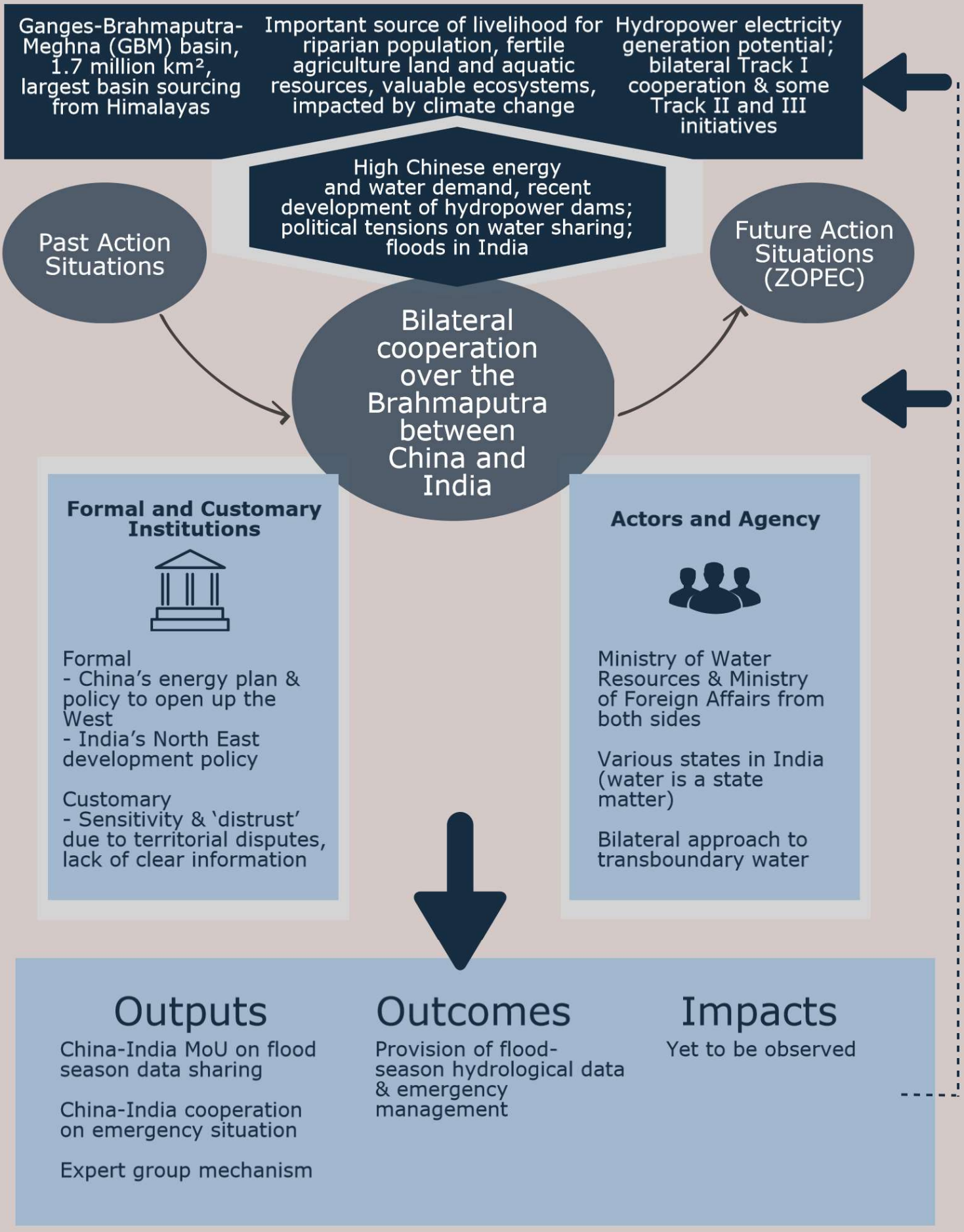

Figure 7: Factors affecting the water cooperation between China and India.

Although not included in the 12th five-year energy plan, there was a proposal to build the world biggest hydropower dam on the Brahmaputra River, the Mo Tuo (墨脱) dam (Amano, 2015; Watts, 2010). If built, this dam would have a capacity of 38 GW, equivalent to almost half the output of the UK's national grid. The suggested location of the dam is close to the 'Great Bend'[9] where the Brahmaputra River takes a sharp turn, 30 km north of the border claimed by India (Amano, 2015).

Figure 8: Map of hydropower dams on the Brahmaputra River. Source: Samaranayake et al. (2016).

Chinese energy demand is expected to increase as a result of economic growth, and this is an obvious driver for new hydropower development. According to a forecast by the International Association for Energy Economics, Chinese GDP is expected to grow by approximately six to seven per cent until 2025 and electricity demand is expected to grow at 1.1 times of GDP growth (Shealy & Dorian, 2008). There were divergent views on energy supply, and demands and the needs for creating more energy sources. Some interviewees said that China already had an energy surplus; making the construction of new hydropower dams may not be economically viable (CH1, 2016; CH17, 2016). Others indicated the need for China to increase its energy supply to meet growing demand (CH4, 2016; CH5, 2016). According to energy demand scenario by the State Grid Energy Research Institute, total primary energy demand will reach 4840-5070 Mtce[10] in 2020, and 5580-5870 in 2030 (Shan, Xu, Zhu, & Zhang, 2012). Another forecast of energy demand in

[9] Location of Great Bend is illustrated in Figure 10.
[10] metric tons of carbon equivalent

2020 suggests that China's coal, oil, and natural gas imports will continue to increase (Adams & Shachmurove, 2008).

One of the incentives for China to invest in hydropower dams arises from its climate change obligations. China currently relies heavily on fossil fuels, and this situation needs to be shifted towards 'less carbon' energy sources (CH5, 2016; CH9, 2016). Coal is the dominant source of electricity generation in China, accounting for approximately 70 per cent of electricity production (China Energy Group, 2014; The Shift Project Data Portal, n.d.). As one interviewee commented, hydropower dams are not always financially viable, as they depend on a grid connection to the national system. Some of the small hydropower dams in the tributary of the Nu River are not connected to the national grid and therefore suffer financially (CH20, 2016). This point of departure for a potential shift in China's energy strategy could also raise concerns by downstream countries in the future.

In conjunction with this demand, CH1 (2016) said that Chinese technology for electricity transmission has significantly improved in the recent years and nowadays allows for transmission of electricity through grid system with minimum loss. This technology opened up opportunities for the Western provinces to produce electricity and sell it to the large cities mostly located on the east coast of China.

According to Michael Buckley, author of *Melt Down*, another possible reason for the development of hydropower dams in the region is to also expand mining operations to the region, as there are several mineral deposits in the Tibetan Plateau along the Brahmaputra River (Buckley, n.d.). This information was echoed by several interviewees who reported that there are a number of mining operations in the Tibetan Plateau, and possibly along the Brahmaputra River. However, these interviewees also pointed out that many of these plans emerged during previous administrations, and that it is possible that existing mining plans may be changed or cancelled by the current administration which emphasises environmental conservation (CH4, 2016; CH5, 2016; CH9, 2016; CH13, 2016).

Another debate related to development of the Brahmaputra River is the idea of diverting Himalayan water to water-scarce parts of China. The idea has been debated among scientists for many years. There are three routes for water diversion projects in China: the east, central areas and the west. The eastern and central routes divert water from the Yangtze and Han rivers to the Yellow River in the north of China, and have already been completed (Amano, 2015; CH6, 2016; CH15, 2016). The plan for the western route, which would divert water from the Brahmaputra to the Yellow River through a series of canals and blasting mountains, has been debated among scientists (Samaranayake et al., 2016; CH15, 2016). The most well-known publication regarding this plan is a booked entitled 'Tibet's Waters Will Save China' (西蔵之水救中国) published in 2005 by Li Ling, a former officer of the People's Liberation Army (PLA), with a support by the Ministry of Water Resources (Amano, 2015; Samaranayake et al., 2016). Amano (2015) points out that this proposal was made by a person linked to the army that is in possession of weapons that could be potentially used to build tunnels among

mountainous areas. There were divergent views among interviewees about the status of the plan, as some considered it to be a costly and illogical project (CH16, 2016; CH18, 2016), and a myth created by Indian media (CH1, 2016). Another interviewee said that such considerations are important as a potential solution for the water shortages China faces[11] (CH6, 2016). The plan is currently on hold.

IN6 (2016) explained that tension over water has continued to grow since China began constructing dams upstream, coupled with ongoing border disputes between the two countries. China's dam-building agenda has created apprehension in India about the risk of flash floods and landslides affecting millions downstream (Khadka, 2016, IN6, 2016). In 2000, a naturally formed dam in one of the tributaries of the Brahmaputra broke and flooded Arunachal Pradesh and Assam with 3-4 billion cubic meters of water, killing 30 people and leaving 50,000 homeless. This incident was catalytic in initiating cooperation on data sharing between China and India (Samaranayake et al., 2016). The report by Khadka (2016) argues that the casualties and serious damage to Indian infrastructure resulting from floods are caused by a lack of hydrological data exchange between the two countries. IN6 (2016) makes the same point and further asserts that India was not aware of the approaching flood. To them, this has heightened India's apprehension over water sharing with China, which has continued to be a characteristic of the bilateral relationship. They further argued that China refused to divulge hydrological information to India on the grounds that it was deemed to be a domestic issue.

The recent activities of China in the upstream section of the Brahmaputra River, and changes observed in water levels in India, created concern in Indian society. In 2012, the water level of the Brahmaputra suddenly receded significantly at Pasigwat, a town in Arunachal Pradesh, creating suspicion among the Indian community about a possible water diversion by China (The Economic Times, 2012; CH18, 2016).

5.2.2 Formal institutions

As discussed in previous section, China's energy demand is one of the key driving forces of recent developments in the upstream of the Brahmaputra River, creating concern in downstream India that encouraged the current cooperation between the two countries. China's energy plan is based on the country's Five-Year Plan that provides blue-prints for the national social, political and economic goals (APCO worldwide, 2015). Existing plans for hydropower development are based on the 12th Five-Year Plan that covers the period 2010-2015. The plan promotes energy use from non-fossil fuel sources. As part of this effort, the construction of dams to generate 160 GW of additional hydropower capacity is slated, increasing China's hydropower capacity to 290 GW (Li, Yao, Yu, & Guo, 2014). Under this plan, three new hydropower dams on the middle reaches of the Brahmaputra River were approved in 2013: Jia Cha (加查), Jie Xu(街需), and Da gu (大古) dam

[11] 2000 m³ per capita for China whereas India has 4000 m³ per capita

(Samaranayake et al., 2016; State Council, 2013; CH17, 2016). As the Zanmu (藏木) dam is already built (CH16, 2016; CH17, 2016), this has increased the number of hydropower dams on the main steam of the Yalung-Tsangpo in Chinese territory to four (Krishnan, 2013).

At the end of 2015, China adopted its 13th Five-Year Plan for 2016-2020. Energy policy was based on the plan, and this was finalized in December 2016 and made public in January 2017 (Tianjie, 2017; 能源局网站, 2017). During interviews conducted before the plan was announced, several interviewees indicated that changes could be made to the proposed hydropower dams (CH15, 2016; CH17, 2016). The new plan indicates that China has increased installed hydropower capacity from 220 GW in 2010 to 320 GW in 2015. The plan also indicates further development of hydropower dams in some of the rivers in China, however, there is no specific mention of dams on the Brahmaputra River (能源局网站, 2017).

Another policy that may be driving the development in this region is the Chinese government's policy to 'open up the West (西部大開発)'. The initiative, launched in 2000, seeks to encourage development of the impoverished western part of China (Samaranayake et al., 2016). The idea follows the vision proposed by Deng Xiaoping, who proposed the development of the coastal area of China first, followed by inner (Western) part of China (Lai, 2002).

In India, the Brahmaputra River flows through the northeast of the country. Historically, this area was at the forefront of seaborne trade. However, after India's independence and the partition of East Pakistan (now Bangladesh) in 1947, this part of India was virtually disconnected from the rest of the country. This separation created political fragmentation and violence (Maier, 2009). The region is economically less developed than the rest of India, which is why the Indian government has various policies and measures in place to improve the economic development of the region. In 1996, the Indian prime minister announced 'New initiatives for North Eastern Region' that allowed at least 10 per cent of the budget of central government ministries and departments to be earmarked for the development of North Eastern States (Ministry of Development of North Eastern Region, n.d.). The Brahmaputra River plays a crucial role in the development of the region as it provides water for agriculture, hydropower generation, and floods affect riparian populations' livelihoods. Water security is paramount for the development of the region, and contributes to India's keen interest in requesting upstream China's cooperation over the river.

5.2.3 Customary institutions

A number of interviewees highlighted how the lack of trust between China and India affects cooperation between the two countries (CH7, 2016; CH8, 2016; CH11, 2016; CH14, 2016; IN5, 2016). There seem to be two main reasons for this.

A key factor is the territorial dispute between China and India originating from 1947, when the British colonial government drew a de-facto border between the

two states that China did not recognize. In 1962, China declared war on India over the dispute. However, the border issue was not resolved (Li et al., 2014; Lidarev, 2012, CH7, 2016). Negotiations have failed to resolve the dispute, although one interviewee indicated that an agreement was nearly reached ten years ago, but was not signed (CH1, 2016). Another interviewee suggested that the cost of not resolving the border issue is relatively low for both governments, as the area is located far from the centre of both countries, and the area is not economically important (CH18, 2016). After border talks between the two countries in April 2016, a Chinese official was reported to have said that "both sides agreed that the negotiation on the China-India boundary maintains a positive momentum", and to have suggested that finding a partial resolution as workable (PTI, 2016a).

Another issue that erodes trust between two nations is the lack of information sharing. According to one of the Indian interviewees, during the 1990s and 2000s, there was persistent speculation in India over China's dam building upstream of the Brahmaputra. However, the existence of any such plans were denied by the Chinese government for many years until 2010, when China confirmed its construction of the Zangmu dam (IN8, 2016). A further area of uncertainty stems from China's purported plan for water diversion. Interviewees in India expressed concern that China, as an upstream state, would have the freedom and capacity to divert water, and were concerned about potentially irreparable losses that would cause problems in large areas of northeast India (IN1, 2016; IN5, 2016). Particularly worrying for some interviewees is that China has the required resources, such as manpower, technology and funding, to take the Brahmaputra diversion project forward should it decide to do so (IN5, 2016).

5.2.4 Actors and Agency

In China, the main actors responsible for the transboundary cooperation over the Brahmaputra River are the Ministry of Foreign Affairs and the Ministry of Water Resources (CH2, 2016; CH13, 2016; CH21, 2016). Under the Ministry of Water Resources, there are seven river basin commissions (International Water Centre, n.d.). The Yangtze River Scientific Commission has a dedicated international department responsible for providing scientific advice to the Ministry of Water Resources on international rivers originating from Tibetan Plateau, including the Brahmaputra River (CH7, 2016; CH13, 2016). Some interviewees said that the river basin commissions in China do not have real decision-making power regarding the management of river basins, only authority to conduct research and administer some aspects related to the river (CH13, 2016; CH15, 2016).

This research did not identify any NGOs working on the Brahmaputra River in China. Interviewees indicated that this is due to the area being relatively remote from large cities and being sparsely populated, so that conflicts are not as high profile as they would be elsewhere in China (CH1, 2016; CH3, 2016; CH4, 2016), resulting in factors such as relocation becoming less acute (CH4, 2016). Tibet is also a politically sensitive area in China that makes it difficult for NGOs to be

present in the area, particularly international NGOs (CH3, 2016). One interviewee said: "I just feel that the river is off the radar" (CH4, 2016).

Another interviewee said that the plan for hydropower dams on the Brahmaputra has existed since 1980s, but construction only started in 2010 because of disagreement over the impact of the dams among researchers and local residents that lasted more than 20 years, and because environmental NGOs (such as Green Peace, China Water Risk, China Dialogue) opposed their construction (CH15, 2016). However, other interviewees did not confirm this.

In India, the Ministry of External Affairs (MoEA) leads the negotiations at the Track I level. In the case of issues related to water resources, the Ministry of Water Resources (MoWR) is the highest authority that administers water resources policy.

Indian and Chinese interviewees emphasized the role of the media. Respondents suggested that media in India in particular played an important role in raising issues of upstream hydropower development (IN11, 2016; CH1, 2016; CH15, 2016; CH17, 2016, CH18, 2016). Some Chinese interviewees said that Indian media were not always necessarily communicating 'true' information (CH1, 2016; CH6, 2016; CH17, 2016).

Recent Chinese activities at the upstream section of the Brahmaputra River, and subsequent Indian concern, shifted India's awareness towards its position within the Brahmaputra from being an upstream country to being a middle-riparian. This shift in India's position changes its agency with other riparians; a development that is discussed in more detail in following chapters.

5.3 Chapter conclusion and possible future action situations

Cooperation between China and India is at its initial stage, and focuses on technical data exchange and meetings among experts. Some Indian interviewees see this as stepping stone for further cooperation, with hopes that China could play a greater role in cooperation as an upper riparian (IN4, 2016; IN6, 2016).

The research identified that India and China have indications for policies and laws that encourage basin-wide management and environmental flow. There are opportunities for improved management of the Brahmaputra River if these policies for domestic rivers are applied to international rivers.

For example, some of the staff members from the General Institute of Water Resources and Hydropower Planning and Design at the Ministry of Water Resources co-authored a publication with WWF that provides a theoretical framework for water allocation and river basin management, which takes environmental flow and flow variations into consideration (Speed, Yuanyuan, Le Quesne, Pegram, & Zhiwei, 2013). According to CH10 (2016), the Chinese government developed master plans for its seven major river basins, but these are not publicly available. The Chinese government also introduced eco-compensation, a public scheme for Payment for Ecosystem Services (PES) and applied the concept to pilot projects within some domestic river basins (Bennett, 2009).

The revised National Water Policy 2012 of India as a whole sets a tone that could be interpreted as pro-cooperation. For example, sections 1.3, 2.2, and 3.3 highlight the importance of a broader thinking. It shows an endeavour to address, first, the inter-state conflicts over water availability within India and that is a common-pool resource whose management should incorporate "minimum ecological needs" (Ministry of Water Resources, 2012, p. 3). In Section 3.3 on Use of Water, the policy further emphasizes on the need to have an evidence-based approach to understand the ecology of the rivers and its natural flows To use it for economic development. In Section 2.3 on Framework of Law, it explicitly mentions the need to enable states and to give space for basin authorities to have institutional power to decide on the basin. The policy stipulates that water management should be seen under IWRM "taking river basin / sub-basin as a unit should be the main principle for planning, development and management" (Ministry of Water Resources, 2012, p. 11). Under Section 13 on Transboundary Rivers, the policy explicitly mentions that the cooperation with other nations has to be bilateral, even when the unit of development is the basin (Ministry of Water Resources, 2012). It seems, under the purview of the draft national water policy of 2012, the Indian approach has a clear willingness to cooperate at the inter-state and international (transboundary) scales. However, it is also explicit in the policy that the overall indication of the policy is to defend the national interest.

In addition, India's Draft National Water Framework Bill of 2016 suggests an integrated river basin management approach, as well as the establishment of a basin authority for inter-state river basins (Ministry of Water Resources, 2016a). Such concepts for integrated river basin management and basin authorities provide a positive basis for India to extend the scope of such authorities to transboundary rivers.

Open information, joint monitoring, and research on river flow could potentially ease tension between China and India. This is particularly important as many interviewees commented on the influence of a "lack of trust" between the two countries that arises from a lack of clear information and communication, coupled with territorial disputes, highlighting influence of customary institutions. Joint monitoring and research are also areas of potential cooperation (ZOPEC) identified during the stakeholder workshop in Bangkok November 2016 (Furze, 2016). There is a need for both countries to develop mutual goodwill. Undertaking joint research projects in the region, and sharing water data more extensively, could foster stronger bilateral relations. Developing an understanding of shared water resource challenges should, therefore, help limit the potential for conflict. More open communication between the two countries can potentially lessen speculations and increase trust between the parties.

6. Action situation 2: India-Bangladesh cooperation

6.1 Action situation, outputs and outcomes

India and Bangladesh share 54 rivers that fall within the Ganges-Brahmaputra-Meghna basins. The major cooperative mechanism is the Joint River Commission (JRC). The JRC was established in 1972 with the mandate to maintain the liaison between the two countries to ensure that effective joint efforts are taken to maximize benefits from shared river systems (Joint Rivers Commission, 1972). The JRC relies on India supplying Bangladesh with flood forecasting data for major rivers such as the Ganges, Teesta, Brahmaputra and Barak during the monsoon season (Ministry of Water Resources, n.d.).

Under the auspices of JRC, there are two major agreements on shared rivers between the two countries, namely the Ganges Water Treaty (1996-2026) and the Teesta agreement (1983-85). Table 5 illustrates the dimensions of these treaties.

The Ganges Water Sharing Treaty of 1996 details water sharing at the Farakka barrage in India. An interim agreement was previously signed in 1975, followed by the first Ganges Agreement in 1977 with an initial duration of five years (Farakka Barrage Treaty, 1996, Art. XV). Several MoUs on water allocation were signed following the expiry of the initial agreement, before the current Ganges Treaty was signed in 1996 with a validity of 30 years (Rahaman, 2006). This treaty is for the Ganges only, and does not cover the Brahmaputra and Meghna basins or their tributaries.

The JRC currently does not have a treaty that extends to all 54 transboundary rivers shared by the two countries, nor is there any sign of publicly available management strategy for them. Having said this, there is some potential latitude within the existing arrangements that some of the parties may be interested in exploring. Specifically, there were some articles in the 1996 agreement that directly relate to broader water cooperation between the two countries (Farakka Barrage Treaty, 1996, Art. VIII-XI). They address long-term arrangements for augmenting of the Ganges water at Farakka. Article IX specifically instructed the JRC to investigate schemes to augment dry season flow of the Ganges.

It is also important to note that Article IX of this treaty recognizes the principles of equitable use and no harm, which are key principles of the international water law (Rahaman, 2006; Wouters, Vinogradov, Allan, Jones, & Rieu-Clarke, 2005), indicating that "[g]uided by the principles of equity, fairness and no harm to either party, both the Governments agree to conclude water sharing Treaties/ Agreements with regard to other common rivers" (Farakka Barrage Treaty, 1996, Art. IX).

Table 5: Indo-Bangladesh Treaties on water sharing. Sources: JRC (n.d.), Ministry of Water Resources (n.d.), Teestra River Agreement (1983).

Name of Treaty	**Purpose and Terms**	**Period**	**Monitoring and implementation**
Ganges Water Sharing Treaty of 1996 (Farakka Barrage Treaty)	Sharing of Ganges/Ganges waters.	30 years, renewable by mutual consent	Joint Committee (technical). Every year, the Committee is supposed to meet three times and observe the joint measurements on Ganges at Farakka (India) and Ganges at Hardinge Bridge (Bangladesh) during lean season. However, the last (37th) joint meeting was held at New Delhi, India, from 17th to 20th March, 2010
Agreement on ad-hoc sharing of the Teesta waters between India and Bangladesh 1983 (Teestra River Agreement)	Sharing of water on the ad-hoc basis: India 39%, Bangladesh 36%, with the allocation of the remaining 25% subject to scientific studies. Studies conducted between 1997 and 2004 were unable to come up with a conclusive formula for how the remaining share should be allocated	Valid till 1985 because the agreement came into being contingent on intensive scientific studies that the Joint Tista/Teesta Committee was supposed to fulfil by the end of 1985.	Secretaries in charge of Irrigation in both countries should meet and transform this ad-hoc agreement into a formal one. As part of this, they were asked to urgently specify the location/locations at which the sharing should be made.

The only agreement between India and Bangladesh that relates explicitly to the Brahmaputra basin concerns one of its major tributaries: the Tista/Teesta River Agreement signed in 1983. The Tista/Teesta River flows from Sikkim through the districts of Darjeeling and Jalpiaguri in West Bengal to Bangladesh before eventually joining the Jamuna River (as the Brahmaputra is called in the Bangladesh part). The 1983 agreement was an ad hoc agreement that allocated 75 per cent of the waters, of which 39 per cent went to India and 36 per cent to Bangladesh, with the remaining 25 per cent to be allocated after detailed studies. The agreement expired in 1985 and a new agreement has yet to be signed.

In the case of Tista/Teesta, it is still unknown to what extent India's construction of the Gazaldoba Barrage in West Bengal reduces the Tista/Teesta flow into Bangladesh in general, and into the Dalia barrage in particular[12]. Issues around irrigation have intensified in recent years due to the expansion of the *boro* season in West Bengal that depends heavily on groundwater. Groundwater consumption is now becoming unsustainable, particularly as some groundwater is also polluted by an arsenic contamination. As such, the utilisation of surface water has assumed increased importance in West Bengal in recent years and, along with it, issues around the sharing of water on Indo-Bangladesh transboundary rivers. At the same time, as this has become contentious between West Bengal and Bangladesh, there has been less attention given to the extensive projects planned or already built in Sikkim.

In an attempt to resolve disagreement over Teesta water allocation, a Joint Committee of Experts was formed in 1997, which met several times until 2004. The ambit of this committee was to examine the sharing of waters. In 2004, a Joint Technical Group (JTG) was convened to conduct a joint scientific assessment as a precursor to an agreement between the two countries on lean season flows. In 2005, after its fourth meeting the JTG put on record its inability to come up with a solution (Prasai & Surie, 2013). Since 2010, there have been various attempts at political agreements, most notably a proposal by then Indian Prime Minister Manmohan Singh, but the chief minister of West Bengal, Mamata Bannerjee, rejected the proposal at the time, and there has been a political stalemate ever since[13].

An updated version of the Tista/Teesta River Agreement has not yet been agreed, with clear differences of opinion within and between the countries as to what would be an appropriate division of the water under this prospective agreement. This is largely due to the allocation of the Teesta having implications for the livelihoods of

[12] The Dalia barrage was built to supply irrigation water to drought prone northern parts of the country. In 1996, the dry season withdrawal increased from the Indian side of the barrage that is upstream to the Dalia barrage, which at the time was already in full operation for irrigation, rendering the Dalia Barrage useless. Moreover, sudden release of excessive water through the Gazoldoba Barrage in the rainy season caused floods and bank erosion, leading to serious suffering of the people in the Bangladesh area of the basin. See Islam (2016).

[13] India's federal system means that states have the capacity to stall agreements.

millions of people in West Bengal and Bangladesh, making the issue politically contentious. From the perspective of Bangladesh, an appropriate allocation would see water sharing on a 50:50 basis, as was the case with the Ganges Water Sharing Treaty of 1996 (Jacob, 2015). According to a report by the Asia Foundation, this position is maintained on the basis that additional water for irrigation is important for agriculture (Prasai & Surie, 2013). There are certainly some stakeholders in India that are willing to agree to such an allocation. However, the state government of West Bengal has opposed the signing of this new deal (Prasai & Surie, 2013). The rationale of the West Bengal government is that an equal share basis would deprive the state's northern region of water, especially in the drier months (November to February) when water is crucial for the boro crop (Ray, 2012).

The sharing of the water of the Teesta is therefore an issue with domestic and bilateral political implications in both countries (Kumar, 2013). An attempt to sign an agreement during the visit of then Indian prime minister Dr. Manmohan Singh to Bangladesh in 2011, did not move forward, with the opposition of the state government of West Bengal often seen as the major obstacle. However, at that time, India and Bangladesh did sign a broad framework agreement on bilateral cooperation emphasizing, among other factors, the requisite to explore the possibility of "common basin management of common rivers" (Rashid, 2012).

The overall perspectives of Indian interviewees regarding this cooperation are largely mixed. Many of the interviewees who are experts of water management and engineering, including experts working for the government departments, think that when it comes to the Brahmaputra basin, very little is known and that there is little substantive cooperation on the Brahmaputra basin region. Their views are based on the fact that compared to the others in the region, the Brahmaputra basin is the least studied, even at the technical level. Since its water resources are relatively untapped and the water flow is comparatively greater than in the Ganges River, there is little focus to develop a basin-wide vision and management strategy (IN4, 2016; IN7, 2016; IN8, 2016). In contrast, government policy makers see effective cooperation between the two countries. They believe that the existing cooperation with Bangladesh on the Ganges is working well, and that the existing project to link the Manas-Sankosh-Teesta Rivers can resolve the problem of sharing Tista/Teesta water (IN13, 2016; IN16, 2016).

One of the interviewees in India points out that the cooperative mentality is growing at Track I level. IN8 (2016) suggests that in the internal debates on the newly drafted National Water Policy of India from 2012, there was an observed shift away from the infrastructure-in-the-state approach[14] towards a more multi-layered diplomatic one that tries to look at the basin-wide cooperation. This is further substantiated by recent developments in Bangladesh, Bhutan, India, Nepal

[14] Water policies under the previous NWP from 2002 focused mainly on infrastructural development of water works.

(BBIN) cooperation with working groups on Water Resources Management and Power/Hydropower (Energy Bangla, 2015; The Economic Times, 2015; BA8, 2016).

Despite these positive signs of enhanced cooperation between India and Bangladesh, there remains a general feeling of dissatisfaction among many Bangladeshi interviewees. Critics frequently argue that while the JRC was supposed to function as a joint institution, it is split between the two countries at this point, without any permanent offices to house both parties, and thus does not operate according to best practice (BA2, 2016; BA3, 2016; BA4, 2016; BA6, 2016; BA7, 2016). BA6 indicated that in 1960s, Bangladesh proposed to jointly manage the Farraka barrage, building one barrage to serve both countries: "what is hindering this type of cooperation with [our] neighbour is the lack of political will" (BA6, 2016).

Data sharing on water has long been a contentious issue within South Asia. While all countries in the region are protective of their data, information regarding water flows in the Ganges-Brahmaputra-Meghna (GBM) basin in India is officially 'classified' and is not readily available (Prasai & Surie, 2013). Unsurprisingly, then, many interviewees expressed frustration that India does not provide all the data that Bangladesh needs, particularly data on dry season flow (BA4, 2016; BA5, 2016; BA6, 2016; BA8, 2016). This affects the perception of the downstream country towards its upstream neighbour. BA5 (2016) for instance, said that this is due to the belief that the release of dry season flow data may reveal the amount of water that India is withholding for domestic consumption. BA3 (2016) observes that if data was shared on the Teesta, it may actually affect the negotiation of the agreement.

Another key area of cooperation between Bangladesh and India is on inland navigation. Inland navigation offers substantial opportunities to move cargo and people across major rivers and their tributaries in energy- and cost-efficient ways, for example, in terms of transport costs and emissions per tonne-kilometre. There are currently four protocol routes for Inland Water Transport and Trade, identified by India and Bangladesh under Article VIII of their Trade Agreement of June 2015. Under this agreement, the two governments agreed to the use of their waterways for commerce and the passage of goods (India-Bangladesh Trade Agreement, 2015).

Nayak and Panda (2016), in their case study on Assam's socio-economic life, analysed the importance of the fisheries sector connected to the Brahmaputra and how it is related to the overall socio-economic conditions of people in the state of Assam. This notion is also true for the Bangladeshi communities of the Brahmaputra River, as they share the same overall culture. In retrospect, a documentary film titled "River Highways", and a situation analysis on inland navigation between Bangladesh and India conducted by Mishra and Hussain (2012), suggest better management of inland navigation between the two countries as a solution to concerns of reconciling economic development and environmental protection of riverine biodiversity in the Brahmaputra basin. They suggested that intensifying the use of capacities of the GBM basin waterways in a thoughtful and

integrated manner can contribute to coping with impacts of traffic volumes in a way that is environmentally and socially responsible (IUCN, 2014b; Mishra & Hussain, 2012).

There are currently four designated protocol routes in the GBM basin between India and Bangladesh, for the use of Bangladeshi waters by Indian vessels and vice versa. Consultations with local communities, whose livelihoods are impacted by these developments, are rarely done. For example, the Standing Committee on inland transport between India and Bangladesh has no civil society representation. Several new transboundary inland waterway routes are currently in the design phase. The time would thus be appropriate for promoting the integration of the broader civil society perspectives into government level planning (IUCN, n.d.).

6.2 Factors affecting the cooperation

As illustrated by the Figure 9 below, there are a number of factors that affect the cooperation between India and Bangladesh on shared water resources.

6.2.1 Contextual factors

Bangladesh is a low-lying country characterised by a delta landscape. The Brahmaputra River joins with the Ganges River and the Meghna River in Bangladesh before flowing into the Bay of Bengal. The river's total catchment area within Bangladesh is 1.72 million km², making up 7 per cent of total basin area. As a delta country with its livelihoods heavily dependent on and impacted by water, management of transboundary rivers is a critical issue for Bangladesh. The Brahmaputra River plays a particularly important role for Bangladesh as the river provides 70 to 75 per cent of its dry season flow (Samaranayake et al., 2016; BA8, 2016).

There are more than 400 rivers in Bangladesh, including 54 transboundary rivers shared with India, and three shared with Myanmar (JRC, 2016). Management of transboundary rivers, particularly with India, is therefore an issue of critical importance for Bangladesh.

The key concerns for Bangladesh related to the Brahmaputra include the water use by agriculture, floods, salinity, and riverbank erosion. Bangladesh faces a situation where there is "too much and too little" water (BA9, 2016). Floods are a seasonal occurrence in Bangladesh, and an important part of the ecosystem as it replenishes the soil in the delta, necessary for agriculture (Samaranayake et al., 2016). However, severe floods also cause problems. In addition to the floods occurring due to monsoon rains, climate change can also cause flooding.

