Project: Making Water Cooperation Work

The Multi-track Water Diplomacy Framework

A Legal and Political Economy Analysis for Advancing Cooperation over Shared Waters

The Hague Institute for Global Justice

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Print: Multicopy.nl (The Hague Centre)

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WATER DIPLOMACY

This publication is part of the project Water Diplomacy: Making Water Cooperation Work, 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), International Union for Conservation of Nature (IUCN), 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 financially supported by Stockholm International Water Institute (SIWI) and the YEP Water Program/ Netherlands Water Partnership.

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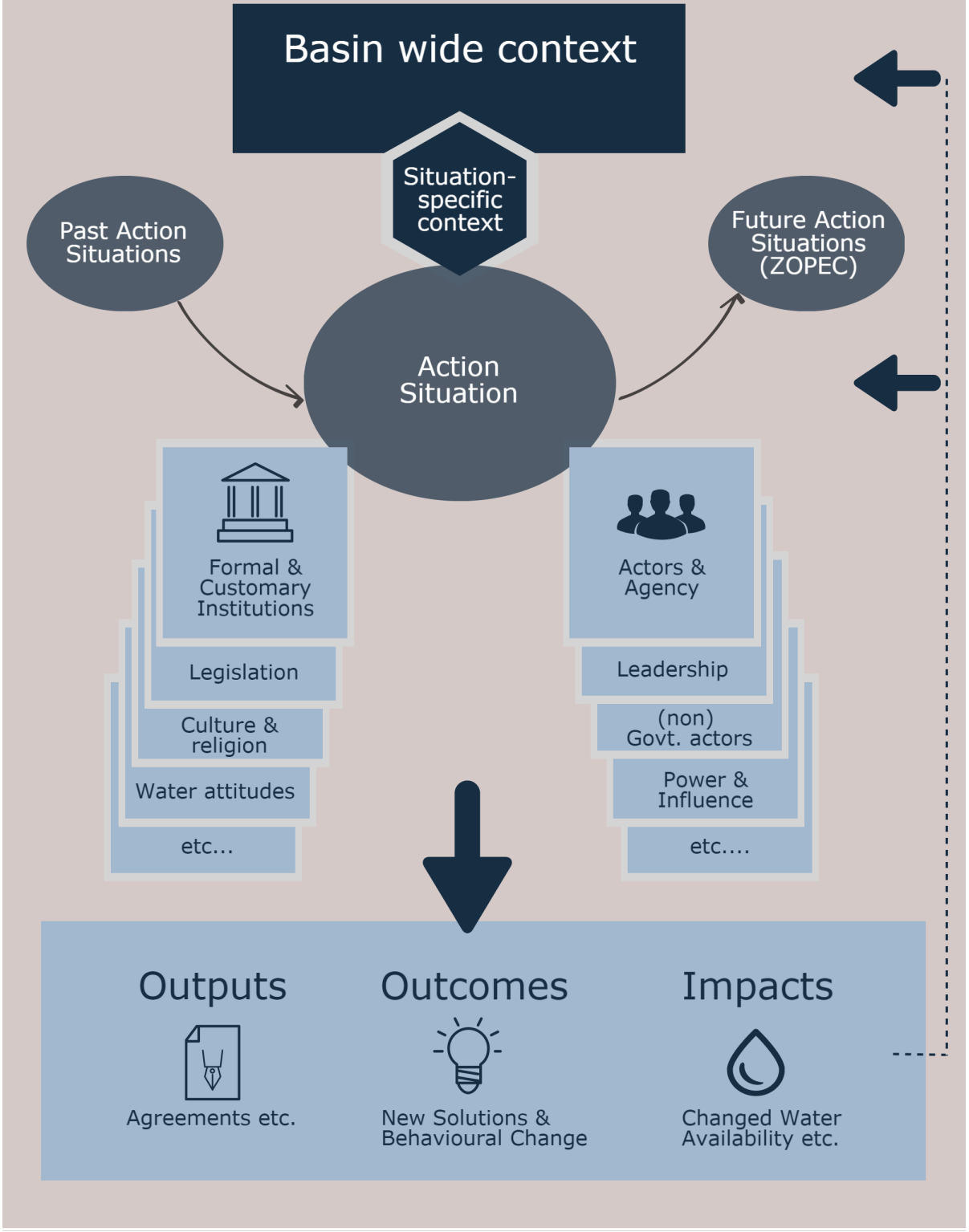
Acknowledgements: The authors would like to thank Douglas Hill (University of Otago), Marian Patrick (SIWI) and Zaki Shubber (UNESCO-IHE) for taking the time to provide constructive written feedback on earlier drafts of this paper. Thanks also to Mathijs Veenkant, Ting Zhang, Hasan Aloul, Marie-Laure Poiré and Anneke Veltman for their editorial and communications support. Finally, we would like to thank Edward Crocker for carefully editing this report.

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

Multi-Track Water Diplomacy Framework



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Foreword – Irina Bokova

Water is and will remain a vital global issue, impacting on human rights, on sustainable development and on international peace and security.

We need action from the international community that is sharper and more coordinated to raise awareness, to mitigate conflict, and to build cooperation to tackle the rising challenges posed by water scarcity and water-related disputes, both between and within States.

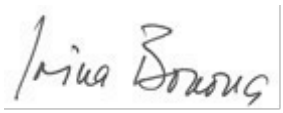
The commitment of the United Nations and UNESCO to mediation and conflict prevention and, specifically, to water diplomacy, is illustrated by the breadth of UNESCO's water diplomacy toolbox – this includes the UNESCO International Hydrological Programme, the United Nations World Water Assessment Programme led and hosted by UNESCO, the UNESCO-IHE Institute for Water Education, the UNESCO Category II Centre on International Water Cooperation, along with numerous water-related centres across the world, under UNESCO auspices.

The multi-track water diplomacy framework presented here is a timely and innovative tool to move this agenda forward. The framework will help scholars gain a better understanding of factors affecting cooperation over shared waters. It will support Governments and relevant actors in navigating the complexities of building cooperation, undertaking collaborative or joint investments in shared river basins, and addressing local or community-based conflicts.

The framework is unique in helping to diagnose water problems across sectors and administrative boundaries, and at different levels of governance. To this end, it identifies intervention points and proposes sustainable solutions to help accommodate uncertainty, as well as changing, even competing needs. The case study of the Brahmaputra basin shows how it is possible to facilitate a paradigm shift among key actors in water-related disputes, to move from zero-sum to multiple-sum approaches.

Cooperation over shared waters is vital to take forward the 2030 Agenda for Sustainable Development -- the availability and sustainable management of water and sanitation is a stand-alone Goal that is essential to reaching all other objectives. At a time when more than 700 million people do not have access to clean and safe water for a healthy life, and 2 billion people require access to improved sanitation, with girls and women especially disadvantaged, cooperation is the only way forward.

For this, we need stronger training, better science, and sharper guidelines such as this framework, which highlights new methods to prevent, mitigate and resolve water-related conflicts worldwide.



United Nations
Educational, Scientific and
Cultural Organization

Irina Bokova
UNESCO Director-General

Foreword – Henk Ovink

The power of water

It is through water that we feel the impact of climate change the most. Water is essential for our economy, our social and cultural well-being. Water quality defines our economic and societal prosperity and water risks - too much or too little - define our societies' vulnerability. It is all connected, climate change, changing demographics, urbanization, economy and ecology. The risks posed by floods, droughts, water pollution and the need for fresh water intertwine with the basic need for food, energy and prosperity. These risks show clear and strong interdependencies on a regional scale. Although this increases our vulnerability, this is also the scale where mankind can adapt to and mitigate these risks; this complexity is also our opportunity.

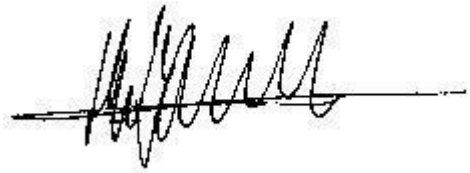
The scale, urgency and complexity of the water challenges the world faces demand this inclusive, comprehensive and international approach; combining diplomacy, innovation, partnerships and new funding mechanisms. That is why the Dutch Ministries of Foreign Affairs, Economic Affairs and Infrastructure & the Environment decided to collaborate stronger for better efficiency and effectiveness and strengthen the partnership with expertise from governments, private sector and research organizations. Water diplomacy will be more effective by combining and synergizing governance and diplomacy

expertise. The International Water Ambition (IWA) defines the framework for this collaboration. One of the ambitions of the IWA is to help improve transboundary water governance, in and between countries, and making greater use of water diplomacy.

This publication on a multi-track Water Diplomacy Framework fills a gap in the theory and practice of cooperation over shared waters and the implementation of water diplomacy by presenting a conceptual and analytical framework that identifies the key factors influencing water cooperation. Given the growing number of water-related conflicts and the shortcomings of existing concepts and approaches in water governance and negotiation, it is time to launch this multi-track diplomacy framework. It is informative in the academic realm as well as instructive in the policy domain. For the latter, the framework's instrumental value will hopefully manifest in real sustainable conflict resolution that also takes into account local needs and other ambiguities and uncertainties.

It is encouraging to see that this framework has already been applied to transboundary river basins such as the Brahmaputra basin and has yielded initial success. The commitment of riparian states with long-standing conflicting interests to come together to resolve water-related disputes shows that a situation of mutual gains and joint wins can indeed be achieved, as the framework identifies a zone of possible effective cooperation.

I commend the efforts of The Hague Institute for Global Justice, the Stockholm International Water Institute (SIWI), the UNESCO Category II Centre on International Water Cooperation (ICWC), the International Union for the Conservation of Nature (IUCN), Uppsala University, University College Cork, University of Otago, and Tufts University in developing this framework, which not only has academic value, but will also bolster transboundary water cooperation. The power of water lies within people's reach, if only we act.



Henk Ovink

Special Envoy for International Water Affairs, Kingdom of The Netherlands and Sherpa to the UN/ World Bank High Level Panel on Water

Executive Summary

The availability, allocation and quality of water resources determine the well-being, prosperity and stability of societies worldwide. However, one in three people do not have enough water to meet their daily needs. The situation is worsening as demand for water rises along with population growth, urbanization, and increased domestic and industrial use. According to the UN, in 2025 nearly 2 billion people will live in conditions of absolute water scarcity, and two thirds of the world in areas of water stress.

Water scarcity affects different stakeholders in different ways, and can lead to tensions among them. It will become more difficult to provide access to water to all, particularly to vulnerable groups. Furthermore, multiple groups of traditional and non-traditional actors will increasingly influence decision-making on the availability of fresh water. Some parties may even profit from the societal unrest and conflict, seeking to gain political influence, discursive closure, and reinforcement of the ruling party. Inequitable access to supplies and control over the availability of fresh water, as well as diverging political and societal interests, will lead to more water-related conflicts - some small and covert, some open and violent - between local communities and between nation states. In cases of (potential) conflict, involved parties must find ways to prevent escalation.

Water should be an integral part of any discussion on agriculture, energy, public health, transportation, environment and the future. However, as water issues are complex to manage, because of their natural and societal intricacies as well as diverging values and interests, coming to a shared vision of both the problem and possible solutions is difficult. Bridging differences requires a well-informed mutual gains diplomacy process.

Water diplomacy may play an increasingly important role in preventing, mitigating and resolving current and future water conflicts. Conceptually, water diplomacy is defined differently by various academics and organizations. However, they share a common understanding of the importance of integrating the interests of the multiple dimensions and stakeholders in the cooperation process.

Practice shows that water-related conflict prevention and resolution is largely the outcome of processes of research and fact finding, negotiation, mediation and conciliation that are rooted in an in-depth understanding of the social/ cultural/ economic/ environmental conditions and the political context. This should be supported by a sound assessment and integrated analysis of the water system.

Informed by this experience, we define water diplomacy as follows: *Water diplomacy includes all measures by state and non-state actors that can be undertaken to prevent or peacefully resolve (emerging) conflicts and facilitate cooperation related to water availability, allocation or use between and within states and public and private stakeholders*.

To improve the effectiveness of these measures, it is essential to identify the factors that influence water cooperation at different levels. In the case of transboundary freshwater bodies (e.g. groundwater aquifers or rivers), effective cooperation among riparian states is often a challenge. While much research has been done on transboundary rivers, there has been a lack of attention towards identifying the key determinants for shifting water conflict into cooperation. We argue that

cross-border dynamics can only be understood by also analyzing the processes of support and contestation at multiple levels within the respective countries.

The objective of this publication is to outline a conceptual and analytical framework that identifies the key factors affecting current efforts by state and non-state actors to cooperate on water issues. Identifying such factors will not only contribute to the existing academic body of knowledge, but also has the potential to bolster cooperation over shared waters.

This publication is developed within the context of the research project 'Water Diplomacy: Making Water Cooperation Work', 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), International Union for the Conservation of Nature (IUCN), Uppsala University, University of Otago, University College Cork and Tufts University Water Diplomacy Program.

The common aim of the project and this publication is to identify and operationalize the key factors affecting transboundary water cooperation.

As a first step of the project, the research team developed a multi-track water diplomacy framework (which is described in this publication). Subsequently, the framework is being tested and fine-tuned in the Jordan and Brahmaputra case-study basins through literature analysis, in-depth interviews and multi-stakeholder dialogues. An example of framework application in the Brahmaputra basin has been included in this publication (Chapter 8). The research findings - on the specific challenges and opportunities related to water cooperation within the basin – are presented in multi-stakeholder dialogues to identify the zone of possible effective cooperation (ZOPEC). Even though in this project we apply our framework to transboundary river basins, we also consider it as a suitable framework for analyzing local or community-based conflicts.

Conceptual background

First, we outline the current academic understanding of what constitutes (in)effective cooperation (chapter 5). Defining what constitutes successful or unsuccessful cooperation is an important step in identifying the key factors that influence cooperation. Within a (transboundary) water context, there is no simple answer to this question. In this section we will therefore analyze the current debate and the different angles and elements associated with effective cooperation. Concepts discussed include: mutual satisfaction, the role of negotiation and procedural and outcome based justice, the sustainability and benefits of cooperation, the relations between peace and conflict and cooperation, the role of trust and reciprocity, information sharing, policy learning and, finally, adaptive governance and multi-level governance as important conceptual approaches. This review will inform and help to identify the key building blocks of the conceptual framework (Chapter 6).

Conceptual and analytical framework

The latest generation of frameworks for political economy analysis, which began to gain traction in the early 2000s, are now being widely employed in international development. It is an important step in a chain of efforts to improve development actors' understanding of the politics of development contexts, and builds on a series of influential frameworks developed for key development agencies (e.g. World Bank, UNDP, USAID, DFID, SIDA, DGIS etc.). All these frameworks seek to capture and analyze the

essentially political actors, institutions and processes that influence, and more often than not constrain, the effectiveness of development programming, especially in countries with weak governance structures.

Despite these developments, a comprehensive political economy analytical framework, focusing on multiple levels in a transboundary basin, has not been widely developed and applied. The need for comprehensive frameworks that allow for the explanation of (the lack of) cooperation is great. Such a comprehensive framework ought to be able to include and explain the identified limitations and should therefore reflect on the cross-sectoral dynamics, and the role of representation on discourse and practice, and refrain from presenting conflict and cooperation as a dichotomy, but rather as a complex set of drivers[1].

The interpretation of institutional change is influenced by the discussion about structure-agency relationships, one of the important debates in social science. 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.

In our conceptual framework we consider the action situation as the interface or 'glue' between two important analytical components: structure/ institutions on the one hand, and actor-agency on the other. Our conceptual framework is centered around the action situation, defined by Ostrom (2005, 32) as a "*situation when two or more individuals are faced with a set of potential actions that jointly produce outcomes"*. An action situation refers to the social space where participants with diverse preferences interact, exchange goods and services, solve problems, dominate one another, or fight (among the many things that individuals do in action situations). Although institutions may have a level of permanency, in our analysis of action situations the institutions are sustained or altered by the actions of the people that reproduce or change them. It is exactly at this juncture (i.e. in the action situation) that institutions are 'renegotiated' and changed. Consequently, each action situation will have a certain set of outputs (e.g. decisions, agreements) and outcomes (e.g. impacts on the ground, such as reduced river flow). These outputs and outcomes may in turn impact on or feedback into structure and agency.

Based on this outline, we identify in the next chapter (chapter 6), the conceptual building blocks for a framework for understanding how cooperation over shared water resources 'works'. These building blocks are: a) the assessment of a river basin and the contextual factors related to a action situation; b) the institutions structuring action; c) the actors and their agency; d) the action situation: the interface between structure-agency; and finally e) the different outputs, outcomes and impacts as a result of the interaction.

These conceptual building blocks are operationalized in the analytical framework (chapter 7). An example of framework application in the Brahmaputra basin has been included in this publication (chapter 8).

Zone of possible effective cooperation (ZOPEC)

The result of an analysis of each component and their relationships will support the identification of a zone of possible effective cooperation (ZOPEC). 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. The analytical framework aims to support the identification of possible areas of cooperation, not necessarily based on a specific agreement between interested parties. Hence, we adopt the term 'zone of possible effective cooperation' to illustrate the potential areas that could promote effective cooperation and benefit all parties involved in managing shared waters.

Conclusion

The framework helps to diagnose 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.

The framework has great potential to build a sound bridge from actual or potential conflict to effective cooperation and practical solutions. Its initial application to the Brahmaputra basin uniquely identifies a zone of possible effective cooperation (ZOPEC), and has already gained the strong commitment from delegates representing all riparian countries (including China, India, Bangladesh and Bhutan), for example to identifying and developing benefit-sharing arrangements across sectors. 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.

The framework presented in this publication has several potential uses in practice:

- First, decision-exploring, decision-making and evaluating steps at different levels of water cooperation can be made more effective through diagnosis of key issues and possible zones of collaboration.
- Second, the framework should be useful for exploring new, and refining existing, approaches and strategies for cooperation over shared waters by drawing more attention to the governance, political economy and legal dimensions of water-related conflicts. In particular, it elucidates the decision-making process behind particular interventions beyond the technical domain. This can help to overcome the frequent neglect of power relations and interests in the making of water policies.
- Third, the framework will be useful not only to planning agencies and governments, but also to community-based and private sector organizations that are interested in working proactively with other stakeholders on water cooperation at multiple levels.

The multi-track water diplomacy framework presented in this publication is being fine-tuned by applying the proposed methodology in the Brahmaputra and Jordan basins. For this purpose, the proposed approach has been operationalized into a questionnaire for field research (see annex 1). The results of the field research will be

discussed in multi-stakeholder dialogues and focus group meetings with stakeholders from all riparian states. While our analytical framework is based on literature on effective/ ineffective cooperation and political economy analysis, our case studies may reveal additional factors that have played an important role in cooperation, which we will consider and integrate into the proposed methodology, taking both an inductive and deductive approach.

1. Global water challenges

Water is an essential resource for life, good health and development. However, one in three people worldwide do not have enough water to meet their daily needs.[2] The situation is getting worse as the demand for water rises along with population growth, urbanization, and increased domestic and industrial use. According to the UN, in 2025 nearly 2 billion people will live in conditions of absolute water scarcity, and two thirds of the world in areas of water stress.

As water scarcity can affect different stakeholders in different ways, tensions may arise among them. Water and food insecurity is already at the root of violent conflict in many parts of the world. Acute cases of water-related conflicts include Iran, Syria, the Israeli-Palestinian conflict, the war in Yemen, Darfur in Sudan, and previously, the 1994 genocide in Rwanda. While these are all distinct conflicts, all have links to conflicting claims over water and land. Figure 1 provides an overview of regional water conflicts between 1990-2008. These developments are also considered major threats to global peace and stability (Jägerskog, Swain and Öjendal 2015). Water, therefore, should be a concern for national security and human security at the local level.

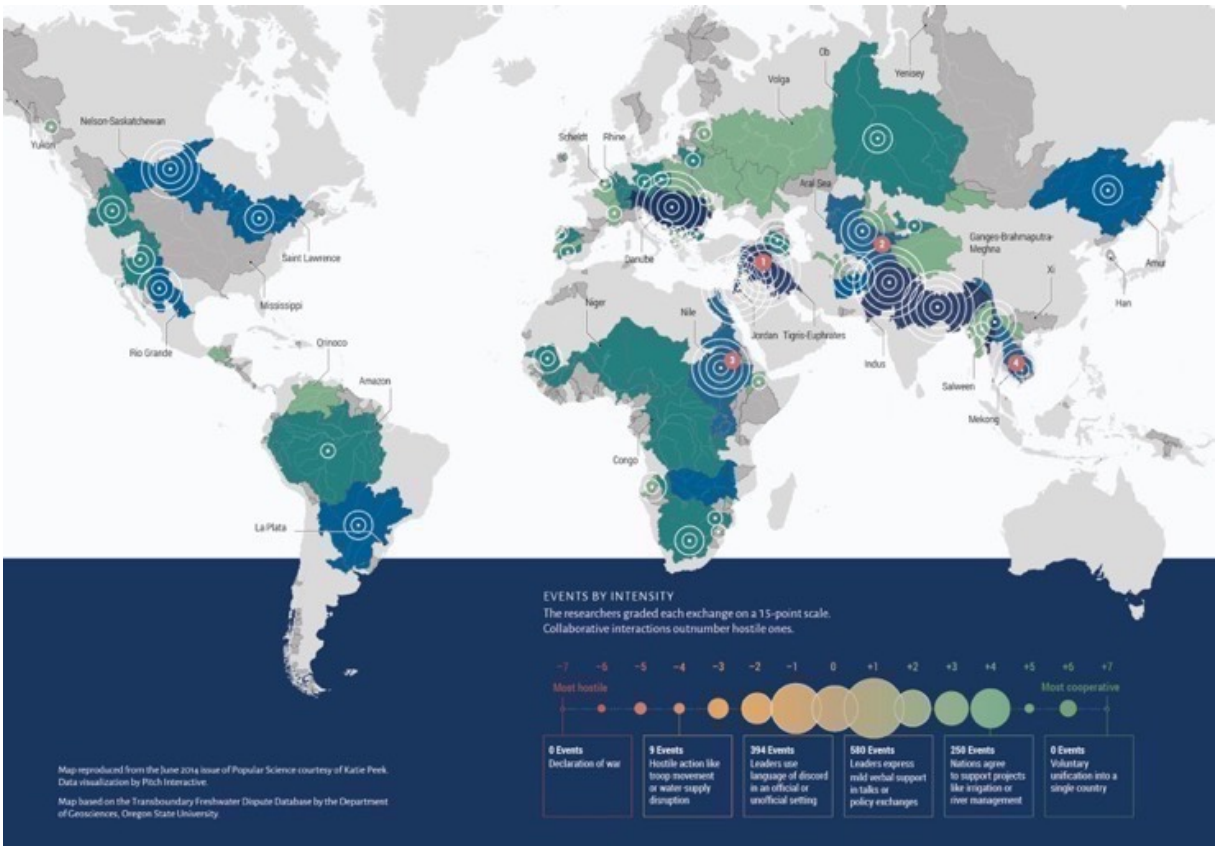


Figure 1 Global Heat Map of water conflict risk. Source: adapted from original map from Rüttinger et al. (2015, 52-53)[3], reproduced from Peek (2014).[4]

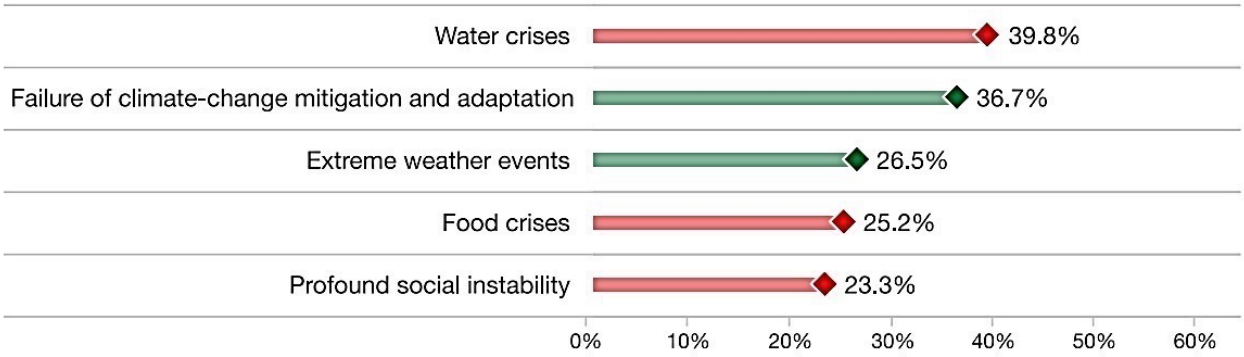


Figure 2 The top-five global risks of highest concern for the next 10 years. Source: original figure from Global risks perception survey 2016 (World Economic Forum, 2016 13), data from 2015.