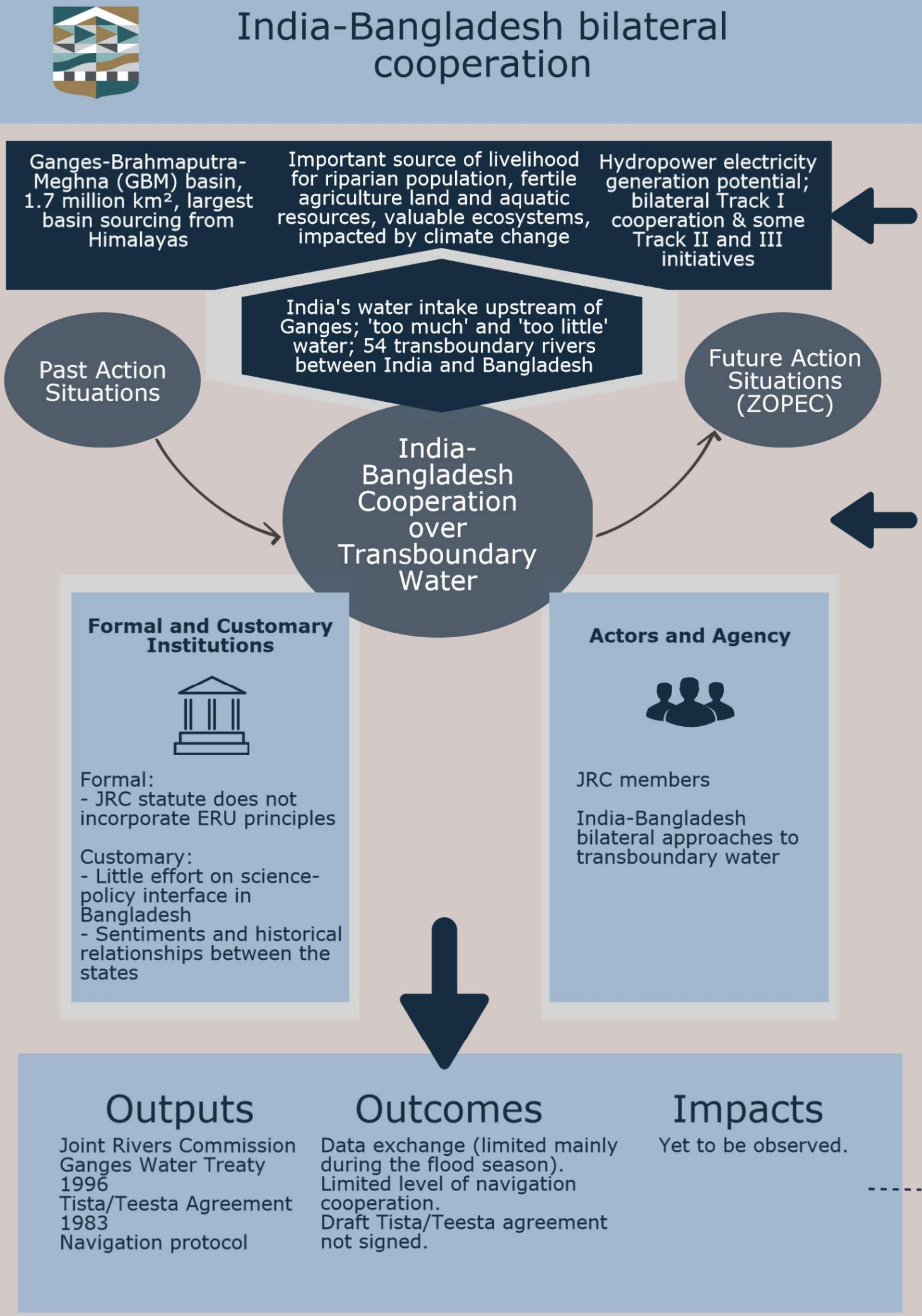

Figure 9: Factors affecting the water cooperation between India and Bangladesh.

Historically, agriculture in Bangladesh was overwhelmingly rain-fed, confined to the *aman* and *aus* seasons, and thus largely reliant upon monsoon rains (BA3, 2016; BA8, 2016). Therefore, the dry season river flow was not an issue until 1972. It did, however, become more important from the mid-1980s onwards as intensifying agricultural activity became more prevalent in eastern South Asia (Boyce, 1987; Rogaly et al., 1999, BA8, 2016). The Green Revolution allowed farmers to grow dry season crops, making it possible to harvest two to three times a year, providing some security to farmers who were no longer reliant on their monsoon-season harvest when crops might be damaged by floods (BA3, 2016). At the same time, however, dry season agriculture also increased water demand during the dry season, resulting in withdrawal of groundwater which put farmers in some parts of Bengal at risk of saltwater intrusion, and the lowering of the groundwater table. Potential sea level rise due to climate change can also accelerate saltwater intrusion in many parts of the delta. These contextual factors create a situation where Bangladesh requires dry season and flood season flow data from India to better manage their resources and agriculture, and to prepare for extreme weather events.

According to BA3 (2016), it is not technically difficult to gain flood season data from satellite information. The difficulty lies in obtaining dry season data, as this needs to be measured on the ground and is not available from satellite data. For this reason, obtaining dry season data from upstream countries is critical for Bangladesh. However, interviewees indicated that India was reluctant to share dry season data (BA3, 2016; BA4, 2016). Referring specifically to the issue of data sharing, BA3 (2016) said: "Data is political, it's power… If I run a model showing India that this is what is happening to the basin, India may or may not agree. But if the country shares the data then India is bound to agree. For example, in the Farakka when we are measuring, because we were measuring together, it's official data. And because this is official data, we can say 'India, look this is happening'. The moment India shares, it becomes official."

The importance of understanding the Brahmaputra's flow within India also stems from the fact that the majority of the flow into Bangladesh comes from India. Referring to this point, BA6 indicated that the main concern for Bangladesh is the flow from India rather than from China that contributes to approximately 15 per cent of dry season flow. The main concern for China is the potential release of dam water at peak season (BA6, 2016).

India has a number of hydropower plans for the Brahmaputra, which could affect Bangladesh. Rahman, M. Z. (2016) reports that in Arunachal Pradesh alone, 168 MoUs have been signed between the state government of Arunachal Pradesh and private and public dam building companies. There are approximately 30 hydropower projects planned on the Teesta/Tista River in Sikkim, with a planned total capacity of more than 5,000 MW (Prasai & Surie, 2013).

In addition to concerns over water withdrawal and India's plans for hydropower dams, the India Rivers Inter-link programme raises concerns in downstream Bangladesh. It aims to re-route water from major rivers including the Brahmaputra

and the Ganges into rivers in central India to alleviate water shortages (The Guardian, 2016). River linking was first proposed by the British in the 1850s, and revisited several times, including in the early 1980s during Indira Gandhi's government (Alley, 2004). Though river linking is thus not new, it never went beyond planning stages for much of India's post-colonial history. The Vajpayee government revived river linking following a directive of the Supreme Court. The Congress-led United Progressive Alliance II, however, stepped back from the idea (Hill, 2013). The current Modi government approved the plan in 2016. The scheme would create 30 new canals, with an estimated project cost of 20 trillion rupees (USD 300 billion; Doshi, 2016a). One interviewee estimated that if the plan were to be implemented, approximately 30 per cent of the annual flow of the Brahmaputra would be diverted to other parts of India. The diversion of this amount, particularly in the dry season, would cause significant damage to Bangladesh (BA2, 2016). Referring to the river-linking project, BA4 (2016) indicated that Bangladesh's concern over the project has been raised at the JRC meetings, but India has been "resisting".

There are several biophysical and material conditions that affect the cooperation over international waters between Bangladesh and India. One major challenge is the natural river widening process, particularly in the lower riparian states such as Assam and in Bangladesh (IN1, 2016; IN4, 2016). According to interviewee IN4, under this widening process, an area of approximately 0.5 million hectares (4860 km^2) of land was lost due to erosion and annual flood in the Assam stretch, and that the loss of land was estimated at more than INR 680 million (more than USD 10 million) in 2015. They added that 4,000 villages were destroyed in 2015 alone. In light of this, interviewees see the Brahmaputra basin as one of the most "destabilized rivers in the region" (IN4, 2016).

While flooding is a natural part of the Brahmaputra's annual cycle, there is a sense among some interviewees that the extent and impact of these processes are more severe and damaging than they have been in the past. The impact of the river widening process as portrayed by IN4 is also consistent with a report published by National Disaster Management Authority of India in 2012, which states that it "adversely affect the benefits anticipated while implementing the flood control and anti-erosion works. High floods cause large scale breaches in the existing embankments bringing vast areas under flood inundation" (Indian Institute of Technology, 2012).

There is a sense of how complex and challenging it is to technically understand the Brahmaputra River, and therefore take appropriate measures against the ever-changing behaviour of the river. The Brahmaputra has a maximum altitude of 5,000 m above sea level before entering Assam in India where precipitation is so great that large amounts of water cause floods in the Assam Valley and carries vast quantities of sediment to lower riparian Bangladesh (India-WRIS Wiki, 2016; IN7, 2016). The tremendous force within such a dynamic river system created the physiology of the Brahmaputra River. High levels of precipitation during the

monsoon season causes flash floods in the Assam Valley from April to September (Mahanta et al., 2014).

From an ecological angle, however, the catchment shows a very rare transition of ecological classes: from alpine to tropical-evergreen (Mahanta et al., 2014). IN7 (2016) further explains that this change of landscape and vegetation unique to the Brahmaputra basin and due to the climatic conditions, making the river 80 per cent rain-fed and 20 per cent fed by snowfall. The basin, particularly south of Tibet, is characterized by high levels of rainfall leading to a high flow velocity and sediment carrying capacity at the 'Great Bend', depicted in the Figure 10. According to the Water Resources Information Systems of India, the Indian sub-basin terrain of the Brahmaputra is suitable for hydropower (India-WRIS Wiki, 2016). However, IN7 (2016) opines that the steepness of the river following the Great Bend makes technical management on the upper stretches of the river highly challenging, obstructing constructions to rip the benefits of hydropower or flow control.

According to Mahanta et al. (2014), the greatest threat faced by agriculture are floods in the basin as they cause large-scale erosion of the riverbank soil, breaching embankments and other river protection structures. This suggests that, whether they are designed to tackle drought or flood or climatic variability as a whole, infrastructures built on the river are interfering with the river's natural capacities and such impacts are translated into large-scale costs for the state economies of India as well as Bangladesh, on which, once these structures are operational, little can be done to undo impacts. The envisaged conflicts within India and with neighbouring lower riparian Bangladesh have a significant impact on the water cooperation between the two nations.

The Teesta River, with a total length of about 414 km, traverses Sikkim for 151 km, stretches along the border of West-Bengal and Sikkim and then inside West-Bengal for 142 km before reaching Bangladesh for the final 121 km. It then merges with the Jamuna River at Chilmari in the Gaibandha district, passing through five districts (Prasai & Surie, 2013). The Teesta flows through a diverse ecosystem, in the lower part – from West Bengal onwards – through dense tropical forests and through the floodplains in Bangladesh. In Bangladesh, the river provides water for the livelihood nearly 2.1 million people engaged in agriculture and fisheries, and is the major navigation route for remote villages and riverine islands (CISMHE, 2006).

The annual flow of water through the Teesta varies dramatically between wet and dry seasons, as Haque, Aich, Subhani, Bari, and Diyan (2014) summarize, with one estimate being that the Teesta supplies a flow rate of nearly 4,494 cumec[15] of water in summer, while the minimum is only eight cumec measured at Dalia, Nilphamari. This study also notes that the reduction of dry season flow of the Teesta has significant consequences on its ecosystem and thereby the services it

[15] 1 cumec (cubic meter per second) = 35.3 Cusec (cubic feet per second) is a measure of flow rate of rivers

Figure 10: The Great Bend highlighted on the entire Brahmaputra River stretch. Source: BBC News (2014).

provides. This is attributed to the dry flow of the river being highly controlled for hydropower and irrigation projects in India and Bangladesh (Haque et al., 2014). For Bangladesh, the importance of the river and related concerns are focused on agricultural and residential lands in the north of the country. In contrast, the Indian state Sikkim is comparatively sparsely populated. Cultural and spiritual values attached to the Teesta are more significant here (Little, 2009, 2010). Many of the people to be affected by the construction of hydropower projects in Sikkim are from tribal communities (Dutta, 2012). In the more densely populated West Bengal and Bangladesh, there is greater emphasis on agriculture and inland fisheries and the shared culture of open fish resources (e.g the *Hilsa*, *Ruhi*, *Katla* fishes).

The sections above have demonstrated the tremendous demographic and biophysical complexity of the basin, with significant changes in livelihoods and priorities as the river traverses through different parts of the basin. This complexity undoubtedly impacts the potential for cooperation, since reconciling the different priorities between and within countries is extremely difficult.

6.2.2 Formal institutions

The JRC was established through a formal agreement between India and Bangladesh, the Statute of the Indo-Bangladesh JRC, in 1972 (JRC, 1972). The Statute is mostly focused on the institutional aspect of the JRC, including the provision of rules related membership of the JRC (Article 1) and procedures related

to the JRC (Article 6). Substantive norms are discussed in Article 4 and focus on areas: 1) joint efforts to maximise the benefit from the shared river systems (Article 4.i.a), and 2) formulating measures associated with flood control and warnings (Article 4.i.b-e). The Statute does not include any principles related to equitable and reasonable utilization (ERU) of the rivers' resources, one of the key principles of international water law (Wouters et al., 2005). BA2 (2016) indicated that "India is not signatory to international law, so they don't agree with certain clause in there. The fact that the upstream country is bound to have some obligations, they don't agree." The lack of an ERU principle clause in the Statute is reflected in the current status of cooperation where Bangladeshi interviewees expressed their dissatisfaction that relationships were unequal (BA8, 2016).

India is one of the four riparian countries in the Brahmaputra basin and has considered all water related issues to be a case of national water security. Article 14 of the National Water Policy 2012 indicates that "all hydrological data, other than those classified on national security consideration, should be in public domain" (Ministry of Water Resources, 2012). This is confirmed by Kumar (2011), mentioning, "In general, India's approach should be to deal with water issues in the overall political and security context." This approach is not specific to the context of the Brahmaputra alone, but could be one of the defining reasons as to why water-related cooperation in India has only been bilateral with all neighbouring riparian nations. It is also possible that this contributes to India's reluctance to share data.

Inter-State disputes within India

Water sharing among the different states is emphasized in India's National Water Policy of 2002. However, in Clause 20.1 the Water Policy also states that "water sharing / distribution amongst the states should be guided by a national perspective with due regard to water resources availability and needs within the river basin" (Ministry of Water Resources, 2012). The exact mechanisms by which trade-offs are established between states taking a national perspective are thus not explicitly mentioned within this document. As such, it suggests the need for a basin-wide approach among Indian states, but the exact implementation in each instance is left open. Similarly, it is important to note that the Draft National Water Framework Bill of 2016 suggests integrated basin management, and establishment of basin authority for inter-state river basin (Ministry of Water Resources, 2016a).

According to interviewee IN9 (2016), Indian states tend not to talk to each other, and have failed to present an integrated management plan to tackle these challenges. IN2 (2016) added that it is common practice for decisions related to water sharing to be taken by state governments that have the authority to take their own decisions and negotiate on their own terms with other states. This might be a way to empower state governments within India, though conflicts persist from the powers granted to them. This practice is also causing bottlenecks at the institutional level in cooperation for ecosystem-based management of

internationally shared rivers with Bangladesh. This notion can be substantiated by the West Bengal's government's unwillingness to develop an equal share treaty with the Bangladesh government on the Tista/Teesta River.

Emerging role of the Bangladesh Delta Plan 2100

The Bangladesh Delta Plan (BDP) 2100 was developed by taking inspiration from the delta planning process used in the Netherlands as both countries face similar challenges on water safety. According to the website of the BDP 2100, the key elements of the planning process consist of conducting of baseline studies (BDP2100, n.d.b), outlining of a delta vision and scenarios (BanDuDeltAS, 2015), the creation of a delta framework for delta governance, the iterative selection of delta strategies, the formulation of an investment plan, and a programme for capacity building. The plan aims to identify immediate applicability through a set of short-term no-regrets measures that have been worked out as input to the Bangladesh's 7th Five-Year Plan for 2016-2020 (General Economics Division, 2015).

Out of the seven intended outcomes of the BDP, number six states: "The Delta Plan provides a means for strengthening international cooperation, with development partners and neighbouring countries e.g. on trans-boundary river issues" (BDP2100, n.d.a). This, along with the rest of the key points, shows a possible creation of another channel for future cooperation that will be intensively researched with Track II and Track I.5 on board from the very beginning.

In November 2015, the prime minister of Bangladesh, HE Seikh Hasina, visited the Netherlands where she said that utilising the experience of the Netherlands, the Bangladesh government is considering forming a Delta Commission and a Delta Fund to mobilise the resources required to implement the Bangladesh Delta Plan 2100.

6.2.3 Customary institutions

Sentiment towards other riparian states seems to play a key role in the cooperation between Bangladesh and India. Many interviewees from Bangladesh expressed frustration over Indian counterparts. One of the interviewees who has been engaged in negotiations with India referred to proceedings within the JRC when stating: "They dictate. It's not pleasant experience to attend those meetings with India" (BA8, 2016). Another interviewee said that although this type of agreement is very important for Bangladesh, in their experience, it does not seem to be as important for Indian government officials (BA6, 2016). Referring to India's water diversion through Farakka barrage, BA8 (2016) expressed that "India is diverting water at Farakka. What can you do? They are powerful and a powerful person doesn't obey the norm and rule and regulation." On the overall relationship with India, BA1 (2016) indicated that "It is always better to make good relation with your neighbours, and if your neighbour is rich and stronger then you don't have any other choice but to 'cooperate'."

Referring to Bangladesh's plans for diverting water, BA6 (2016) said: "Bangladesh is trying to build barrage within Ganges that allows distribution of water. We need barrage because of Farraka barrage in India…. Morally India should support Bangladesh. However, India is not happy with this barrage because they may cause inundation." BA7 (2016) said: "India said that they won't build any dam unilaterally that will affect Bangladesh but now they have linking/dam project with Nepal. So Bangladesh is asking them to at least to inform them but in reality India does not respond."

These comments reflect the perception of an asymmetrical relationship between India and Bangladesh, and illustrate the sentiments created through this relationship.

These sentiments may partly stem from the way India treats Ganges water. Referring to the relationship between the Ganges, the Brahmaputra, and regional sentiments, RB1 (2016) indicated that the Indian strategy is to merge the two rivers in the discourse of negotiating on the Ganges as the Brahmaputra has more water. Merging the two rivers in discourse thus means that the overall water quantity shared by India to Bangladesh, especially in the dry season, looks sufficient on paper. In reality, the two rivers need to be discussed separately as the western region of Bangladesh, where the Ganges enters the country behind the Farakka barrage, is impacted by decisions made by the state of West Bengal.

Another source of these sentiments may be the lack of information sharing: when facts are not shared, people tend to speculate. This is reflected in a comment by BA9 (2016): "In the monsoon period we probably get too much because India opens up their floodgates to allow all the water to come out. In the dry season they close everything so we get less water." BA2 (2016), however, indicated that India's secrecy with regards to water data matches the overall culture on the Asian continent.

Some of the Bangladeshi interviewees commented on the lack of negotiation skills, particularly related to understanding science, which may be a contributing factor to the weaker position of Bangladesh in its negotiations with India (BA2, 2016; BA5, 2016). The JRC statute requires that two out of three JRC members should be engineers (JRC, 1972, Art. 2). However, some interviewees in Bangladesh said that the JRC members from Bangladesh are not necessarily technically oriented, and are often not equipped with proper scientific information when they are at the negotiation table. Interviewees identified a lack of cooperation between scientists and policy-makers in Bangladesh, referring to culture as a reason for this (BA2, 2016; BA5, 2016). According to BA5 (2016), this contrasts with the Indian government that fosters a close relationship with academic institutions, which in turn express pride in their government. BA5 adds that Bangladesh should learn to emulate the trust that exists between government and academia in India (BA5, 2016).

6.2.4 Actors and Agency

The Ministry of Water Resources, River Development and Ganges Rejuvenation (MoWR) is the highest authority that administers policy decisions related to water resources in India. The CWC is India's premier technical organization, and is currently attached to the MoWR. The CWC is responsible for the coordination with the state-level governments on the use and distribution of water resources, including flood control, irrigation, navigation, drinking water supply and water power development (CWC, n.d.).

The Ministry of External Affairs (MoEA) of the Government of India leads negotiations with riparian countries on the Track I level. Negotiations relate to water among other issues, and include MoEA representatives and members of relevant technical committees (Schaffer & Schaffer, 2016). Other actors relevant to the Brahmaputra basin include other government ministries and agencies, such as the Department of Fisheries, the Department of Agriculture and the Inland Water Authorities of India, and individual states such as Assam.

According to IN2 (2016), the most significant group of actors with regards to transboundary water management are bureaucrats who were said to often take decisions based on politics rather than scientific evidence. Such sentiments have clear resonances with a recent World Bank Strategy Report on the northeast of India, which argues that the principal obstacle to the region using its water resources effectively is not disagreement between states, or indeed diversions in Tibet. Rather, according to the Word Bank, the major obstacle is the bureaucratic culture prevailing in India, which it suggests is characterised by "the paternalism of central-level bureaucrats, coercive top-down planning, and little support or feedback from locals" (World Bank, 2006, p. 13).

Interviewees in Bangladesh pointed out that the existing power relationship between India and Bangladesh is reflected in the relations within the JRC. BA2 said that at the JRC level, many decisions are taken just to maintain good relations with the Indian side. They continued: "Even the person who is appointed as a member of JRC needs to have good linkage with the Indian counterpart there. If someone is very knowledgeable but not really acceptable to them [Indian negotiators], the person may not be appointed as the member of JRC" (BA2, 2016).

India's domestic politics, with differing relationships between states as well as between states and the central government, is another key factor that affects cooperation with Bangladesh. According to Bangladeshi interviewees, India needs to manage its domestic state interests (BA2, 2016; BA6, 2016). BA3 (2016) indicated that international treaties are signed by the central government, but relevant state governments have to provide their consent, as water is a state matter. Referring to the signing of the 1996 Ganges Water Treaty, Pandey (2014) argues that the central government consulted the state of West Bengal in the negotiation process, but not the state of Bihar, which is another riparian state to the river. This was justified by India's United Front government that negotiated the treaty, as Calcutta port, located within West Bengal, would be directly impacted. However, the state of Bihar was also affected by the regulated flow of water,

resulting in a state-owned power plant having to shut down which affected the power supply to Bihar (Pandey, 2014).

Within the same state, different leaders acted differently on transboundary water cooperation. When Jyoti Basu was the chief minister of West Bengal, he helped facilitate the Ganges Water Treaty 1996 with Bangladesh (Pandey, 2014). When Basu passed away in 2010, the Bangladeshi parliament unanimously passed a resolution to pay tributes to his death, with the prime minister commenting that "without his support, it was difficult for Bangladesh to have fair share over Ganges water" (IANS, 2010). In contrast, Basu's successor, Mamata Banerjee, raised objections over the signing of the Teesta agreement, and has delayed the process. Basu led the Communist Party of India, which was in turn the leading partner in the Left Front (a coalition of left-leaning parties). This coalition led West Bengal from 1977 till 2011, with Basu in office from 1977 till 2000. Banerjee heads the Trinamul Congress who has been in power in West Bengal since 2011. Basu's collaborative approach towards cooperation with Bangladesh may also have been backed by the fact that Inder Kumal Gujal who was the prime minister heading the United Front, Basu's coalition partner, also pushed for cooperation with Bangladesh as a part of his overall strategy to cooperate with smaller neighbouring states.

Referring to the importance of engaging Indian state governments, BA5 (2016) said: "Teesta also broke down for one reason, because Bangladesh didn't approach West Bengal before that. […] Bangladesh delegates flew directly to New Delhi instead of going through Kolkata. It did not happen in case of Ganges Water Treaty. Bangladesh first approach India, West Bengal and went to Delhi through Kolkata. So all transboundary negotiation has to be through states. We have to bring states into confidence first. Otherwise they feel neglected, side-tracked and they have we have seen, they have so many internal problems. They have internal politics. So Bangladesh has to give due respects to the states and gain their confidence first and then approach Delhi and then they can approach jointly to Delhi."

6.2.5 Other factors

Commenting on other factors important for transboundary water cooperation, some interviewees suggested the need for a change in mind-set (BA2, 2016; BA6, 2016). BA6 (2016) mentioned political will as another key factor affecting cooperation. BA8 (2016) expressed the need for a facilitator to enhance the process of cooperation.

6.3 Chapter conclusion and potential future action situation

In the case of the bilateral cooperation over the Brahmaputra River between Bangladesh and India, there are a number of aspects that emerged as important areas of concern. In addition, India faces significant challenges within its own boundaries including, but not limited to, inter-state power relations and agendas, and increasing climatic stress in the form of droughts, even in rain-rich regions of the northeast, resulting in food insecurity and mass migration. These factors

influence the two nations in ways that render existing formal institutional set-ups inadequate to achieve their stated cooperation objectives.

Bangladeshi interviewees pointed out that data sharing of dry season river flow records by India is instrumental for the lower riparian nation to forecast low flow events, and thereby improve preparedness for agricultural and drought prone areas (BA3, 2016; BA4, 2016). Indian interviewees showed a mixed response in how they see the effectiveness of current cooperation between the two countries – the experts and broader civil society are more compassionate to the general remarks made by Bangladeshi counterparts (IN4, 2016; IN11, 2016). A governmental interviewee believes that existing cooperation is working (IN16, 2016). However, the majority of interviewees from both countries seem to feel that if future steps towards cooperation, based on evidence and data sharing, can be ingrained in the negotiation talks between the two nations, then there are areas of cooperation to be realized.

There is also a need to view cooperation from the perspective of basin-wide and ecosystem-based management that might aggregate the efforts towards a paradigm of shared benefits rather than nationalization of transboundary rivers. From the overall recommendations by interviewees and past or ongoing projects, some areas of possible effective cooperation were highlighted. These are discussed below.

Inland water navigation and fish habitat conservation

Environmental and non-governmental organisations alike have been pushing for riverine species conservation by linking the issue to the overall health of the river, and the sustainable livelihoods of the ultra-poor communities that depend on them. The ongoing BRIDGE GBM project of IUCN Asia argues that research must be conducted to better understand the technicalities of the protocol routes, and to identify management options with dual value: that inland navigation management can be done in a way that increases the flow of rivers to ultimately benefit aquatic fauna (IUCN, n.d.). According to Mishra and Hussain (2012), the waterways are still the most cost-effective and ecologically friendly mode of transport, and will be key for the development of trade, transport, tourism and goodwill between the two countries. Since there are four inland water protocol routes between Bangladesh and India, all of which are major (culturally) shared fish habitats, experts envisage a much anticipated "entry point" to cooperation (Roy & Hussain, 2016). Entry point conjecture is highly favoured by a number of experts in Bangladesh and India, as expressed in an IUCN documentary entitled "River Highways" (IUCN, 2014b).

Science-policy linkages

One of the issues Bangladeshi interviewees stressed is the lack of linkages between scientists and decision-makers in Bangladesh. While this is an issue that may

require efforts by both sides, facilitating multi-stakeholder dialogues that involve scientists and decision-makers can support such collaboration. Bangladesh has the possibility to learn from India’s approach of science-policy linkages that could also support joint capacity building.

7. Action situation 3: India-Bhutan cooperation

7.1 Action situation, outputs and outcomes

Bhutan is the upper riparian country in the Brahmaputra basin. According to India's Ministry of Water Resources (MoWR) website, bilateral cooperation in the water sector between the two countries dates back to 1955, when India's Ministry of External Affairs (MoEA) sponsored a scheme for flood warning measures in India. Following this scheme, 19 rain gauge stations and eight wireless stations were set up by the MoEA and subsequently handed over to the Royal Government of Bhutan (Ministry of Water Resources, 2016b). They also cooperate on flood control and ecological preservation through the Joint Group of Experts (JGE) on Flood Management. The JGE looks at effects of recurring floods and erosion in the southern foothills of Bhutan. Additionally, a Joint Expert Team (JET), consisting of officials from India and Bhutan, has been in operation since 1979 to prevent the recurrence of floods on shared rivers (Mondal, n.d.). India and Bhutan also run the 'Comprehensive Scheme for Establishment of Hydro-meteorological and Flood Forecasting Network on rivers Common to India and Bhutan', which consists of 32 hydro-meteorological and meteorological stations in Bhutan that are funded by India. According to the MoWR, the CWC uses data received from these stations to formulate flood forecasts (Ministry of Water Resources, 2016b).

Hydropower cooperation between Bhutan and India started in 1961, with the signing of an agreement to construct the 25 MW-Jaldhaka hydro power dam, located on the Jaldhaka tributary running from Bhutan to India into the Brahmaputra River. Other major treaties on hydropower dam development between the two countries include the 1974 Chhukha Agreement, the 1994 Kurichu Agreement, and the 1996 Tala Agreement (Premkumar, 2016). In 2006, the two countries signed a cooperation agreement on hydroelectric power (Embassy of India to Russia, 2006). According to the protocol of this agreement, signed in 2009, the Indian government agrees to assist Bhutan in developing a minimum of 10,000 MW of hydropower, and to import surplus electricity to India by the year 2020 (Protocol to India-Bhutan Hydropower Agreement, 2009).

There are 10 hydropower projects being developed under the 2006 India-Bhutan Hydropower Agreement (Bisht, 2011). Six are run-of-the-river hydropower projects, and four are large reservoir-based projects. During the current phase of the cooperation, changes in financial modality are proposed as 70 per cent loan and 30 per cent grant (Premkumar, 2016). The proposed project modality is mostly based on joint venture companies from each country bringing 50 per cent of project finances. In Bhutan, this would include project-specific joint venture companies, including the Druk Green Power Cooperation (DGPC), a Bhutanese government owned corporation. The joint venture modality has a built-in debt equity ratio of 70:30, whereby equity is split between the joint venture companies, and debt is raised on the open market (Bisht, 2011).

Bhutanese actors, including those from the private sector, are reluctant to adopt the new modality due to elevated risk compared to earlier stages of India-Bhutan cooperation, which was largely based on the inter-governmental model (Bisht, 2011; Premkumar, 2016). The inter-governmental model is implemented by an independent project authority established by both governments. In this model, after two years of implementing the project, the project authority is dissolved into the DGPC. The project cost is financed by grants and loans from the Indian government (Premkumar, 2016).

Table 6: Projects under 2006 Agreement. Source: Bisht (2011).

Name of the project	**Installed capacity**	**Estimated project cost (million Nu)**	**Implementation model (loan-grant ratio)**	**Year of commissioning expected**
Punantsangchhu-I	1200	36,348	IG (64:40)	2015 (under construction)
Punantsangchhu-II	1000	42,301	IG (70:30)	2017 (agreement signed)
Mangedechu	720	38,105	IG (70:30)	2017 (agreement signed)
Kuri Gongri	1800	79,200	IG (70:30)	2020 (on hold)
Bunakha	180	12,240	JV (70:30) (THDC)	2020
Sankosh	4060	42,301	IG (70:30)	2020 (on hold)
Wangchu	900	50,400	JV (70:30) (SJVNL)	2020
Chamkarchhu-I	670	37,520	JV (70:30) (NHPC)	2018
Amochhu	620	39,680	IG (70:30)	2017
Kholongchu	650	25,272	JV (70:30) (SJVNL)	2018
Total	**11,636**	**500,263**		

As interviewee BT5 (2016) says, the existing model of hydropower development in Bhutan by Indian investment is highly inter-governmental. BT4 (2016) explains that while India provides a mixture of grants and loans to Bhutan to develop hydropower, it is still Indian construction companies that do most of the business, hiring mostly Indian workers. This point was echoed by a report by the Vasudha Foundation, which examined issues related to the India-Bhutan Energy Cooperation Agreements, and the implementation of hydropower projects in Bhutan (Premkumar, 2016). As stated by BT4 and BT5, this is often equated with the paternalistic attitude of India towards Bhutan, since it shows India seems to exercise considerable influence on the terms of trade (BT4, 2016; BT5, 2016). This is further explained by Akter (2016), who argues that India has always insisted on having bilateral negotiations with its riparian nations, and adopts separate approaches to deal with each of them to tackle its own water shortages.

Indeed, Bhutanese interviewee BT5 suggested that greater attention should be paid to examining the impacts on the Bhutanese ecosystem, as well as whether projects considered conducting detailed impact assessments. They said that "of the 23 glacial lakes that are prone to bursting, about eight […] lie along the Puna Tsang Chu River [a tributary of the Brahmaputra]; and it is also an irony at best so to say that most of the hydropower projects that are coming up in the country are in this river basin!" (BT5, 2016). They argued that, if asked, the government would say that even if there was a glacier flood, the existing hydropower plant would be able to withstand the force of water. However, the government does not have any empirical evidence to suggest that this is the case, according to the same interviewee (BT5, 2016). BT4 (2016) stated that the whole ecosystem of Puna Tsang Chu River is devastated; river and mountain ecologies have been hit. BT5 (2016) maintains that doubt exists over how well Bhutanese authorities really know the river system and, for example, the impacts these hydropower plants cause the aquatic life of the river. They said: "we really don't know what the impact of this hydropower project is on the aquatic life of the river. No comprehensive study has been done" (BT5, 2016). They also drew an example stating that the only so-called independent research conducted on Puna Tsang Chu 1 and Puna Tsang Chu 2 plants, and that this was done by a college student. They added: "independent research is very difficult to do in Bhutan and the major problem is the lack of access to funding […] and we literally have no environmental NGO's and CSO's over here private I mean or independent. RSPN [Royal Society for Protection of Nature] is partly governmental" (BT5, 2016).

In contrast to Bhutanese interviewees, not many Indian interviewees spoke about India-Bhutan cooperation in detail. Interviewee IN11 (2016) stated that it is not a black-and-white relationship. Echoing BT4's take on the facts of the status of cooperation, they agreed that, though the hydropower plants are located in Bhutan and therefore adds to Bhutan's GDP, it is nevertheless, in turn, more beneficial for the India: according to the same interviewee, there are "Indian companies with Indian money making hydropower infrastructures to consume well over 85 per cent of that generated electricity – this is not a Bhutanese project so I effectively call it Indian project" (IN11, 2016).

7.2 Factors affecting cooperation

As illustrated in Figure 11, there are a number of factors that affect cooperation between India and Bangladesh on shared water issues.

7.2.1 Contextual factors

Bhutan is rich in water resources with a per capita availability of 75,000 m³ a year, one of the highest in the region (Boruah, 2015). The major rivers in Bhutan flow from north to south and carry an estimated potential 30,000 MW of hydro-power generation (IDSA Task Force, 2010). This massive potential for Bhutan to generate and export clean energy gives the Bhutanese landscape an immense value for India with its growing demand and power deficit (Premkumar, 2016). India faces growing energy demand, while current supply is limited. This is a tremendous challenge for the country with its rapidly growing population and economy. According to a report published by the International Energy Agency in 2015, 20 per cent of the Indian population, (240 million people), lack access to electricity. The report indicates that this figure fluctuates depending on the individual survey as the Census of India 2011 indicates 400 million are without electricity (International Energy Agency, 2015, p. 28). India currently relies heavily on fossil fuel for its energy, as in 2013, 44 per cent of its electricity was generated by coal, and 23 per cent by oil (International Energy Agency, 2015, p. 23).