This has been highlighted many times by international organizations such as the UN and the EU. In 2013, both the EU Council and the intelligence agencies of the United States noted that, in the coming 10 years, tensions and conflicts over access to water are likely to become more frequent and could endanger international peace and security. Unsurprisingly, water crises and the failure to adapt to climate change are first and second on the list of greatest global threats, as highlighted during the last World Economic Forum in Davos (2016). And, recognizing the importance and urgency of water security, the United Nations Security Council held a public debate on 'water, peace and security' in November 2016 (United Nations Security Council 2016).

The need to collectively address the relationship between water and disaster risks was emphasized by the UN Secretary-General's water and sanitation Advisory Board (UNSGAB) in 2015. UNSGAB (2015) stated that despite a growing water crisis with an increasing number of people living under water stress, worsening flood and drought catastrophes, degrading ecosystems, and exacerbated political tensions in water-scarce areas, water continues to be undervalued and badly managed (UNSGAB 2015). Pointing to a mismatch between the 2030 Sustainable Development Goals adopted in September 2015, and the international political structures available to contribute to its implementation, the report called for a major update of today's institutional infrastructure.

According to UN-Water, water institutions are still largely technology and water supply driven. To improve the effectiveness of these institutions, the emphasis has to gradually change from technological solutions to management of processes and people, involving inclusive decision-making and bottom-up approaches.

The observed and expected increase in water stress described above calls for mechanisms and instruments to mitigate the increasing stresses through technological innovations in combination with mechanisms and instruments that prevent and resolve conflicts over water allocations and water use Preventing and resolving water-related conflicts, with both technical and governance interventions, is exactly what water diplomacy is about.

2. Water Diplomacy: An approach to prevent and resolve water conflicts

Water diplomacy[5] facilitates cooperation over water. Diplomacy and comparable tools are currently applied by a variety of state and non-state actors to facilitate such cooperation. To improve the effectiveness of diplomacy, it is of upmost importance to identify the factors that influence cooperation at different levels.

As described in the previous section, the availability, allocation and access of water resources determine the well-being, prosperity and stability of societies worldwide. Currently, as demand for freshwater increases, access to freshwater resources becomes increasingly skewed. The unequal access in combination with other societal issues (unemployment, structural discri-mination, etc.) may deepen the divide between actors and increase the potential for conflict. According to Swyngedouw: "*in fact, uneven access to or control over water is invariably the outcome of combined geographical conditions, technical choices and politico-legal arrangements and water inequalities have to be understood increasingly as the outcome of the mutually constituted interplay between these three factors.*" (Syngedouw 2009, 58)

In cases of (potential) conflict, involved parties will need to find ways to address the tensions, in order to prevent escalation. However, some parties may profit from, or even promote, societal unrest and conflict, as they might gain political influence, discursive closure, and reinforcement of the ruling party.

In our highly interconnected world, water should be an integral part of any discussion on agriculture, energy, public health, transportation, environment and the future. However, as water issues (local as well as transboundary) are complex to manage, because of their intricate coupling with multiple issues within the natural and societal domains, coming to a shared definition of both the problem as well as possible solutions is difficult due to diverging values and interests (c.f. Hisschemöller and Hoppe, 2001). Bridging these differences requires a well-informed mutual gains diplomacy process. Water diplomacy, based on a mutual gains approach, may therefore play an increasingly important role in preventing, mitigating and resolving the growing water conflicts.

The concept of water diplomacy is defined by various academics and organizations in a different manner (see e.g. Pohl et al. 2014); however, they do share a common understanding of the importance of including the interests of the multiple dimensions and multiple stakeholders in the cooperation process. Practice shows that water-related conflict prevention and resolution is largely the outcome of processes of research and fact finding, negotiation, mediation and conciliation that are rooted in an in-depth understanding of the social/ cultural/ economic/ environmental conditions and the political context. This should be supported by a sound assessment and integrated analysis of the water system.

Informed by this experience, we define water diplomacy as follows: *Water diplomacy includes all measures by state and non-state actors that can be undertaken to prevent or peacefully resolve (emerging) conflicts and facilitate cooperation related to water availability, allocation or use between and within states and public and private stakeholders*.

Consequently, water diplomacy related efforts can and will take place at many levels depending on the particular situation, as we will demonstrate through the research carried out based on the framework developed in this paper. It could involve formal high-level diplomatic interactions between riparian states, or relationship building through unofficial dialogues organized by civil society organizations. Key elements within these encounters include fact-finding and the involvement of third parties, because they support the dialogue on the basis of which communality and shared understandings are -hopefully- developed.

3. Objective and research questions

Water management is an important point on the global agenda in the twenty first century (United Nations General Assembly 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 the case of freshwater bodies (e.g. groundwater aquifers or rivers) that cross national borders, effective cooperation among riparian states is often a challenge. While it is an important topic of concern and much research has been conducted on transboundary rivers, little research has been done on identifying the key determinants for shifting water conflict into cooperation in the context of transboundary rivers. Identifying such determinants will not only contribute to the existing academic body of knowledge, but also has potential for bolstering cooperation over shared waters.

As stated in the previous section, to improve the effectiveness of water diplomacy, it is of upmost importance to identify the factors that influence cooperation. The objective of this paper is therefore to specify a conceptual and analytical framework that identifies the key factors affecting current efforts by state and non-state actors (e.g. civil society and private sector) to cooperate on water issues.

This publication is developed within the context of the research project 'Water Diplomacy: Making Water Cooperation Work', 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), International Union for the Conservation of Nature (IUCN), Uppsala University, University of Otago, University College Cork and Tufts University Water Diplomacy Program.

The aim of this project is to identify and operationalize the key factors affecting transboundary water cooperation in a number of case studies. As a first step, we developed a multi-track water diplomacy framework (which is described in this paper). Next, we tested and fine-tuned the framework in the Jordan and Brahmaputra case-study basins through literature analysis, in-depth interviews and multi-stakeholder dialogues. We will present and discuss the research findings, on the specific challenges and opportunities related to water cooperation within the basin, in dialogues to identify the 'zone of possible cooperation'. In our project, we apply our framework to two transboundary river basins, although we also consider it as a suitable framework for analyzing local or community-based conflicts.

The common aim of the project and this publication is to conceptualize and identify the key factors affecting transboundary water cooperation. The key research question is: *What are the key factors affecting transboundary water cooperation?*

In order to address this question, we specify three sub-research questions as follows:

1. *How can the key determinants for transboundary water cooperation be identified?*
2. *Based on the application of the framework in case studies, what are the key determinants for transboundary water cooperation?*
3. *Based on the application of the framework in case studies, what can we say about the key determinants for transboundary water cooperation that can be generalized to other basins?*

4. Reading Guide

First, we outline the current academic understanding of what constitutes (in)effective cooperation (chapter 5). Concepts discussed include: mutual satisfaction, the role of negotiation and procedural and outcome based justice, the sustainability and benefits of cooperation, the relations between peace and conflict and cooperation, the role of trust and reciprocity, information sharing and finally adaptive governance and multi-level governance.

Based on this outline, we identify, in the next chapter (chapter 6), the conceptual building blocks for a framework for understanding how cooperation over shared water resources 'works'. These building blocks are: a) assessment of the river basin; b) contextual factors related to action situation; c) the institutions structuring action; d) the actors; e) the interface between structure-agency interface: the (action) situations in which different actors interact; and finally f) the different outputs and outcomes as a result of the interaction.

These conceptual building blocks are operationalized in the analytical framework (chapter 7). An example of framework application in the Brahmaputra basin has been included in this publication (chapter 8). In the concluding chapter, we identify the opportunities for application of the framework (chapter 9).

The annexes contain guiding interview questions based on a further operationalization of the analytical framework (annex 1) and a comparison of the key features of the main political economy analysis frameworks (annex 2).

5. Conceptual Discussion

To improve the effectiveness of water cooperation, it is of upmost importance to identify the factors that influence cooperation. But what is cooperation, and what constitutes (un)successful or (in)effective cooperation? The purpose of this chapter is to outline the current debates on the concepts of 'cooperation' and 'effective cooperation'. We do so by analyzing different angles and elements associated with effective cooperation. Concepts discussed include: mutual satisfaction, the role of negotiation and procedural and outcome based justice, the sustainability and benefits of cooperation, the relations between peace and conflict and cooperation, the role of trust and reciprocity, information sharing, policy learning and, finally, adaptive governance and multi-level governance as important conceptual approaches. This review will inform and help to identify the key building blocks of the conceptual framework (Chapter 6).

5.1 The effectiveness of cooperation

In attempting to understand cooperation, it is critical to understand the key factors that are conceptually enclosed within the concept, as well as in 'effective' cooperation. Dictionaries define cooperation as "*working together to the same end*" (McKean 1996, 310), or 'to act or work with another person or other people for a common purpose' (Allen 2003, 303). However, at what point can we say that cooperation is being 'effective'? The word 'effective' is defined as "*producing a desired or intended result*" (Soanes 2003, 349; Allen 2003, 444). But what does 'intended or desired result' mean in the context of transboundary watercourses? And for whom is the cooperation effective (beneficial)?

Existing literature on international watercourses does not provide an agreed definition for the term 'effective cooperation' (Zawahri 2008, 103; Grey, Sadoff, and Connors 2009). Grey, Sadoff, and Connors (2009) suggest that "*effective cooperation on an international watercourse is any action or set of actions by riparian states that leads to enhanced management or development of the watercourse to their mutual satisfaction*" (Grey, Sadoff, and Connors 2009, 19). However, mutual satisfaction is not necessarily the same as effective cooperation. While satisfaction is associated with state of mind, effective cooperation is often associated with a combination of economic gain and political benefits.

Biermann et al. (2007) provide an overview of the different types of institutional effectiveness, based on scholarly literature. Accordingly, an effective institution should have a positive contribution to the environment, however the real impact of an institution is difficult to measure. Other indicators of regime effectiveness such as behavioral changes may be referred to as the 'outcome' of institutions. Next, institutions produce reports, speeches, social media releases, etc. which may be referred to as the 'output' of institutions. There is however no causal link between the output and impact. Besides output, outcome, and impact, the compliance of institutions with common agreed targets also provide an indication of the effectiveness of the institution. In addition, one has to distinguish between the regime effectiveness and its broader consequences or the 'non-intended effects' of environmental institutions.

5.2 Mutual satisfaction

Existing literature on international watercourses does not provide an agreed definition for the term 'effective cooperation' (Zawahri 2008, 103, Grey, Sadoff, and Connors 2009). Grey et al (2009) suggest that *"effective cooperation on an international watercourse is any action or set of actions by riparian states that leads to enhanced management or development of the watercourse to their mutual satisfaction"* (Grey, Sadoff, and Connors 2009, 19). Huntjens and de Man (2014) suggest that cooperation is effective when there is enough trust among stakeholders, in contested arenas, to reach a mutually accepted agreement and sustainable implementation (Huntjens and Man 2014, 7). Above authors suggest that key to the effective cooperation is whether the suggested cooperation leads to 'mutual satisfaction' by involved parties. But at what point can one say that involved parties have reached mutual satisfaction?

Figure 3 provides a diagram of mutual satisfaction. Similarly to Pareto optimality, mutual satisfaction can occur at a point where two parties can find a negotiated compromise where both parties share gains and losses (point B). Through further collaboration, two parties may potentially explore maximizing both gains and achieving joint wins (point E). Based on this simple diagram, one can argue that point E is where cooperation is 'effective'.

It is also important to know that a 'mutually satisfied' result may not necessarily bring 'effective' outputs if examined from different perspectives. For example, riparian states may have a mutually satisfied way of dividing water, but without having any cooperation beyond the agreement or without considering the environmental sustainability of the agreement. Agreement in this case is an end-point of cooperation, while it can be a starting point for effective cooperation. An agreement over a transboundary river can be signed by riparian states in a mutually satisfactory manner; however, the river may not be managed in the most ecological and economically sound way.

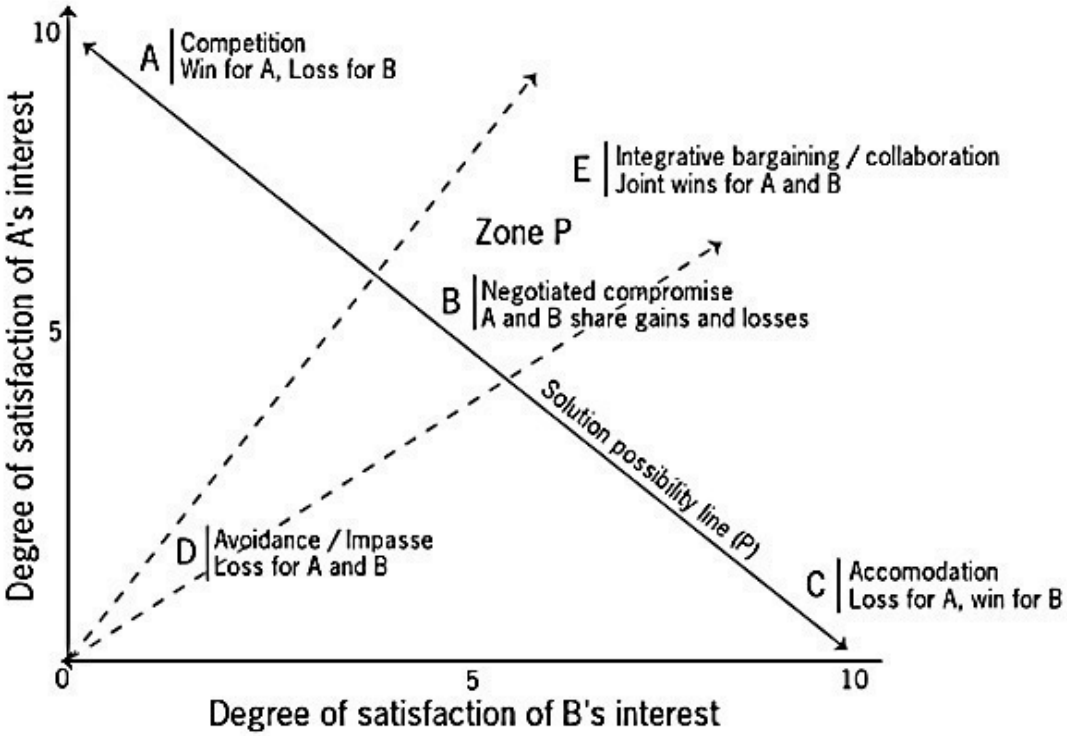


Figure 3 Style of conflict management. Source: Grey et al. (2010, 158)

5.3 Cooperation requires negotiation

Referring to cooperation in international regimes, Keohane (1984) distinguishes cooperation from mere 'harmony', suggesting that "*cooperation requires that the actions of separate individuals or organizations –which are not in pre-existent harmony– to be brought into conformity with one another through a process of negotiation*" (Keohane 1984, 51). He continues: "*cooperation occurs when actors adjust their behavior to the actual or anticipated preferences of others, through a process of policy coordination*" (Keohane 1984, 51). In other words, cooperation requires parties to make effort, and at times, make compromise in their interests for a better joint outcome. Nevertheless, negotiation is required for cooperation if there is expressed conflict. Otherwise, negotiation should not be a requirement.

5.4 Satisfaction triangle

Another important perspective that can lead to mutual satisfaction is illustrated in Figure 4 as the satisfaction triangle (Creighton et al. 1998, 55). This triangle illustrates that maximizing substantive benefits is only one contributing factor that leads to mutual satisfaction. Procedural and psychological satisfaction are also important elements that lead to mutual satisfaction for all parties involved (Priscoli and Wolf 2009, 112). Including psychological aspects as a key element for satisfaction provides an important aspect in the context of transboundary water cooperation. International agreements and treaties often provide agreements on the substance and procedure for cooperation over transboundary waters. Experts on transboundary water agreements suggest that substantive norms and procedural norms are key components that need to be taken into account when assessing transboundary water

agreements (Wouters et al. 2005). However, they struggle to accommodate the psychological side of cooperation as it often arises through history and culture.

As an example, in 1960, after nine years of negotiation, India and Pakistan signed the Indus Water Treaty, with detailed provisions on the use of the Indus river water (Swain 2004, 252-253). However, both parties were doubtful about the continuation of the treaty, partly due to the ongoing confrontation between India and Pakistan over Kashmir. As a way to retaliate against Pakistan for its alleged support of terrorist outfits targeting India, India had been considering leaving the treaty since 2001 (Swain 2004, 254). "*The ruling elites of Pakistan thrive in the national atmosphere of extreme bitterness between [Pakistan] and India*" (Swain 2004, 261). This example illustrates the impact of history and the emotional effect that can affect effective cooperation.

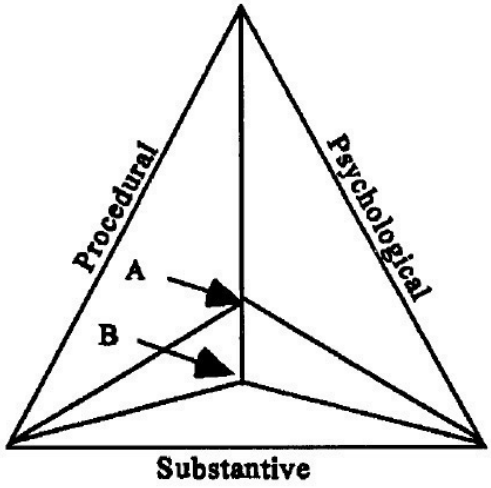


Figure 4 Satisfaction triangle. Source: Creighton et al. (1998, 55)

5.5 Benefits of cooperation

In understanding the 'benefits' of cooperation from different perspectives, including the river's ecosystem, Sadoff and Grey (2002) suggest four types of cooperation depending on the types of benefits and costs that the cooperation provides and gains benefits from (Sadoff and Grey 2002). Table 1 illustrates these different typologies. Type 1 cooperation increases benefits to the river, type 2 cooperation increase benefits from the river, type 3 cooperation reduces costs because of the river, and type 4 increases benefits beyond the river (Sadoff and Grey 2002, 393). This classification can provide a useful angle in understanding the possible effective outcomes from cooperation.

Table 1 Types of cooperation and benefits of international rivers

Type	The challenge	The opportunities
Type 1: increasing benefits *to the river*	Degraded water quality, watersheds, wetlands, and biodiversity	Improved water quality, river flow characteristics, soil conservation, biodiversity and overall sustainability

Type 2: increasing benefits *from the river*	Increasing demands for water, suboptimal water resources management and development	Improved water resources management for hydropower and agricultural production, flood-drought management, navigation, environmental conservation, water quality and recreation
Type 3: reducing costs *because of the river*	Tense regional relations and political economy impacts	Policy shift to cooperation and development, away from dispute/conflict; from food (and energy) self-sufficiency to food (and energy) security; reduced dispute/conflict risk and military expenditure
Type 4: increasing benefits *beyond the river*	Regional fragmentation	Integration of regional infrastructure, markets and trade

Source: adapted from original in Sadoff and Grey (2002, 393)

5.6 Cooperation continuum

Cooperation on international waters can take a variety of forms, ranging from simple information sharing to developing basin-wide plan and river flows (Grey, Sadoff, and Connors 2009, 18). Sadoff and Grey (2005) suggest that cooperation in transboundary waters is a continuum effort starting from unilateral action such as information sharing, coordination, collaboration and joint action (Sadoff and Grey 2005), as illustrated in Figure 5.

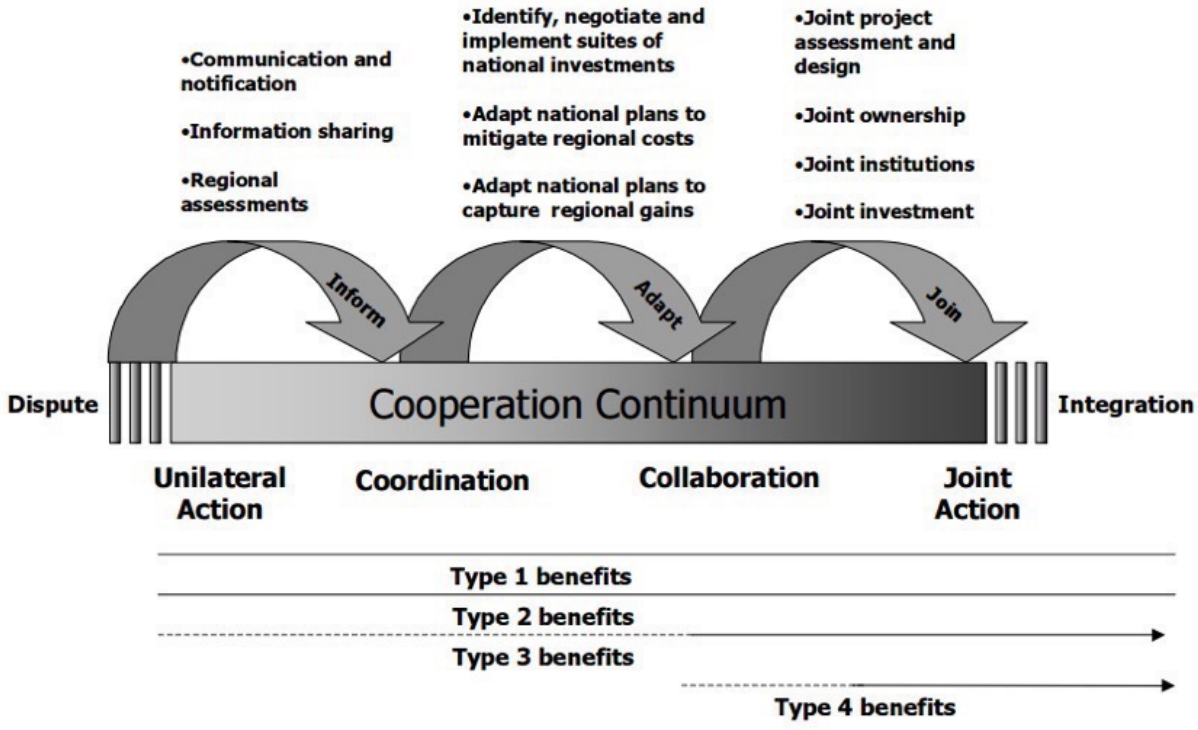


Figure 5 Types of cooperation- the Cooperative Continuum. Source: Sadoff and Grey (2005, 424)[6]

5.7 From cooperation to peace making

Cooperation over transboundary waters can also pave the way for cooperation and peace building at multiple levels, from the local to bilateral and regional cooperation and, in particular, peace building processes. Sadoff and Grey (2002) refer to the latter as 'catalytic river' since cooperation over international rivers may contribute to a political process among riparian states (Sadoff and Grey 2002, 399). Managing shared natural resources can provide a platform for enhanced dialogues and building confidence among states and divided groups (UNEP 2009, 19). Scholars claim that such cooperation is theoretically possible, admitting its difficulty in reality (Conca and Dabelko 2002, 9; Swain 2004, 250).

As an example, India and Pakistan's cooperation over the Indus River in the past 40 years has not contributed to peace-making in the region (Swain 2004, 250). Israel and Palestine cooperated over water resources both at national level as well as between local authorities and communities, however the extent of their contribution to peace making at state level is difficult to assess (Djernaes, Jorgensen, and Koch-Ya'ari 2015, 4). However, as stated in the first chapter, water is part of a complex set of variables influencing the eruption of conflict. Therefore, drawing a one-to-one relation between water-related dialogues and peace does injustice to the other influencing variables and the scales they operate at.