Tortajada and Saklani (2016) report that Bhutan's hydropower generation potential accounts for one third of India's hydropower potential. While there are plans to develop hydropower dams in the northeast of the country, mainly on the Brahmaputra River, India has unable to develop these resources due to regulation and implementation issues. According to Tortajada and Saklani (2016), more than 93 per cent of the total potential in the northeast remains untapped (Tortajada & Saklani, 2016). One of the reasons for this is relatively strong local resistance to hydropower dams in India, including in the northeast. As an illustrative example, the Lower Subansiri dam planned in Arunachal Pradesh faced vehement protests from local residents in Arunachal Pradesh and residents in Assam, making the project highly politicized. As a result, construction of the dam has been on hold for more than five years (Sharma, 2012).

India committed to shift 40 per cent of its electricity capacity away from fossil fuel-free sources by 2030 as part of its Intended Nationally Determined Contributions targets under the United Nations Framework Convention on Climate Change (UNFCCC). Achieving this target would require adding between 196 and 276 GW of renewable energy sources for India, which is a challenging target (Pulla, 2015). Given strong resistance to building hydropower dams in its own territory, it is reasonable to consider India's incentive in investing hydropower dams in Bhutan, as a way to shift its energy mix domestically.

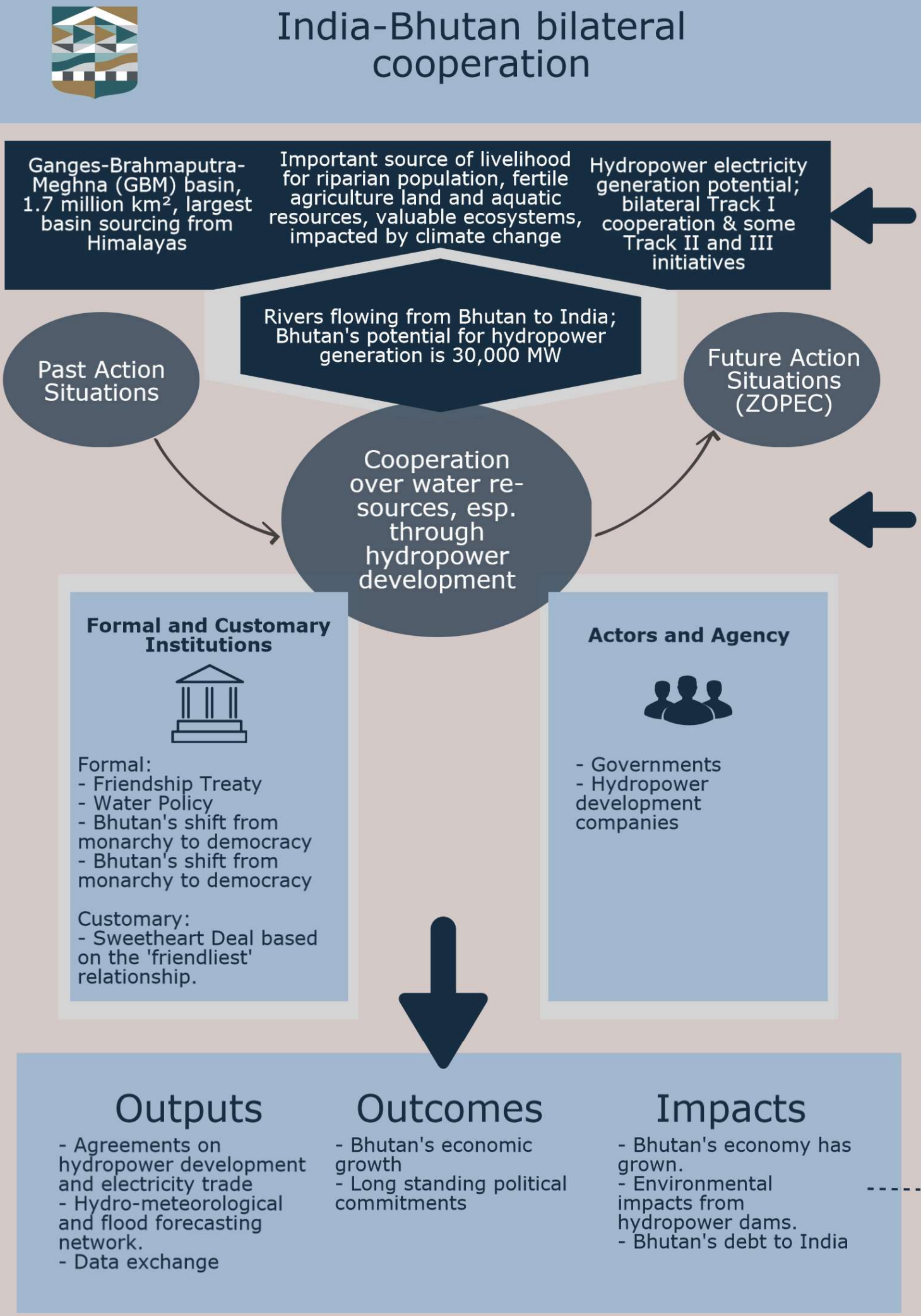

Figure 11: Factors affecting the water cooperation between India and Bhutan.

As of 2015, Bhutan had completed six hydropower projects, tapping into 6 per cent of its 30,000 MW electricity generation capacity. Bhutan currently generates 1608 MW of electricity, 300 MW of which it uses for domestic consumption. While the country has a huge electricity surplus in the wet season, it has an electricity deficit during the dry winter season. This means that Bhutan has to import electricity from India (Premkumar, 2016).

Bhutan's overall socio-economic development, and its relationship with India, are also important factors affecting cooperation. Since India's independence in 1949, it has provided development assistance to Bhutan. India has been the main donor supporting Bhutan's five-year socio-economic development plans that started in 1961 (see Table 7). Bhutan's economy has strong linkages with India as 80% per cent of all imports come from India and 90 per cent of its exports go to India (Premkumar, 2016).

Table 7: *India's contribution to Bhutan's Five-Year plans. Source: Premkumar (2016, p. 8).*

Year (Plan)	Total allocation (Rs cr*)	India's contribution (Rs cr*)	Percentage of India's contribution in total allocation (%)
1961 (1st Plan)	10.72	10.72	100
1966 (2nd Plan)	20.22	22.22	100
1971 (3rd Plan)	47.52	42.66	90
1976 (4th Plan)	110.62	85.30	77
1981 (5th Plan)	444.05	134.00	30.2
1987 (6th Plan)	950.00	400.00	42.1
1992 (7th Plan)	2350.00	750.00	31.9
1997 (8th Plan)	4000.00	1050.00	26
2002 (9th Plan)	8900.00	2610.14	29.33
2008 (10th Plan)	14900.00	3400.00	23
2013 (11th Plan)	21300.00	45.00.00	21

** Rs 100 cr = Rs 1 billion*

7.3.2 Formal institutions

One of the key international agreements that provides a basis for the relationship between India and Bhutan is the Treaty of Friendship, which was signed in 1949 and revised in 2007. The 1949 version of the treaty granted India a considerable role in the development of Bhutanese foreign policy (Treaty of Friendship, 1949). The 2007 amendment grants Bhutan more sovereignty in this area (India-Bhutan Friendship Treaty , 2007). It also provides the basis for free trade and economic cooperation between the two countries (Treaty of Friendship, 1949, Art. 5).

According to one Bhutanese government official, Bhutan can play a greater role in the region, especially in the environmental sector as Bhutanese policies and legislation, as stated in its constitution, supports conservation and environmental

protection (BT3, 2016). Article 5, Clause 1 of the Bhutanese constitution stipulates, among other things, the "fundamental duty of every citizen to contribute to the protection of the natural environment" – that every Bhutanese is a trustee of the nation's environment and its resources. Moreover, Clause 3 stipulates that: "a minimum of sixty per cent of Bhutan's total land shall be maintained under forest cover for all time" (Constitution of the Kingdom of Bhutan, 2008). BT3 (2016) points out that "even before the constitution came into force, we had our leadership protecting our environment." This highlights a very crucial intersection between the modern (democratic constitutional) and the historic (monarchical) institutions. It is important to note that the modern and the historic institutions are considered to be formal as Bhutan was a full-fledged kingdom with a king as the highest decision maker on all national issues until the country introduced democracy in 2008. According to Sinpeng (2008), this pro-environmental mind-set in the current constitutional setup is an extension of the already deeply imbibed age-old culture of keeping nature pristine practiced by the King's family lineage and the people of Bhutan as a whole.

Before 2008, the king's family and its political agenda seemed to have kept Indo-Bhutan relations stable. It is this historic relationship between the two, starting with the Jaldhaka Agreement of 1961, which perpetuates the so-called 'sweetheart deal', which means that Bhutan is able to boost its economy through investment from India in hydropower and, in return, India enjoying lower power costs courtesy of Bhutan (Ganapathy, 2013).

It is important to look at what brought about the democratisation of Bhutan to understand any influence it has on the institutional aspect of the Bhutan-India relationship. According to an analytical media report by The Globalist, "[t]he political transformation was a royal directive, rather than the result of socio-economic change" (Sinpeng, 2008). This is seconded by the fact that political parties were illegal in Bhutan until mid-2007 (Encyclopaedia Britannica, n.d.). The ban was lifted by a royal decree, establishing Bhutan as a parliamentary democracy. The People's Democratic Party was the first legal party to be registered, followed shortly thereafter by the Bhutan Peace and Prosperity Party. These two parties were the sole contestants in elections held in 2007 and 2008. As The Globalist reports, on March 24, over 80 per cent of eligible voters cast their votes under order of the king (Sinpeng, 2008).

According to the king, the goal of Bhutan is not to necessarily reach democracy, "but a part of good governance and a key pillar of the King's ultimate objective — to achieve Gross National Happiness" (Sinpeng, 2008). Gross National Happiness (GNH) is considered as the official measure of well-being in Bhutan, as outlined in the constitution that "[t]he State shall strive to promote those conditions that will enable the pursuit of Gross National Happiness" (Constitution of the Kingdom of Bhutan, 2008, Art. 9). In an interview, the Bhutanese prime minister summed up the relationship of GNH to hydropower development of the nation in an interview with Bhutanese news agency NPR: he highlighted that all hydropower constructions so far are run-of-the-river, not reservoir-type dams, making them

as environmentally friendly as possible given the latest offerings of technology. Since hydropower fuels the economy, the minister believes that its gains offset its disadvantages. The minister further elaborated that Bhutan's GNH and pro-environmental philosophy of development will give neighbouring countries an opportunity to use green energy, allowing them to offset millions of tonnes of carbon dioxide they would otherwise produce (Martin, 2016). This statement indicates how a leader from the democratic government views the formal institution of GNH, constitutional and customary to Bhutan, and how it creates a political space and incentive for other countries in the region to seek economic cooperation through hydropower. This is a vital area where the formalization of customary and constitutional spheres is intertwined. As Sinpeng (2008) describes, the Bhutanese have always voiced great reverence toward the monarchy, and satisfaction towards its policies rooted in safeguarding the natural environment. This unique move to democracy therefore seems to be based on an overall social and political consensus deeply rooted in the trust the people have for the royal family – a view echoed by numerous interviewees (BT2, 2016; BT3, 2016; BT4, 2016). According to BT1 (2016): "There is not much difference between our government and the community peoples."

Bhutan's Water Policy was first drafted in 2002 (Singh & Karki, 2004), and was published by the National Environment Commission (NEC) in 2003 as the 'Bhutan Water Vision and Bhutan Water Policy', a single document (NEC, 2003). Later, the NEC also re-published the water policy in 2007, independently from the 'Bhutan Water Vision 2025', unchanged (NEC, 2007). The policy considers water resources management to be based on natural river basins, and hence highlights the need for appropriate institutional structures at the basin level (Gawel & Ahsan, 2014). The policy recognizes the tremendous potential of hydropower for socio-economic development, as well as its potential to earn export revenues. As articulated in the policy, transboundary water issues are to be dealt with in accordance with international law and conventions to which Bhutan is a signatory and need to take the integrity of the rivers as well as the legitimate water needs of riparian states into consideration. 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. Hence, the water policy of Bhutan expresses the benefits of regional water cooperation (NEC, 2007). However, this research did not identify evidence of to what extent this plays a role in influencing or strategizing water related negotiations with India.

Bhutan's water policy has incorporated Integrated Water Resources Management (IWRM) as a guiding principle for water resources management in the country. The policy stresses that management of water resources will be at the river basin level in recognition of the impact of land use of water resources and upstream-downstream linkages (National Environment Commission, 2007, Sec. 6.2). The need for such umbrella legislation was clearly felt in the face of increasing water demands in various sectors, and the existing fragmented management structure

for water resources. The policy stresses that sustainable water resources management can only be achieved through the integration of conservation, development and scientific management of water resources. It advocates the management of water resources at river basin levels and with active stakeholder participation. The Water Policy 2007 in its introduction section admits that the current water management institutions work independent of each other and that this lack of coordination has resulted in fragmented data, duplication of efforts and weak resource management systems (section 1.8). There are no institutional linkages or coordinated planning of the entire water sector.

The Bhutan Water Policy also outlines the importance of working out trade-offs among the upstream and downstream water and land users as a strategy to foster development of hydropower and energy generation in Bhutan. In section 5.4.2, the policy clearly indicates that hydropower is the backbone of Bhutanese economic development, and section 5.4.3 indicates that it is a source of clean energy (NEC, 2007). This reiterates the importance of hydropower cooperation between Bhutan and India to the Bhutanese economy. As the majority of the related projects are funded by India, and as the relationship with India related to implementation of hydropower projects is a politically sensitive one, Premkumar (2016) suggests that this 'political sensitivity' is creating an information blackout for the citizen. Although, according to the Water Act of Bhutan 2011, "[a]ll citizens shall have access to water related information" (Royal Government of Bhutan, 2011, Sec. 11), none of the hydropower projects (operational, finished or under planning) in Bhutan, sourced from Indian investments, have any publicly shared documents (Premkumar, 2016). Premkumar also reports that there is "documented evidence of negative impacts of several projects on the local ecology" (Premkumar, 2016, p. 25) that shows the implementation of hydropower projects without adequate risk assessment and mitigation plans. This is also a matter of concern since Bhutan's political philosophy stands for conservation and protection oriented development and strives for GNH rather than GDP.

In 2008, the Bhutanese government published Sustainable Hydropower Development Policy. This policy provides the details of how to develop hydropower, roles of key state actors in hydropower development, modality of development, and social and environmental considerations required for development of hydropower dams. The policy requires conducting environmental impact assessment for all projects (Ministry of Economic Affairs, 2008).

The Power System Master Plan provides an estimate of the total hydropower potential of Bhutan to be 30,000 MW, with a production capacity of 120,000 GWh. The plan identified 76 economically viable locations for hydropower projects that cover every river in Bhutan. Currently, there are 58 projects planned by 2030 (Premkumar, 2016).

Furthermore, one of the most recent Bhutanese national water legislations is the Water Act of Bhutan 2011. In this Act, no mention is made of international cooperation or the shared governance of river basins, but rather outlines a national integrated water resources management for the coordinated development,

management, conservation and efficient use of the country's water resources. Additionally, it states that the National Environment Commission will exercise the powers and discharge the functions conferred under the 2011 Act. Chapter 10 of the Act is devoted to the construction of water infrastructures and prevention of flooding, yet no mention is made of any partnership with or funding by India (Royal Government of Bhutan, 2011).

7.2.3 Customary institutions

Bhutan and India are seen as the friendliest nations to each other in the region (PTI, 2014). It is often dubbed that India has a so called 'sweetheart deal' with Bhutan, as India provides favourable conditions for purchasing electricity from Bhutan (Ganapathy, 2013). For India, the sweetheart deal to Bhutan is more of a political will based on an economic rational of win-win, as mentioned earlier. On the other hand, the long-standing cooperation between India and Bhutan has been based on the pre-existing diplomatic relationship between the two. IN15 (2016) explained the 'sweetheart deal' as a politically costly position for India because India can buy the electricity at a lower rate from the domestic producers. They added that contrary to the common belief, it is not true that huge quantities of electricity is flowing from Bhutan to India. It might be a large share of Bhutan, particularly as the electricity sale to India makes up a large percentage of Bhutan's GDP, but for India, Bhutan's electricity demand would be less than 1 or 2 per cent of that of India and thus hardly matters to them. Assessing this situation, IN15 said "I would say it is a political price that India is importing electricity from Bhutan since India has many big companies and well renowned ones NTPC, NHPC etc. to produce its own electricity. It's not an economical price, it couldn't be. India wants at least a friend in South Asia region" (IN15, 2016).

7.2.4 Actors and Agency

The major actor in Bhutan is the National Environment Commission (NEC) as the apex body to administer any water resources related policy decisions nationally. The Bhutanese Water Act from 2011 was designed with the NEC as the main coordinating body on the national level and as the custodian of the act (BT3, 2016). The Ministry of Agriculture and Forests, and the Department of Forest and Park Services, protect the forests and national parks. This is a very important aspect of the Bhutanese view of nature and reflects their understanding of forest and water as a combined ecosystem and not as separate because, as BT3 expresses, "forests are so important for the water" (BT3, 2016).

In August 2001, the Royal Government of Bhutan established a multi-stakeholder body called Bhutan Water Partnership, comprising of relevant agencies in the water resources sector, as a mechanism to coordinate and formulate the national water policy as well as Bhutan's water vision and to coordinate action plans for integrating water resources.

The Department of Hydropower and Power Systems (DHPS) and the Department of Hydro-Meteorological Services (DHMS) are the two important departments in Bhutan. The latter deals with national collection of hydrological and meteorological parameters, the first develops policy based on technical knowledge provided by a number of agencies alongside the DHMS (Ministry of Economic Affairs, 2008; BT2, 2016; BT3, 2016).

Druk Green Power Corporation (DGPC) is a major player and is the owner of the hydropower projects in the country in the sense that it operates and maintains the projects. DGPC is staffed by government employees and thus not a regular private sector business *per se,* but meets all other criteria commonly related to businesses such as creating revenue by generating and selling electricity (BT2, 2016). According to the website of the Druk Holding and Investments (DHI), it is a holding company and "the commercial arm of the Royal Government of Bhutan" with the government being the sole shareholder (DHI, n.d.). They hold almost all national assets for the benefit of the country. According to interviewee BT2 (2016), this set-up is designed so that the mainframe political system does not affect the wealth of the people of Bhutan. The DHI is governed by a separate charter to ensure that the business benefits and dividends accrue to the people of Bhutan (BT2, 2016).

According to interviewees, while NEC is the custodian of all environmental related decisions in Bhutan, it does not have a major say in matters of cooperation at regional scale (BT3, 2016; BT5, 2016). This is possibly the case since it is the Ministry of External Affairs in consultation with DHPS and DHMS, which participates in all bilateral negotiations. There is also no regional formal institution that deals with the Brahmaputra or other sub-basins along the stretch of the Brahmaputra basin.

However, this has also meant that Bhutan has not been able to influence other major bilateral and multilateral cooperation in the hydropower sector. For instance, as BT4 (2016) explains, "According to my senses, India, as you know, has a very dynamic relationship with China." China and India share large trade volumes and small countries such as Bangladesh, Nepal and Bhutan get caught in between their power struggle and the preferences thereof: India has reasons to passively disallow Bhutan from forming diplomatic relationships on trade with China blocking potential cooperation. In addition, BT4 (2016) suggests that Bhutan's almost full dependence on India will play a part for Bhutan to negotiate with any other riparian's since it has a stronghold on the negotiations with India.

Some Indian interviewees expressed the view that the basis of this cooperation is not as simple as India convincing Bhutan of the economic merits of hydropower, building hydropower plants in the latter country, and then buying the power from Bhutan to supply its demand (IN14, 2016; IN15, 2016). IN15 (2016) asserted that "[i]t is more to do with geo-economics". Hydropower is one of the cleanest ways of power generation and in high altitudinal landscapes like Bhutan, the natural slope is used for run-of-the river plants to generate power. This seems to be advantageous for both sides. By investing in Bhutan, India supports the Bhutanese

economic development on the one hand[16], and keeps close diplomatic ties with Bhutan on the other. As Bhutan shares a border with China, this enables India to manoeuvre against any strategic disadvantage that might arise if Bhutan were to strike a diplomatic agreement with China on hydropower or other substantially wealth-generating sectors (Gallenkamp, 2010). According to interviewee IN15 (2016), chiming in with Gallenkamp (2010) and Akter (2016), India has the power to devise skewed terms of negotiations with other smaller countries in the region. That is most likely the case as India has large power companies, like the NTPC Ltd. and NHPC Ltd., which the government has an interest in supporting as these large companies are the financial backbone of today's India that employ an immense labour force. Moreover, Akter (2016) points out that Bhutan is a political safety-net from the constant deliberations from China to construct road and military movements along borders. Transboundary water cooperation, particularly through hydropower between India and Bhutan is therefore connected to regional geopolitical security, with China, India and Bhutan.

7.3 Chapter conclusion and possible future action situations

As analysed in this chapter, India and Bhutan have a high degree of pre-disposition towards future cooperation. First, unlike Bangladesh, Bhutan's water is more of a 'cash-crop' for India and Bhutan through the development of hydropower. This contrasts starkly with the status of cooperation with Bangladesh where water is used for a variety of uses such as agriculture, disaster safety, inland navigation, and fish biodiversity conservation that use the riverine ecosystem services. Cooperation to share becomes the face of conflict and political dead-ends, rather than using the same resource as a 'cash crop'.

Bhutan made significant commitments to the maintenance of biodiversity and ecosystem services, but arguably these have the potential to be in conflict with cooperation projects with India to expand Bhutan's hydropower significantly towards 10,000 MW. However, there is a possible area for India to potentially invest in hydropower dams in a way that does not undermine Bhutan's environment goal through its design. One way would be for India to support and collaborate with Bhutan in the cumulative environmental impact assessment from all the hydropower dams in Bhutan, rather than taking a single investment approach. Another possible area for cooperation would be to ensure the inclusion of local (Bhutanese) enterprises and experts in hydropower investment by India. Ensuring that Bhutanese hydropower dams are developed and operated in a sustainable manner that minimizes changes and impacts downstream would also

[16] According to Gallenkamp (2010), 95% of Bhutanese exports and 79% imports are to and from India, respectively, and the majority of foreign aid received by Bhutan is from India. Further, the arrangement that India invests in Bhutan for clean power and furthering employment of Indians in the construction sector (of Bhutan) as its win and, in return, Bhutan enjoys the economic benefit of selling surplus domestic power to foreign earnings (referred by interviewee IN15) is a clear win-win scenario.

be of interest to India as it is the downstream country to Bhutan that would receive the direct impact from any consequences of hydropower dam development.

The other area of developing cooperation equitably is in the construction sector of hydropower projects. As mentioned earlier, the Bhutanese construction companies are leanly represented in the projects whereas Indian companies get the majority of the opportunities. Ensuring inclusion of more Bhutanese construction companies and experts will benefit Bhutan in capacity development of the sector and create employment opportunities. For India, it could mean saving of labour costs as Bhutanese construction workers who are often less experienced may cost less once they are trained as compared to the Indian workers.

8. Action Situation 4: Bhutan-Bangladesh cooperation

8.1 Action situation, outputs and outcomes

Cooperation between Bhutan and Bangladesh started relatively recently. In October 2015, the Bhutanese Minister of Economic Affairs and the Bangladeshi State Minister visited a high-voltage direct current (HVDC) back-to-back station of the Bangladeshi Power Grid Company (PGCB) (PGCB, 2015; Rahman, 2016). Following this visit, the Bangladeshi minister for energy visited Bhutan in December 2015 and expressed an interest to invest in hydropower (BT2, 2016). In March 2016, local media reported that Bangladesh was mulling the investment of USD 1 billion in hydropower dams in Bhutan (Rahman, 2016). The main interest of Bangladesh towards Bhutan is its potential for electricity generation, which Bangladesh is interested in purchasing (BA1, 2016; BA5, 2016). Bangladesh would like to invest in the hydropower for cleaner and cheaper electricity in the face of increasing electricity demand (BA1, 2016). BA5 (2016) pointed out that Bangladesh is not particularly concerned about hydropower development in Bhutan, although Bhutan is located upstream from Bangladesh. Rather, Bangladesh is interested in purchasing electricity produced by Bhutan (BA1, 2016; BA5, 2016).

In October 2016, India informally agreed to the Bangladeshi investment in Bhutan. Bangladesh is investing in the Dorjilung hydropower project with capacity of 1125 MW. This makes Bangladesh the first country to invest in a major hydropower project in Bhutan, apart from India (Lamsang, 2016). According to Bhutanese media, India is also interested in investing in the Dorjilung project, thus requiring negotiations among the three countries (Lamsang, 2016). In relation to this, BT2 (2016) mentioned that Bhutan suggested a trilateral MoU with Bangladesh and India on hydropower development. In October 2016, Bhutanese media reported that Bhutan and Bangladesh have signed an MoU, and is awaiting India's agreement (Lamsang, 2016). India agreed to the content of MoU in 2017, after requesting some amendments (Lamsang, 2017).

Bangladeshi interviewees mentioned Bhutan as part of sub-regional cooperation (BBIN), which will be discussed in greater detail in Chapter 13 (BA5, 2016; BA7, 2016; BA8, 2016). According to BA7 (2016), this cooperation initially took place between India and Bangladesh only, but Bangladesh suggested to include Bhutan and Nepal with intention to have a wider basin approach to water management. Referring to potential cooperation over electricity from Bhutan and Nepal, another Bangladesh interviewee hopes that this cooperation will create a situation of 'benefit sharing' among riparians (BA1, 2016). It would allow Bangladesh to purchase cleaner and possibly cheaper electricity compared to natural gas, diesel, furnace oil and coal (BA1, 2016) that currently supply over 93 per cent of electricity used in Bangladesh (Bangladesh Power Development Board, 2016).

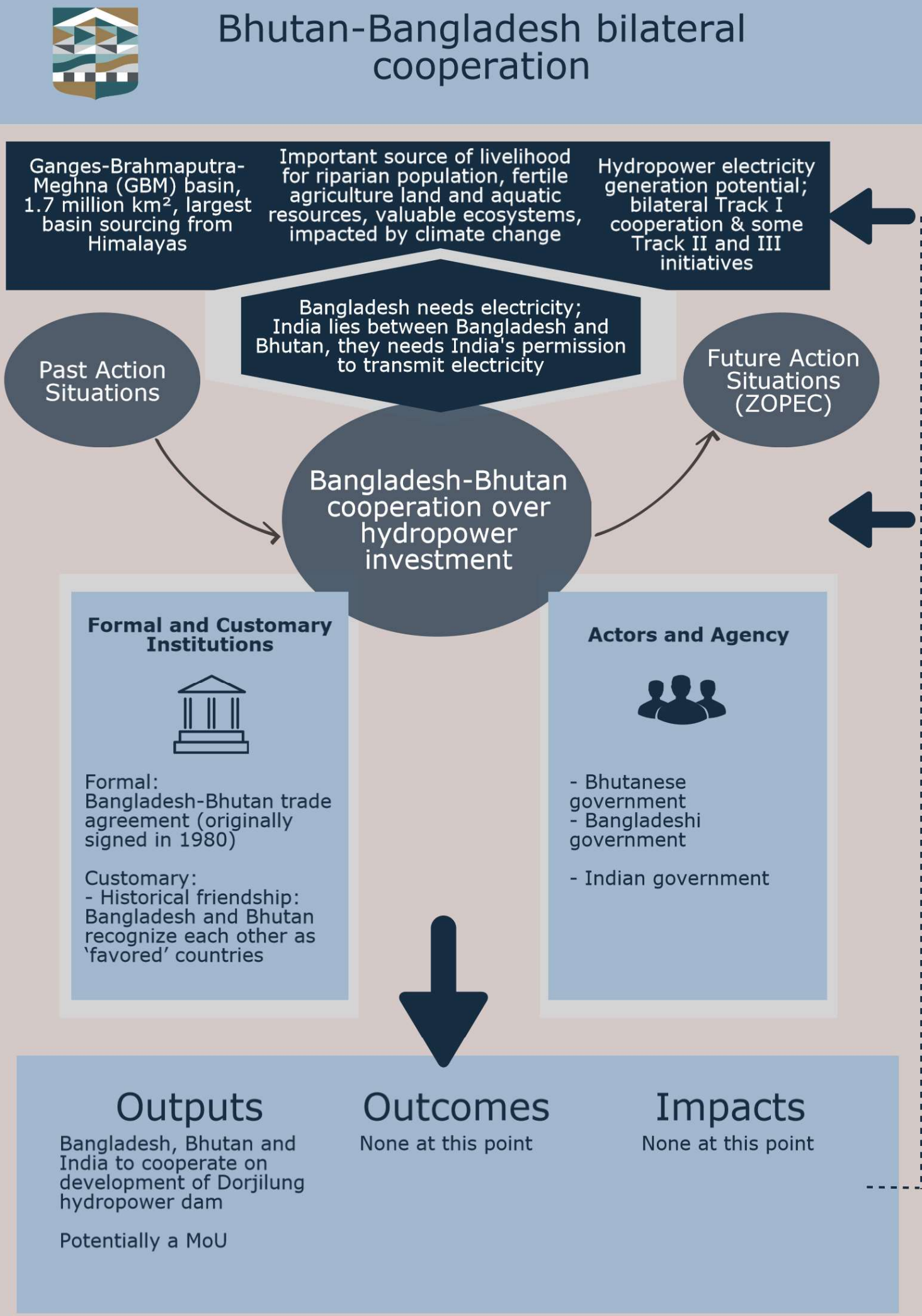

Figure 12: Factors affecting the water cooperation between Bhutan and Bangladesh.

8.2 Factors affecting the cooperation

Figure 12 illustrates the factors affecting existing cooperation between Bangladesh and Bhutan.

8.2.1 Contextual factors

Bhutan and Bangladesh do not share a border. Transmission lines that cross India are needed to transmit electricity generated in Bhutan to Bangladesh. This, in addition to India's political and economic influence within the region, affects cooperation between Bhutan and Bangladesh. It will be discussed in detail in the section on actors and agency.

Bangladesh suffers from lack of access to energy that creates an incentive for the country to explore additional energy sources. As of 2013, more than half of the country's population has no access to electricity. There are frequent power outages, and energy demand is nearly twice as much as its electricity generating capacity (Asian Development Bank, 2013).

8.2.2 Formal Institution

Bhutan and Bangladesh originally signed a bilateral trade agreement in 1980. After negotiations with India on trans-boundary transit rights, trade started in 1988 (Ngawang, 2016). The bilateral trade agreement was renewed in 2009 and 2014 respectively (Ministry of Foreign Affairs, 2015). Article II of this agreement indicates Bhutan and Bangladesh to grant each other most favoured nation status in various aspects of their trade (Bhutan-Bangladesh Trade Agreement, 2014).

8.2.3 Customary Institution

Links between Bhutan and Bangladesh date back to 1971 when Bangladesh became an independent country, and Bhutan was one of the first countries to recognize Bangladesh as an independent state (Ministry of Foreign Affairs, 2013). This relationship may be one of the reasons for Bangladesh and Bhutan to recognize each other as most favoured nations, (Bhutan-Bangladesh Trade Agreement, 2014, Art. II), an important factor that can facilitate cooperation.

8.2.4 Actors and Agency

Key actors that influence this action situation include governments of Bhutan and Bangladesh, particularly the ministries related to hydropower production such as the Department of Hydropower and Power Systems (DHPS), the Department of Hydro-Meteorological Services (DHMS), Bhutan's NEC, and the Energy and Mineral Resources Division of Bangladesh.

In addition, the Indian government plays an important role in the relationship between Bhutan and Bangladesh. As India lies in between Bhutan and Bangladesh, any power transfer needs to cross Indian territory, requiring both parties to obtain India's consent to establish energy trade.

The fact that India is in discussion with Bhutan and Bangladesh to allow trade in electricity is significant. Historically, India has enjoyed the upper hand in political and economic relationships with Bhutan and Bangladesh. As BT4 (2016) points out, India has taken a paternalistic attitude towards Bhutan, (and Nepal and Bangladesh), so without India's formal agreement for transit of power exports to Bangladesh, there is little or no chance for such engagement. BT4 (2016) and BT5 (2016) raise concerns that this political dynamic, particularly as Bhutan is fully dependent on India for its export earnings, tends to make potential cooperation for Bhutan with the riparian nations obsolete. As discussed in Chapter 7, until recently, Bhutan relied on India for its foreign policy (India-Bhutan Friendship Treaty, 2007; BA8, 2016). Bhutan's location as a landlocked country bordering only China, means that it needs to transit all goods through India (BA1, 2016), creating a hegemonic situation for India.

India has maintained its hegemonic situation towards Bangladesh, one of the reasons being Bangladesh's economy is heavily dependent on India, as the country does not have rich natural resources and is surrounded most of its border by India. In 2002, Bangladeshi export to India was USD 43.58 million, and imports from India were USD 1018.55 million, resulting in a trade deficit of USD 974.97 million (Inoue et al., 2004).

The economic and political dependency of Bangladesh and Bhutan on India had previously undermined efforts to negotiate an electricity deal between the countries. Therefore, India's willingness to facilitate electricity investment is a significant achievement. Field interviews did not identify any specific reasons for India's motivation in this area. However, one possible reason is that countries such as China are starting to invest in South Asian countries, including Bangladesh, changing the economic power balance among countries in the region. In this context, India has an incentive to participate in its small neighbours' cooperation projects, rather than restricting them. This shift is something that has future potential for cooperation, which will be discussed further in Chapter 13.

However, before buying into the euphoria of hope of sub-regional cooperation between Bangladesh, Bhutan, India and Nepal, it would be prudent to look at the reasons for India's diversion from its decades-old policy of bilateralism in the region. India's relationship with Pakistan has deteriorated considerably since early 2016. China's firm support for Pakistan has pushed India to improve its relationship with Bangladesh and Bhutan. In November 2016, Pakistan was scheduled to host the South Asian Association for Regional Cooperation (SAARC) Summit, but India persuaded Bangladesh, Bhutan, and even Afghanistan to boycott the summit, resulting in its cancellation (AFP, 2016; The Hindu, 2016a). Thus, India's acceptance of a multilateral approach on shared rivers with Bangladesh, Bhutan and Nepal is less due to consideration of improving water management, more of a

strategic decision to create a 'bloc' against Pakistan. Water cooperation therefore remains a hostage to the whims of regional power politics.

This is not the first time that India has agreed to the possibility of a multilateral arrangement on sharing international rivers. In 1986, while India was in negotiations with Bangladesh to find long-term solutions to the sharing of the Ganges River water at the Farakka Barrage, it consented to Nepal being part of arrangement (Swain, 2004). However, although India formally agreed to explore a trilateral option, there was no whole-hearted support for it as India saw its water interests best served by a bilateral arrangement. Ultimately, nothing came out of this trilateral approach. The same mind-set seems to still dominate India's water negotiators in particular, and its political elites in general.