5.8 The grey zones of conflict and cooperation

There is a debate over whether all forms of cooperation are good and any conflict is bad (e.g. Zeitoun and Mirumachi, 2008) as evidence indicating the opposite can be true, especially when a conflicting interaction leads to or catalyzes the initiation of a meaningful cooperative process. In some cases of subnational water cooperation, such as in the Netherlands and Australia, a reframing of (initially conflicting) interests was necessary to identify (new) solutions (Huntjens et al. 2012, 74).

Zeitoun and Mirumachi (2008, 299) addressed the interplay between cooperation and conflict, and they point out that transboundary water interaction is an inherently political process determined by the broader political context. Zeitoun and Mirumachi (2008) state that cooperation and conflict co-exist at different levels at different times, illustrating the relationship through the TWINS matrix of conflict and cooperation (Zeitoun and Mirumachi 2008, 307). The TWINS matrix provides a way to understand the relationship between cooperation and conflict. This coexistence of conflict and cooperation is a very common issue with the sharing of resources.

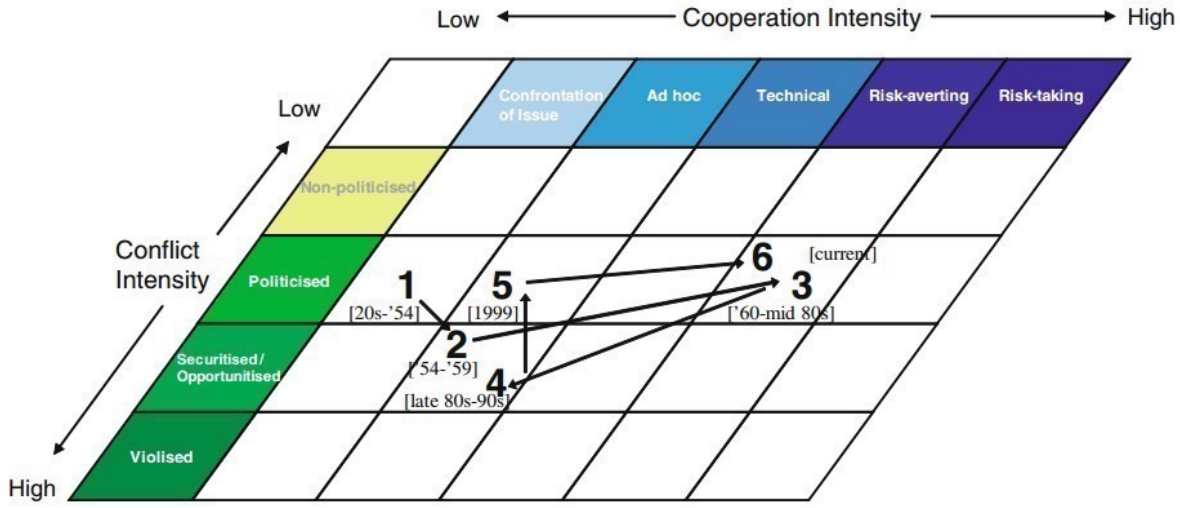


Figure 6 The TWINS matrix of conflict and cooperation, applied to hydropolitical bilateral relations over time between Sudan and Egypt. Source: Zeitoun and Mirumachi (2008, 307)

5.9 Cooperation and uncertainty

Conca (2011) provides several key factors that can theoretically connect environmental cooperation and peacemaking. One of the them is reducing uncertainty, since uncertainty is often a barrier to international cooperation (Conca 2011, 231). Both strategic and analytical uncertainties are pervasive in the environmental realm, creating a space for steps towards reducing uncertainties through cooperation on the subject (Conca 2011, 231-232).

5.10 Cooperation and reciprocity

Conca (2011) also suggests that reciprocity and interdependencies are key elements of international cooperation. Parties cooperating over natural resources will create a culture of cooperation. This culture of peace and cooperation will deter the idea of taking up arms over other incompatibilities. As environmental problems often do not recognize national borders because of their nature, their solution requires reciprocity and the creation of inter-dependency, potentially leading in general to enhanced international cooperation (Conca 2011, 233-240).

Mutual gains diplomacy helps in identifying these interdependencies. Understanding how uncertainties and interdependencies influence the cooperation over transboundary rivers can provide some insight into understanding how cooperation could potentially result in building peace. The importance of natural resources for the economy of the country will often direct the leadership to adopt a cooperative attitude over its sharing.

5.11 Trust building

Building trust is an important element of a robust and flexible process (Huntjens et al. 2012, 75). This might include proper expectation management by providing stakeholders with a clearly defined and realistic scope of what to expect during the cooperation process (*idem*). This is the big challenge of stakeholder participation: providing enough room for ideas and wishes from the stakeholders, while at the same time providing them with a realistic and politically defined scope (*idem*). Looking forward, trust is also likely to be

important to further the evolution of strategies and the taking of alternative actions as new knowledge becomes available (*idem*).

More work is needed on how trust is built, starting with areas that Huntjens et al. (2012) suggest, such as: early communication of uncertainties; joint/participative knowledge production; open access to, and shared, information sources; transparency about the decision-making process, and the sharing of responsibilities (e.g. on regional knowledge transfer). Transparency and trust-building are closely related (Abrams et al. 2003) and special attention is given to the role of leaders who are able to provide key functions for adaptive governance such as "building trust, making sense, managing conflict, linking actors, initiating partnership among actor groups, compiling and generating knowledge, and mobilizing broad support for change" (Folke et al. 2005, 451).

5.12 Information sharing

In addition, the sharing of information at the right time during the process may support trust between stakeholders and trust regarding the process itself (Huntjens et al. 2012). In addition, monitoring and evaluation of the cooperation process are considered important for increasing accountability, and thus building the trust that those who are responsible are also held accountable (*idem*).

Robustness may be enhanced by cross-sectoral policy integration, because it reduces the incidence of large adverse side-effects and feedbacks or 'maladaptation' (Dovers and Hezri 2010). The multi-level complexities of water cooperation make integration challenging. This is not easy: for example, innovative flood management in the Netherlands requires strong coordination with spatial planning and agricultural policy (Huntjens et al. 2012).

5.13 Flexible and robust processes and policy learning

Huntjens et al. (2012) provide evidence for institutional design propositions important for water cooperation in times of climate change. Two propositions stand out as being relevant for transboundary water cooperation: 1) a robust and flexible process and 2) policy learning. We will briefly discuss both of them here. By 'robust and flexible' we mean institutions and policy processes that continue to work satisfactorily when confronted with social and physical challenges but which at the same time are capable of changing (Anderies et al. 2004; Lebel et al. 2006; Janssen et al. 2007; Dovers and Hezri 2010). Policy learning approaches generally hold that states can learn from their experiences and that they can modify their present actions on the basis of their interpretation of how previous actions have fared in the past (Bennet and Howlett 1992). For more details on policy learning, see chapter 7.5.

5.14 Higher levels of policy learning

An important conclusion based on a large-scale formal comparative analyses of water management regimes by Huntjens et al. (2011) is that better integrated cooperation structures and advanced information management are the key factors leading towards higher levels of policy learning in river basin management. For example, higher levels of policy learning are being reflected and/or consolidated in more advanced climate adaptation strategies for dealing with floods or droughts (Huntjens et al. 2011). These advanced adaptation strategies are characterized by: 1) a robust and flexible process; 2) polycentric, broad and horizontal stakeholder participation; 3) climate change scenario analyses; 4) risk

assessments; 5) high diversity in management and physical interventions; 6) dealing with structural constraints of the management system itself.

For the case-studies with more advance adaptation strategies, Huntjens et al. (2011) show that better integrated cooperation structures are characterized by the inclusion of non-governmental stakeholders, governments from different sectors (supporting horizontal integration) and government from different hierarchical levels (supporting vertical integration). Within the same case-studies, advanced information management is characterized by joint/participative knowledge production, a commitment to dealing with uncertainties, broad communication between stakeholders, open and shared information sources, and flexibility and openness for experimentation (Huntjens et al. 2011, Pahl-Wostl 2015). As such, advanced information management may be considered the lubricating oil within cooperation structures, and is considered a crucial prerequisite for facilitating learning processes, building trust and supporting cooperation (*idem*).

5.15 Adaptive water governance

Successful governance in water resources management depends on adaptive institutions (Pahl-Wostl 2002, 396) that are able to cope with complexity and uncertainty and to face new challenges such as climate change. Water governance refers to the range of political, social, economic and administrative systems that are in place to develop and manage water resources, and the delivery of water services, at different levels of society (Global Water Partnership 2003). The water governance system includes formal water rights or informal participatory approaches in more flexible management schemes. Governance also covers economic aspects (e.g. water pricing and the valuation of different water uses) and organizational forms of water management (e.g. different forms of public-private partnerships). Malfunctions in governance and the policy environment exacerbate the impact of variability and uncertainty related to climate change, population growth, urbanization, and economic development. The system of water governance has a major impact on water use. Water quality, the distribution of water to various users, and the efficiency with which water-related services are delivered all depend on water governance. Another critical issue here is that the failure of governance sometimes leads to water conflicts that suddenly change the water use and availability situation in a river basin or larger region. Moreover, the failure of governance systems has been identified as being one of the most important reasons for the increased vulnerability of populations to water related disasters (Rogers and Hall 2003).

A growing number of studies show the benefits of collaborative, adaptive water governance and what it takes to achieve them (a.o. Kashyap 2004; Folke et al. 2005; Pahl-Wostl et al. 2007; Huitema et al. 2009; Kallis et al. 2009; Engle & Lemos 2009; Huntjens et al. 2011). By offering flexibility and emphasizing learning processes, adaptive water governance promises to better cope with the changing risks of floods and droughts, and other forms of changes to water systems associated with climate change. Taking into consideration (normal) climate variability is already important to the successful management of water in many parts of the world driving processes of local, national and regional adaptation. Climate change adds to the existing complexities of achieving just socio-economic development, involving multiple uses of water among growing numbers of users

in ways that are both fair and sustainable (Lebel 2007). Pro-active integration of climate change adaptation, disaster risk reduction, and sustainable development strategies are needed. However, as yet we know little on the 'politics' of how strategies actually work: trust building, conflict resolution and the way in which different interests are weighed against each other.

5.16 Multi-level water governance

Most specialists agree that states face many institutional inadequacies when dealing with shared resources and that new governance mechanisms are needed to address the global water crisis. The concept of multi-level water governance is an effort to collectively solve public problems by involving a series of relevant actors from the local to the global level, such as institutions, states, civil society, and business. The term multi-level governance is used to characterize the relationship between public actors situated at different administrative and territorial levels. This creates layers of actors who interact with each other: 1) across different levels of government (vertical coordination); 2) among relevant actors at the same level (horizontal coordination at central or at subnational level); or 3) in a networked manner. This relationship exists regardless of constitutional system (federal or unitary) and impacts the implementation of public policy responsibilities.

Debates over 'scaling' powers within multi-level governance have become widely discussed in several related academic sub-disciplines, including economic federalism (e.g. Oates 1998), political geography (e.g. Delaney and Leitner 1997), EU studies (Hooghe and Marks 2003) and international public policy (Young 2002). For example, conflicts over the appropriate 'scale' (Young 2002) or institutional level of policy-making characterize multi-level water governance.

For example, within the EU Water Framework Directive the natural area for water management is the river basin area. This is not only a challenge for transboundary river basins, but also for water management on a local scale, since the majority of administrative boundaries do not match with the hydrological boundaries determined by the Directive. This problem of institutional fit (Young 1999, 45) requires horizontal and vertical cooperation between all administrations and institutions involved, and it causes many debates over 'scaling' powers within multi-level water governance in the EU.