8.3 Chapter conclusion and possible future action situations

This chapter analysed cooperation between Bhutan and Bangladesh. While there is no specific cooperation over the Brahmaputra water, Bangladesh is investing in Bhutanese hydropower development. The countries' location, either side of India, creates barriers for the two nations to cooperate over electricity transmission. However, this situation is gradually shifting with India's recent willingness to cooperate over Bangladesh's investment in a hydropower dam in Bhutan. This shift could open up opportunities for trade in electricity among basin countries that do not necessarily border each other, paving the way for basin-wide cooperation.

Akter (2016) and Gallenkamp (2010) argue that regional cooperation between Bhutan, India and Bangladesh could create a re-balancing in hegemonic relationships to positive outcomes for nations. Gallenkamp (2010) elaborates that since China is attempting to strike a land deal with Bhutan – mostly 'muscling' its way through the construction of roads on its territory and reported trespassing over to Bhutanese border – India feels that it would see its regional power eroded if it cannot secure the trust and cooperation of its neighbours. Akter (2016) states that, given China's unilateral approach to Brahmaputra water, India has no other option but to deepen ties with other states of the GBM. This is also because a "sub-regional framework has tremendous potentials for hydro-power, navigation, and environmental sectors and in the economy of the co-basin countries" (Akter, 2016, p. 7). Cooperation between Bhutan and Bangladesh examined in this chapter is a potential sign of further progress towards more basin-wide benefit sharing.

9. Action situation 5: China-Bangladesh cooperation

9.1 Action situation, outputs and outcomes

In 2007, China and Bangladesh signed an MoU on technical cooperation on water conservancy. The MoU suggests that the countries will cooperate on dykes, designs and ways to regulate river's watercourses on part of the Brahmaputra River, and joint research on the river's watercourses and silt movement (AidData, n.d.; Economic and Commercial Counsellor's Office, 2007). Following this MoU, in 2015 China and Bangladesh signed another MoU on the exchange of hydrological data for the purpose of disaster relief (AidData, n.d.; CH13, 2016; CH21, 2016). This includes rainfall data during the flood season, which China already provides to India (Siddique, 2015). While Chinese interviewees did not indicate whether payments are made for these exchanges, several interviewees in Bangladesh mentioned the exchanges, indicating that Bangladesh receives data from China for free, whereas India pays China for the same data (BA5, 2016; BA6, 2016; BA7, 2016). This point was echoed in reports by Indian media (Siddique, 2015).

Bangladesh is planning to build a Ganges barrage located at downstream of the Farraka barrage on Ganges River known as the Padma River (The Daily Star, 2015). The barrage would store water during the monsoon season and feed small rivers during the lean season. Bangladesh hopes the new barrage would diminish salinity issues in the southwest of the country caused by the Farraka barrage (Roy, 2015). China is one of the potential financiers of the barrage, along with India and Japan (FP Staff, 2016; BA7, 2016).

9.2 Factors affecting the cooperation

The main factors affecting the limited bilateral cooperation between China and Bangladesh are depicted in Figure 13.

9.2.1 Contextual factors

While India is concerned about China's upstream activities (BA8, 2016; IN8, 2016; IN9, 2016), interviewees in Bangladesh indicated that China is not the main concern for Bangladesh (BA2, 2016; BA6, 2016; BA8, 2016). As one interviewee indicated, China's contribution during the dry season is 15 per cent of the overall flow in the basin, and is thus unimportant compared to India's contribution (BA6, 2016). BA2 (2016) suggested a different figure, indicating that China's contribution to the Brahmaputra is 25 per cent (BA2, 2016). In either situation, it is not a major concern. These views were also echoed by a Chinese interviewee who indicated that the highest rainfall occurs in the Indian part of the Brahmaputra (CH1, 2016).

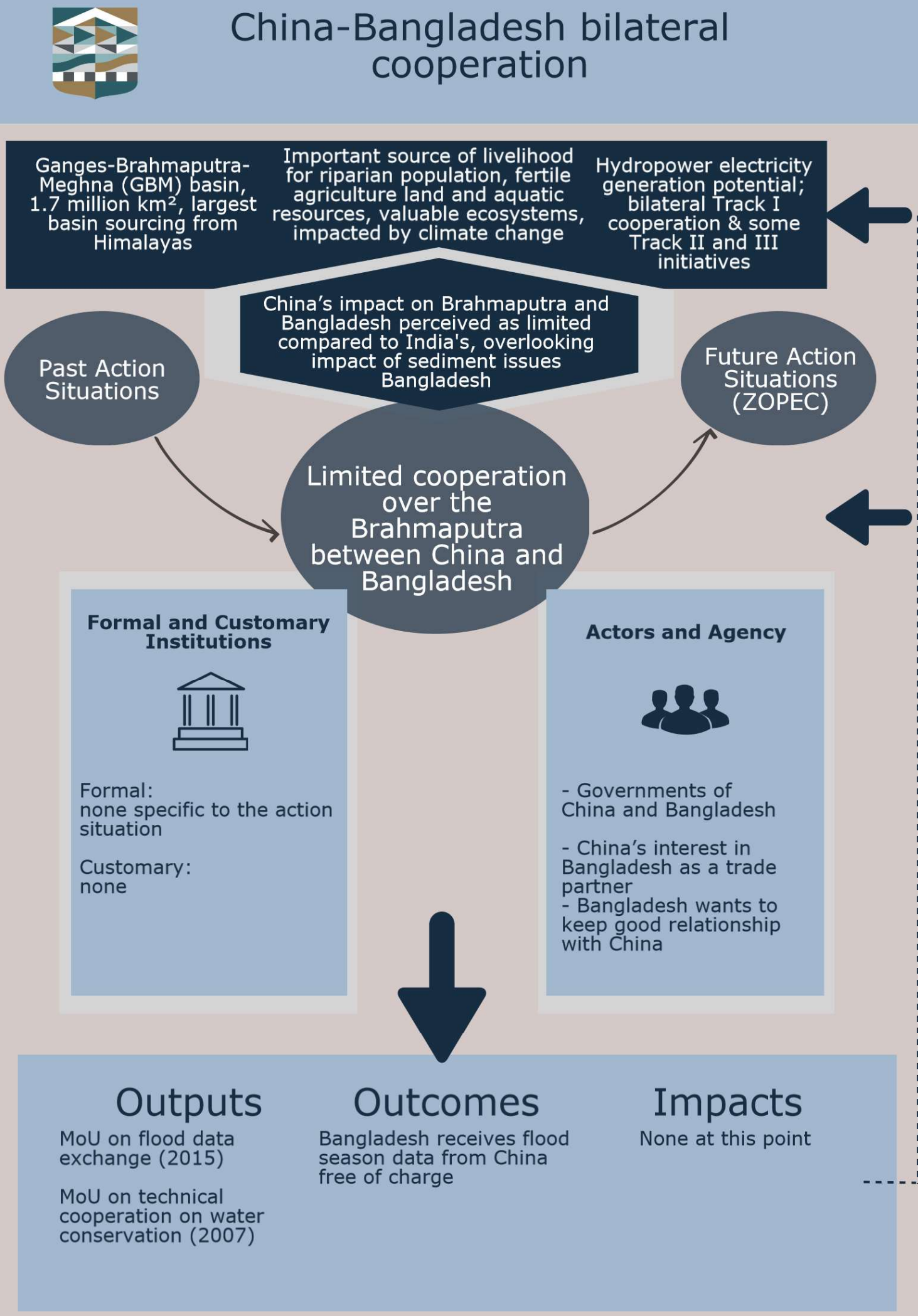

Figure 13: Factors affecting the limited cooperation between Bangladesh and China.

Another interviewee pointed out that most of the contribution to the Brahmaputra from China, particularly during the dry season, is through snowmelt. Due to climate change and glacier melt, China's contribution to the Brahmaputra may gradually decrease, possibly close to nil by 2050 (BA2, 2016). The same interviewee believed that China would not divert water, as melting glaciers would eventually diminish the sources of water (BA2, 2016). BA8 (2016) said that due to the distance between China and India, and attenuation over that distance, if China were to release 10 feet of water, it would be three inches by the time it reached Bangladesh, which is insignificant to Bangladesh. BA2 (2016) continued that due to changes in water contribution, the relationship between China and India regarding the Brahmaputra may change, but the relationship between India and Bangladesh would not change as a major contribution to the Brahmaputra is within the Indian catchment area. BA2 also indicated that sediment is a major concern for Bangladesh, but its contribution stems primarily from areas in India and not from China.

These biophysical and material characteristics of the two countries within the basin, where China's alteration to the river may not severely affect Bangladesh compared to the potential impact of Chinese activities to India, can potentially be one of the reasons of limited cooperation between the countries.

9.2.2 Formal institutions

While there are policies that support the China-Bangladesh economic cooperation, such as China's 'One Road One Belt' policy, this research did not identify any specific formal institutions that affected the current China-Bangladesh cooperation over the Brahmaputra.

9.2.3. Customary institutions

This research did not identify customary institutions that affect the current China-Bangladesh cooperation.

9.2.4 Actors

The main actors related to the cooperation over the Brahmaputra between the two governments are the Ministries of Water Resources of both countries. However, in understanding potential interests over cooperation, it is important to consider potential socio-economical-political interests related to cooperation and how the leadership from both countries is reacting to the situation.

In political, economic, and security terms, Bangladesh is an important strategic partner for China, particularly in the context of its rivalry with India. For Bangladesh, keeping China on her side also helps to counteract the pressure it often receives from India. China and Bangladesh commenced diplomatic relations in 1976. Political and economic cooperation between the countries is growing, with

Bangladesh being China's third largest trade partner in South Asia. Referring to the Prime Minister of Bangladesh who chose China as her first country to visit when she assumed her position as the premier, BA3 (2016) indicated that the prime minister is trying to be friends with China. In 2016, China's President Xi Jinping visited Bangladesh and agreed with Bangladeshi Prime Minister Sheikh Hasina to elevate China-Bangladesh relationship from a "comprehensive partnership of cooperation" to a "strategic partnership of cooperation" (Hasib, 2016; Kabir, 2016). During this visit, China signed off loans worth USD 20 billion to Bangladesh, Dhaka's biggest foreign credit line to date (Agence France-Presse, 2016). The loan will be used to develop infrastructure including a power plant and a deep sea port that Chinese is keen to build, competing with India and Japan, both of which expressed interest in developing it as well (Paul & Blanchard, 2016). The two countries also cooperate on defence: Bangladesh was the second largest recipient of Chinese arms between 2011 and 2015, after Pakistan. Bangladesh purchased submarines from China in 2013 and in 2016. Media recently reported that Bangladesh will build a new submarine in its naval base where Chinese personnel will be involved in supervising the construction as well as training in the Bay of Bengal, enabling the Bangladeshi navy to gather information that could be useful for operation of its own submarines (Smith, 2017).

Referring to potential regional cooperation, CH3 indicated that Bangladesh is an important player for China in its trade route: China would like to use the Bay of Bengal as a port. It also provides an opportunity for the Chinese to invest in large infrastructure (CH3, 2016). Referring to China's 'One Belt One Road' policy, CH8 indicated that for China, Bangladesh might even become more important than India (CH8, 2016). Referring to a potential energy trade between China and Bangladesh, CH7 indicated that since the Tibetan area does not have a lot of income sources, local people want to sell electricity to places such as Bangladesh (CH7, 2016).

9.3 Chapter conclusion and possible future action situations

Cooperation between China and Bangladesh over the Brahmaputra River is limited. Analysing different potential factors that may be affecting this current situation suggests that when there is no conflict in resource use, there is also less of an incentive for cooperation as there are no urgent 'issues' to be solved. On the other hand, potential mutual benefit, (in this case, economic cooperation), can be another driver for cooperation. Analysing the limited cooperation between the two nations helped us to understand that cooperation can occur either through conflict or opportunities for mutual gain.

In this regard, there are opportunities for mutual gain between Bangladesh and China. China is interested in exploring its trade routes via sea routes, and Bangladesh is in a strong position to offer sea access through its port. On the other hand, Bangladesh needs to increase its electricity supply, and China, while geographically distanced, has the technology and capacity available to provide

additional electricity to Bangladesh. The possible ZOPEC is further discussed in Chapter 13.

10. Action Situation 6: Bhutan-China cooperation

10.1 Action situation, outputs and outcomes

This research did not identify any specific cooperation between Bhutan and China with regards to the Brahmaputra River (BT3, 2016; BT5, 2016; BT8, 2016). This chapter briefly discusses some of the factors affecting the relationship between Bhutan and China to understand this lack of cooperation.

10.2 Factors affecting the cooperation

10.2.1 Contextual factors

Most of the Bhutanese tributaries of the Brahmaputra originate from glaciers located within Bhutan, with the exception of some of the tributaries entering Bhutan from China. One Bhutanese interviewee indicated that: "the fact that upstream pollution can have a devastating effect for Bhutan is a worrying issue in the face of absolutely no substantial dialogues and publicly available discussions between the two countries" (BT3, 2016). The same interviewee also said that no information exists on the total amount of water flowing into Bhutan from China (BT3, 2016).

Bhutan shares a border with the Tibetan part of China. China and Bhutan therefore became neighbouring countries only after China's annexation of Tibet in 1951. Historically, China and Bhutan have had minimal to no diplomatic relations, and little cooperation with regards to water resources.

There are long-standing border issues and land disputes for the two countries to resolve (East Asia Forum, 2016). Official talks between Bhutan and China on border disputes started in the 1980s (Mansingh, 1994). Despite regular negotiations, these issues remain unresolved (Mathou, 2003).

10.2.2 Formal Institution

Bhutan relied on Britain for its foreign policy from 1865 to 1947. Thereafter, India guided Bhutan's foreign policy (Savada, 1991). This is partly attributable to the long-standing close relations Bhutan enjoys with India. The Treaty of Friendship signed in 1949 states: "[the] Government of Bhutan agrees to be guided by the advice of the Government of India in regards to its external relations" (Treaty of Friendship, 1994, Art. 2). The renewal and updating of the 1949 Indo-Bhutanese Treaty of Friendship in 2007 gave Bhutan greater latitude in the exercise of its foreign and defence policy, which up until then had been largely directed by New Delhi (Dorji, 2013; Hindustan Times, 2007; India-Bhutan Friendship Treaty, 2007). Bhutan's transition to a constitutional monarchy could also be an impetus for changing the dynamics between the country and its two large neighbours. The first formal meeting between Bhutan and China took place in 2012 on the sidelines of the United Nations Rio+ 20 conference on Sustainable Development, where

Chinese Premier Wen Jiabao and Bhutanese Prime Minister Jigmi Y. Thinley met. During this meeting, both governments indicated their willingness to establish diplomatic ties and examined possibilities for future cooperation (Gupta, 2014).

10.2.3 Customary institutions

The fact that China and Bhutan became neighbours only after China's occupation of Tibet is highly significant. Bhutan is historically and culturally connected to Tibet (Mansingh, 1994; CH1, 2016). Since the 8th century, Tibetan armies have invaded Bhutan, influencing the Bhutanese society and, to some extent, integrating themselves intermarriage with locals, making people of Tibetan origin a predominant population group in the western part of Bhutan. Through these migrations, the Bhutanese society was also strongly influenced by Tibetan Buddhism (Mathou, 2003). As discussed earlier, Bhutan also accommodated many Tibetan refugees after the Chinese annexation of Tibet (Mathou, 2003). It is also important to note that a large part of the Bhutanese elite stems from the refugees that fled Tibet over the centuries (Savada, 1991).

10.2.4 Actors and Agency

While Bhutan and China have direct discussions on issues such as their border, talks are coloured by China-India relations in general, and their border discussions in particular (Mathou, 2003). Therefore, in its negotiation with China, Bhutan needs to strike a fine balance between the India-China relationship.

As an illustration of this sensitive relationship, it is important to note Bhutan's transition to a democracy, and the shifting political landscape within the country. Bhutan's transition to a democracy made Jigme Thinley the country's first elected prime minister in 2008. He attempted to improve the country's relationship with China, and to establish full diplomatic ties with its powerful neighbour to the north. It was reported that this has made India nervous, which in turn decided to reduce its fuel subsidies to Bhutan during the general election of 2013 (Asrar, 2013). This made cooking gas and kerosene prices major election issues, and was considered one of the reasons for the defeat of Thinley, and bringing the pro-India People's Democratic Party to power (BBC News, 2013; Parashar & Dattai, 2013). Since then, India has managed to bring Bhutan back under its security umbrella. However, the growing power of China and democratic transition in Bhutan continue to make India nervous over its relationship with Bhutan.

China has an interest to normalise its relationship with Bhutan as soon as possible, particularly as this could lead to a resumption of trade between Tibet and Bhutan as part of China's overall strategy in the Himalayas (Mathou, 2003).

Tibet is one of the delicate issues that also affects the relationship between India and China, particularly as India hosts many Tibetan refugees, and the exiled Tibetan government and the Dalai Lama. Considering that Bhutan hosts Tibetan

refugees as well, and has close ties with India, this is another factor that can affect Bhutan-China relationship.

10.3 Chapter conclusion and possible future action situations

An improvement of bilateral relations between Bhutan and China, and particularly the resolution of border issues, could bring economic benefits to both countries through increased trade, and the potential opportunity for Bhutan to receive Chinese tourists as one of important pillars of the Bhutanese economy. Despite unresolved border issues, many commentators believe that it is very likely that China and Bhutan will enhance their cooperation in the near future (East Asia Forum, 2016; Krishnan, 2012; Mathou, 2003). The extent to which this will include cooperation in the water sector and transboundary water cooperation over the Brahmaputra River's tributaries is still to be determined.

The previous six chapters focused on analyzing Track I bilateral cooperation within the Brahmaputra River basin. As briefly introduced in Chapter 4, there is also cooperation that has been facilitated by non-state actors, consisting of Track II or III types of cooperation processes. The next two chapters will be analyzing cooperation facilitated by non-state actors: Ecosystem for Life and the Brahmaputra Dialogue.

11. Action situation 7: Ecosystem for Life

11.1 Action situation, outputs and outcomes

This action situation focuses on a series of dialogue events convened by IUCN within the *Ecosystems for Life: A Bangladesh-India Initiative* project (E4L), funded by the Embassy of the Kingdom of the Netherlands. The project promoted and facilitated better understanding of the management of natural resources in Bangladesh and India (Ahsan et al., 2014; Mahanta et al., 2014). For this purpose, the project created avenues for informing decision makers that allow them to establish a system of improved, integrated management of these ecosystems. Research was conducted on food security, water productivity and poverty; climate change; inland navigation; and environmental security and biodiversity conservation in the Indo-Bangladesh region. In our analysis of this action situation, we will use the work undertaken on conservation of the important fish *Hilsa* as an illustration of the E4L dialogue processes in which stakeholders moved from the identification of issues to collaborative joint research, to policy-engagement, and, ultimately, to policy change and its implications (Ahsan et al., 2014; Glaholt, Gonsalves, & Macintosh, 2014; Huntjens, Lebel, & Furze, 2016).

Initiation

The E4L dialogue on *Hilsa* was initiated because it was identified as a significant issue for fishing communities in India and Bangladesh. According to a study by IUCN, *Hilsa* is a culturally and ecologically important species, particularly for Bangladesh and India, as *Hilsa* is the most sought-after fish for food and its spawning pattern requires the entire stretch of Brahmaputra and Ganges River systems for it to develop its unique taste (Ahsan et al., 2014). Thus it is dependent on the natural flow of rivers, including siltation, depth and pollution. It is therefore an effective indicator of the health of the river's ecosystem (Ahsan et al., 2014). Further, the species was an important flagship species for the E4L project – a species that represented an important conservation need in the trans-boundary context.

Hilsa is the national fish of Bangladesh, and is also important culturally in West-Bengal, India. It is an important staple food and source of income for millions of people in the region. The focus of the E4L research on *Hilsa* was prompted by recent serious declines in the *Hilsa* catch (Ahsan et al., 2014).

Prior to the start of E4L project, Bangladesh fishing community had already adopted a ban imposed by the Government of Bangladesh on fishing during a certain period of time whereas there was no such ban by the community on the other side of the river in West Bengal (a state within India) until after the dialogues facilitated under the E4L project. The dialogue therefore was initiated by the E4L project and was important for livelihood, conservation, policy and trans-boundary cooperation. It therefore had a number of dimensions to it, and IUCN's role as a

neutral broker of good faith was crucial to its initiation. The availability of new research findings, which were undertaken by a joint research team from India and Bangladesh and which contained policy recommendations for each country as well as for joint-country policy/practice collaboration, acted as a rationale for the dialogue processes and ultimately for evidence-based policy engagement (Huntjens, Lebel et al., 2016).

Format

The various governance and implementation arrangements set up within E4L have contributed to an effective, iterative process that other initiatives could take valuable lessons from (Glaholt et al., 2014). The external review of E4L, conducted by Glaholt et al. (2014), concluded that having the two national Advisory Committees ensured joint inputs to research studies between Bangladesh and India. The process also lead to increased cooperation through better understandings of partners at personal levels.

The E4L dialogue was structured so that its first section focused on the research itself, and the second focused on the implications of the research in terms of necessary policy and fisheries/conservation management changes. Hence, the structure presented evidence and analysis which had been peer-reviewed and contained recommendations which were at country-level and trans-boundary (the first section) and the grounding of that in terms of usefulness, appropriateness and relevance to various stakeholders (Huntjens, Lebel et al., 2016).

In the context of managing dialogue processes, the second part was particularly insightful. People were allocated to different discussions groups by E4L facilitators to ensure there was a mix of government officials, representatives of fishing communities, and researchers and experts. Communications professionals were also represented at each of the three tables. Each table was asked to identify implications of the policy recommendations, and how an awareness campaign that focused on civil society actors – such as fishers, suppliers, and consumers – could be developed (Huntjens, Lebel et al., 2016).

Content

E4L identified and recognized, at the outset, the strategic importance of knowledge management in delivering the project goals (Glaholt et al., 2014). The external review by Glaholt et al. (2014) indicated that knowledge products and informal hubs served as a supporting mechanism for the dialogue, commending on its detailed and well thought out communication strategy

The two key dialogues for *Hilsa* conservation within the E4L process were those related to research dissemination and policy advocacy. According to Huntjens, Lebel et al. (2016) the dissemination dialogue provided a mechanism by which the research, its findings, and its policy recommendations were 'ground-tested' in the

context of local people and local users. Moreover, by the time of this dialogue, the Department of Fisheries of the Government of West Bengal had already issued a notification that, in essence, made West Bengal's ban period on *Hilsa* fishing more similar to that of Bangladesh, which was a direct outcome/output of E4L in 2012. Hence, it was possible to take these discussions into specific directions – for example, the need for livelihood security in the context of ban periods, or ways to raise awareness of the ban periods – so this dialogue was able to draw very clear policy/practice connections and implications.

Related to information production, availability and exchange, Huntjens, Lebel et al. (2016) described that experts were an integral part of the E4L processes. For researchers, their research was applied to policy-advocacy and livelihood security contexts and implications. Additionally, experts external to the research team were included in peer review processes, in dissemination dialogues, and in policy-advocacy dialogues. The dissemination and policy dialogues brought experts together with policy makers, community stakeholders, and others; so that research was grounded in terms of taking policy engagement forward, and community relevance. The dialogues recognized the importance of multiple experiences and understandings being brought together, hence the focus on ensuring the expert analysis was ultimately grounded analysis, making sense to local communities and policy makers.

Output

Ecosystem for Life facilitated on-going dialogues between the two Fisheries departments, resulting in the development of a *Hilsa* research centre by the Government of West Bengal (Huntjens, Lebel et al., 2016). In E4L, there was a very direct link of research dissemination and policy-advocacy dialogues. Importantly, the rationale for the joint research approach ensured research was *joint* – that is, not India research nor Bangladesh research – and the policy recommendations it contained were national and joint recommendations (Huntjens, Lebel et al., 2016). The joint research initiatives were conducted by using a common research framework (IUCN, 2017). According to IUCN, important outputs included the dialogue processes being established and research conducted on food security, water productivity and poverty; climate change; inland navigation; environmental security, environmental flows and biodiversity conservation in the Indo-Bangladesh region. On these topics, a comprehensive capacity building programme was developed and implemented and relevant stakeholders were exposed to best practices. In addition, region-specific knowledge was generated and disseminated that aimed at improved understanding of trans-boundary water management issues. Finally, a comprehensive database was established for trans-boundary knowledge resources, while policy options were identified and shared for each of the dialogue areas (IUCN, 2017).

Outcome

An example of a CSO/NGO led initiative is the IUCN's facilitation towards formulation and imposition of the Gazette Notification on *Hilsa* catch ban. The Ecosystem for Life initiative played a direct and key role in successfully advocating to the Department of Fisheries of the State of West Bengal to impose a ban on *Hilsa* fishing during the same period as is in Bangladesh, following the Bangladeshi model. This was achieved by constructive dialogue based on evidence created through the joint research on *Hilsa* by the project.

Some interviewees commented on the role of E4L as having created network by bringing people together (BA2, 2016; BA5, 2016; BA6, 2016). It also created a culture of joint research, encouraging experts to work together. One of the interviewees engaged in the E4L process indicated that the process was designed to create knowledge particularly on neutral issues such as biodiversity, the ecosystem and *Hilsa* management that could help the two countries to come together. E4L also aimed to create platform where people could be sensitized and therefore brought in journalists, scientists and retired politicians, with the hope to eventually trickle down to the government level. The process created a lot of knowledge, however, according to interviewee BA8 (2016), there was no uptake by the JRC, indicating that this was because "[t]he Indian technocrats think they know everything."

According to BA9 (2016), it is difficult to say whether the dialogue was successful, since it is difficult to measure success factors. "Sometime the researches are little disdained, because it's a joint research between India and Bangladesh." Referring to the sustainability of the initiative, BA9 (2016) said: "the Track III is participatory in nature which for us in water management is the foundation for any intervention must be participatory in nature and participatory for water management should be also foundation and it was in every program, every water management program we do, that's there. So yes, we think that is important and how do you sustain that? It's difficult, yeah because we have seen the groups we set up are often not functional after projects."

Referring to E4L and the Brahmaputra dialogue process, a government official from Bangladesh indicated that discussion is useless and that it does not change the government's mind-set. Asked for the reason for this situation, the same interviewee said: "they just take it as meeting, for fun, just have good lunch and good environment. It is not part of their business" (BA2, 2016). They further elaborated that if the topics fall within the government's mandate, NGOs should have communicated their recommendation with the government and suggested how it can be fitted within the Bangladeshi government's policy (BA2, 2016).

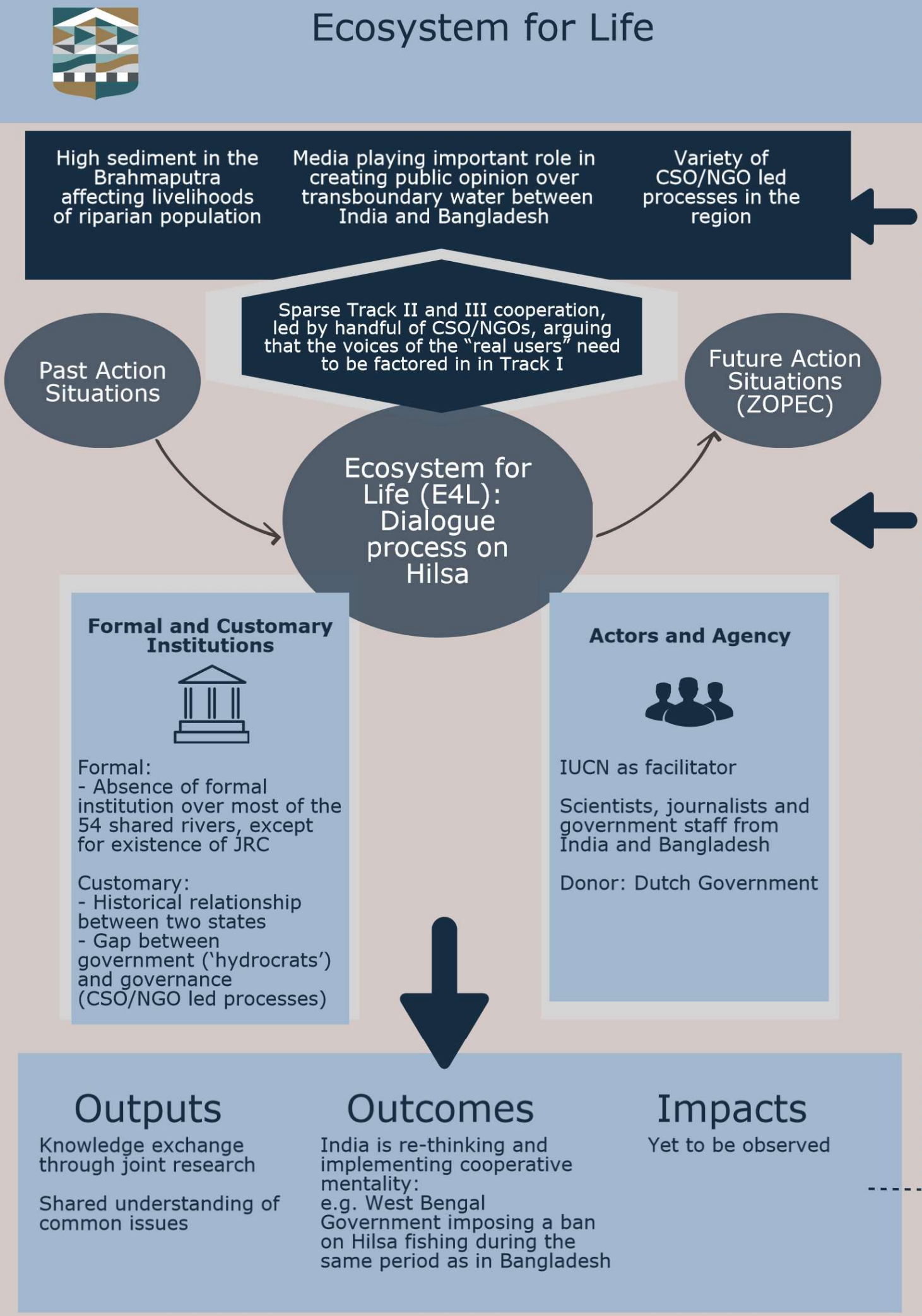

Figure 14: Factors affecting the cooperation through Ecosystem for Life.

11.2 Factors affecting the cooperation

11.2.1 Contextual factors

As discussed in earlier chapters, Bangladesh and India share more than 50 rivers, encompassing the most intricate and complex river systems in the world. Most of these rivers flow into the Bay of Bengal, creating a landscape that integrates system of rivers, floodplains, canals and water bodies. These rivers are closely connected to the history and legends of the region, deeply influencing lives of people, and being the fundamental resource to the mainly agrarian economy (IUCN, 2017).

The region's three major rivers, namely Ganges, Brahmaputra and Meghna, along with their tributaries, drain an area of about 1.75 million km² (Rasul, 2015). The region is home to more than 618.79 million people (Rasul, 2015), which makes the regional one of the most densely populated areas in the world. Thus, it is safe to assume that socioeconomic and biophysical understanding of these river systems is vitally important to building effective strategies that can ensure sustainability of the ecosystems which in turn can lead to an enhanced well-being of the people in the region (IUCN, 2017).

CSO/NGO led processes have brought an interesting twist in the region. In India and Bangladesh, these stakeholders are free and vibrant whereas in China and Bhutan, they are highly restricted and underdeveloped, especially on a basin level. The key point is that these processes are still mostly neglected by the respective Track I dialogues. (BT4, 2016; BT5, 2016; IN11, 2016)

As detailed in the previous action situations, the biophysical conditions form the same space for CSO/NGO to engage in the processes related to conflict and cooperation regarding Transboundary Rivers in the region. For example, the Brahmaputra has the highest sediment load within the greater GBM basin (Wulf, Bookhagen, & Scherler, 2012) and sedimentation flux affects water flow. Sediment affects agriculture/livelihoods, housing and sanitation, and the existing protocol routes for navigation, among others, between India and Bangladesh. Ensuring proper management of this transboundary water body is critical for riparian resident relying on the river, creating needs for CSO/NGO facilitated dialogue process.

It is also inevitable that all related stakeholders, including governmental authorities and media of the two nations, have their respective interests and viewpoints on water cooperation. Since this is also closely linked to transboundary water sharing negotiations in the region, a handful of CSOs and NGOs have been engaged in influencing public opinion on policy issues (Akter, 2016) through dialogues among the basin stakeholders, similarly to the ones held under the Ecosystems for Life project. IN16 (2016) highlighted that the media's role needs to be more positive than it currently is, as it is one of the major players in building public awareness, but also as a voice in favour of regional water cooperation: "Media is an important player and can play a positive role if they talk about fair ideas." IN11, BT5 and BT4 added that NGOs can also play a very important role of

creating a neutral platform where Track III and II led evidences are heard by the Track I, which is responsible in taking the national and transboundary level decisions (IN11, 2016; BT4, 2016; BT5, 2016).

In the specific case of *Hilsa* dialogue under E4L, one of the important contexts is the fact the joint research was already initiated in 2011 and had created its initial results and recommendations. Subsequently, these results and recommendations were disseminated to the Track I level stakeholders through the joint dialogue in India, where Bangladeshi member of parliaments and state minister for fisheries of West Bengal were among the distinguished participants (IUCN, 2012). The final report of the joint research, incorporating suggestions from the dialogue was published in 2014 (Ahsan et al., 2014).

11.2.2 Formal institutions

When India and Bangladesh signed the Ganges Agreement in 1977, some articles of the agreement directly related to broader water cooperation between the two countries (Articles VIII-XI, Ganges Agreement). These articles are specifically about the long-term arrangements for augmenting Ganges water at Farakka. Article IX instructed Indo-Bangladesh-Joint River Commission (JRC) to investigate schemes to augment the dry season flow of the Ganges. Accordingly, there have been various discussions about building link canals between Brahmaputra and Ganges to augment dry season flow of Ganges since then, but they have not led to any official results yet (Rahaman, 2006).

The Ganges Water Sharing Treaty of 1996 does not cover the Brahmaputra basin (Farakka Barrage Treaty, 1996), meaning that there is currently no formal institution in place for cooperation on the Brahmaputra. The absence of any major cooperation mechanism for the Brahmaputra and 54 shared rivers between India and Bangladesh was an important reason for IUCN to initiate the E4L Dialogue.

11.2.3 Customary institutions

Civil society-based organization (CSO) and non-governmental organization (NGO), national and international, have been present in the area of water governance discourse in India. However, the central challenge is that Indian bureaucracy tended to neglect suggestions and arguments as these were considered an exclusively technical domain where experts from government departments would sequentially tackle all decisions pertaining to water management. As described by Nepal's former water minister, Dipak Gyawali, in his foreword to the book *Globalization of Water Governance in South Asia*: "[T]he gap between government and governance has widen with actors other than state agency hydrocrats, such as environmentalists and social activists, demanding that they are heard and addressed. These actors are bringing into the discourse issues important to holistic and healthy water management that had been conveniently filtered out or swept under the carpet by single-mission, construction-focused hydrocracies" (Narain,

2013, p xix). Suffice to say that Gyawali refers this reality to water management at the national as well as transboundary levels, not only related to India. Having said that, over the last decade, a handful of initiatives by I/NGOs and similar organization made it to the limelight for their bold contribution to water dialogues in the entire GBM basin region. However, this bilateral need for consultations and diplomacy has mostly taken place among the Track I and II. Filling this gap and creating space for the broader civil society's engagement in the governance of transboundary water within the region were one of the main incentives for IUCN to start the E4L initiative (IUCN, 2014a).

While it may not have directly impacted the initiation of E4L, it is important to note that the Indian government has been tightening its control over NGOs, particularly under the Modi government since 2014. There have been new restrictions particularly for NGOs that receive support from foreign donors. According to The Guardian, the number of foreign funded NGOs reduced half in size since tightening measures have been taken (Doshi, 2016b). This approach by the Indian government has also become the issue of criticism by the newly elected US Trump administration in 2017, particularly as some of the US NGOs and charity organizations have been targeted (Kasturi, 2017).

11.2.4 Actors and Agency

The E4L regional policy dialogue had participants representing researchers and experts, the fisheries departments of West Bengal and Bangladesh, fishing communities from West Bengal and Bangladesh, and media from both countries. Communications professionals from West Bengal were also among those who participated (Huntjens, Lebel et al., 2016).

In E4L, approximately one third of participants in the dialogues were women. However, in dissemination and policy advocacy dialogues, women's representation was lower (approximately one fifth of participants), probably reflecting the historically patriarchal gender composition of policy-making and scientific water managers (Huntjens, Lebel et al., 2016). Huntjens, Lebel et al. (2016) reflect upon the tension which multi-stakeholders often face – the multiple dimensions to representation and social power. They argue that "another limitation within the E4L process was that consumer groups weren't represented in the dialogues – an important omission as consumers have a significant responsibility in the conservation of *Hilsa*. However, in this case, the dialogues represented an important step towards establishing an awareness campaign for fisher communities, consumers and the restaurant/hotels sector. This is why the dialogue had representatives from media organizations, who were then called upon to scope campaigns. Participation was therefore seen as a longer-term process, bringing layers of participation after foundations were laid, rather than as a 'one-off' dialogue outcome".

Commenting on the delegation, a Bangladeshi interviewee said that there was no continuity in delegation from Indian side (BA6, 2016). Another interviewee said

that India sent a representative from Ministry of Foreign Affairs who, according to the interviewee, "does not know anything about water" (BA7, 2016). The role of IUCN was recognized as an actor who can bring different stakeholders together, as an institution with great acceptability in both countries (BA6, 2016).

11.3 Conclusion and possible future action situations

Since E4L dealt with only India and Bangladesh of the greater basin region (GBM), most of the focus appears to be from the perspective of India and Bangladesh's bilateral point of view. Moreover, as a need, it seems, the full spectrum of water diplomacy can be achieved by incorporating the perspectives of local communities within the transboundary Track III and II dialogue frameworks. Thus, an institutionalized bottom-up approach to the transboundary dialogue processes would be an important recommendation for similar future projects.

Moreover, given the priorities of the South Asian region, the largest pocket of hunger and malnutrition in the world, as discussed earlier, there is significant need for more work to directly consider and explore the linkages between food/livelihoods security and climate change, biodiversity and ecosystem services in relation to the transboundary river basins and the inherent conflicts and scope of cooperation that exists. Thus, entry points for cooperation to resolve conflicts and create a shared regional vision to tackle ecosystem degradation and depletion, biodiversity loss, water pollution, livelihoods insecurity and hunger needs to be identified and mitigated by region-wide joint efforts. Policy influencing and innovation are needed to run hand-in-hand and across all sectors of the nations in the region. E4L's policy influence on the West Bengal government with the *Hilsa* ban is a good example of transboundary cooperation, where the fish *Hilsa* was an entry point for dialogue and cooperation since culturally and economically there is an immense space to bring the decision makers together having a traditional tie towards this particular fish. While this was an innovative effort that proved to be positive in the outcome of Track I cooperation between the state of West Bengal in India and Bangladesh, there needs to be a continued effort in fostering Track III and II dialogues to further the creation of what can be termed as a sustainable ZOPEC.

Nevertheless, as a continuation, IUCN collaborated with and facilitated two other following projects, both of which can be considered resulting action situations. One of them is the Water Diplomacy project, led by The Hague Institute of Global Justice. Through this project, a legal and political economy analysis was conducted on the Brahmaputra basin. The second follow up is the on-going BRIDGE GBM project that looks at two major aspects: the scope to develop the protocol (policy) of inland navigation between India and Bangladesh, and the open resource fishing between the two countries. This project includes, apart from Bangladesh and India, also China, Nepal and Bhutan to create a CSO roadmap – a visioning document for better managing the transboundary rivers in the GBM region (IUCN, n.d.).

12. Action situation 8: Brahmaputra Dialogue

12.1 Action situation, outputs and outcomes

The Brahmaputra dialogue was initiated in 2013 by the South Asian Consortium for Interdisciplinary Water Resources Studies (Saci WATERs), in collaboration with the Indian Institute of Technology Guwahati (IITG), and the Institute of Water and Flood Management (IWFM), Bangladesh University for Engineering and Technology (BUET). The dialogue has subsequently been supported by the Asia Foundation. Thus far, the dialogue has promoted a basin-wide approach, and asserted that effective management needs greater transparency and cooperation between stakeholders. It has been through three phases to date. The initial dialogue was entitled 'Transnational Policy Dialogue for Improved Water Governance of Brahmaputra River', and focused on dialogue between India and Bangladesh (Banerjee, Salehin, & Rames, 2014). This focus in phase 1 was organised around three meetings. The first two meetings in Dhaka and Delhi comprised only those representatives who were from Bangladesh and India, respectively. The third meeting of this first phase brought the representatives from the two countries together (Banerjee et al., 2014). This first phase was a Track III dialogue; that is, it involved NGOs, civil society and academics, but not government representatives.

The geographic focus of the first phase on Bangladesh and India was carried over to the second phase (Phase 1 and 2 in 2013-2014), although there was a change in the sort of actors involved in the dialogue. In the second phase there was a gradual shift towards a Track II dialogue. Within India, the dialogue also included stakeholders from provincial administrations including Assam and Arunachal Pradesh in addition to the central government stakeholders. To do this, the second phase utilised a case study approach to discuss the relations between the states of Arunachal Pradesh and Assam. In fact, the second phase demonstrated the need for vertical (between Arunachal Pradesh and Assam) and horizontal (between India and Bangladesh) integration (Saci WATERs, 2015). During this phase, the first multi-country dialogue was conducted as well, including China and Bhutan (Saci WATERs, 2016b).

The current and third phase of the dialogue on co-management of the river basin aims to include all four riparian countries of the Brahmaputra basin – Bangladesh, Bhutan, China and India. In many respects its intended output builds upon the agreement and goodwill established in the first two phases, with a continued emphasis upon whole of basin approach and more open governance. The third phase aims to bring political willingness and to develop a joint mechanism for effective basin management. During this phase, the dialogue has moved to include Track III, II and I.5 levels of participants (Saci WATERs, 2016b).

The third phase of the Brahmaputra Dialogue aims to develop a basin level institutional framework for strengthening the co-management of the Brahmaputra basin, and has following objectives (Saci WATERs, 2016a):

- To review the existing transboundary protocols/treaties/accords to understand the processes shaping the institutional arrangements for managing the transboundary rivers.
- To bring the views of multi-stakeholders (government, civil society organizations, funding agencies, academia, scientific community, media) through individual interactions and multiple workshops
- To assess the various economic opportunities, challenges and research priorities in the basin
- To map the functionalities attached to various government (central/state) line departments to bring dovetailing and improved coordination for basin management (Saci WATERs, 2016a)

Outputs

One of the concrete outputs to have emerged from the dialogues to date is the development of a joint research proposal by research institutions in China, India and Bangladesh. The research aims to conduct a vulnerability assessment for the entire stretch of the river, and at the time of writing this report, the funding proposal is to be submitted to the government of China and ICIMOD (BA10, 2016).

Outcomes

Having a series of consultations resulted in participants being more open and positive in their discussion over the Brahmaputra basin. A participant from India, engaged with the process since the early stages, said that this openness and positive mind set were not present in the early stages of the dialogue but people have started to open up and speak positively now (IN4, 2016). The dialogue has also been a process of trust building, initially starting from information exchange (IN4, 2016).

The fact that the dialogue started as Track III but then gradually shifted to Track II and Track I.5 is significant. A senior secretary from the Ministry of Water Resources chaired the most recent national dialogue in Bangladesh. During the regional dialogue, held in Singapore in October 2016, the senior secretary participated for the first time in the regional dialogue. Engaging a high-level government official in this way was one of the major achievements of the dialogue process (BA10, 2016).

During the regional dialogue in Singapore, there were many discussions about the direction this dialogue could take, and how to further engage the process leading to a Track I process. Saci WATERs has been strategically engaging individuals who have potential influence on or a connection with high level government officials in the respective countries, with an aim of creating potential channels to engage high level government officials and decision-makers. Many of the discussions during the regional dialogue in Singapore suggested the importance of discussing the subject

of water in the context that national decision makers are interested in. It is important to pay attention to what type of information would be of interest to government officials: typically speaking, discussions about water would not be given a high profile. As a consequence, participant also recognized the need for discussion on water to be undertaken in conjunction with broader discussions about socio-economic development (Saci WATERs, 2016b).

12.2 Factors affecting the cooperation

Figure 15 illustrates the key factors affecting the Brahmaputra Dialogue.

12.2.1 Contextual factors

Space for civil society in India and Bangladesh is relatively open compared to Bhutan and China.

Compared to India and Bangladesh, the role of CSOs and NGOs in Bhutan, national and international, has been less pronounced in general and specifically in the area of water governance (BT4, 2016; BT5, 2016). The political situation in Bhutan has been undergoing significant change in recent years and the way they engage with formal institutions in the future is uncertain. While there is certainly some activity from CSOs, the government's liberalising the space for NGO input into water governance is still in process (BT5, 2016). As a consequence, NGOs operate in partly constrained conditions in terms of expressing opposition to policies. According to BT5 (2016), the public sphere in Bhutan is generally less developed compared to many of its neighbours in South Asia, and while the mass media does participate in environmental journalism, it does not have the same influence on topics related to state-society relations (Business Bhutan, n.d.).

During an informal conversation with the author, a Bhutanese participant to the Brahmaputra Dialogue indicated that the Dialogue is an important venue for understanding what the key pressing issues within the basin are. It also provides an opportunity to share national concerns that would otherwise be difficult to be communicated. For example, the Bhutanese collaboration with India on hydropower development is communicated to the outside world as a success story. However, it is not widely known within the region that while many people support the current trajectory of hydropower development within Bhutan, there is a greater diversity of opinion regarding the progress and appropriateness of these projects within the country[17].

[17] Informal conversation with Bhutanese informant on 27 October 2016. The informant has given consent to the author to cite the conversation.

Brahmaputra Dialogue

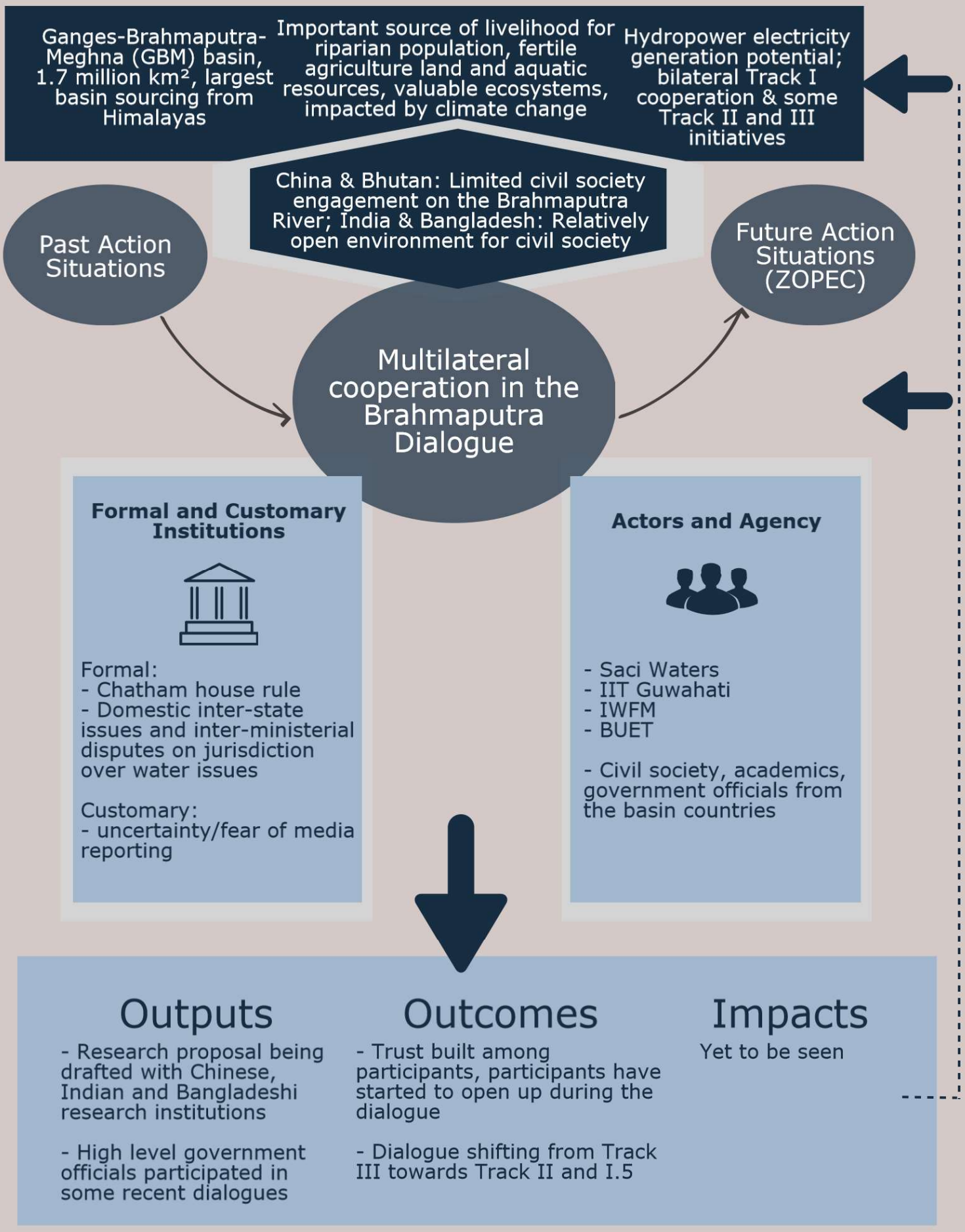

Figure 15: Factors affecting the Brahmaputra Dialogue.

Regional dialogue such as the Brahmaputra Dialogue can play an important role in Bhutan where there is a severe lack of NGO and CSO participation on political issues regarding water (BT4, 2016; BT5, 2016). BT4 (2016) explains that a certain part of the hydropower sector, mainly the construction sub-sector, is trying to make some noise but "the CSO is at its infancy in Bhutan […] because in the culture there has not been a practice of open political activism". BT5 (2016) resonates this by saying that unlike in Bangladesh and India, Bhutan does not have CSO level organisations or similar think tanks that have a say or role; especially in the water sector it is only the government. Independent experts are also lacking, starting from the media to researchers in the field of water. BT5 (2016) opines that funds are very difficult to receive so those that are willing cannot manage to avail funds and focus on researching and writing on environmental and water issues that will significantly contribute in the policy sphere of Bhutan.

In China, a number of interviewees commented on the absence of NGOs working on issues related to the Brahmaputra River (CH3, 2016; CH4, 2016; CH10, 2016; CH14, 2016; CH15, 2016; CH17, 2016). In other transboundary basins such as the Lancang-Mekong River and the Nu-Salween River, NGOs play an important role in proposing policies balancing development and conservation of the river through their campaigns. NGOs advocacy activities led to cancellation of some of the planned hydropower dams on the Nu River (CH17, 2016; CH20, 2016) and in case of the Mekong, resulted in application of a sustainable hydropower protocol guideline in some of the rivers (CH2, 2016). In an informal conversation with the author, one of Chinese participants to the Brahmaputra Dialogue indicated that participating to the Dialogue allowed them to understand each other and the issues other riparian countries face[18].

12.2.2 Formal institutions

The initial phase of the Brahmaputra Dialogue had its focus on a transboundary dialogue between Bangladesh and India as well as an inter-state dialogue between different riparian states in India. The reason for this additional inter-state focus arises from the fact there are inter-state conflict over the use of water among Indian state. In terms of the Brahmaputra River, there is a conflict between Assam and Arunachal Pradesh, one example being Assam's opposition to the hydropower dam development in Arunachal Pradesh from the fear of floods (IN17, 2016). This situation is partially caused by the way responsibility over water is divided into different jurisdictions. India's constitution hands considerable responsibility for water to states. This includes water supply, irrigation, canal, drainage, embankments, water storage and hydropower (Constitution of India, 1949, 7th Schedule). Central government's responsibility over water is primarily related to navigational uses and water issues beyond Indian territory (Constitution of India,

[18] Informal conversation with one of the participants to the Brahmaputra Dialogue workshop, Singapore 2016. Permission to cite given by the participant.

1949, 7th Schedule). This division of responsibilities on water causes the need to work with a wide range of stakeholders when dealing with transboundary rivers, an important factor that influenced the Brahmaputra Dialogue (this point is discussed further in Actor-Agency section).

The Brahmaputra Dialogue adopts the Chatham House Rule, a rule to ensure anonymity and openness of discussions by requesting participants to refrain from the use of information gained from the dialogue in a way that might reveal the identity or affiliation of speakers (Chatham House, n.d.). One of the participants from the Brahmaputra Dialogue indicated that while most participants do not have problem with this rule, some of the participants were uncomfortable with the situation where they are not able to speak freely about what they learnt outside of the room. This was particularly the case for participants in national dialogues, as in Bangladesh, national dialogues were conducted as open public events (BA10, 2016).

12.2.3 Customary institutions

While media attention would certainly support the Brahmaputra Dialogue in raising its profile and getting potential buy-ins and support from political leaders, the Dialogue has not invited media representatives to participate in the dialogues. This is due to the fact there is uncertainty about how media may interpret the dialogue and due to the fear of misreporting (Saci WATERs, 2016b).

BT4 (2016) explains that living in a "very small society" of around 700,000 people influences "how we react to government decisions". The Bhutanese society is too closely knit with everyone seemingly knowing everyone else, the interviewee noted, and that the decision of not speaking up or criticizing other people, even when incorrect decisions are made, making it uncustomary for the public to openly react or express grievances. The same custom makes it difficult for journalists to openly cite primary references or interviewees. According to BT4 (2016), this practices becomes a major barrier for analytical journalism in Bhutan and its ability to strongly debate relevant government decisions. Dialogue initiatives like the Brahmaputra Dialogue foster the possibility of more discussions within the social fabric of Bhutan and the media.

12.2.4 Actors/Agency

The Brahmaputra Dialogue process recognises that there are competing and complimentary stakeholders within a country's water sector and that the sector entails a variety of formal institutions. The processes undertaken in the first phases sought to build confidence and create understanding between the national stakeholders. In the case of India, one element of this is having civil society groups, academics, and, later on, bureaucrats from Assam and Arunachal Pradesh as well as representatives from other parts of Indian water sector (Saci WATERs, 2015). There are also needs to have representatives of different bureaucracies, such as

the Ministry of Environment, Forest and Climate Change, the Central Water Commission, and state and central authorities, because the effective development of the basin is not the under the ambit of a single ministry, but rather of many actors that have overlapping jurisdictions and exist in a variable chain of influence. The formal institutions involved in reconciling the interests of different states are numerous, but they do not encompass all the institutions that are involved when India is negotiating with another country in the Brahmaputra. In later phases of the Brahmaputra Dialogue, the formal institutions broaden to encompass the fact that the issue is then multilateral. The approach taken by the Brahmaputra Dialogue recognises the complexity of this situation by gradually scaling up the dialogue process.

Chinese participants are currently limited to academics (Saci WATERs, 2016b). According to BA5 (2016), the dialogue invited participants from the government sector in China, but they were refused permission to participate.

12.3 Chapter conclusion and possible future action situations

This chapter discussed the Brahmaputra Dialogue, a basin-wide dialogue process facilitated by civil society actors. One of the key facilitating factors was starting this dialogue process as a Track III process. In comparison to official Track I processes that engage government stakeholders, civil society actors and academics have more freedom to discuss the different issues. Joint research for instance is one way to start cooperation on complex and political sensitive issues on transboundary rivers. Compared to Track I cooperation, it is relatively easy to start formulating the process of research cooperation among scientists through Track II and III cooperation. Such cooperation allows for the production of knowledge that can lead to concrete steps towards cooperation and can also support state actors in their decision-making process. It is also an important means of building trust between the actors involved in the process.

The Dialogue moved from Track III towards Track II and I.5. As one of the main interests of the current dialogue is to discuss ideas related to basin institutions, there is a potential future action situation where the Brahmaputra Dialogue can be the vehicle for facilitating discussions among basin stakeholders on concrete steps towards basin-wide cooperation and its institutional mechanisms. As the dialogue process currently includes many academic institutions, conducting joint research is foreseen to be one of the key action situations resulting from the Dialogue in the future.

13. Action situation 9: Zone of possible effective cooperation (ZOPEC)

The result of an analysis of each component and their relationships supports the identification of a zone of possible effective cooperation (ZOPEC)[19]. Literature on negotiation uses a term called 'zone of possible agreement' (ZOPA) referring to a set of possible agreements that are more satisfactory in terms of perceived interests of each potential party than the non-cooperative alternative to agreement (Sebenius, 1992). The analytical framework aims to support the identification of the possible areas of cooperation, not necessarily based on a specific agreement; hence, we adopt the term 'zone of possible effective cooperation' to illustrate the potential areas that could promote effective cooperation and bring benefits to all parties involved in managing the water. In our approach we consider the ZOPEC as a combination of viable future action situations (Huntjens, Yasuda et al., 2016).

The ZOPEC includes areas of mutual gains and common interest (Huntjens, 2017). It identifies intervention points and helps to formulate sustainable solutions that can include different views, as well changing and competing needs (Huntjens, Yasuda et al., 2016). Patrick Huntjens argues that "[a] zero sum thinking can never bring a sustainable solution, referring to the classic idea that negotiations lead to a situation in which each participant's gain or loss is exactly balanced and water is used only once by only one party. 'Zero sum' is a limiting perception and it is often possible for parties with conflicting interests to gain, especially if they collaborate. This is only possible if the benefits derived from the water use are shared, rather than its allocation. Therefore, water diplomacy should be more creative and seek for mutual gains and common interest" (Dutch Water Sector, 2016). The mutual-gains approach stimulates to identify key factors that affect water cooperation by diagnosing water problems across sectors and administrative boundaries, and at different levels of governance. To this end, it identifies intervention points, and proposes sustainable solutions that are sensitive to diverse views and values, and can accommodate ambiguity and uncertainty as well as changing and competing needs (Huntjens, Yasuda et al., 2016). In short, the ZOPEC is an essential output of a mutual gains approach; it is an expanded pie, where parties can benefit more by working together on mutual benefits.

The framework's application to the Brahmaputra basin uniquely identifies a viable zone of effective cooperation. This case study demonstrates the potential of the framework to facilitate a paradigm shift among key stakeholders in water-related disputes from a zero-sum approach to one of mutual gains. Hence, this section serves to transform a river of confrontation into a river of collaboration. The identification of the ZOPEC was conducted based on the following inputs: 1)

[19] Some of the conceptual discussion on ZOPEC discussed in chapter is derived from Huntjens, P., Yasuda, Y., Swain, A., Man, R. de, Magsig, B., & Islam, S. (2016). *The Multi-track Water Diplomacy Framework: A Legal and Political Economy Analysis for Advancing Cooperation over Shared Waters*. The Hague.

analysis of eight action situations of existing cooperation provided some suggestions for possible future action situations, 2) based on interviews and literature review, the research team analysed the current contextual factors and formal and customary institutions that can benefit potential future action situations and analysed a possible shift in power dynamics of actors, 3) the results of the analysis were presented during a multi-stakeholder workshop in Bangkok and feedback received from 27 participants, and 4) participants further discussed possible areas of future cooperation which they prioritized over the course of the multi-stakeholder workshop. The process of discussion during this workshop is explained in detail in the next section (Furze, 2016).

13.1 Action situation, potential outputs and outcomes

Despite some of the on-going development activities and physical interventions to the river, the Brahmaputra River is relatively pristine compared to other large rivers in the region. This condition still allows riparian countries room to manage the river ensuring ecological integrity.

The key feature of the proposed ZOPEC is basin-wide cooperation among all the riparian countries in conjunction with economic cooperation, allowing cross-sectorial cooperation and benefit sharing. Such cooperation integrates all sectors involving water, ecology and economy in its scope and can potentially create mutual gains for the riparian countries and bring solutions to sustainably manage the river basin. Any type of development within the basin, including infrastructure (in particular for hydropower, flood control, irrigation and navigation), needs to be based on a whole-of-basin approach. For example, the development and the level of flow and sediments needs to be coordinated jointly to maintain the ecology of the river system, as well as to ensure navigation. Benefits derived from these infrastructures need to be shared fairly among riparian states. Taking a cross-sectorial approach in water cooperation can open up space for sharing benefits from different sectors. For example, downstream countries (e.g. Bangladesh and India) can benefit from upstream hydropower generation by offering its trade routes (navigation, road and rail) and access to port facilities in return for energy supply by the hydropower generating country (e.g. China and Bhutan). Arrangements for benefit-sharing may include benefits *to* the river (e.g., improved water quality, environmental protection, etc.), benefits *from* the river (e.g. hydropower, irrigation, etc.), benefits *because of* the river (e.g., reduced risk of conflict, increased food and security, etc.), and benefits *beyond* the river (e.g., integration of markets, benefits of regional trade, etc.; Sadoff & Grey, 2002). Adequate management of the basin, based on an ecosystem approach, can also promote tourism, as the river is a home to endangered species such as river dolphins.

The ZOPEC suggests some concrete steps stakeholders within the basin can take to foster regional cooperation. During the multi-stakeholder workshop in November 2016, participants from four basin countries discussed the ideas for

possible future action situations and related activities. This discussion took place after participants were informed about some of the key results of our field research related to current cooperation status and emerging contextual factors relevant for identifying the ZOPEC. Participants were divided into small working groups consisting of seven to eight members in each, brainstormed the idea for possible future action situations. All the ideas were presented and prioritized.

Each priority action can be considered as a possible future action situation. Prioritized actions can of course also be combined in one future action situation. Individual future action situations are considered as output or outcome of the wider ZOPEC, which is the basin-wide cooperation that integrates water, ecology and economy in its scope. The feedback loops in Figure 16 illustrate these relationships.

Based on a voting system 19 priority actions were identified during the multi-stakeholder workshop, divided into three categories: 1) joint research that supports basin management, 2) sharing data and improving communication, and 3) create platforms for fostering economic cooperation. The following section describes these key priority actions. For each priority action we included (between brackets) the number of votes received from participants.

Joint research

Workshop participants raised concerns that there appeared to be a barrier between researchers and policy makers. Whilst it was recognised that this did not always occur, the point was made that policy influence should be an important aspect to research and the relationships/mechanisms developed to ensure relevance and appropriate actions. It was also pointed out that Chinese politicians often take research results seriously into their policies. There was considerable discussion in relation to the forms of cooperation needed for research as well as important topics to focus on. It was recognised that China and India have good research capacity in most areas. Following is the list of prioritised actions following a voting system during the stakeholder workshop:

1) Create comparative studies based on same or similar methodology, e.g. on PES, climate change impacts, navigation, community-based water resources management, food security, policies, gender, adaptive capacity to deal with climate change, joint hydrological modelling (20 votes)
2) Collect existing data (physical, carrying capacity, social, political, etc.) from each basin country to identify gaps and existing river use by people (19 votes)
3) Improve collection (in public domain) of hydrological data (especially at country borders) on surface water, interflow, groundwater (15 votes)
4) Alternative data sources, e.g. remote sensing, GIS, etc. (7 votes)
5) Identifying costs of non-cooperation (6 votes)

Data and information sharing, communication

The discussions on data and information sharing focused on the benefits of shared information. It was recognised that for information to be shared, there needed to be a level of trust between governments and a willingness to share. This was important not only for government-to-government sharing but also for government-to-civil society sharing. Furthermore, the need for comprehensive research on aspects of the Brahmaputra basin and its management was identified. This was likely to encompass new research and the collection of existing research results.

1) Knowledge Platform (19 votes): this type of platform considered as mechanism to facilitate joint research
2) Exchange of experts (13 votes)
3) Public sharing of jointly collected data (13 votes)
4) Exchange of journalists (11 votes)
5) Water & youth ambassadors (7 votes)
6) Exchange of students (2 votes)

Economic cooperation

Workshop participants expressed that the time was right for positive development in economic cooperation across the region. However, this would not be without its challenges.

1) Develop platforms (regional or basin specific) to support multi-track diplomacy, platform to address common threats and to identify benefits (13 votes)
2) River Commission for Brahmaputra Basin (8 votes), step-by-step approach, first a Commission for Lower Basin, later for entire basin (8 votes)
3) Exchange of expertise and information between universities and CSOs, e.g. via MoUs (8 votes)
4) Inclusive governance, e.g. broad and horizontal stakeholder participation, integration of local interests, bottom-up approaches (6 votes)
5) Identify and develop new benefit sharing arrangements (across sectors), including carbon trading, payment for ecosystems services, energy, water resources, water-food-energy nexus, connectivity (navigation, road, rail) etc. (5 votes)
6) Collaboration between (local) CSOs of basin countries (5 votes)
7) Improve collaboration on: navigation (4 votes), disaster risk reduction (4 votes), economic corridors/trade (3 votes), PES (3 votes), hydropower (1 vote)
8) Transparent decision-making (4 votes), e.g. based on high-quality EIAs, vulnerability and risk assessments, monitoring and evaluation of the process

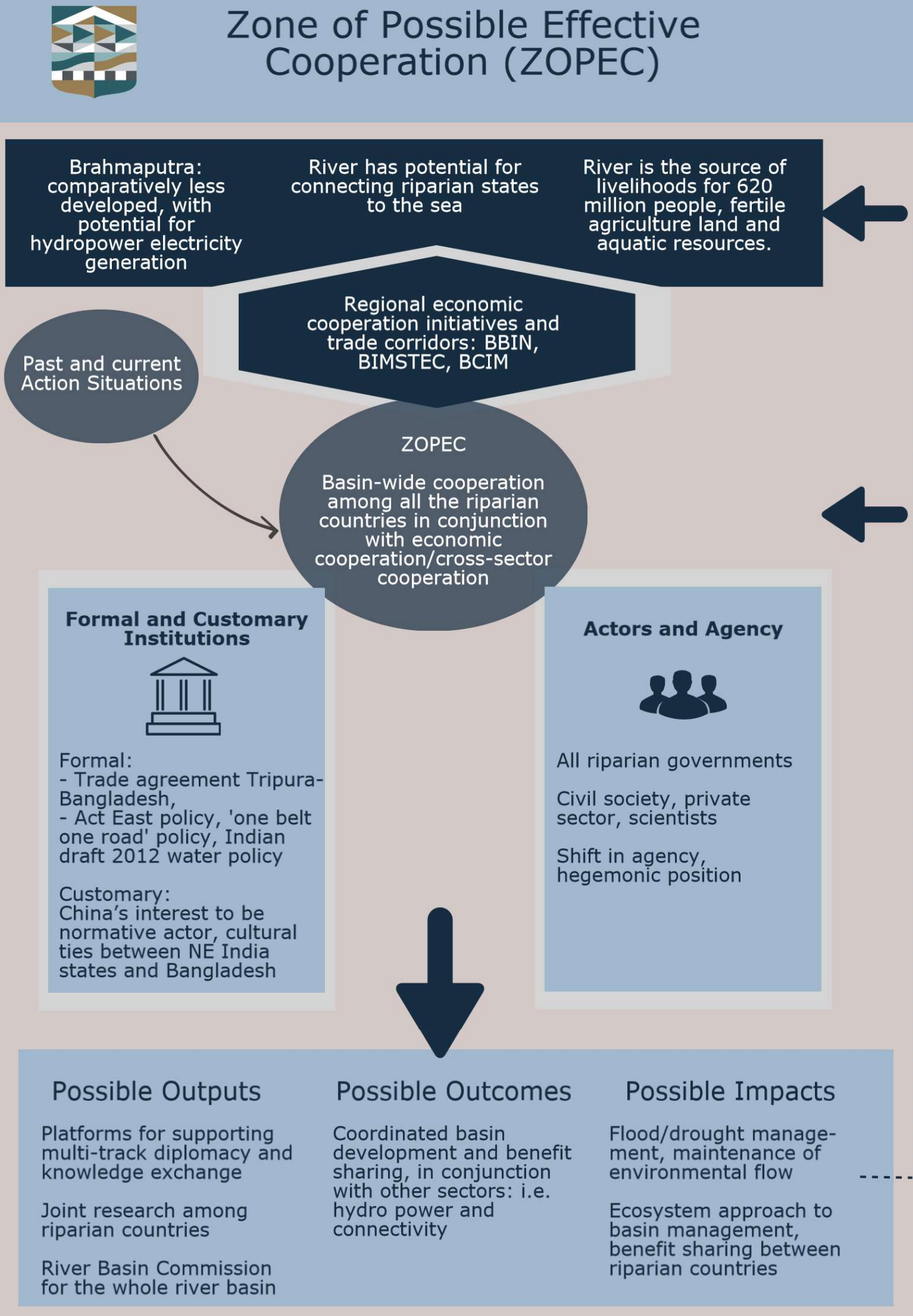

Figure 16: Factors affecting ZOPEC for the Brahmaputra basin.

13.2 Factors affecting ZOPEC

Figure 16 illustrates the factors affecting ZOPEC for the Brahmaputra basin.

13.2.1 Contextual factors

There is currently no Track I basin-wide cooperation over the Brahmaputra that includes all its riparian countries. However, countries are starting to discuss multilateral cooperation over water in the context of regional economic cooperation.