5.17 Conclusion

In this chapter we provided an outline of the current debates on the concepts of 'cooperation' and 'effective cooperation'. We do so by analyzing different angles and elements associated with effective cooperation. Existing literature on international watercourses does not provide an agreed definition for the term 'effective cooperation' (Zawahri 2008, 103, Grey, Sadoff, and Connors 2009). Grey et al (2009) suggest that *"effective cooperation on an international watercourse is any action or set of actions by riparian states that leads to enhanced management or development of the watercourse to their mutual satisfaction"* (Grey, Sadoff, and Connors 2009, 19). Huntjens and de Man (2014) suggest that cooperation is effective when there is enough trust among stakeholders, in contested arenas, to reach a mutually accepted agreement and sustainable implementation (Huntjens and Man 2014, 7). Above authors suggest that key to the effective cooperation is whether the suggested cooperation leads to 'mutual satisfaction'

by involved parties. But at what point can one say that involved parties have reached mutual satisfaction? Several authors provide different answers this question:

- Similarly to Pareto optimality, mutual satisfaction can occur at a point where two parties can find a negotiated compromise where both parties share gains and losses (Grey et al. (2010, 158). Through further collaboration, two or more parties may potentially explore maximizing mutual gains and achieving joint wins for all parties involved.
- Maximizing substantive benefits is only one contributing factor that leads to mutual satisfaction. Procedural and psychological satisfaction are also important elements that lead to mutual satisfaction for all parties involved (Creighton et al. 1998, 55; Priscoli and Wolf 2009, 112).
- Obviously, after finding a negotiated compromise or agreement the parties involved should achieve the goals as stated in the agreement. Failure of doing so is a clear sign of a non-satisfactory performance without alluding to any normative claims (Huntjens, 2011: 285). This is also referred to as 'degree of compliance', as the measure for institutional effectiveness (Biermann et al. 2007: 10). An example of a normative goal to be achieved could be that of water security. Water security is framed broadly as *''the availability of an acceptable quantity and quality of water for health, livelihoods, ecosystems and production, coupled with an acceptable level of water-related risks to people, environments, and economies''* (Grey and Sadoff, 2007, 545), or by the Global Water Partnership as: *''[W]ater security at any level from the household to the global means that every person has access to enough safe water at affordable cost to lead a clean, healthy and productive life, while ensuring that the natural environment is protected and enhanced''* (Global Water Partnership, 2000, 1).
- One of the ways to understand what entails effective cooperation is to attempt to understand the outcome that cooperation has brought as a result (Zawahri 2008; Sadoff and Grey 2002). For example, Zawahri (2008, 107) proposes an economically and ecologically optimal way of managing international rivers that respects the relationship between water and its surrounding environment.

Based on these different angles and elements associated with effective cooperation we take the following working definition of effective water cooperation: *a collaboration in which two or more parties find a negotiated compromise on maximizing mutual gains and achieving joint wins for all parties involved, resulting in the availability of an acceptable quantity and quality of water for health, livelihoods, ecosystems and production, coupled with an acceptable level of water-related risks to people, environments, and economies.*

Literature review conducted in this chapter provides useful inputs to the conceptual and analytical framework for water diplomacy, particularly considering key building blocks and factors affecting water cooperation. First of all, while having formal agreements and structures to manage water and river basins are often considered as a symbolic factor that constitutes cooperation. Second,

taking effective cooperation as a point where 'mutual satisfaction' takes place, existing literature indicate that psychological and emotional aspects play an important role in cooperation (Grey, Sadoff and Connors 2009; Huntjens and de Man 2014). Trust is another factor that can influence cooperation and conflict (Folke et al. 2005; Huntjens et al. 2012). The example of the Indus treaty (Swain 2004) illustrates that these aspects can often be connected to the historical and cultural context of water, leading us to consider the influence of informal and customary institutions on water cooperation. Reflecting on different types of cooperation and their inter-relationships, reciprocity is another important factor that incentivizes cooperation (Conca 2011).

Secondly, Sadoff and Grey (2005)'s work informed us that cooperation can bring different outputs and outcomes, and these outputs and outcomes are often inter-linked moving along the continuum of cooperation, ranging from unilateral action to joint action. A wide range of possible outputs and outcomes from the cooperation process are also associated with perspectives on where mutual benefits are generated (Sadoff and Grey, 2002). Their work informs us ways to understand different output, outcomes and impacts that can potentially arise from water cooperation.

Thirdly, Zeitoun and Mirumachi (2008)'s work informed us that cooperation and conflict co-exist and actors' interactions over transboundary water is often a reflection of its larger geopolitical context, emphasizing the importance of analyzing political economy contexts on a regional or basin scale.

Finally, literature discusses the importance of focusing on processes of policy learning, information sharing and adaptive management that sheds light on different ways of understanding cooperation processes and their outputs and outcomes (Huntjens 2012; Anderies et al. 2004; Lebel et al. 2006; Janssen et al. 2007).

These components that are key factors determining effective cooperation will be integrated into key components of our conceptual and analytical framework for water diplomacy, discussed in the next chapter.

6. Conceptual framework for understanding factors affecting water cooperation at multiple levels

Water cooperation between and within states requires an approach that helps to diagnose water problems across sectors and administrative boundaries, and at different levels of governance. To this end, our approach is developed with the objective to identify 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 (Susskind and Islam 2012; Islam and Repella 2015). Hence, our applied analytical framework should support riparian governments and other stakeholders with the complexities of building cooperation and undertaking collaborative or joint investments in shared river basins. This chapter presents the building blocks of the conceptual framework.

6.1 Drawing upon existing political economy approaches

Existing frameworks for political economy analysis (PEA) can provide useful insights to develop an analytical framework to understand effective cooperation in the context of international rivers. These frameworks display a number of differences, though limited to small variations around a common analytical core that guides users to investigate how power is exercised, how decisions are made, and how incentives and disincentives are brought to bear on specific organizations and individuals (Harris and Booth 2013).

The conceptual and analytical framework we present in this paper complements a growing body of work on applied political economy analysis in international development. In annex 2 we have provided an overview of some of the existing PEA frameworks and the key features of each.

The development of the political geography domain after the Cold War both widened (Hirsch 2016) and deepened the focus required to accurately explain the occurring changes in water related conflicts. Foci shifted from a state-boundary focus to a geographical basin-focus; it led to a shift from state domain processes (military power) to attention for more critical approaches (representation of power in discourse and practice); and it led to attention from state-actors to multi-level processes, including the role of non-state actors. However, "*the number of serious studies applying IR frameworks to transboundary water issues remains limited. Fewer still take a critical perspective*" (Warner and Zeitoun, 2008, 803).

The latest generation of frameworks for political economy analysis, that began to gain traction in the early 2000s, is now widely being employed in international development. It is an important step in a chain of efforts to improve development actors' understanding of the politics of development contexts, and builds on a series of influential frameworks developed for key development agencies (e.g. World Bank, UNDP, USAID, DFID, Netherlands MoFA, SIDA, DGIS etc.). All these frameworks seek to capture and analyze the essentially political actors, institutions and processes that influence, and more often than not constrain, the

effectiveness of development programming, especially in countries with weak governance structures.

The majority of current political economy analytical frameworks tend to be more focused on the economics of allocation than the fundamentals of politics and power behind the processes of decision-making: the political economy on a *project or programmatic* level (Fritz et al. 2009; Eaton et al. 2010; World Bank 2011; Wilkinson 2012; Asia Foundation 2014) or on a *national or subnational* level (Saront and Bambaci 2002; Booth et al. 2005; Lee 2006; Bebbington et al. 2006; Lewis 2011; Verhoeven 2011; Ioris 2013), or it is predominantly focused on a *single economic sector* (Ponte 2008; Edelmann 2009; Kingdon and Muzammil 2009; Booth and Golooba-Mutebi 2009; Resnick and Birner 2010; Das Gupta and Ban 2010; Mejía Acosta 2014; Fox 2014).

Despite these developments, a comprehensive political economy analytical framework focusing on multiple levels in a transboundary basin is not widely developed and applied. The need for comprehensive frameworks, which enable the explanation of (the lack of) cooperation, is great. According to Swynegedouw (2009):

"*Particular attention, therefore, needs to be paid to social power relations (whether material, economic, political, or cultural) through which hydro-social transformations take place. This would also include the analysis of the discourses and arguments that are mobilized to defend or legitimate particular strategies. It is these power geometries and the social actors carrying them that ultimately decide who will have access to or control over, and who will be excluded from access to or control over, resources or other components of the environment*" (Swynegedouw 2009,57).

On the basis of a geopolitical analysis of the Mekong, Hirsch adds that "*a nuanced analysis of the spatial deployment of power and its outcomes requires a multi-dimensional approach to the geopolitics of the regional entity with which we are dealing […], whether as metaphor or in its materiality as an object of development and impacted socio-ecological system*" (Hirsch 2016, 71).

The requirements of a new comprehensive framework will be its ability to take into account and explain the identified limitations. Such a framework should therefore reflect on the cross-sectoral dynamics, refrain from presenting conflict and cooperation as a dichotomy (but as a complex set of drivers), the transboundary political-economy/ geography processes, the impact of non-traditional actors of the processes of cooperation, and the role of representation on discourse and practice.

6.2 Structure-agency debate

Based on the previously discussed conceptual elements, in this section we construct the conceptual framework that will provide the basis for the analytical framework. In developing a framework that analyses interactions between institutions and actors in the context of common pool resources, such as transboundary rivers, the Institutional Analysis and Development (IAD) Framework (Ostrom 2005 15) provides a useful reference (see figure 7).

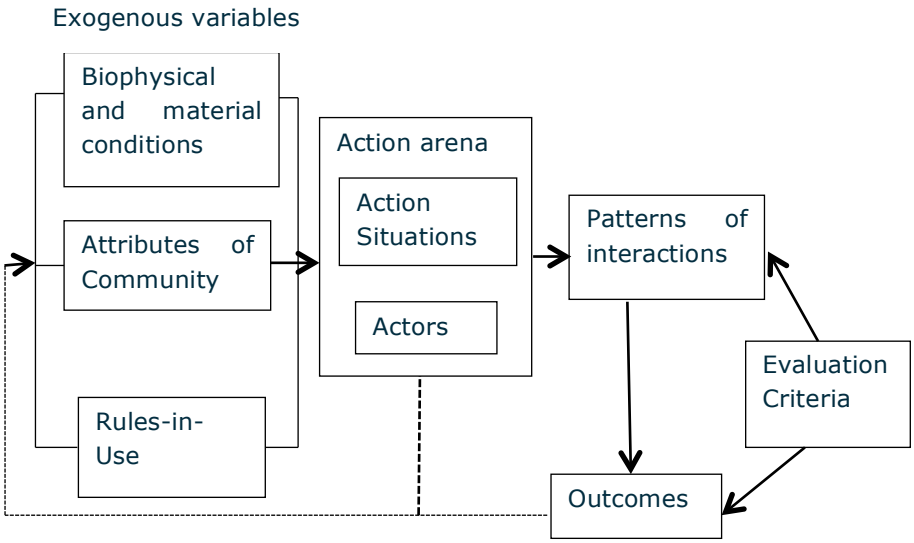


Figure 7 Institutional Analysis and Development Framework. Source: adapted from original in Ostrom (2005, 15)

The IAD Framework, as illustrated in figure 7, is centered around the action situation, and is defined as a *"situation when two or more individuals are faced with a set of potential actions that jointly produce outcomes"* (Ostrom 2005, 32). An action situation refers to the social space where participants with diverse preferences interact, exchange goods and services, solve problems, dominate one another, or fight (among the many things that individuals do in action arenas). We take the action situation as the object of our analysis, but we have reframed and repositioned the key analytical components (see figure 8) to better reflect the structure-agency relationships.

One of the important debates in social science is the relationship between structure and agency. Anthony Giddens (1984) argues that social structure is both the medium and outcome of action. According to Giddens (1984) and Alexander Wendt (1987), 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 (cf. Grin 2010). 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 independently sets of phenomena, meaning that structures should not be treated as external to individuals. This is what Voß and Kemp (2005) call second-order reflexivity, which is about self-critical and self-conscious reflection on processes of modernity, particularly instrumental rationality. It evokes a sense of agency, intention and change. Here actors reflect on and confront not only the self-induced problems of modernity, but also the approaches, structures and systems that reproduce them (Stirling 2006; Grin et al. 2004). In other words, agents have the ability to look at actions to judge their effectiveness in achieving their objectives. This means that if agents can reproduce structure through action, they can also transform it.

Whenever the conditioning of individual action through structure is leading to some identifiable pattern in society, the pattern is commonly defined as an institution. An institution is an organized way of doing things (Parker et al. 2003). The sociologist Calhoun says that institutions are: *"deeply embedded*

patterns of social practices or norms that play a significant role in the organisation of society. Institutions can include diverse areas of social activity, from the family to basic aspects of political life. In some cases they acquire an organised or bureaucratised administrative structure, in which case they become institutions in something closer to the common use of the term" (Calhoun 2002, 233). Consequently, institutions can be found in all domains of social life.