The Bangladesh, Bhutan, India, Nepal (BBIN) initiative is one such cooperation. BBIN is a sub-regional cooperation of the four countries Bangladesh, Bhutan, India and Nepal. There are two Joint Working Groups under BBIN: JWG on Water Resources Management and Power/Hydropower, and JWG on Connectivity and Transit (Energy Bangla, 2015; PTI, 2015a; BA8, 2016). In 2015, the BBIN countries signed an agreement on motor vehicle traffic amongst them with aims of facilitating safe, economical, efficient and environmentally sound road transport in the sub-region and creating institutional mechanisms for regional integration (Press Information Bureau, 2015b).

The JWG on water and power has met three times so far (RB2, 2016). The last meeting was held in January 2016 where delegates discussed the scope for power trade and inter-grid connectivity as well as potential hydropower projects under the BBIN framework. The JWG also decided to establish an expert group with the purpose of exchanging best practices in water resource managements, flood forecasting, power trade and inter-grid connectivity (Ministry of Foreign Affairs, 2016). The establishment of the expert group within the Water and Power JWG is a specific output from the current BBIN process that can further enhance the sub-regional cooperation.

In addition to BBIN, there are number of sub-regional economic collaboration programs in the region that can create potential platforms for water and economic cooperation. The Bay of Bengal Initiative for Multi-Sectorial Technical and Economic Cooperation (BIMSTEC) for instance is a regional organization consisting of Bangladesh, Bhutan, India, Nepal, Sri Lanka, Myanmar and Thailand. The purpose of BIMSTEC is to enhance the economic cooperation of its member countries. There are 14 sectorial committees including agriculture, fisheries, energy, transport, and culture (BIMSTEC, 2015). There is currently no specific committee on water. The BIMSTEC member countries signed the Framework Agreement on the BIMSTEC Free Trade Area in 2004 (BIMSTEC, 2015).

The Bangladesh-China-India-Myanmar (BCIM) Economic Corridor is another sub-regional economic cooperation that is being discussed within geographic area of the Brahmaputra River. BCIM originally started in early 1990s as a Track II process known as 'Kunming Initiative' that included representatives from academia, think tanks, civil society, businesses, technical experts and tourism officials (Sajjanhar, 2016). When completed, this corridor will connect Kolkata with Kunming, passing through Bangladesh and Myanmar (Aneja, 2015). According to Aneja (2015), the

main artery connecting Kolkata to Kunming (2800 km) was almost finalised as of June 2015.

Another regional platform for socio-economic cooperation is the South Asian Association for Regional Cooperation (SAARC). SAARC is an initiative among eight countries in South Asia including Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka. They cooperate in various areas of social and economic development in the region, including agriculture, rural development, environment, economic and trade. In 2004, the member countries signed the Agreement on South Asian Free Trade Area (SAFTA), which has a primary focus on a trade liberalisation programme including tariff reduction within the contracting states (SAFTA Agreement , 2004, Art. 7). With regards to water, one interviewee said: "In SAARC, they decided not to talk about water in the initial days, but later on water was included and knowing about the relation between India and Pakistan we do not foresee the SAARC is going to be the major force. It is already maybe 30 or 40 years old and nothing tangible has happened" (BA8, 2016).

There are several processes of sub-regional cooperation initiated by China. First of all, some interviewees indicated that the recent Lancang-Mekong Cooperation Mechanism initiative by China was setting a positive example for transboundary water cooperation as it illustrates potential for China to open its bilaterally focused approach towards transboundary rivers to allow multilateral approach (CH11, 2016; CH13, 2016). It is of course important to keep in mind the different situations surrounding cooperation over the Lancang-Mekong and the Brahmaputra: the Lancang-Mekong River already has the Mekong River Commission, an inter-governmental river basin commission among four lower riparian states, actively seeking dialogue with upstream China. There are no border disputes with other riparian countries within the Lancang-Mekong initiative (except for Vietnam in the South China Sea), whereas the Brahmaputra flows through disputed border areas. As Ho (2014) points out, Southeast Asian states have been more actively seeking cooperation with China whereas limited cooperation has been sought by South Asian nations.

Such basin-wide cooperation could be positioned as a part of larger regional and economic cooperation. Although historically, China had stronger cooperation with the Southeast Asian nations, China's new 'One Road One Belt' policy aims to establish new trade route towards west, positioning South Asian nations as important trade routes and thereby partners.

These pre-existing economic corridors points to the role that the Brahmaputra River could play as economic corridor and trade routes. This function would be particularly important for Bangladesh who can offer geographic connection to the sea through its port, transit between Northeast India, China, as well as Southeast Asia. Economic dependency of Bhutan and Bangladesh over India is shifting with increased sub-regional cooperation, Bhutan's more open policy towards outside world and the emerging economic influence of China in the region. These can bring competitive advantage. As BA8 (2016) suggests: "If we can have Bangladesh,

Bhutan and India working together, that would provide the solution that's needed for Bangladesh. If China is involved, it's very good."

13.2.2 Formal institutions

One interviewee indicated that the BBIN cooperation initially emerged from a bilateral cooperation between India and Bangladesh (RB2, 2016). During the Indian Prime Minister's visit to Bangladesh in 2011, the Framework Agreement on Cooperation for Development was signed between the two heads of the state (Framework Agreement on Cooperation , 2011). The agreement provided a starting point for India and Bangladesh to cooperate on water, calling for cooperation with other riparian states (BA6, 2016; RB2, 2016). Article 2 of the Framework Agreement indicates that "[t]o 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" (Framework Agreement on Cooperation, 2011). Specifically referring to water sector, Article 7 suggests that "[t]o harness the advantages of sub-regional cooperation in the power sector, water resources management, physical connectivity, environment and sustainable development for mutual advantage, including jointly developing and financing projects" and Article 11 allows amendment of this agreement to deepen and widen the scope of regional or sub-regional cooperation (Framework Agreement on Cooperation , 2011). According to RB2 (2016), although this framework agreement is only between the two countries, having these sections allowing India and Bangladesh to approach other countries for sub-regional cooperation facilitated the initiation of the BBIN cooperation.

India and Bangladesh started a collaboration in 2016 whereby India provides 100 MW of electricity to Bangladesh in exchange for Bangladesh providing 10 gigabits per second internet bandwidth to the neighbouring north-eastern Indian state of Tripura (Express News Service, 2016; BA1, 2016; BA5, 2016). This cross-sectorial, cross-border cooperation aims to supplement specifically what each party lacks. Referring to this cooperation, Indian prime minister Narendra Modi is reported to have said: "As part of my 'Act East' policy, this gateway in the east is very important. The opening of eastern gateway in association with Bangladesh will bring connectivity to eastern region particularly Assam, Tripura and Sikkim" (Express News Service, 2016).

Modi launched the 'Act East' policy as a way of promoting economic cooperation and cultural ties, and develop strategic relationships with countries in Asia and the Pacific region. The northeastern part of India is the priority area for India's 'Act East' Policy, as the region is geographically situated as a connection to its eastern neighbouring countries (Press Information Bureau, 2015a). As indicated by Modi, India's 'Act East' Policy is a formal institution that can potentially create new and enhance existing cooperation between countries. Referring to the 'Act East' Policy, BA3 (2016) said that Modi is trying to be a regional leader.

Another key formal institution is India's North-east Development Policy. In India, the Brahmaputra River flows through the northeast of the country. Historically, this area was at the forefront of economic trade via sea routes. However, following independence from the UK, and the partition of East Pakistan, (now Bangladesh), in 1947, the northeast of India became virtually disconnected from the rest of the country. This geographic separation created political fragmentation, and resulted in a violent insurgency (Maier, 2009). The Brahmaputra River plays a crucial role in the development of the region. It provides the water needed for agriculture and hydropower generation, and is the source of floods that affect the riparian populations' livelihoods. Water security is paramount for the development of the region, and contributes to India's keen interest in requesting upstream China's cooperation over the river. The region is economically less developed than the rest of India, which prompted the Indian government to put various policies and measures in place to improve the economic development of the region. In 1996, the Prime Minister announced 'New initiatives for North Eastern Region' that required at least 10 per cent of the budget of the central ministries and departments to be earmarked for the development of the north-eastern states (Ministry of Development of North Eastern Region, n.d.).

China's 'One Belt One Road' policy also brings competitive advantage for Bangladesh as it can provide China with port and road access towards markets in South Asia and beyond. India's National Water Policy from 2012, discussed in greater detail in Chapter 5, takes a basin approach to water management. If applied to the transboundary river basin, it can benefit the Brahmaputra River. Bangladesh and India's trade route and related protocol (also discussed in Chapter 5) can additionally create opportunities for establishing joint river management among the countries in the basin.

Although none of the Brahmaputra River's riparian countries have ratified it, it is important to consider the United Nations Convention on the Law of Non-navigational Uses of International Watercourses (UNWC). China is not a party to the UNWC and one of the few countries that objected to the convention during the United Nations General Assembly in 1997 (He, 2015; United Nations, 1997; United Nations General Assembly, 1997). The main reasons for China to object to the UNWC were an imbalance of obligations between upstream and downstream countries and the failure to recognize territorial sovereignty (He, 2015). China was also opposed to the provisions on dispute settlement mechanism under the UNWC. The Chinese delegate to the United Nations General Assembly in 1997 said that "China favours settlement of all disputes through peaceful negotiations" (United Nations General Assembly, 1997). However, one interviewee suggested China integrates some of the key principles of the UNWC into their bilateral water agreements (CH14, 2016). Su (2014) conducted a legal analysis of the Chinese transboundary water law practices and argues that China integrates the principle of equitable utilization and the no-harm principle in its transboundary water agreements with Russia, Mongolia and other neighbouring countries. Based on a detailed analysis of Sino-Russian water agreements, Vinogradov and Wouters

(2013) argue that the water agreement signed between China and Russia in 2008 includes principles of equitable and reasonable utilization and protection of transboundary waters, as well as a clause to "take all necessary measures to prevent significant harms, caused by transboundary impact." This integration of key substantive norms of the international water law into China's bilateral water treaties presents a possibility for the future use of these principles in other river basins that China is part of, such as the Brahmaputra River.

Chinese domestic policies and experiences on benefit sharing, PES and environmental flow can enable China to take up a leadership position in introducing these measures in the context of a transboundary river. According to an interviewee, China recently adopted the concept of environmental flow in developing their master plan for the Yangtze River (CH10, 2016). Interviewee CH9 indicated that the concept of environmental flow was introduced to China by international organizations only relatively recently (CH9, 2016). In 2013, Chinese experts from the Ministry of Water Resources in collaboration with international experts published a technical report on basin water allocation planning, which integrates concept of environmental flow (Speed et al., 2013).

Some of the interviewees pointed out the importance of the Chinese policy on Ecological Civilization, one of the visions proposed by Chinese leaders (CH5, 2016; CH9, 2016). Ecological Civilization refers to a policy that ensures conservation and recovery of nature as a way of sustainable economic and social development (State Council Information Office, 2015). It is a 'five-in-one' model that integrates traditional economic, social and ecological dimensions of development, but also integrates political and cultural dimensions, allowing to focus on behavioural changes of citizens and public officials (UNEP, 2016). Through Ecological Civilization, China aims to "make the skies bluer, mountains greener, water cleaner and ecological environment better" (UNEP, 2016). The current Chinese leader President Xi pointed out that "green is gold" (UNEP, 2016; CH16, 2016). The concept of Ecological Civilization was first introduced at the 17th CPC National Congress in 2007, and it was elevated as a political outline and national strategy of the government at the 18th CPC National Congress in 2012 (UNEP, 2016). The concept is integrated into the 13th Five Year Plan for 2016-2020, which includes the specific targets of reducing the water consumption per unit of GDP by 23% and reducing the energy consumption per unit of GDP by 15%. One of the policies under the Ecological Civilization is to introduce four types of zoning categories throughout the country, depending on the land use and ecological status. The Qinghai Sanjiang National Nature Reserve for instance is designated as key ecological functional area as it is the source area of the Yangtze River, the Yellow River and the Lancang River (UNEP, 2016). The principle of Ecological Civilization, if applied to the Brahmaputra, can potentially contribute to positive relationships and contributions in transboundary cooperation. One interviewee indicated that the government has established a nature reserve in the upstream area of the Brahmaputra River (beyond the basin area) called Manasaravor (CH19, 2016). Referring to the China-India bilateral cooperation, another interviewee, who is

involved with a governmental institution, mentioned a comment by a high official government as "the section of trans-border rivers within China have basically been kept in its natural conditions, and should be considered as the best protected rivers in the world, making significant contributions to the economic and social development, as well as the ecological and environmental protection in India" (CH13, 2016).

Another point to note are China's domestic policies and experiences related to domestic rivers. China, due to its size, has rivers flowing through different provinces of the country. Therefore, China has policies and experiences related to benefit sharing within different provinces in the basin. According to CH13 (2016), in case of Three Gorges Dam, there is a fund that supports under-developed region, which is mostly used for resettlement. China also introduced policies reflecting payment for ecosystem services called eco-compensation on the domestic level (Bennett, 2009; Zhang, Lin, Bennet, & Jin, 2010). China has already invested over 130 RBM to eco-compensation, one of the largest public schemes for PES (Bennett, 2009). According to guiding opinions on the Development of Eco-compensation pilot work issued by the Chinese Ministry of Environmental Protection in 2007, the watershed was one of the priority areas for the pilot, and since then has led to the development of pilot projects in some of the domestic river basins (Bennett, 2009). One interviewee indicated that the government compensates people living in the head water area of three rivers – the Yangtze River, the Lancang-Mekong River and the Nu River – for protecting the environment (CH15, 2016). China's experience of managing inter-provincial rivers and introducing new policy measures to balance cost and benefit among various stakeholders within a single river basin could allow China to take the leadership in balancing various interests within a transboundary river basin in the future.

13.2.3 Customary institutions

Regional cooperation can be facilitated through cultural factor. In addition to geographic proximity, BA5 (2016) pointed out that north-eastern states of India has been culturally and economically closely related to Bangladesh. The partition of India-Bangladesh in 1947 resulted in north-eastern India to be connected with the rest of India through a corridor of only 27 km wide (Downie, 2014). Since the 1950s, the region has faced large-scale insurgent violence targeted at Indian security forces and communities from central Indian states, resulting in Indian federal states government to deploy large number of military forces (Bhaumik, 2007). According to BA5 (2016) people in north-eastern India prefers Bangladeshi products more than products from western part of India, as India acts like a 'big brother' to them (Hazarika, 2016).

Referring to a wider regional history, BA5 (2016) also pointed out that the region is one sub-continent that was divided as a result of colonial force, therefore there remains opportunity for regional integration similar to the European Union.

Several interviewees said that China wants to be seen as a 'good neighbour' and 'the normative player' that abides by international law (CH14, 2016; CH20, 2016). This is one of the approaches adopted by current president Xi Jiping (CH13, 2016) who, according to another interviewee, understands the outside world, and is concerned about how China is perceived in the rest of the world (CH9, 2016). According to one interviewee: "because there is a saying that when a country gets stronger, then you try to get into war and hegemony, but Chinese government is saying no we are getting strong but we will seek peace" (CH14, 2016). Another interviewee noted that China was late to join the international law regime, (around the 1970-80s), and is thus just starting to understand the international legal system. It was better not to 'push' China too much and rather allow them to take their time (CH11, 2016).

There is also a culture to respect harmony, which was mentioned by an interviewee as an informal cultural factor that affects the Chinese approach in the international arena. This informal institution is the reason for China to prefer to settle disputes through negotiation rather than arbitration (CH14, 2016).

13.2.4 Actors and Agency

Cooperating over water issues in conjunction with regional economic cooperation can potentially shift agency, and could create a situation where all riparian countries find agreement. In case of the Brahmaputra River, Bangladesh, as a lowest riparian country, has been the weaker state in its relationship with India (BA2, 2016). However, geographically, Bangladesh has much to offer to India, particularly on India's development to northeastern states. For India to connect its northeast to the rest of the country, it is more efficient to go through Bangladesh rather than Indian territory. Providing navigational paths could also allow the northeast of India to access the port. For India as a federal country, the socio-economic development of the relatively impoverished and politically unstable northeast of the country is important. Referring to this point, BA8 (2016) said that Bangladesh has the possibility to block development of India's northeastern states, providing incentives for the two prime ministers to cooperate each other.

Another favourable factor for Bangladesh is the emerging role of China in the region. China has keen interest in expanding its economic network with its South Asian neighbours. Bangladesh's geographic location can provide advantage to China, as it can provide access to their port as well as to land transit. The Brahmaputra River has a large potential for navigation that could benefit all riparian states. Bangladesh is in an advantaged position thanks to its ability to offer a port at the mouth of the river.

India has always been the strongest country within the region, politically and economically. With regards to the Brahmaputra River, a number of Bangladeshi interviewees suggested that India as the upper riparian has not always been an easy neighbour to deal with in terms of shared river water related issues (BA2, 2016; BA3, 2016; BA4, 2016; BA6, 2016; BA7, 2016). However, as discussed in

Chapter 4, China has started using the Brahmaputra River upstream of India in recent years, leading to a shift in India's position from upper riparian to middle riparian. For example, referring to the hydropower project that started in 2014 in Chinese part of the Brahmaputra River, The Hindu, a national daily newspaper of India, stated that the Indian Minister of State for Water Resources, Sanwar Lal, issued a statement expressing concerns over such upstream construction on the river; China, however, maintained that it will not restrict water flow to India as the construction plans had been designed under the run-of-the-river principle (The Hindu, 2016b). Nevertheless, the shift in India's position of upper to middle riparian in the face of China's hydropower development on the upper parts of the Brahmaputra River leads the country to the dilemma of being the upper and the lower riparian (BA6, 2016; BA7, 2016). In the context of this situation, India is shifting its focus on transboundary water issues from a bilateral to a multilateral approach.

One key factor to determine China's future cooperation is its political leadership. An interviewee said that in China, the head of the family traditionally makes the decisions and the others follow, and that people expect this from their political leaders too (CH9, 2016). Referring to Chinese president Xi Jiping's 'One Belt One Road' policy, another interviewee said that leaders have to be philosophers, even though they may not necessarily implement what they say (CH18, 2016). These comments reflect the importance of the Chinese leadership and their roles in presenting their vision and the future direction to a wider public.

Several interviewees stated that Xi Jiping is more environmentally conscious compared to previous leaders (CH5, 2016; CH15, 2016; CH16, 2016). These interviewees noted that many of the existing development project plans were initiated during the previous leaderships of Zhang Zu Ming and Hu Jing Tao (CH5, 2016; CH15, 2016). In contrast, some other interviewees criticized that President Xi was just trying to create a certain image but without actually implementing things (CH17, 2016; CH20, 2016). These interviewees indicated that president Xi was mainly concerned about China's image on the international stage (CH9, 2016).

While there were mixed opinions about environmental consciousness of the current Chinese leadership, there are clear policies reflecting environmental consideration in place, such as the philosophy of Ecological Civilization. Having such a vision can positively influence the mind-set of Chinese actors who would be interested in following the direction of the leadership.

Another encouraging factor regarding cooperation over transboundary water is that China established joint commissions under every water-specific agreement it has signed (Su, 2014). While the effectiveness of these joint commissions is yet to be assessed, it provides a positive precedence for the future cooperation over the Brahmaputra River.

It is important to note emergence of new actors, particularly civil society actors and academics. Currently the only initiative that focuses on cooperation with a Brahmaputra basin-wide scope including all the riparian countries is the

Brahmaputra Dialogue. As discussed in Chapter 12, this process was initiated by actors from civil society and academia. The process is gradually expanding to incorporate governmental actors and decision-makers, an important step towards basin-wide cooperation that involves all the stakeholders.

Scientists can also play an important role. Most of the Chinese research institutes and think tanks are directly associated with government. For example, most think tanks focusing on international relations operate within the administrative hierarchies under either a State Council Ministry, a Central Committee Department or the People's Liberation Army (Shambaugh, 2002). Xufeng (2009) provides three categories of Chinese think tanks: 1) official research institutes that are founded within government agencies; 2) semi-official think tanks that are not completely independent from the government but are run in a more autonomous manner compared to official research institutes. They are headed by a government-nominated person, and obtain funding from government and external sources. These think tanks can be close to government and at the same time have the possibility to be critical about the government and 3) civilian think tanks that have less of a government affiliation and work with a wide range of funding sources including private enterprises and overseas funding. Some of these think tanks have relatively loosely supervised by government departments (Xufeng, 2009).

There are two sides to this situation: The close connection between scientific institutes and government agencies in China could entail that governments are likely to use or refer to scientific research results conducted by these research facilities. On the other hand, the institutes' freedom and liberty of science may be restricted.

Scientific cooperation is already taking place nowadays through some multilateral mechanisms like ICIMOD (CH16, 2016; CH19, 2016). However, referring to the development of the Saleween-Brahmaputra landscape, one interviewee involved with ICIMOD said: "ICIMOD is just talking and talking, that's why I left" (CH1, 2016). These comments may be a reflection of the fact that scientific inter-governmental body like ICIMOD can be effective in producing knowledge, but that other actors need to take up the information produced by scientists and implement them into policies.

13.3 Chapter conclusion

This chapter identified and analysed the ZOPEC for the Brahmaputra River basin. Analyses of contextual factors, formal institutions, customary institutions and shifts in actors and agencies all point towards viable future action situations for basin-wide cooperation. One significant aspect that emerged from the analysis is the importance of exploring solutions to the water problems in conjunction with economic cooperation. This also requires openness towards engaging with 'new' actors who may not have been traditionally engaged in the water sector.

The framework's application to the Brahmaputra basin uniquely identifies a viable zone of effective cooperation. It also provides a better understanding of key factors that may affect future cooperation. Understanding these factors was important in suggesting directions for the ZOPEC. This case study demonstrates the potential of the framework to facilitate a paradigm shift among key stakeholders in water-related disputes from a zero-sum approach to one of mutual gain.

14. Conclusion: Key factors affecting cooperation on the Brahmaputra River

As discussed in Chapter 2, this research was aimed at answering two key research questions:

1) What are the factors affecting water cooperation in transboundary context?
2) What are the zones of possible effective cooperation (ZOPEC)?

To answer these questions, the research analysed eight existing action situations related to transboundary water cooperation within the Brahmaputra River basin. This chapter concludes this report by discussing how the research answered these questions.

Factors affecting water cooperation in transboundary context

The analysis of different action situations provides us with some of the lessons on key factors that affect cooperation in case of the Brahmaputra River. Overall, each factor in the Multi-Track Water Diplomacy Framework, namely contextual factors, formal institutions, customary institutions and actors and agency plays an important role in determining the way cooperation took place.

Contextual factors

The basin's contextual factors proved to be a key factor affecting cooperation. Referring to the Multi-Track Water Diplomacy Framework, one of the dimensions of the contextual factors are the biophysical and material conditions. Through the review of bilateral cooperation over the Brahmaputra, we can conclude that cooperation takes place when there is a certain level of conflict over the resource use. This is echoed in existing literature, Zeitoun and Mirumachi (2008) for instance, argue that conflict and cooperation co-exist in many cases. As an example from the analysed action situations, the cooperation between India and China only started after China began constructing its dam upstream of the Brahmaputra River. There is currently no conflict on resource use over the Brahmaputra between Bhutan and China, which seems to be the reason for the absence of specific cooperation over the river between the two nations. India and Bangladesh have had a long-standing cooperation since the establishment of the JRC in 1972 as there had been conflicts over the water use on the river, e.g. regarding the Farraka barrage. These situations allow us to consider the influence of biophysical characteristics (biophysics) and physical changes in the river system (alterations). As discussed by Sadoff and Grey (2002), this type of cooperation is considered as cooperation that reduces the costs from the river.

The opposite is also true as cooperation can also take place to promote economic benefits without having conflicts as a starting point. Geographically, Bhutan and

Bangladesh do not share borders, and thus there is no direct contact through the Brahmaputra River. However, these nations have recently entered into cooperation over electricity. Similarly, there is cooperation over electricity generation between Bhutan and India. In case of these two countries, there is also the factor of interdependency, as Bhutan heavily relies on India economically and politically. These factors highlight the importance of the socio-economy dimension in promoting cooperation. As discussed by Sadoff and Grey (2002), this type of cooperation is considered as cooperation that increases benefits from the river.

The political context is a factor that affects most cooperation, particularly on Track I. This was observed in many cases of bilateral cooperation such as between India and China, India and Bangladesh and Bhutan and India and in the emerging cooperation between Bhutan and Bangladesh.

Formal institutions

Formal institutions also play an important role in determining the cooperation. The Chinese energy policies clearly indicate hydropower development in upstream of the Brahmaputra River, which created direct concerns by downstream riparians and an Indian request to start data sharing. Between India and Bangladesh, the JRC statute is the formal institution that sets up the cooperation framework. In the case of the Bhutan-India relationship, the Bhutanese monarchy played a key role in cultivating and maintaining their 'sweet heart deal' with India, which was an important factor in making the hydropower development and electricity purchasing cooperation between two countries. In addition, changes related to the Friendship Treaty created some shifts in its international relationships with other riparian neighbours, including the potential opening of formal ties with China.

Customary institutions

Customary institutions, in parallel to formalized policies, are also important for current and prospective cooperation. Trust is one of the main dimensions of customary institutions that affect cooperation processes. Lack of trust can be created through a combination of different factors. It arises, for instance, through a lack of communication and information. In the context of the India-China relationship, the lack of information about Chinese upstream development raised suspicion and concerns in India. In the case of India and Bangladesh, India's failure to provide dry season data creates adverse sentiment in Bangladesh, and fuels suspicions that India may be diverting more water than it is allowed to. Trust is also affected by historical factors such as former or still ongoing conflicts over other issues. In the case of India and China, an unsettled border dispute was a source of contention for both parties, which many interviewees referred to as the source of sensitivity regarding cooperation over the Brahmaputra River and the two countries' relationship.

Actors and agency

Actors and agency in the basin are particularly important when there is a shift in agency to be observed. The cooperation between Bhutan and Bangladesh for instance only became possible once India agreed to cooperate. While India has traditionally been dominating the bilateral cooperation with its neighbouring countries, it is gradually shifting its approach on transboundary water cooperation towards a multilateral focus, which allows for a trilateral cooperation to emerge among Bhutan, Bangladesh and India. The regional approach of BBIN also became possible when India started to be interested in taking a multilateral approach. This may be caused by emerging awareness of China as an upstream country, which India only came to face recently.

Interaction of key factors

This research revealed that these factors interact with each other when affecting water cooperation. For example, many of the political contexts (contextual factor) arise from historical legacy, culture and religion (customary institutions), and are influenced by actors' agencies (actors and agency). The political context between India and Bangladesh for once is affected by the historical legacy of Bangladesh, which used to be a part of Pakistan. Geographically surrounded by India in most directions, Bangladesh is economically heavily dependent on India, creating a power imbalance between the two nations (agency), which affects the cooperation (action situation) as well as the overall political context (contextual factor). China and India's political context is affected by a border dispute that arises from a past war.

Similarly, agencies of actors can shift through changes in the context or in formal rules. India for instance has traditionally been a politically and economically strong country within South Asia, which had an effect on its cooperation over the Brahmaputra with Bhutan and Bangladesh. However, the recent Chinese upstream development of the Brahmaputra River (shift in the contextual factors) moved India's position as upper riparian (towards its weaker neighbour Bangladesh) to be a downstream riparian itself, allowing India to understand the downstream riparian's perspective. Emerging formal rules that foster regional trade, including China's 'One Belt One Road' policy and India's 'Act East' policy, put Bangladesh in an advantageous position with regards to economic competition with its neighbouring states in the region, resulting in a shift of its agency.

It is important to note that all factors affecting transboundary water cooperation are not static. While some factors are fundamental, underlying facts or attitudes may take longer to change (such as customary institutions). Other factors such as contextual factors including the status of river alteration or the development of formal institutions, (such as a new regional trade agreement), can take place rather quickly, shifting actors' relationships and their agencies, influencing the dynamics of transboundary water cooperation (Williamson, 2000). The use of the

Multi-Track Water Diplomacy Framework allows the capture of this shift over the course of a longer time period.

ZOPEC

The Zone of Possible Effective Cooperation (ZOPEC) was identified through a combination of the analysis of key factors that can affect possible future action situations in the Brahmaputra Basin and the discussions in the stakeholder workshop.

The use of the Multi-Track Water Diplomacy Framework in analysing current cooperation and the ZOPEC suggests that the framework is a valuable tool that can be used for the investigation of past, current and future water cooperation.

One of the important observations is the emerging interest in water cooperation beyond bilateral relations. This trend originated from shifts in actors' interests and their agencies.

The emerging role of non-state actors is another important factor that contributes to the ZOPEC. In particular, dialogues facilitated by civil society actors are bringing stakeholders from the entire basin together, and are supporting dialogues and joint activities. Such dialogues can put stakeholders in contact that would not have met otherwise, and are an important step towards cooperation, potentially creating trust among various actors that is crucial for lasting cooperation.

The analysis of contextual factors and formal institutions all point towards expanding regional approaches, particularly through economic cooperation. Combining regional cooperation in different sectors, such as water, electricity and economy, expands the 'zone' of possible areas where different riparian actors are able to cooperate, as opposed to trying to identify a solution within a single sector, in this case the water sector.

There are differences in terms of socio-economic development, knowledge, technical management capacity, finance and infrastructure, political outlook, and also the legal contexts. These represent challenges to effective and coordinated management of trans-boundary water resources. Broader civil society has been neglected by the Track I in diplomacy arena, which needs to change through the joint dialogues between all layers of stakeholders and not only the governments. Furthermore, above nationalistic, concerns developing a regional outlook that could contribute to cooperation on transboundary water management at the Track II and III levels is therefore imperative. In particular, there is a need to enhance and integrate private sector and CSO capacities and to establish a regional cooperation framework for the integrated development of the GBM's water resources – a framework that feeds into the development of water governance policies that are inclusive and contribute to basin level planning.

This last aspect is also very relevant when bringing potential solutions to water problems to the attention of decision makers. Within governments, the water

sector is typically not at a high priority unless there is a severe drought or flood that affects the national economy. Linking water issues to other economic sectors can increase the level of interest of high level decision-makers' within a government, catalysing the implementation of solutions to water-related problems (Qutub et al., 2003).

The analysis of the ZOPEC leads us to conclude on the importance of thinking 'outside of the water-box' when looking for solutions to water problems.

Annex I: Indicative questions used during the interviews

A: Overview of key dimensions for the context.[20]

Dimension	Variable	Indicators	Guiding questions/Sources of information
Political context	Key political characteristics	I.e. general relation among riparian countries, political system	What are the political systems adopted by riparian countries? What are the political relationships among countries?
Socio-economy	Key socio-economic characteristics	I.e. types of livelihoods, industrial activities, social networks	What kind of livelihoods are riparian populations dependent on? What types of industrial and agricultural activities exist?
Biophysics	Key biophysical characteristics	I.e. water parameters, river morphology, flora/ fauna species, climate characteristics, etc.	Which are the key biophysical characteristics of the river system?
Alterations	Physical changes in the river systems	I.e. hydropower development, irrigation development	What is the level of physical alteration to the river? Are there any (hydropower) dams, irrigation schemes, or other water diversion activities being developed?
Interdependency	Interdependencies among riparians	Interdependencies among riparian states; among riparian residents	Has water cooperation increased interdependencies among riparian states? Or riparian residents? How could/did cooperation improve the benefits from interdependency?
Status of conflict and cooperation (basin-wide, and not only related to water)	Conflict and cooperation	Existence of conflict and cooperation: Overview of action situations related to transboundary water cooperation	What are the previous and on-going conflicts and cooperation that exist in the basin?
	People's perspective about cooperation	Interviewee's perception about cooperation	What is your observation about the current cooperation? Do you think it is working? Effective? Done in a mutually satisfied way?

[20] List of indicative questions and variables are derived from Huntjens, P., Yasuda, Y., Swain, A., Man, R. de, Magsig, B., & Islam, S. (2016). *The Multi-track Water Diplomacy Framework: A Legal and Political Economy Analysis for Advancing Cooperation over Shared Waters*. The Hague.

B: Dimensions, variables, and guiding questions for the analysis of formal institutions.

Dimension	Variable	Indicators	Guiding question
Formal institutions	Key legislations	Laws and policies that relate to management of the river basin	What are the laws and policies that relates to management of this river basin?
	Resource and uses covered	Water law adopts a basin and IWRM approach to water resource management	Does the law adopt a basin and IWRM approach to water resource management?
	Stakeholder engagement	Stakeholder involvement (in particular vulnerable groups) in (a) decisions on large scale projects and (b) the development of water laws and policies	Are stakeholders– in particular vulnerable groups – involved in (a) decisions on large-scale projects and (b) the development of water laws and policies?
	Avoidance of significant harm	Liability: law provides an obligation on the state to protect its citizens and riparian states from the adverse effects of natural hazards	Does the law provide an obligation on the state to protect its citizens and riparian states from the adverse effects of natural hazards?
	Data and information management	Exchange of data and information; law provides the public with a right of access to hydrological data; authorities share such data with riparian countries	Does the law provide the public with a right of access to hydrological data and do the authorities share such data with riparian countries?
	Joint institutions	Existence of joint institution assigned to govern shared water resources; allocation of resources and authority to actually govern	Have the basin states set up a joint institution with the assignment to govern shared water resources? Are the resources and authority provided to this institution to actually govern the shared resources?
	Ecosystem approach	Environmental impact assessment (EIA) legislation in place	Is an environmental impact assessment (EIA) legislation in place?
	Managing risk, including floods and droughts	Emergency measures in place which automatically kick in if human health or the environment is at risk	Are emergency measures in place which automatically kick in if human health or the environment is at risk?
	Dispute avoidance & settlement	Dispute settlement, provisions in place regulating the various steps of dispute settlement during a conflict of use	Are provisions in place regulating the various steps of dispute settlement during a conflict of use?
	Equitable and reasonable use	Rules of allocation correspond with the	Do the rules of allocation correspond with the principle of equitable and reasonable use?

		principle of equitable and reasonable use	

C: Dimensions, variables, indicators and questions for the analysis of customary institutions.