Actors have, depending on the institution, a degree of freedom. Actors can choose; they are subjects, not objects. Giddens argues that when structures are not being used, they have only a 'virtual' existence. But social realists (i.e. Archer) argue that structures have a real existence and causal force, whether or not they are used by actors and will continue to exist as a set of rules. If we follow the definition of Calhoun that institutions are "*deeply embedded patterns of social practices or norms that play a significant role in the organisation of society*" (Calhoun 2002, 233) we may argue that as soon as institutions fail to have a significant role in the organization of society, they become virtual.

The discussion above regarding structure-agency relationships has consequences for the interpretation of institutional change as put forward by institutionalists. In our conceptual framework we consider the action situation as the interface or 'glue' between two important analytical components: structure/institutions on the one hand, and actor-agency on the other. Although institutions may have a level of permanency, in our analysis of action situations the institutions are sustained or altered by the actions of the people that reproduce or change them. It is exactly at this juncture (i.e. in the action situation) that institutions are 'renegotiated' and changed. When individual behavior diverges from stated norms, structures will be renegotiated and may change. The duality of structure applies here: social structures determine and constrain social action on the one hand, but are reproduced, renegotiated or changed by that same human action simultaneously (Giddens 1979). Thus, institutional change is not a process by design, but by institutionalization. The process of institutionalization is referred to as follows: *"[Institutions] are the outcome of a process of institutionalization, whereby preferred ways of doing things are progressively reinforced, making them relatively reliable. This process usually involves conflict and the exercise of social power"* (Parker et al. 2003, 212).

6.3 Interacting key components

Based on our review of existing literature (chapter 5), and taking the action situation as the central unit in our analysis, in line with the structure-agency debate (in the above section), we differentiate five key interacting components for our conceptual framework for understanding factors affecting water cooperation:

1. Basin wide context & Situation specific context
2. Structure/institutions
3. Actors/agency
4. Action situation
5. Outputs, outcomes and impacts

These key interacting components have been joined in a convenient info-graphic in Figure 8.

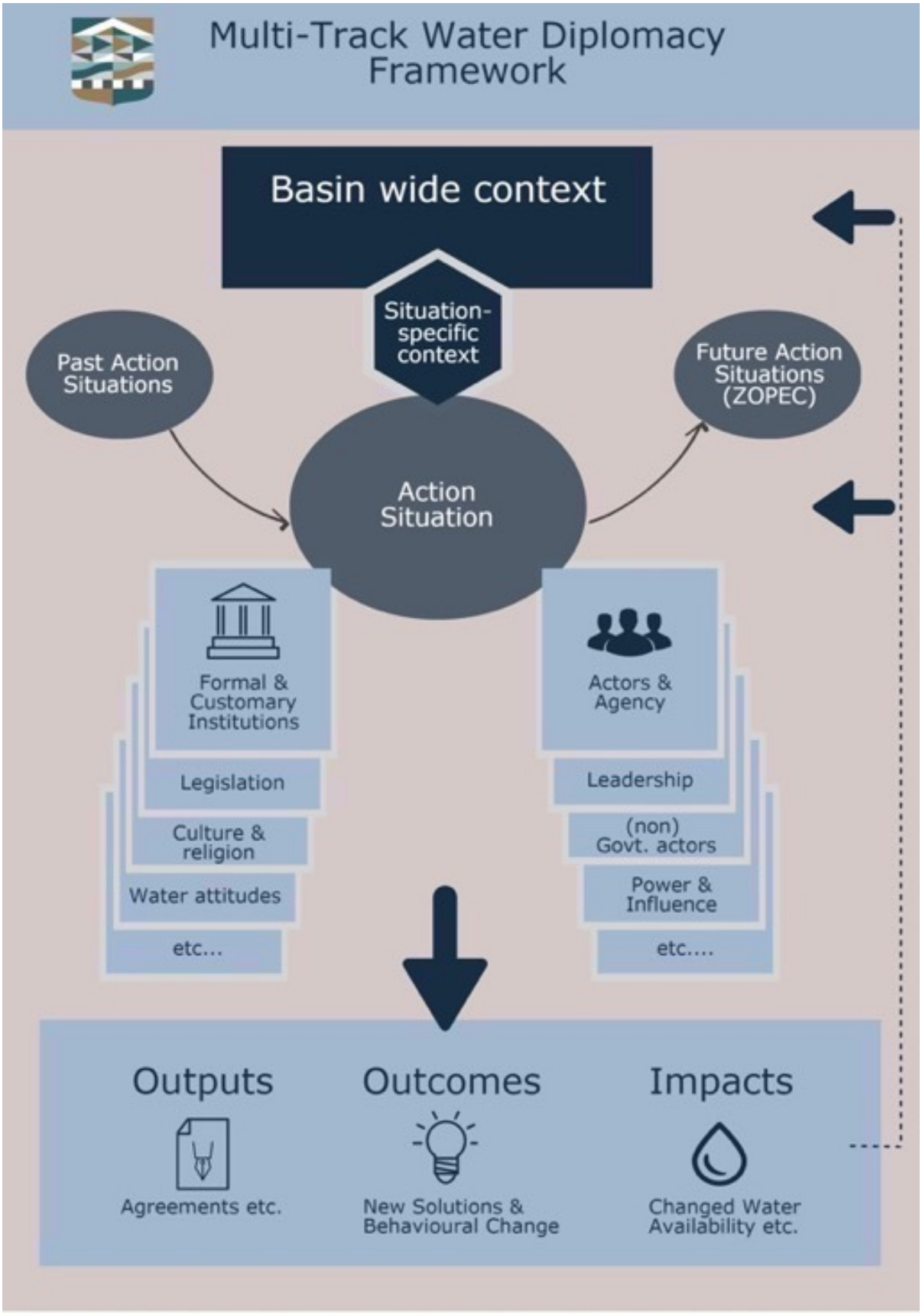


Figure 8 Conceptual framework for understanding factors affecting water cooperation at multiple levels

7. Analytical Framework: a legal and political economy framework for understanding water cooperation at multiple levels

In this chapter, we describe the following five analytical components of our framework (including dimensions, variables, indicators and guiding questions), following the same structure of our conceptual framework (see chapter 6):

1. Basin wide context & Situation specific context
2. Structure/institutions
3. Actors/agency
4. Action situation
5. Outputs, outcomes and impacts

7.1 Context

The first analytical component describes a selection of challenges related to specific transboundary basin risks and opportunities. This selection is based on existing literature. Examples of contextual factors are the nature and extent of development (and/ or cooperation) at the basin level, prevalence of conflicts and cooperation, key biophysical and material characteristics of the river, and key socio-economic characteristics. Understanding the conditions that affect the nature of the resources (Ostrom 2005, 22) is an important first step in the analysis. It clarifies the scope of analysis, to ensure that analytical outcomes are of sufficient specificity to inform decision-making on particular cooperation challenges. See table 2 for an overview of key variables for the entire basin to be used for assessment of a basin. Situation specific context variables related to action situations are variables from this initial assessment that are articulated in a specific action situation.

Table 2 Overview of key dimensions for the context

Dimension	Variable	Indicators
Political context	Key political characteristics	I.e. general relation among riparian countries, political system
Socio-economy	Key socio-economic characteristics	I.e. types of livelihoods, industrial activities, social networks
Biophysics	Key biophysical characteristics	I.e. water parameters, river morphology, flora/ fauna species, climate characteristics, etc.
Alterations	Physical changes in the river systems	I.e. hydropower development, irrigation development
Interdependency[7]	Interdependencies among riparians	Interdependencies among riparian states; among riparian residents
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
	People's perspective about cooperation	Interviewee's perception about cooperation

7.2 Institutions

As the word 'institutions' is interpreted differently by various scholars, it is important to clarify what is meant in this paper. In this paper, we adopt the following definition by Calhoun: "*institutions are deeply embedded patterns of social practices or norms that play a significant role in the organisation of society. Institutions can include diverse areas of social activity, from the family to basic aspects of political life. In some cases they acquire an organised or bureaucratised administrative structure, in which case they become institutions in something closer to the common use of the term*" (Calhoun 2002, 233). Institutions in general are the outcome of a process of institutionalization, whereby preferred ways of doing things are progressively reinforced, making them relatively reliable. This process usually involves conflict and the exercise of social power (Parker et al. 2003). We differentiate between formal and customary institutions, as described in the sections below:

- Formal institutions:
  Institutions which structure the practices of actors, and which are adopted through a formalized process. They include constitutional rules, codified laws, rules adopted by organizations, and policies.

- Customary institutions:
  Institutions which structure the practices of actors, and which are embedded in organizations or groups without a formalized process. They include norms and culture.

7.2.1 Formal Institutions

International environmental governance in general, and transboundary water management in particular, have long been dominated by the either/or debate on sovereignty versus the joint management of natural resources. While most states have now accepted a more nuanced interpretation of sovereignty, the debate about how sovereignty over freshwater resources should be interpreted today is still in full swing. Critically, the notion of sovereignty carries a responsibility to cooperate with it. As indicated by Article 1 of the UN Charter: "*[t]he purposes of the United Nations are: […] (3) [t]o achieve international co-operation in solving international problems of an economic, social, cultural, or humanitarian character […].*" This unspecified duty to cooperate was partially clarified by the 1970 Declaration on Principles of International Law concerning Friendly Relations and Co-operation among States in accordance with the Charter of the United Nations, which stipulates that "*states have the duty to co-operate with one another, irrespective of the differences in their political, economic and social systems, in the various spheres of international relations, in order to maintain international peace and security and to promote international economic stability and progress, the general welfare of nations and international co-operation free from discrimination based on such differences.*"

In the area of international water law, both global instruments – the 1997 UN Watercourses Convention and the 2008 Draft Articles on the Law of Transboundary Aquifers – promote the general obligation to cooperate. Article 8.1 of the UN Watercourses Convention provides that "[*w]atercourse states shall cooperate on the basis of sovereign equality, territorial integrity, mutual benefit and good faith in order to attain optimal utilization and adequate protection of an international watercourse*". This general obligation to cooperate contains the procedural duties

of prior information and of prior consultation, which aim to operationalize the rather vague principle. One shortcoming of international water law is that states still have much discretion with regard to the particular means of cooperation. The setting up of joint institutions, for instance, is not compulsory, even though their immense benefit for transboundary freshwater management has long been proven (Schmeier 2013).

There is a correlation between states' ability to cooperate over shared water resources and the existence of a legal framework guiding such an endeavor (Magsig 2015). In the following section we outline the various dimensions, variables and indicators, which form a robust and effective legal regime. While they are based on the Legal Assessment Model developed by the IHP-HELP Centre for Water Law, Policy and Science (Wouters et al 2005), they have been updated and advanced in order to acknowledge the continuous evolution of international law – based on general principles of international law, customary international law, treaty law, international judicial and arbitral decisions, declarations and resolutions of international organizations and state practice. The three fundamental components of the legal analytical framework include: (1) scope; (2) substantive norms; and (3) implementation – which will be used to introduce the rules of international law on the cooperation over shared freshwater resources.

In addition to formal rules, the establishment of formal organizations such as river basin organizations (RBOs) can also serve as one of the indicators of cooperation. In fact, these organizations are often defined by formal agreements. Similarly to formalized agreements, the establishment of formal organizations such as RBOs may not necessarily result in effective cooperation, however they serve as one of the indicators of cooperation.

Schmeier (2013) defines effectiveness of RBOs as "*the extent to which an RBO contributes to behavior changes among riparian actors, ultimately contributing to the solution of the collective action problem that prompted the RBO's establishment and the promotion of joint governance of water-related collective action problems in the basin"* (Schmeier 2013, 26). Schmeier (2013) further breaks down the effectiveness of RBOs into three different dimensions, including 1) effectiveness *level*, referring to the outcome and impact from the RBO's work 2) effectiveness *scope* referring to the scope of issues RBOs focus on and 3) the effectiveness *range* referring to the RBO's governance over the river's water resources and beyond (Schmeier 2013, 27). Table 3 provides the dimensions in understanding the effectiveness of RBOs that can provide useful criteria in understanding the effectiveness of cooperation.