Dimension	Variable	Indicators	Guiding questions
Trust	Trust	Existence of trust	What is the level of trust between riparians?
Customary rules	Customary rules	Existence of customary rules	Are there any customary rules that have been applied in managing the river? (Try to ask some indirect questions as well.)
		Impact of informal rules on river basin management/cooperation and its effectiveness	What role/functions did the customary rules play in managing the river? How did it affect effectiveness of cooperation?
		Relationship between formal and informal rules; complementary or contradictory	What is the relationship between formal and informal rules? Did they complement each other? Or did they contradict each other?
Historical legacy	History of conflict and cooperation over water	I.e. references to historical events on conflict and cooperation in current water cooperation	Is there any history of conflict and cooperation on water among stakeholders? How was conflict resolved? At which levels?
	History of disputes other than water	Wars, conflicts in the past history between states/tribes	What is the history of disputes/ on-going conflicts with other riparian countries, not necessarily related to water?
	Culture/ religion	Impact of culture or religion on conflict/ cooperation	What cultural/religious factor(s) affect(ed) the dispute/ cooperation?
Attitudes towards water	Sentiments of regarding water	Sentiments of people regarding water	What are the general public's sentiments over the river/ water?
	Sentiments regarding other	Sentiments of people regarding other riparian countries/residents	What are the general public's sentiments towards other riparian countries/ residents?
	Type of value	Perceptions and values towards water management by key stakeholders within the basin	What are the perceptions and values towards water management by key stakeholders within the basin?

D: Dimensions, variables, indicators and questions for the analysis of actor-agency.

Dimension	Variables	Indicators	Guiding questions/Sources of information
Actors	Key actors/ stakeholders	Existence of actors/stakeholders	Who are the key stakeholders within the basin? - Government bodies - Water users - NGOs/civil society

			- Private sector - Regional bodies
		Type of actors that occupy key influential positions and why	Who are the actors that occupy key influential positions and why?
		Existence of coordinating organizations	Is there any formal/informal mechanism that coordinates different actors? For example, inter-ministry coordination? Or RBOs?
		Arrival of new actors, like multi-national companies (MNCs), civil society groups and other non-state actors	Are there new actors that played a role in conflict prevention and resolution?
		Informal organizations	Are there any informal organizations or actors who have been playing a catalytic role in managing the river? If so, how was it established?
	Actor's influence	Interests and incentives	What are the stakeholders' interests, incentives and beliefs?
		Control over critical resources	Who controls critical resources?
		Existence of coalitions	With whom do stakeholders form coalitions?
		Use of strategies and venues	What strategies and venues do stakeholders use to achieve their objectives?
		Influence of bureaucracy on the outcomes	What is the role of bureaucracy?
		Influence of new actors	What is the impact of civil society, MNC's and other non-state actors, on formal negotiations and vice versa?
			What is the influence of new actors (and their constituencies) on conflict prevention and conflict resolution (i.e. negotiated agreement and its implementation)? To what extent do these actors address the root causes of conflict?
		Influence of MNCs	What is the role of MNC's in water conflict and cooperation? Can they provide a sustainable financial underpinning to conflict resolution?
		Influence of civil society	Is there any transboundary civil society that works on water cooperation?
			What kind of role did transnational civil society play in water cooperation and regional peace building?
		Influence of coordinating organizations	How does the coordination work? Is any actor more influential than the others?

		Influence of RBOs	What are the roles and mandates of RBOs?
			Does the RBO contribute to the behavioral changes of its members? To what extent does the RBO achieve the goals set by its founding documents/strategic plans? Did the RBO play a role in solving the collective action problems that prompted its establishment?
			How does the RBO contribute to: 1) peaceful resolution of water-related collective action problems and promote cooperation among the member states? 2) improvement of the state of the environment in the basin? 3) efficient use of the river's resources and economic development? 4) improvement of the riparian population's livelihoods and their river-related well-being?
			To what extent does the RBO effectively govern the river's water resources? To what extent does the RBO contribute to the improvements of issues other than water resources governance in the basin?
		Influence of informal organizations	What roles/functions did informal organizations/actors play in managing the river? Or enhancing cooperation/gaining mutual understandings?
			What is the relationship between formal and informal organizations/actors?
			What kinds of contribution did the informal organization make in improving the cooperation? (In case informal organizations were found to be important, then, ask similar questions to RBO related questions above)
	Type of leadership	Type and role of leadership	Were there any actors who played important leadership roles? Who was it? What was the role the leader played in cooperation?

E: Dimensions, variables, indicators and questions for the analysis of action situations.

Dimension	**Variable**	**Indicators**	**Guiding questions/Sources of information**
Initiation	Initiation of action situation	Awareness and sense of urgency; purpose; convener; mobilization of support	What triggered the dialogue or negotiation? What was the stated purpose? Who convened? How was support mobilized?
Format	Stakeholder participation	Type of stakeholder participation and their	Who was invited to participate, and who attended? Who spoke or wrote? What venue?

		access to decision-making regarding the river	
		Involvement and impact of non-state-actors on formal negotiations and vice versa	What is the impact of civil society, MNC's and other non-state actors, on formal negotiations and vice versa?
	Informal processes	Existence of informal processes for cooperation	Were there any informal processes that facilitated cooperation over the river/water?
		Relationship between formal and informal processes	What is the relationship between formal and informal processes?
	Session format	Session format, agenda/structure, presentation formats, kind of facilitation	What was the format of sessions? What was the structure (agenda) of the event? What kind of organizational and presentation formats were used? How were exchanges between participants facilitated?
	Extent of collective action	Coordinated activity, involving experts, stakeholders, ordinary citizens and policy makers in a process of collective discovery	To what extent was there a coordinated activity, involving a variety of actors, in a process of collective discovery?
	Transparency about the decision-making process	Proper expectation management by providing stakeholders with a clearly defined and realistic scope of what to expect during the cooperation process	Is it clear for stakeholders what to expect during the cooperation process?
	Negotiation style	Negotiation strategies, e.g. yielding (accepting the first offer), compromising (split the difference), competing (zero-sum game), problem-solving (mutual gains)?	In case of negotiation: What type of negotiation strategy was being used and/or dominated the process?
Content	Issue selection	Issue/topic selection in the action situation, topic exclusion/avoidance	What issues and topics were addressed during the dialogue or negotiation? Which were excluded or avoided?
	Information availability	Information availability beforehand, relevance of information, sufficient reviewing time for input materials	What information was made available to participants beforehand? Was it relevant? Was there sufficient time to review the input materials?
	Dealing with uncertainties	Identification of uncertainties	What uncertainties were being acknowledged and addressed in the action situation?
		Uncertainties are not glossed over but communicated (in final reports, orally)	Are uncertainties communicated? If yes, how and by whom?

		Transparent and early communication of different types of uncertainties during cooperation process	How could/did cooperation overcome the uncertainties?
	Joint/participative information production	Different government bodies are involved in information production and supply, or at least consulted (interviews, surveys etc.)	How are different government bodies involved in information production and supply?
		Idem for non-governmental stakeholders	
	Interdisciplinarity	Different disciplines are involved in information production and supply: in addition to technical and engineering sciences and also for instance ecology and the social sciences	Are there different disciplines that are involved in information production and supply?
	Elicitation of mental models/ critical self-reflection about assumptions	Participants allow their knowledge and information to be challenged by other participants and present their own assumptions in as far as they are aware of them	Are participants open to be challenged by other participants?
		Information (e.g. research results and consultancy reports) is not presented in an authoritative way, but in a facilitative way, to stimulate reflection by the stakeholders about what is possible and what it is they want	Was information presented in an authoritative or facilitative way that stimulates reflection by the stakeholders?
	Broad communication	Governments exchange information and data with other governments	Do governments exchange information with others within the government?
		Governments actively disseminate information and data to the public: on the Internet, but also by producing leaflets, though the media, etc.	Do governments actively disseminate information and data to public? In what way?
	Utilization of information	New information is used in the action situation (and is not distorted)/ New information influences policy	Was any new information used in the action situation/did it influence the negotiation or dialogue?
	Decision support system(s)	River basin information systems are present and up to standards	Is there any river basin information system in place? Are they up to date and up to standards?

F: Dimensions, variables, indicators and questions for the analysis of output.

Dimension	Variable	Indicators	Guiding questions/Sources of information
Output	Produce	Result of negotiations or dialogues, e.g. agreements, decisions, project approval	What follow-up was there by conveners and participants?
		Issue relevant outputs from informal processes	What are the key outcomes from informal processes?
	Change in level of trust	Change in level of trust	Did water cooperation create any trusts among riparian states? Or riparian residents?
	Deliberating alternatives	Different strategies for dealing with possible future scenarios	Have different strategies been developed for dealing with possible future scenarios? If yes, how, where and by whom?
	Reframing problems	Shifting viewpoints/angles to describe problems to unlock potential for finding new solutions	Whether reframing of problems occur, and if yes how? Did participants learn useful things from each other?
	Monitoring and evaluation	Development of M&E in water cooperation	Does M&E of cooperation process occur? If yes, how, where and by whom?

G: Dimensions, variables, indicators and questions for the analysis of outcomes and impacts.

Dimension	Variable	Indicators	Guiding questions/Sources of information
Solutions	New solutions	Development and implementation of new solutions	Which innovative solutions are being implemented? How were these new solutions received?
	Customary solutions	Solutions that are created without formal agreement	Are there any solutions that are being created and implemented by local stakeholders outside the context of formal policies?
Ecologically optimal outcome	Environmental flow	Existence of environmental flow assessment	Was environmental flow assessment been conducted?
		Scientific quality of environmental flow assessment; analysis of relationships between flow alteration and ecological characteristics for different river types	Did the environmental flow analyze relationships between flow alteration and ecological characteristics for different river types?
		Recommended level of environmental flow	What is recommended as environmental flow?
		Current situation of environmental flow,	What is the reality (current situation) of managing environmental flow?

		how much is actually flowing	
		Process of determining environmental flow; who was involved; level of stakeholder participation; evidence-based decision-making	Who was involved in assessment of environmental flow? What was the level of stakeholder participation? What was the process of science-policy interface?
	Ecosystem	Existence of ecosystem assessment, e.g. by government of NGO	Does any type of ecosystem of biodiversity assessment exist?
		Quality of ecosystem assessment; key criteria; scientific methodology	What are the key criteria/ scientific methodology used for assessment?
		Recommendations from the ecosystem assessment, e.g. on conservation	What is the recommendation from assessment reports?
		Water management practice which takes ecosystems into account	Are there any management practices that take into account ecosystems?
Economically optimal outcome	Economy	Mentioning of rivers' resources in socio-economic development plan	In the socio-economic development plan, is there any mention of use of rivers' resources?
		Economically optimal outcome from using the river	What is the economically optimal outcome from using the river?
	Use of natural resources for economic activities (non-water)	Ecosystem services provisions, including: provisioning services, regulating services, habitat or supporting services, cultural services	What are the main ecosystem services the river provides? The following are examples of different service: • Provisioning services: Water supply, use of water for energy production, sediment and soil for cultivation and geomorphological formation. • Regulating services: Regulating flood and erosion. • Habitat or supporting services: Providing habitat for fish, other aquatic organisms, water birds, riparian vegetation etc. • Cultural services: River for recreational use, aesthetic use, and cultural use.

	Use of water for economic activities	Extent of river water used for irrigation; optimal level in terms of outputs	Is irrigation use from the river water being at optimal level?
		Extent of hydropower development; planned in optimal levels in terms of hydropower outputs	What is the extent of hydropower development (ongoing and planned)? Are they planned in optimal levels in terms of hydropower outputs?
		Extent of river water used for domestic use; distributed at optimal level; system of allocation	What is the extent of river's water use for domestic use? Is it used/distributed at optimal level? What is the system for allocation?
		Extent of river water used for industrial use; optimal distribution; system of allocation	What is the extent of river's water use for industrial use? Is it used/distributed at optimal level? What is the system for allocation?
Non-intended impacts	Non-intended impacts	Unforeseen negative or positive consequences of an intervention	Which unexpected consequences can be identified following the implementation of the intervention at hand?
Creation of behavioral norms/expected behaviors	Behavioral norms	Existence of behavioral norms; creation of any behavioral norms	Did water cooperation create any behavioral norms/expected behaviors among riparian states? Or riparian residents?
Interdependency	Interdependency	Increased interdependencies among riparian states; among riparian residents	Has water cooperation increased interdependencies among riparian states? Or riparian residents?
		Maximization of the benefits from interdependency due to cooperation	How could/did cooperation maximize the benefits from interdependency?

Annex II: Interviews in each country

Interviews were conducted in four riparian countries of the Brahmaputra River: Bangladesh, Bhutan, China and India. In addition, a number of informants with regional perspectives were interviewed. A total of 61 interviews were conducted with 59 informants. A combination of stakeholder mapping and snowball sampling methodology were used to identify key informants in each country. The following section provides an overview of interviews conducted in each country.

Bangladesh

In Bangladesh, nine out of ten interviews were conducted in Dhaka and one interview was conducted in Singapore, taking the opportunity of a regional workshop related to the Brahmaputra River. These interviewees included current and former government officials, NGO staff, donor agency staff, and individuals from research and academic institutions and are listed in Table 8. The initial list of interviewees was created through knowledge and contacts of IUCN Bangladesh, a locally based organization that has been working on the subject of transboundary rivers, and was also triangulated through suggestions by interviewees (snowball sampling method).

Table 8: List of interviewees in Bangladesh.

Interviewee number	Sector	Interview location
BA1	Research institute	Dhaka
BA2	Government	Dhaka
BA3	International Organization	Dhaka
BA4	Research institute	Dhaka
BA5	Research institute	Dhaka
BA6	Former government official	Dhaka
BA7	Government	Dhaka
BA8	Academic institute	Dhaka
BA9	Donor agency	Dhaka
BA10	Research institute	Singapore

Bhutan

Nine face-to-face interviews were conducted in Thimpu, the capital city of Bhutan. Snowball sampling allowed the research team to meet interviewees from a variety of sectors including: government, civil society, semi-local government entity, water service provider, professionals and academics. The interviewees all have specific knowledge about how water resource priorities are planned and implemented and were additionally selected to factor in as much of diversity as possible in the sample so that there is a balance and representation of the different groups of the 'Brahmaputra debate'. Table 9 provides an overview of interviewees.

Table 9: List of interviewees in Bhutan.

Interviewee number	Sector	Interview location
BT1	Government	Thimpu
BT2	Government, technical	Thimpu
BT3	Government	Thimpu
BT4	Media	Thimpu
BT5	Media	Thimpu
BT6	Government	Thimpu
BT7	CSO/NGO	Thimpu
BT8	NGO/Government Trust	Thimpu
BT9	NGO	Thimpu

China

In China, 20 face-to-face interviews and one email interview were conducted in five locations including Beijing, Shang Hai, Wuhan, Xiamen and Kunming as listed in Table 10. Interviewees were drawn from academic research institutes, NGOs, private sector and the media. Compared to interviews in other countries, interviewees in China were mostly from academic sectors. The snowball sampling methodology resulted in getting mostly academic contacts but no government contacts. The researcher also attempted to contact the Ministry of Water Resources and the Ministry of Foreign Affairs directly, but was unable to have an appointment. However, all research institutes interviewed are associated with the Chinese government and are considered to have insights about views of Chinese governments, thus supplemented the lack of access to government informants. This research did not identify any NGOs currently working on the Brahmaputra River. NGO interviewees selected for this study are informants who have been working on similar issues (such as transboundary rivers in China or rivers originating from the Tibetan Plateau) and have also been working with grassroots and policy advocacy within China on rivers and other natural resources. As such, they provided a very good understanding of the context and institutional arrangements pertinent to water resource development in China. It was not feasible to obtain a permit to enter Tibet to conduct field research. To complement this situation and considering the wide geographic spread of key informants and institutions, 21 interviews were conducted.

Table 10 List of interviewees in China.

Interviewee number	Sector	Interview location
CH1	Academic	Kunming
CH2	NGO/Academic	Kunming
CH3	Donor	Beijing
CH4	Journalist	Beijing
CH5	NGO/Entrepreneur	Beijing

CH6	Academic	Beijing
CH7	Private sector (hydropower company)	Beijing
CH8	Academic	Germany
CH9	NGO	Beijing
CH10	NGO	Wuhan
CH11	Academic	Wuhan
CH12	Research Institute	Wuhan
CH13	Research Institute	Wuhan
CH14	Academic	Xiamen
CH15	Academic	Shanghai
CH16	Academic	Kunming
CH17	NGO	Beijing
CH18	Academic	Beijing
CH19	Research Institute	Beijing
CH20	NGO	Beijing
CH21	Research Institute	Beijing

India

In India, 18 face-to-face interviews were conducted with interviewees from Delhi and Guwhati in Assam. In addition, some informants were interviewed away from these locations when taking opportunities for travel outside their hometowns. Delhi was chosen because as the capital city it enabled us to interview several stakeholders including those involved in central government as well as donors, civil society organisations and academia. Assam was chosen to reflect the perspectives of those living within the Brahmaputra basin. One informant from Arunachal Pradesh was interviewed taking an opportunity of the interviewee's travel outside of the state. The research benefited from the researchers' previous work in Assam in building onto the significant networks. Ideally, the research might have taken a similar approach in West Bengal and Sikkim, both of which are involved in the *debate* in different ways, however, these locations were not included as part of the field work due to resource limitations. Attention was given to the upper and lower riparian dimensions of the Indian part of the Brahmaputra when discussions were carried out with listed interviewees. In this way, the researchers tried to minimize the weakness of not being able to explicitly incorporate perspectives of these other states.

Snowball sampling allowed the research team to meet with interviewees from variety of sectors including: government, civil society, semi-local government entity, water service provider, professionals and academics. Again, interviewees were chosen for their expertise and involvement in the water resource management issues in the Brahmaputra. While it is difficult to fully encompass the diversity of stakeholders in India in a way that could be seen as representative, the research employed purposive sampling to try and capture the range of views

of the different groups involved in the 'Brahmaputra debate', something which is essential in understanding the complexities of cooperative transboundary ecosystem management. Table 11 provides an overview of interviewees.

Table 11: List of interviewees in India.

Interviewee number	Sector	Interview location
IN1	CSO/National NGO	Assam
IN2	Academia	Assam
IN3	Government (retired)	Assam
IN4	State Government	Assam, Singapore (twice)
IN5	International Private Knowledge-based Institution	Assam
IN6	Government	Assam
IN7	Academia	Assam
IN8	Government, Research	Delhi
IN9	Academia	Delhi
IN10	Multinational Donor	Delhi
IN11	International/regional media	Delhi
IN12	Academia	Delhi
IN13	Government	Delhi
IN14	Media	Delhi
IN15	CSO	Delhi
IN16	Government	Delhi
IN17	Government	Bangkok

Regional interviewees

In addition to interviewees from each country, two regional interviewees with insights in basin perspectives were interviewed. Table 12 outlines the regional interviewees.

Table 12: List of regional interviewees.

Interviewee numbers	Sector	Interview location
RB1	Academia	Sweden
RB2	International organization, civil society, former government official	Delhi (interviewed twice)

References

Adams, F. G., & Shachmurove, Y. (2008). Modeling and forecasting energy consumption in China: Implications for Chinese energy demand and imports in 2020. *Energy Economics*, *30*(3), 1263–1278.

AFP (2016, September 28). Bangladesh, Afghanistan, Bhutan Join India in Withdrawing from Saarc Summit in Pakistan. *The Express TRIBUNE*. Retrieved from https://tribune.com.pk/story/1190209/bangladesh-pulls-pakistan-summit-tensions-rise/ (Accessed 27 March 2017).

Agence France-Presse (2016, October 14). Bangladeshi and Chinese firms ink deals worth US$13.6 billion. *Asia Times*. Retrieved from http://www.atimes.com/article/china-sign-record-us25-billion-loans-bangladesh/ (Accessed 17 February 2017).

Agreement between the Government of the Republic of India and the Royal Government of Bhutan concerning cooperation in the field of hydroelectric power (2006).

Agreement on ad-hoc sharing of the Teesta waters between India and Bangladesh (1983).

Agreement on trade between the Royal Government of Bhutan and the Government of the People's Republic of Bangladesh (2014).

Ahsan, D. A., Naser, M. N., Bhaumik, U., Hazra, S., & Bhattacharya, S. B. (2014). *Migration, Spawning Patterns and Conservation of Hilsa Shad (Tenualosa ilisha) in Bangladesh and India*. New Delhi: Academic Foundation.

AidData (n.d.). China signs a memorandum of understanding on water conservancy with Banglades. Retrieved from http://china.aiddata.org/projects/38279 (Accessed 9 December 2016).

Akter, M. (2016). Conceptualizing environmental governance on the GBM basin. *Bandung: Journal of the Global South*, *3*(1).

Ali-Khan, F., & Mulvihill, P. R. (2008). Exploring collaborative environmental governance: perspectives on bridging and actor agency. *Geography Compass*, *2*(6), 1974–1994.

Alley, K. D. (2004). The Making of a River Linked Plan in India: Suppressed Science and Spheres of Expert Debate. *India Review*, *3*(3), 210–238.

Amano, K. (2015). Analysis of Conflict and Cooperation between China and India on the Brahmaputra River Basin Water Resources. *Asian Studies*, *61*(2), 55–68.

Aneja, A. (2015, June 26). China, India fast-track BCIM economic corridor project. *The Hindu*. Retrieved from http://www.thehindu.com/news/national/china-india-fasttrack-bcim-economic-corridor-project/article7355496.ece (Accessed 10 October 2016).

APCO worldwide (2015). The 13th Five-Year Plan: Xi Jiping Reiterates his Vision for China. Retrieved from http://www.apcoworldwide.com/docs/default-source/default-document-library/Thought-Leadership/13-five-year-plan-think-piece.pdf?sfvrsn=2 (Accessed 27 May 2016).

Asian Development Bank (2013). Increasing Access to Energy. Retrieved from https://www.adb.org/sites/default/files/publication/30185/bangladesh-increasing-access-energy.pdf (Accessed 8 March 2017).

Asrar, N. (2013, July 12). Gas Subsidies to Bhutan Stopped: India's Foreign Policy Faux Pas? *NDTV*.

BA1 (2016). Interview with BA1 on 28 March 2016.

BA2 (2016). Interview with BA2 on 28 March 2016.

BA3 (2016). Interview with BA3 on 29 March 2016.

BA4 (2016). Interview with BA4 on 30 March 2016.

BA5 (2016). Interview with BA5 on 30 March 2016.

BA6 (2016). Interview with BA6 on 31 March 2016.

BA7 (2016). Interview with BA7 on 31 Mach 2016.

BA8 (2016). Interview with BA8 on 2 April 2016.

BA9 (2016). Interview with BA9 on 3 April 2016.

Bajracharya, S. R., Mool, P. K., & Shrestha, B. R. (2007). *Impact of climate change on Himalayan glaciers and glacial lakes: Case studies on GLOF and associated hazards in Nepal and Bhutan*. Kathmandu: ICIMOD.

BanDuDeltAS (2015). *Bangladesh Delta Scenarios: Process of scenario development and scenarios for the BDP 2100*. Dhaka.

Bandyopadhyay, J. (2009). Need for a Holistic Framework for Engineering and Hydro-diplomacy in the Ganges Brahmaputra-Meghna Basin. *Economic and Political Weekly*, *44*(45), 50–60.

Banerjee, P., Salehin, M., & Rames, V. (2014). *Water Management Practices and Policies along the Brahmaputra River Basin. India and Bangladesh: Status Report 2014*. Andhra Pradesh.

Bangladesh Inland Water Transport Authority (2017). Summary of Protocol. Retrieved from http://www.biwta.gov.bd/site/page/1b97ef89-e181-4950-84c2-b4f49ad22d2d/%E0%A6%AA%E0%A7%8D%E0%A6%B0%E0%A6%9F%E0%A7%8B%E0%A6%95%E0%A6%B2-%E0%A6%B8%E0%A6%BE%E0%A6%B0%E0%A6%AE%E0%A6%B0%E0%A7%8D%E0%A6%AE (Accessed 17 February 2017).

Bangladesh Power Development Board (2016). Key Statistics. Retrieved from http://www.bpdb.gov.bd/bpdb/index.php?option=com_content&view=article&id=5&Itemid=6 (Accessed 24 December 2016).

BBC News (2013, July 13). Bhutan PDP Opposition Party Wins Election. *BBC News*. Retrieved from http://www.bbc.com/news/world-asia-23302048 (Accessed 8 February 2017).

BDP2100 (n.d.a). Bangladesh Delta Plan 2100: a holistic, long-term, vision-based plan for the Bangladesh Delta. Retrieved from http://www.bangladeshdeltaplan2100.org/about/bangladesh-delta-plan-2100-bdp2100/ (Accessed 14 December 2016).

BDP2100 (n.d.b). Baseline Studies. Retrieved from http://www.bangladeshdeltaplan2100.org/publications/baseline-studies/ (Accessed 11 March 2017).

Bennett, M. T. (2009). *Markets for Ecosystem Services in China: An Exploration of China's "Eco-Compensation" and Other Market-Based Environmental Policies*. Washington DC.

Bhattachaiyya, N. N., & Bora, A. K. (1997). Floods of the Brahmaputra River in India. *Water International*, *22*, 222–229.

Bhaumik, S. (2007). *Insurgencies in India's Northeast: Conflict, Co-option & Change* (East-West Center Washington Working Papers). Washington DC.

BIMSTEC (2015). Organization Structure. Retrieved from http://www.bimstec.org/index.php?page=working-structure (Accessed 9 October 2016).

Bisht, M. (2011). *India-Bhutan Power Cooperation: Between Policy Overtures and Local Debates* (IDSA Issue Brief). New Delhi.

Boruah, U. R. (2015, July 31). Indo-Bhutan Hydro Relations: Between Economic Well Being And Environmental Sustainability – Analysis. *Eurasia Review*. Retrieved from http://www.eurasiareview.com/31072015-indo-bhutan-hydro-relations-between-economic-well-being-and-environmental-sustainability-analysis/ (Accessed 8 October 2017).

Boyce, J. K. (1987). *Agrarian impasse in Bengal: Institutional constraint to technological change*. Oxford: Oxford University Press.

BT1 (2016). Interview with BT1 on 31 August 2016.

BT2 (2016). Interview with BT2 on 31 August 2016.

BT3 (2016). Interview with BT3 on 31 August 2016.

BT4 (2016). Interview with BT4 on 1 September 2016.

BT5 (2016). Interview with BT5 on 2 September 2016.

BT6 (2016). Interview with BT6 on 1 September 2016.

BT7 (2016). Interview with BT7 on 2 September 2016.

BT8 (2016). Interview with BT8 on 30 August 2016.

BT9 (2016). Interview with BT9 on 30 August 2016.

Buckley, M. (n.d.). Yarlung Tsangpo. Retrieved from http://www.meltdownintibet.com/f_river_tsangpo.htm (Accessed 10 July 2016).

Business Bhutan (n.d.). About Us. Retrieved from https://businessbhutan.bt/about-us/ (Accessed 9 October 2016).

Calhoun, C. (2002). *Dictionary of the Social Sciences*. Oxford: Oxford University Press.

Cederlöf, G. (2013). *Rule against Nature: Founding an Empire on India's North-Eastern frontiers* (NMML Occasional paper History and Society). New Delhi.

Central Water Commission (n.d.). About Us. Retrieved from http://www.cwc.nic.in/ (Accessed 11 March 2017).

Central Water Commission, & Bureau of Hydrology and Water Resources (2014). *Implementation Plan between the Central Water Commission, Ministry of Water Resources, River Development and Ganga Rejuvenation, the Republic of India and the Bureau of Hydrology and Water Resources, Tibet Autonomous Region, the People's Republic of China upon Provision of Hydrological Information of the Yarlung Zanbgu/Brahmaputra River in Flood Season by China to India.*

CH1 (2016). Interview with CH1 on 3 April 2016.

CH2 (2016). Interview with CH2 on 4 April 2016.

CH3 (2016). Interview with CH3 on 5 April 2016.

CH4 (2016). Interview with CH4 on 5 April 2016.

CH5 (2016). Interview with CH5 on 5 April 2016.

CH6 (2016). Interview with CH6 on 6 April 2016.

CH7 (2016). Interview with CH7 on 7 April 2016.

CH8 (2016). Interview with CH8 on 12 April 2016.

CH9 (2016). Interview with CH9 on 13 April 2016.

CH10 (2016). Interview with CH10 on 26 April 2016.

CH11 (2016). Interview with CH11 on 26 April 2016.

CH12 (2016). Interview with CH12 on 26 April 2016.

CH13 (2016). Interview with CH13 on 27 April 2016.

CH14 (2016). Interview with CH14 on 27 April 2016.

CH15 (2016). Interview with CH15 on 29 April 2016.

CH16 (2016) Interview with CH16 on 2 May 2016.

CH17 (2016). Interview with CH17 on 4 May 2016.

CH18 (2016). Interview with CH18 on 5 May 2016.

CH19 (2016). Interview with CH19 on 5 May 2016.

CH20 (2016). Interview with CH20 on 5 May 2016.

CH21 (2016). E-mail communication with CH21 on 1 May 2016.

Chatham House (n.d.). Chatham House Rule. Retrieved from https://www.chathamhouse.org/about/chatham-house-rule (Accessed 3 March 2017).

Chettri, N., Sharma, E., Shakya, B., Thapa, R., Bajracharya, B., Uddin, K.,. . . Choudhury, D. (2010). *Biodiversity in the Eastern Himalayas: Status, trends and vulnerability to climate change; Climate change impact and vulnerability in the Eastern Himalayas* (Technical Report No. 2). Kathmandu.

China Energy Group (2014). *Key China Energy Statistics.*

Chowdury, M. R., & Ward, N. (2004). Hydro-meteorological variability in the greater Ganges-Brahmaputra-Meghna basins. *International Journal of Climatology*, *24*, 1495–1508.

CISMHE (2006). *Carrying Capacity Study of Teesta Basin in Sikkim*. New Delhi. Retrieved from Centre for Inter-Disciplinary Studies of Mountain and Hill Environment, University of Dehli website: http://www.actsikkim.com/docs/CCS_I_Introductory_Volume.pdf (Accessed 19 September 2016).

Dhar, O. N., & Nandargi, S. (2000). A Study of Floods in the Brahmaputra Basin in India. *International Journal of Climatology*, *20*, 771–781.

DHI. (n.d.). About DHI. Retrieved from http://www.dhi.bt/company-profile1 (Accessed 11 March 2017).

Dorji, K. (2013). *India-Bhutan: A Model of Friendship?* New Delhi.

Doshi, V. (2016a, May 19). India set to start diverting major rivers including Ganges in unprecedented $300bn project. *RT News*. Retrieved from https://www.rt.com/news/343635-india-river-linking-drought/ (Accessed 6 October 2016).

Doshi, V. (2016b, November 24). India accused of muzzling NGOs by blocking foreign funding. *The Guardian*. Retrieved from https://www.theguardian.com/global-development/2016/nov/24/india-modi-government-accused-muzzling-ngos-by-blocking-foreign-funding (Accessed 10 March 2017).

Downie, E. (2014, December 14). Narendra Modi's Northeast India Outreach. *The Diplomat*. Retrieved from http://thediplomat.com/2014/12/narendra-modis-northeast-india-outreach/ (Accessed 17 February 2017).

Dutch Water Sector (2016). Multi-track framework for water diplomacy launched at Planetary Security conference, The Hague. Retrieved from

http://www.dutchwatersector.com/news-events/news/22488-multi-track-framework-for-water-diplomacy-launched-at-planetary-security-conference-the-hague.html (Accessed 10 March 2017).

Dutta, S. (2012). Sikkim High Court takes suo moto cognizance of Current report. Retrieved from https://www.internationalrivers.org/sites/default/files/attached-files/sikkim_corruptioninhydropower_62012.pdf (Accessed 11 March 2017).

East Asia Forum (2016). The China factor in India–Bhutan relations. Retrieved from http://www.eastasiaforum.org/2016/10/15/the-china-factor-in-india-bhutan-relations/ (Accessed 8 March 2017).

Economic and Commercial Counsellor's Office (2007). China-Bangladesh Relations. Retrieved from http://bd2.mofcom.gov.cn/article/bilateralcooperation/inbrief/200705/20070504675608.shtml (Accessed 4 October 2016).

Embassy of India to Russia (2006). 28/07/2006 - Agreements signed between India and Bhutan. Retrieved from http://indianembassy.ru/index.php/media-news/press-releases/54-media/india-in-the-international-arena-/383-28072006-agreements-signed-between-india-and-bhutan (Accessed 6 February 2017).

Encyclopaedia Britannica (n.d.). Bhutan - Government and Society. Retrieved from https://www.britannica.com/place/Bhutan/Government-and-society (Accessed 11 March 2017).

Energy Bangla (2015). Power & Transit Cooperation Between BBIN. Retrieved from http://energybangla.com/power-transit-cooperation-bbin/ (Accessed 6 October 2016).

Express News Service (2016, February 24). Take 100 MWs of power, give 10 Gbps Internet speed: India-Bangladesh deal. *The Indian Express*. Retrieved from http://indianexpress.com/article/india/india-news-india/take-100-mws-of-power-give-10-gbps-internet-speed-indo-bangla-new-deal/ (Accessed 7 October 2016).

FP Staff (2016, October 13). Ahead of Brics Summit, China-Bangladesh bonhomie has India's attention: Here's why. *FIRSTPOST*. Retrieved from http://www.firstpost.com/india/ahead-of-brics-summit-china-bangladesh-bonhomie-has-indias-attention-heres-why-3049570.html (Accessed 17 February 2017).

Framework Agreement on Cooperation for Development between Government of the Republic of India and Government of the People's Republic of Bangladesh (2011).

Furze, B. (2016). *Making water cooperation work in the Brahmaputra Basin: Draft report of the Dialogue organized by The Hague Institute, Bangkok, Thailand, 8-9 November 2016.*

Gallenkamp, M. (2010). *Between China, India and the Refugees: Understanding Bhutan's National Security Scenario* (IPCS Issue Brief No. 154). New Delhi.

Ganapathy, N. (2013, December 27). Bhutan boost economy by powering India. *AsiaOne*. Retrieved from http://news.asiaone.com/news/asia/bhutan-boost-economy-powering-india?nopaging=1 (Accessed 19 February 2017).

Ganguly, S., & Stoll Farrell, K. (Eds.). (2016). *Heading East: Trade, Security and Environment Between India and Southeast Asia*. New Delhi: Oxford University Press.

Gawel, A., & Ahsan, I. (2014). *Review and Compendium of Environmental Policies and Laws in Bhutan: Input to the Asian Judges Network on Environment*. Manila.

General Economics Division (2015). *Seventh Five Year Play FY2016-FY2020: Accelerating Growth, Empoweing Citizens*. Dhaka.

Glaholt, R., Gonsalves, J., & Macintosh, D. (2014). *Ecosystems for Life: A Bangladesh-India Initiative. External Review Report.*

Glaser, B. G., & Holton, J. (2004). Remodeling grounded theory. *Forum: Qualitative Social Research*, *5*(2).

Gupta, S. (2014). *The Himalayan Face-Off: Chinese Assertion and the Indian Riposte*. New Delhi: Hachette India.

Haque, E. A. K., Aich, D., Subhani, R., Bari, E., & Diyan, M. A. A. (2014). *Tale of a Tamed River: The Value of Ecosystem Services of Teesta River - an estimate of value of provisional services in agriculture and fisheries*. Sylhet.

Hasib, N. I. (2016, October 14). What is meant by a strategic partnership between Bangladesh and China? *bdnews24.com*. Retrieved from http://bdnews24.com/bangladesh/2016/10/14/what-is-meant-by-a-strategic-partnership-between-bangladesh-and-china (Accessed 17 February 2017).

Hazarika, S. (2016). Making People's Voice Count: Northeast India and its neighbourhood. In S. Ganguly & K. Stoll Farrell (Eds.), *Heading East: Trade, Security and Environment Between India and Southeast Asia* (pp. 108–124). New Delhi: Oxford University Press.

He, Y. (2015). China's practice on the non-navigational uses of transboundary waters: transforming diplomacy through rules of international law. *Water International*, *40*(2), 312–327.

Hill, D. P. (2013). Trans-Boundary Water Resources and Uneven Development: Crisis Within and Beyond Contemporary India. *South Asia: Journal of South Asian Studies*, *36*(2), 243–257.

Hill, D. P. (2016). Regional integration and its discontents: Water and Energy. In S. Ganguly & K. Stoll Farrell (Eds.), *Heading East: Trade, Security and Environment Between India and Southeast Asia* (pp. 195–215). New Delhi: Oxford University Press.

Hindustan Times (2007, February 10). India, Bhutan sign friendship treaty. *Hindustan Times*. Retrieved from http://www.hindustantimes.com/world/india-bhutan-sign-friendship-treaty/story-03O9hJv3DkYDq80J3VseXJ.html (Accessed 8 March 2017).

Ho, S. (2014). Rivers Politics: China's policies in the Mekong and the Brahmaputra in comparative perspective. *Journal of Contemporary China*, *23*(85).

Huntjens, P. (2017). Mediation in the Israeli-Palestinian Water Conflict: A practitioner's view. In S. Islam & K. Madani (Eds.), *Water Diplomacy in Action: Contingent Approaches to Managing Complex Water Problems.* London: Anthem Press.

Huntjens, P., Lebel, L., & Furze, B. (2016). Effectiveness of multi-stakeholder dialogues on water - Reflections on experiences in the Rhine, Mekong, and Ganga-Brahmaputhra-Meghna River basins. *International Journal of Water Governance*.

Huntjens, P., Yasuda, Y., Swain, A., Man, R. de, Magsig, B., & Islam, S. (2016). *The Multi-track Water Diplomacy Framework: A Legal and Political Economy Analysis for Advancing Cooperation over Shared Waters*. The Hague.

IANS (2010, January 18). Bangladesh parliament mourns Jyoti Basu's death. *The Hindu*. Retrieved from http://www.thehindu.com/news/international/Bangladesh-parliament-mourns-Jyoti-Basus-death/article16838037.ece (Accessed 14 February 2017).

ICIMOD (2014). Cooperation framework for Brahmaputra-Salween Landscape finalized. Retrieved from http://www.icimod.org/?q=14263 (Accessed 21 October 2016).

ICIMOD (n.d.). About ICIMOD. Retrieved from http://www.icimod.org/?q=abt (Accessed 29 September 2016).

IDSA Task Force (2010). *Water Security for India: The External Dynamics*. New Delhi: Institute for Defence Studies and Analyses.

IN1 (2016). Interview with IN1 on 9 June 2016.

IN2 (2016). Interview with IN2 on 10 June 2016.

IN3 (2016). Interview with IN3 on 8 June 2016.

IN4 (2016). Interview with IN4 on 6 June 2016.

IN5 (2016). Interview with IN5 on 7 June 2016.

IN6 (2016). Interview with IN6 on 7 June 2016.

IN7 (2016) Interview with IN7 on 8 June 2016.

IN8 (2016). Interview with IN8 on 11 May 2016.

IN9 (2016). Interview with IN9 on 16 May 2016.

IN10 (2016). Interview with IN10 on 16 May 2016.

IN11 (2016). Interview with IN11 on 16 May 2016.

IN12 (2016). Interview with IN12 on 14 May 2016.

IN13 (2016). Interview with IN13 on 17 May 2016.

IN14 (2016). Interview with IN14 on 18 May 2016.

IN15 (2016) Interview with IN15 on 18 May 2016.

IN16 (2016). Interview with IN16 on 4 July 2016.

IN17 (2016). Interview with IN17 on 9 November 2016.

India-Bangladesh Trade Agreement (2015).

India-Bhutan Friendship Treaty (2007).

Indian Institute of Technology (2012). *Final Report on the Study of Brahmaputra River Erosion and its Control*. New Delhi.

India-WRIS Wiki (2016). Brahmaputra. Retrieved from http://www.india-wris.nrsc.gov.in/wrpinfo/index.php?title=Brahmaputra (Accessed 23 February 2017).

Inoue, K., Murayama, M., Rahmatullah, M., & Centre for Bhutan Studies. (2004). *Sub-Regional Relations in the Eastern South Asia: With Special Focus on Bangladesh and Bhutan* (Joint Research Program Series No. 132). Chiba.

International Energy Agency (2015). *India Energy Outlook* (World Energy Outlook Special Report). Paris.

International Water Centre (n.d.). Yangtze River Water Resources Commission China visits Queensland. Retrieved from http://www.watercentre.org/news/yangtzi-river-water-resources-commission-china-visits-queensland (Accessed 2 June 2016).

Islam, M. F. (2016). Water Use and Poverty Reduction: New Frontiers in Regional Science. *Asian Perspectives*, *8*, 13–43.

IUCN (2012). *Proceedings: Trans-boundary Policy Dialogue on Hilsa Fisheries Management*. Kolkata.

IUCN (2014a). *Annual Progress Report 2013 - Ecosystems for Life: A Bangladesh-India Initiative (Dialogue for Sustainable Management of Trans-Boundary Water Regimes in South Asia: A Bangladesh-India Initiative)*. Dhaka.

IUCN (2014b). *River Highways: Documentary produced under the project 'Ecosystems for Life: A Bangladesh-India Initiative'.*

IUCN (2017). Ecosystems for Life (E4L). Retrieved from https://www.iucn.org/regions/asia/our-work/regional-projects/ecosystems-life-e4l (Accessed 18 December 2016).

IUCN (n.d.). BRIDGE in the Ganges-Brahmaputra-Meghna River basins (BRIDGE GBM). Retrieved from https://www.iucn.org/regions/asia/our-work/regional-projects/bridge-ganges-brahmaputra-meghna-river-basins-bridge-gbm (Accessed XX).

Iyer, R. R. (2015). India-China-Brahmaputra Suggestions for an Approach. *Economic and Political Weekly*, *1*(9).

Jacob, J. (2015, June 6). Oh Teesta! The river which gives Bangladesh heartburns. *Hindustan Times*. Retrieved from http://www.hindustantimes.com/india/oh-teesta-the-river-which-gives-bangladesh-heartburns/story-mehLzuY0iFvcU9bjpXQ8FI.html (Accessed 26 September 2016).

Joint Rivers Commission (1972). Statute of the Indo-Bangladesh Joint Rivers Commission. Retrieved from http://www.jrcb.gov.bd/statute.html (Accessed 10 March 2017).

Joint Rivers Commission (2016). Home. Retrieved from http://jrcb.gov.bd/new/ (Accessed 10 March 2017).

Kabir, A. (2016, October 14). Chinese President Xi Jinping's Visit To Bangladesh Gives Boost To Bilateral Relations. *Forbes*. Retrieved from https://www.forbes.com/sites/arafatkabir/2016/10/14/chinese-president-xi-jinpings-visit-to-bangladesh-gives-boost-to-bilateral-relations/#367f8b336ccb (Accessed 17 February 2017).

Kasturi, C. S. (2017, March 9). First Modi-Trump niggle: NGO curbs. *The Telegraph*. Retrieved from https://www.telegraphindia.com/1170310/jsp/nation/story_139992.jsp#.WMKfvW_yu70 (Accessed 10 March 2017).

Khadka, N. S. (2016, September 8). India and Nepal concern over Tibet flood advice gap. *BBC World Service*. Retrieved from http://www.bbc.com/news/world-asia-37249193 (Accessed 18 December 2016).

Krishnan, A. (2012, June 22). China, Bhutan 'ready' to establish diplomatic ties. *The Hindu*. Retrieved from http://www.thehindu.com/news/international/china-bhutan-ready-to-establish-diplomatic-ties/article3559058.ece (Accessed 2 February 2017).

Krishnan, A. (2013, January 30). China gives go-ahead for three new Brahmaputra dams. *The Hindu*. Retrieved from http://www.thehindu.com/news/international/China-gives-go-ahead-for-three-new-Brahmaputra-dams/article12323702.ece#! (Accessed 7 March 2017).

Kumar, A. (2013). Impact of West Bengal Politics on India-Bangladesh Relations. *Strategic Analysis*, *37*(3), 338–352.

Kumar, S. (2011). *India's National Security: Annual Review 2010*. New Delhi: Routledge.

Kurian, N. (2014). *India—China Borderlands: Conversations Beyond the Centre*. New Delhi: SAGE Publications India Pvt Ltd.

Lai, H. H. (2002). China's Western Development Program: Its Rationale, Implementation, and Prospects. *Modern China*, *28*, 432–466.

Lamsang, T. (2016, October 9). Exclusive: Bangladesh, Bhutan and India agree to 1125 MW Dorjilung project. *The Bhutanese*. Retrieved from http://thebhutanese.bt/bangladesh-bhutan-and-india-agree-to-1024-mw-dorjilung-project/ (Accessed 12 December 2016).

Lamsang, T. (2017, June 24). India agrees to trilateral MoU on hydropower, Chukha tariff revision and clarifies on CBTE. *The Bhutanese*. Retrieved from http://thebhutanese.bt/india-agrees-to-trilateral-mou-on-hydropower-chukha-tariff-revision-and-clarifies-on-cbte/ (Accessed 21 July 2017).

Li, B., Yao, S., Yu, Y., & Guo, Q. (2014). *The "Last Report" On China's Rivers: Executive Summary.*

Lidarev, I. (2012, August 21). History's Hostage: China, India and the War of 1962. *The Diplomat*. Retrieved from http://thediplomat.com/2012/08/historys-hostage-china-india-and-the-war-of-1962/ (Accessed 7 March 2017).

Little, K. (2009). Deep Ecology, Dams, and Dzonguland Lepchas Protest Narratives about their Threatened Land. *The Trumpeter*, *25*(1).

Little, K. (2010). From the Villages to the Cities: the battlegrounds for Lepcha protests. *Transforming Cultures*, *5*(1).

Mahanta, C., Zaman, A. M., Shah-Newaz, S. M., Mahbubur Rahman, S. M., Mazumdar, T. K., Choudhury, R.,. . . Saikia, L. (2014). *Physical Assessment of the Brahmaputra River* (Ecosystems for Life: A Bangladesh-India Initiative). Dhaka.

Maier, A.-S. (2009). *Government of India's Northeast policy.*

Mansingh, S. (1994). China-Bhutan Relations. *China Report*, *30*(2), 175–186.

Martin, M. (2016, February 21). Gross National Happiness: Bhutan's Unique Measurement. *npr*. Retrieved from http://www.npr.org/2016/02/21/467582508/gross-national-happiness-bhutan-s-unique-measurement (Accessed 19 February 2017).

Mathou, T. (2003). Bhutan-China Relations: Towards a New Step in Himalayan Politics. In K. Ura & S. Kinga (Eds.), *The Spider and the Piglet: Proceedings of the First International Seminar on Bhutan Studies* (pp. 388–411).

Mekong River Commission (2016). Lancang-Mekong Cooperation: MRC welcomes the New Initiative for Regional Cooperation by six countries in the Mekong River Basin. Retrieved from http://www.mrcmekong.org/news-and-events/news/lancang-mekong-cooperation-mrc-welcomes-the-new-initiative-for-regional-cooperation-by-six-countries-in-the-mekong-river-basin/ (Accessed 9 June 2016).

Memorandum of Understanding between the Ministry of Water Resources, the Republic of India and the Ministry of Water Resources, the People's Republic of China on Strengthening Cooperation on Trans-border Rivers (2013).

Ministry of Development of North Eastern Region (n.d.). Background. Retrieved from http://mdoner.gov.in/content/background-1 (Accessed 15 November 2016).

Ministry of Economic Affairs (2008). *Sustainable Hydropower Development Policy*. Thimphu.

Ministry of External Affairs (2010). Joint Communiqué of the Republic of India and the People's Republic of China. Retrieved from http://mea.gov.in/bilateral-documents.htm?dtl/5158/Joint+Communiqu+of+the+Republic+of+India+and+the+Peoples+Republic+of+China (Accessed 8 June 2016).

Ministry of External Affairs (2013). Onboard media interaction with Prime Minister on March 23, 2013 on return from BRICS Summit. Retrieved from http://mea.gov.in/media-briefings.htm?dtl/21484/Onboard+media+interaction+with+Prime+Minister+on+March+28+2013+on+return+from+BRICS+Summit (Accessed 7 March 2017).

Ministry of Foreign Affairs (2013). Press Release: First Bilateral Consultations between the Royal Government of Bhutan and the People's Republic of Bangladesh. Retrieved from http://www.mfa.gov.bt/press-releases/press-release-30.html (Accessed 12 December 2016).

Ministry of Foreign Affairs (2015). List of Agreements and MOUs between Bangladesh and Bhutan. Retrieved from http://www.mofa.gov.bd/media/list-agreements-and-mous-between-bangladesh-and-bhutan (Accessed 12 December 2016).

Ministry of Foreign Affairs (2016). Third Joint Working Group (JWG) Meetings on Sub-Regional Cooperation between Bangladesh, Bhutan, India and Nepal (BBIN) (January 19-20, 2016). Retrieved from http://www.mofa.gov.bd/media/third-joint-working-group-jwg-meetings-sub-regional-cooperation-between-bangladesh-bhutan (Accessed 9 March 2017).

Ministry of Water Resources (2012). *National Water Policy.*

Ministry of Water Resources (2014). India-China Co-Operation. Retrieved from http://wrmin.nic.in/forms/list.aspx?lid=349 (Accessed 28 November 2016).

Ministry of Water Resources (2016a). *Draft National Water Framework Bill*. New Delhi.

Ministry of Water Resources (2016b). India-Bhutan Cooperation. Retrieved from http://wrmin.nic.in/forms/list.aspx?lid=350 (Accessed 13 December 2016).

Ministry of Water Resources (2016c). Inter Linking of Rivers. Retrieved from http://wrmin.nic.in/forms/list.aspx?lid=1279 (Accessed 14 March 2017).

Ministry of Water Resources (n.d.). Indo-Bangladesh Cooperation. Retrieved from http://wrmin.nic.in/forms/list.aspx?lid=348 (Accessed 10 March 2017).

Mishra, D. K., & Hussain, S. M. (2012). *Situation Analysis on Inland Navigation* (Ecosystems for Life: A Bangladeah-India Initiative). Dhaka.

Mondal, P. (n.d.). Indian Rivers: Cooperation with its Neighboring Countries. Retrieved from http://www.yourarticlelibrary.com/india-2/indian-rivers-cooperation-with-its-neighboring-countries/20891/ (Accessed 11 March 2017).

Narain, V. (Ed.). (2013). *Globalization of Water Governance in South Asia*. New Delhi: Routledge.

National Environment Commission (2003). *Bhutan Water Vision and Bhutan Water Policy*. Thimphu.

National Environment Commission (2007). *Bhutan Water Policy*. Thimphu.

National Institute of Hydrology, Roorkee (n.d.). About the Brahmaputra Basin. Retrieved from http://nihroorkee.gov.in/rbis/basin%20maps/brahmaputra_about.htm (Accessed 6 March 2017).

Nayak, P., & Panda, B. (2016). *Brahmaputra and the Socio-Economic Life of People of Assam*. Assam.

Nepal, S., & Shrestha, A. B. (2015). Impact of climate change on the hydrological regime of the Indus, Ganges and Brahmaputra river basins: a review of the literature. *International Journal of Water Resources Development*, *31*(2).

Ngawang, U. D. K. (2016). Bhutan: Economic Integration of a Hermit Economy. In S. Otsubo (Ed.), *Globalization and development. Volume II: Country experiences.* London: Routledge.

Ostrom, E. (1999). Institutional Rational Choice: An assessment of the institutional analysis and development framework. In P. A. Sabatier (Ed.), *Theories of the Policy Process.* Oxford: Westview Press.

Pandey, P. (2014). Bangladesh, India, and Fifteen Years of Peace. *Asian Survey*, *54*(4), 651–673.

Parashar, S., & Dattai, S. (2013, July 6). Ties Strained as India Cuts Fuel Subsidy to Bhutan. *The Times of India*.

Paul, R., & Blanchard, B. (2016, October 13). China to sign some $24 bln in loans to Bangladesh as Xi visits. *Reuters*. Retrieved from http://www.reuters.com/article/bangladesh-china-idUSL4N1CJ3BS (Accessed 17 February 2017).

PGCB (2015). State Minister Nasrul Hamid visited HVDC station at Bheramara with Bhutanese Minister. Retrieved from http://www.pgcb.org.bd/PGCB/?a=pages/latest_news_details.php&id=30 (Accessed 9 December 2015).

Prasad, E. (2014). Situation analysis on floods in East and Northeast India. In E. Prasad & N. Mukherjee (Eds.), *Ecosystems for Life: A Bangladeah-India Initiative. Situation Analysis on Floods and Flood Management.* Bangkok, Dhaka, New Delhi: IUCN.

Prasai, S., & Surie, M. D. (2013). *Political Economy Analysis of the Teesta River Basin*. New Delhi.

Premkumar, L. (2016). *A Study of the India-Bhutan Energy Cooperation Agreements and the Implementation of Hydropower Projects in Bhutan*. New Delhi.

Press Information Bureau (2015a). Act East Policy. Retrieved from http://pib.nic.in/newsite/PrintRelease.aspx?relid=133837 (Accessed 10 March 2017).

Press Information Bureau (2015b). Bangladesh, Bhutan, India and Nepal (BBIN) Motor Vehicle Agreement for the Regulation of Passenger, Personal and Cargo Vehicular Traffic amongst BBIN. Retrieved from http://pib.nic.in/newsite/PrintRelease.aspx?relid=122416 (Accessed 15 March 2017).

Protocol on Inland Water Transit and Trade within the India-Bangladesh Trade Agreement, (2015).

Protocol to India-Bhutan Hydropower Agreement (2009).

PTI (2013, April 17). China spikes India's proposal for joint mechanism on Brahmaputra. *The Hindu*. Retrieved from http://www.thehindu.com/news/national/china-spikes-indias-proposal-for-joint-mechanism-on-brahmaputra/article4627285.ece (Accessed 7 March 2017).

PTI (2014, June 15). Narendra Modi leaves for Bhutan on his first foreign visit as PM. *The Economic Times*. Retrieved from http://economictimes.indiatimes.com/news/politics-and-nation/narendra-modi-leaves-for-bhutan-on-his-first-foreign-visit-as-pm/articleshow/36585307.cms (Accessed 11 March 2017).

PTI (2015a, January 31). India explores scope for power trade with Bangladesh, Bhutan, Nepal. *The Economic Times*. Retrieved from http://articles.economictimes.indiatimes.com/2015-01-31/news/58650561_1_power-trade-the-jwg-inter-grid-connectivity (Accessed 9 March 2017).

PTI (2015b, October 13). China operationalises biggest dam on Brahmaputra in Tibet, India worried. *The Economic Times*. Retrieved from http://economictimes.indiatimes.com/news/politics-and-nation/china-operationalises-biggest-dam-on-brahmaputra-in-tibet-india-worried/articleshow/49334904.cms (Accessed 7 March 2017).

PTI (2016a, April 22). Should meet halfway to resolve Sino-India border dispute: China. *The Indian Express*. Retrieved from http://indianexpress.com/article/india/india-news-

india/should-meet-halfway-to-resolve-sino-india-border-dispute-china-2765924/ (Accessed 7 March 2017).

PTI (2016b, August 23). Assam to start dredging of Brahmaputra to combat flood, erosion. *The Economic Times*. Retrieved from http://economictimes.indiatimes.com/news/politics-and-nation/assam-to-start-dredging-of-brahmaputra-to-combat-flooderosion/articleshow/53832810.cms (Accessed 3 February 2017).

PTI (2016c, August 26). World Bank sanctions Rs 980 cr for Brahmaputra dredging: Assam minister. *The Indian Express*. Retrieved from http://indianexpress.com/article/india/india-news-india/world-bank-sanctions-rs-980-cr-for-brahmaputra-dredging-assam-minister-2997620/ (Accessed 3 February 2017).

Pulla, P. (2015). Can India keep its promises? *Science*, *350*(6264), 1024–1027.

Qutub, S. A., Saleemi, A. R., Reddy, M. S., Char, N. V. V., Gyawali, D., Sajjadur Rasheed, K. B., & Nickum, J. E. (2003). *Water sharing conflicts within countries, and possible solutions* (WASSA Project Reports No. 2). Honululu.

Rahaman, M. M. (2006). The Ganges Water Conflict: A comparative analysis of 1977 Agreement and 1996 Treaty. *asteriskos*, *½*, 195–208.

Rahman, M. A. (2016, February 29). BD to invest $1.0b in Bhutan hydropower. *The Financial Express*. Retrieved from http://www.thefinancialexpress-bd.com/2016/02/29/18449 (Accessed 7 March 2017).

Rahman, M. Z. (2016, September 26). China and India's race to dam the Brahmaputra river puts the Himalayas at risk. *The Conversation*. Retrieved from http://theconversation.com/china-and-indias-race-to-dam-the-brahmaputra-river-puts-the-himalayas-at-risk-65496 (Accessed 9 March 2017).

Rashid, B. H. U. (2012, June 18). Indo-Bangladesh Framework Agreement. *The Daily Star*. Retrieved from http://www.thedailystar.net/news-detail-242489 (Accessed 10 March 2017).

Rasul, G. (2001). The role of the Himalayan Mountain system in food security and agricultural sustainability in South Asia. *International Journal of Rural Management*, *6*(1), 95–116.

Rasul, G. (2015). Water for growth and development in the Ganges, Brahmaputra, and Meghna basins: An economic perspective. *International Journal of River Basin Management*, *13*(3), 387–400.

Ray, A. (2012, June 8). India, Bangladesh: Water Disputes and Teesta River Diplomacy. *Global Voices*. Retrieved from https://globalvoices.org/2012/06/08/india-bangladesh-water-disputes-and-teesta-river-diplomacy/ (Accessed 26 September 2016).

RB1 (2016). Interview with RB1 on 27 January 2016.

RB2 (2016). Interview with RB2 on 13 September 2016.

Rogaly, B., Harriss-White, B., & Bose, S. (Eds.). (1999). *Sonar Bangla? Agricultural Growth and Agrarian Change in West Bengal and Bangladesh*. New Delhi: SAGE Publications.

Roy, & Hussain (2016). *1st Joint Consultation On Sustainable Development Of Inland Water Transport And Fish Biodiversity Conservation*, Dhaka.

Roy, P. (2015, December 3). Bangladesh seeks Indian cooperation to build $4 billion Ganges barrage. *TheThirdPole.net*. Retrieved from

https://www.thethirdpole.net/2015/12/03/bangladesh-seeks-indian-cooperation-to-build-4-billion-ganges-barrage/ (Accessed 17 February 2017).

Royal Government of Bhutan. (2011). *The Water Act of Bhutan 2011*. Thimphu.

Saci WATERs (2015). *Consolidated Report - Brahmaputra Dialogue Phase II: The Transnational Policy Dialogue for Improved Water Governance of the Brahmaputra Basin: Phase II*. Andhra Pradesh.

Saci WATERs (2016a). Transnational Policy Dialogue for Improved Water Governance of Brahmaputra River: About the Project. Retrieved from http://www.saciwaters.org/brahmaputra-dialogue/about.html (Accessed 17 September 2016).

Saci WATERs (2016b, October). *Transnational Policy Dialogue on Improved Water Governance of Yarlong Zangpo-Brahmaputra-Jamuna River Basin*. Brahmaputra Dialogue, Singapore.

Sadoff, C. W., & Grey, D. (2002). Beyond the river: the benefits of cooperation on international rivers. *Water policy*, *4*(5), 389–403.

Sajjanhar, A. (2016). Understanding the BCIM Economic Corridor and India's Response. *ORF Issue Brief*. (147).

Samaranayake, N., Limaye, S., & Wuthnow, J. (2016). *Water Resource Competition in the Brahmaputra River Basin: China, India, and Bangladesh*. Arlington.

SANDRP (2013). Brahmaputra: The Beautiful River or The Battleground? Retrieved from https://sandrp.wordpress.com/2013/07/17/brahmaputra-the-beautiful-river-or-the-battleground/ (Accessed 6 March 2017).

Savada, A. M. (Ed.). (1991). *Bhutan: A Country Study*. Washington: GPO for the Library of Congress.

SAWI (n.d.a). Abu Dhabi Dialogue. Retrieved from https://www.southasiawaterinitiative.org/ADD (Accessed 8 October 2016).

SAWI (n.d.b). Strategic Alignment. Retrieved from https://www.southasiawaterinitiative.org/SAWIAlignment (Accessed 22 October 2016).

Schaffer, T. C., & Schaffer, H. B. (2016). *India at the Global High Table: The Quest for Regional Primacy and Strategic Autonomy*. Washington DC: Brookings Institution Press.

Sebenius, J. K. (1992). Challenging conventional explanations of international cooperation: negotiation analysis and the case of epistemic communities. *International organization*, *46*(1).

Shambaugh, D. (2002). China's international relations think tanks: evolving structure and process. *The China Quarterly*, *171*, 575–596.

Shan, B.-g., Xu, M.-j., Zhu, F.-g., & Zhang, C.-l. (2012). China's energy demand scenario analysis in 2030. *Energy Procedia*, *14*, 1292–1298.

Sharma, R., Gorsi, M., & Paithankar, Y. (2016). Brahmaputra. Retrieved from http://www.india-wris.nrsc.gov.in/wrpinfo/index.php?title=Brahmaputra (Accessed 23 February 2017).

Sharma, T. (2012, January 23). Outrage over Dams Being Built as Part of India's Hydro Energy Scheme. *Oilprice.com*. Retrieved from http://oilprice.com/Alternative-Energy/Hydroelectric/Outrage-over-Dams-Being-Built-as-Part-of-Indias-Hydro-Energy-Scheme.html (Accessed 10 March 2017).

Shealy, M., & Dorian, J. (2008). *Forecasting Chinese Energy Demand: Is the World in Denial?* Cleveland.

Shelley, I. J., Takahashi-Nosaka, M., Kano-Nakata, M., Hague, M. S., & Inukai, Y. (2016). Review: Rice Cultivation in Bangladesh: Present Scenario, Problems, and Prospects. *Journal of International Cooperation for Agricultural Development*, *14*, 20–29.

Siddique, A. B. (2015, September 29). China to give Brahmaputra flow data to Bangladesh. *TheThirdPole.net*. Retrieved from https://www.thethirdpole.net/2015/09/29/china-to-give-brahmaputra-flow-data-to-bangladesh-2/ (Accessed 4 October 2016).

Singh, N., & Karki, S. (2004). *Discourse, Legislative Framework and Practice on Integrated Water Resources Management in Bhutan (Second Draft)*. Kathmandu.

Sinpeng, A. (2008, April 1). Bhutan: The World's Youngest Democracy. *The Globalist*. Retrieved from https://www.theglobalist.com/bhutan-the-worlds-youngest-democracy/ (Accessed 25 December 2016).

Smith, J. M. (2017, January 20). Why China's Submarine Deal With Bangladesh Matters. *The Diplomat*. Retrieved from http://thediplomat.com/2017/01/why-chinas-submarine-deal-with-bangladesh-matters/ (Accessed 17 February 2017).

South Asian Free Trade Area Agreement between Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka (2004).

Speed, R., Yuanyuan, L., Le Quesne, T., Pegram, G., & Zhiwei, Z. (2013). *Basin Water Allocation Planning. Principles, procedures and approaches for basin allocation planning*. Paris: UNESCO.

State Council (2013). *12th Five-Year Plan for Energy Development*. Beijing.

State Council Information Office (2015). Views by the CPC Central Committee and the State Council on Promoting the Ecological Civilization. Retrieved from http://www.scio.gov.cn/xwfbh/xwbfbh/yg/2/Document/1436286/1436286.htm (Accessed 7 June 2016).

Statute of the Indo-Bangladesh Joint Rivers Commission (1972).

Su, Y. (2014). Contemporary legal analysis of China's transboundary water regimes: international law in practice. *Water International*, *39*(5), 705–724.

Swain, A. (2004). *Managing Water Conflict: Asia, Africa and the Middle East*. London: Routledge.

The Constitution of India (1949).

The Constitution of the Kingdom of Bhutan (2008).

The Daily Star (2015, March 29). Ganges Barrage Project blessing for country. *The Daily Star*. Retrieved from http://www.thedailystar.net/city/ganges-barrage-project-blessing-country-74393 (Accessed 17 February 2017).

The Economic Times (2012, March 1). Brahmaputra dries up in Arunachal Pradesh town! Is China responsible? *The Economic Times*.

The Economic Times (2015, January 31). India explores scope for power trade with Bangladesh, Bhutan, Nepal. *The Economic Times*. Retrieved from http://economictimes.indiatimes.com/news/economy/foreign-trade/india-explores-scope-for-power-trade-with-bangladesh-bhutan-nepal/articleshow/46079585.cms (Accessed 11 March 2017).

The Guardian (2016, May 18). India set to start massive project to divert Ganges and Brahmaputra rivers. *The Guardian*. Retrieved from

https://www.theguardian.com/global-development/2016/may/18/india-set-to-start-massive-project-to-divert-ganges-and-brahmaputra-rivers (Accessed 6 October 2016).

The Hindu (2016a, September 28). Saarc Summit to Be Cancelled. *The Hindu*.

The Hindu (2016b, October 1). China blocks tributary of Brahmaputra to build dam. *The Hindu*. Retrieved from http://www.thehindu.com/news/international/China-blocks-tributary-of-Brahmaputra-to-build-dam/article15421066.ece (Accessed 25 January 2017).

The Shift Project Data Portal. (n.d.). Breakdown of Electricity Generation by Energy Source. Retrieved from http://www.tsp-data-portal.org/Breakdown-of-Electricity-Generation-by-Energy-Source#tspQvChart (Accessed 31 January 2017).

The Third Pole (n.d.). About: What is The Third Pole? Retrieved from https://www.thethirdpole.net/about (Accessed 13 December 2016).

Tianjie, M. (2017, January 14). China's Ambitious new Clean Energy Targets. *The Diplomat*. Retrieved from http://thediplomat.com/2017/01/chinas-ambitious-new-clean-energy-targets/ (Accessed 14 February 2017).

Tischer, S., Meyer, M., Wodak, R., & Vetter, E. (2000). *Methods of Text and Discourse Analysis*. London: SAGE Publications.

Tortajada, C., & Saklani, U. (2016, June 30). India and Bhutan: Cross-Country Power Connectivity. *The Diplomat*. Retrieved from http://thediplomat.com/2016/06/india-and-bhutan-cross-country-power-connectivity/ (Accessed 7 February 2017).

Treaty between the Government of the People's Republic of Bangladesh and the Government of the Republic of India on sharing of the Ganga/Ganges water at Farakka, (1996).

Treaty of Friendship between India and Bhutan (1949).

UNEP (2016). *Green is Gold: The Strategy and Actions of China's Ecological Civilization*. Nairobi.

United Nations (1997). *Official Records of the General Assembly, Fifty-first Session, 99th plenary meeting, A/51/PV99*. New York.

United Nations (2015). *Transforming our World: The 2030 Agenda for Sustainable Development*. New York.

United Nations General Assembly (1997). *United Nations General Assembly Press Release GA/9248 99th Meeting 21 May 1997*. New York.

United States Institute of Peace (2011). Glossary of Terms for Conflict Management and Peacebuilding. Retrieved from http://glossary.usip.org/resource/tracks-diplomacy (Accessed 28 November 2016).

Verlare, J., & van der Putten, Frans Paul. (2015). *'One Belt, One Road': An Opportunity for the EU's Security Strategy* (Policy Brief). The Hague.

Vinogradov, S., & Wouters, P. (2013). *Sino-Russian Transboundary Waters: A Legal Perspective on Cooperation*. Stockholm.

Watts, J. (2010, May 24). Chinese engineers propose world's biggest hydro-electric project in Tibet. *The Guardian*. Retrieved from https://www.theguardian.com/environment/2010/may/24/chinese-hydroengineers-propose-tibet-dam (Accessed 7 March 2017).

Williamson, O. E. (2000). The New Institutional Economics: Taking Stock, Looking Ahead. *Journal of Economic Literature*, *38*(3), 595–613.

Wolf, A. T. (1998). Conflict and cooperation along international waterways. *Water policy*, *1*(2), 251–265.

World Bank (2006). *Natural Resources, Water and the Environment Nexus for Development and Growth in Northeast India* (Strategy Report). Washington DC.

Wouters, P., & Chen, H. (2013). China's 'soft-path' to transboundary water cooperation examined in the light of two UN Global Water Conventions – Exploring the 'Chinese way'. *Journal of Water Law*, *22*, 229–247.

Wouters, P., Vinogradov, S., Allan, A., Jones, P., & Rieu-Clarke, A. (2005). *Sharing Transboundary Waters: An Integrated Assessment of Equitable Entitlement: The Legal Assessment Model*. Paris.

Wulf, H., Bookhagen, B., & Scherler, D. (2012). Climatic and geologic controls on suspended sediment flux in the Sutlej River Valley, western Himalaya. *Hydrology and Earth System Sciences*, *16*(7), 2193–2217.

WWF (2017). Brahmaputra. Retrieved from http://wwf.panda.org/about_our_earth/about_freshwater/rivers/brahmaputra/ (Accessed 16 July 2017).

Xufeng, Z. (2009). The influence of think tanks in the Chinese policy process: Different ways and mechanisms. *Asian Survey*, *49*(2), 333–357.

Zeitoun, M., & Mirumachi, N. (2008). Transboundary water interaction I: Reconsidering conflict and cooperation. *International Environmental Agreements: Politics, Law and Economics*, *8*(4), 297–316.

Zhang, Q., Lin, T., Bennet, M. T., & Jin, L. (2010). *An Eco-Compensation Policy Framework for the People's Republic of China: Challenges and Opportunities*. Manila.

能源局网站. (2017). 能源局发布《能源发展“十三五”规划》等. Retrieved from http://www.gov.cn/xinwen/2017-01/05/content_5156795.htm?allContent#1 (Accessed 14 February 2017).