Table 3 Dimensions of river basin governance effectiveness

Dimensions of river basin governance effectiveness			
Effectiveness level	Outcome		The extent to which the RBO contributes to behavior changes among its members
	Impact	Goal attainment	The extent to which the RBO achieves the goals set by its founding documents and its strategic plans
		Problem-solving	The extent to which the RBO solves the collective action problems that prompted its establishment
Effectiveness scope	Political stability		The extent to which the RBO contributes to the peaceful resolution of water-related collective action problems and the promotion of cooperation among riparians
	Environmental sustainability		The extent to which the RBO contributes to the improvement of the state of the environment in the basin
	Economic growth		The extent to which the RBO contributes to the efficient use of the river basin´s resources for economic growth and development
	Social development		The extent to which the RBO contributes to the improvement of the riparian population´s livelihood and their river-related well-being
Effectiveness range	To the river		The extent to which the RBO effectively governs the river's water resources
	Beyond the river		The extent to which the RBO contributes to improvements in issue-areas other than water resources governance in the basin

Source: adapted from original Schmeier (2013, 27)

The legal analysis, then, has to be coupled with an examination of how such norms impact on social, political and economic systems. The key components associated with this section of the framework are as presented in table 4.

Table 4 Dimensions, variables and indicators for the analysis of formal institutions

Dimension	Variable	Indicators
Formal institutions	Key legislations	Laws and policies that relate to management of the river basin
	Resource and uses covered	Water law adopts a basin and IWRM approach to water resource management
	Stakeholder engagement[8]	Stakeholder involvement (in particular vulnerable groups) 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
	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
	Joint institutions	Existence of joint institution assigned to govern shared water resources; allocation of resources and authority

		to actually govern
	Ecosystem approach	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
	Dispute avoidance & settlement	Dispute settlement, 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 principle of equitable and reasonable use

7.2.2 Customary institutions

As discussed earlier, there is a wide range of customary institutions that can be a source of conflict or support for effective cooperation over transboundary rivers. Customary institutions can provide services where formal ones are absent or inefficient. Rules related to the use of water do not necessarily have to be formal in order for cooperation to take place. There are many community-based water resource cooperatives[9] that have survived a long history (Bardhan 1999). Some of the procedures and organizations for cooperation may exist on a customary basis. As customary institutions are often not documented, they may not be so easily identified. These customary institutions include specific rules, norms, and cultural settings. In considering informal rules, it is also important to consider the relationship and the patterns of interaction between formal and informal rules (Helmke and Levitsky 2004; Williamson 2009; Yasuda 2015). Formal and customary institutions, however, do not solely shape decision-making. History (Aggestam and Sundell-Eklund 2014, 17), culture (Swain 2004) and values (Wigfield and Eccles 2000), (Johnston 1998), (Creighton et al. 1998, 55, Swain 2004) –for example of residents over their riparian neighbors– are also important factors that shape conflict and cooperation.

As discussed in section 2, one of the reasons for unsuccessful water cooperation on the Indus river was associated with the historical and cultural context between India and Pakistan (Swain 2004). Psychological factors that affect the mutual satisfaction of riparian states and riparian populations (Creighton et al. 1998) may be partially driven by historical and cultural contexts. Therefore, customary institutions can play an important role in determining the effectiveness of cooperation.

However, multiple formal or customary institutions for the same purpose can lead to legal pluralism (Benda-Beckmann 1997), which can in turn lead to confusion and forum shopping, thus reducing the impact of the institution at hand. For analyzing customary institutions we argue the importance of including the perceptions, sentiments and values towards water, based on the insights derived from the Canadian Water Attitudes Studies published annually since 2008, and the report on Water Attitudes in South Asia (Price et al. 2014). Table 5 provides dimensions, variables and indicators for the analysis of customary institutions.

Table 5 Dimensions, variables, indicators for the analysis of customary institutions

Dimension	Variable	Indicators
Trust	Trust	Existence of trust
Customary rules[10]	Customary rules	Existence of customary rules of influence to water cooperation
		Impact of customary rules on river basin management/cooperation and its effectiveness
		Relationship between formal and customary rules; complementary or contradictory
Historical legacy[11]	History of conflict and cooperation over water	I.e. references to historical events on conflict and cooperation in current water cooperation
	History of disputes other than water	Wars, conflicts in the past history between states/tribes
	Culture/religion[12]	Impact of culture or religion on conflict/cooperation
Attitudes towards water[13]	Sentiments regarding water	Sentiments of people regarding water
	Sentiments regarding other	Sentiments of people regarding other riparian countries/residents
	Type of value[14]	Perceptions and values towards water management by key stakeholders within the basin

7.3 Actor-Agency

Agency refers to the ability of an actor to exert influence (Ali-Khan and Mulvihill 2008; Newman and Dale 2005). For understanding the actor-agency dimension in a transboundary river basin, the first step involves identifying the key stakeholders and actors. Stakeholder includes all persons, groups and organizations with an interest or ´stake´ in an issue, either because they will be affected or because they may have some influence on its outcome. This includes individual citizens and companies, economic and public interest groups, government bodies and experts. For each stakeholder or actor active in the action situation it is important to understand the interests, incentives, access to resources, next to the existence of coalitions and the venues and strategies being used. Together, this provides a deeper understanding of the actor's influence.

In addition, understanding the type of leadership is important since collaboration in governance networks requires leadership (Folke et al. 2005). Folke et al. argue that leaders play important roles in building trust, making sense, managing conflict, linking actors, initiating partnership among actor groups, compiling and generating knowledge, and mobilizing broad support for change (Folke et al. 2005; Huntjens 2011). Leach & Pelkey (2001) reviewed the literature on watershed partnership and suggested that effective leadership and management was one of the key factors that affected success in partnerships (Leach and Pelkey 2001; Huntjens 2011).

If river basin organizations (RBOs) exist within the basin, it would be important to understand the roles they play in cooperation. As discussed in section 3, Schmeier (2013) suggests three dimensions of effectiveness of RBOs that can be used for the purpose of this study: level, scope and range of effectiveness (Schmeier 2013). These

dimensions are integrated in the table below. In addition to understanding the role formal basin organizations play, it is also important to understand the role that informal organizations play, if any exist. Table 6 provides dimensions, variables, indicators and questions for the analysis of actor-agency dimensions.

Table 6 Dimensions, variables and indicators for the analysis of actor-agency dimensions

Dimension	Variables	Indicators
Actors	Key Actors/stakeholder	Existence of actors/stakeholders
		Type of actors that occupy key influential positions and why
		Existence of coordinating organizations, like RBOs
		Informal organizations
		Arrival of new actors, like multi-national companies (MNCs), civil society groups and other non-state actors
	Actor's influence	Interests and incentives
		Control over critical resources
		Existence of coalitions
		Use of strategies and venues
		Influence of bureaucracy on the outcomes
		Influence of new actors
		Influence of MNcs, civil society, coordination organizations, RBOs, informal organizations
	Type of leadership	Type and role of leadership

7.4 Action Situations

According to Ostrom (1999, 42; 2005, 13), an action situation is a situation in which two or more individuals are faced with a set of potential actions that jointly produce outputs and outcomes. The selection of action situations should be based on the criterion of key importance to transboundary water cooperation. An example in the Brahmaputra case-study is the Teesta agreement (drafted, but not formalized for many years). An example in the Jordan Valley case study is the Israeli-Jordan Water Treaty. When applying the framework to a case study the first step is to identify the relevant action situations, after which selected action situations can be analyzed by using the variables and indicators in Table 7. For each action situation, the primary unit of analysis is a particular dialogue, negotiation, process of cooperation or cluster of closely related dialogues/negotiations, while recognizing that these were triggered by different factors (context related), and usually part of a larger process. A set of shared questions will be used to guide the analysis of the selected action situation, covering initiation, format, content, and outcomes (based on Huntjens et al. 2016).

Table 7 Dimensions, variables and indicators for the analysis of action situations

Dimension	Variable	Indicators
Initiation[15]	Initiation of action situation	Awareness and sense of urgency; purpose; convener; mobilization of support
Format	Stakeholder participation[16]	Type of stakeholder participation and their access to decision-making regarding the river
		Involvement and impact of non-state-actors on formal negotiations and vice versa
	Informal processes[17]	Existence of informal processes for cooperation
		Relationship between formal and informal processes
	Session format[18]	Session format, agenda/structure, presentation formats, kind of facilitation
	Extent of collective action[19]	Coordinated activity, involving experts, stakeholders, ordinary citizens and policy makers in a process of collective discovery
	Transparency about the decision-making process[20]	Proper expectation management by providing stakeholders with a clearly defined and realistic scope of 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)
Content	Issue selection[21]	Issue/topic selection in the action situation, topic exclusion/avoidance
	Information availability[22]	Information availability beforehand, relevance of information, sufficient reviewing time for input materials
	Dealing with uncertainties[23]	Identification of uncertainties, Uncertainties are not glossed over but communicated (in final reports, orally)
		Transparent and early communication of different types of uncertainties during cooperation process
	Joint/participative information production[24]	Different government bodies are involved in information production and supply, or at least consulted (interviews, surveys etc.)
		Idem for non-governmental stakeholders
	Interdisciplinarity[25]	Different disciplines are involved in information production and supply: for instance, ecology and the social sciences in addition to technical and engineering sciences
	Elicitation of mental models/ critical self-reflection about assumptions[26]	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
		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
	Broad communication[27]	Governments exchange information and data with other governments
		Governments actively disseminate information and data to the public: on the Internet, but also by producing leaflets, though the media, etc.
	Utilization of information[28]	New information is used in the action situation (and is not distorted) / New information influences policy
	Decision support system(s)[29]	River basin information systems are present and up to standards

7.5 Output

Within the action situations, outputs are produced. In the context of water cooperation, these can include a specific agreement about the use or division of water, MoUs related to technical cooperation such as data sharing, or joint action that has been agreed, etc. Outputs are different from outcomes and impacts (7.6).

In addition, Huntjens et al. (2011) have defined the output of a water management regime as the level of policy learning being identified in existing strategies or plans. Policy learning approaches generally hold that states can learn from their experiences and that they can modify their present actions on the basis of their interpretation of how previous actions have fared in the past (Bennet and Howlett 1992).

Huntjens et al. (2012) have introduced policy learning - through exploring uncertainties, deliberating alternatives and reframing problems and solutions - as an essential element for improving water cooperation, especially in a situation of changing environments, such as political change, climate change, financial crises, and natural disasters. Based on case-study research, two elements of policy learning have been identified as being important for water cooperation (Huntjens et al. 2012): 1) a commitment for dealing with uncertainties, and 2) deliberating alternatives and reframing problems and solutions. Table 8 provides dimensions, variables and indicators for the analysis of output.

Table 8 Dimensions, variables and indicators for the analysis of output

Dimension	Variable	Indicators
Output	Produce	Result of negotiations or dialogues, e.g. agreements, decisions, project approval
		Issue relevant outputs from informal processes[30]
	Change in level of trust[31]	Change in level of trust
	Deliberating alternatives[32]	Different strategies for dealing with possible future scenarios
	Reframing problems[33]	Shifting viewpoints/angles to describe problems in order to unlock potential for finding new solutions
	Monitoring and evaluation[34]	Development of M&E in water cooperation

7.6 Outcome and impacts

One of the ways to understand what entails effective cooperation is to attempt to understand the outcome that cooperation has brought as a result (Zawahri 2008; Sadoff and Grey 2002). We differentiate between outcomes and impacts. The ultimate touchstone for truly effective cooperation is whether the state of the environment would be worse off without cooperation (Keohane, Haas and Levy 1993). This often called the 'impact' of institutions or cooperation, We define impacts as facts on the ground and actual (adverse) impacts and results of policy decisions and agreements. However, impact is often difficult to measure in many cases. Therefore, most scholars have turned to other indicators of regime effectiveness, and focused on observable political effects and behavioral changes of actors (see here for example the early contribution of Keohane, Haas and Levy

1993: 7). This change in the behavior of actors is often referred to as the 'outcome' of institutions. In addition, water experts, engineers and hydrologists often propose an economically and ecologically optimal way of managing international rivers that respects the relationship between water and its surrounding environment (Zawahri 2008).

There are many concepts for understanding the ecologically optimal outcome of managing the river, such as the environmental flow and an ecosystem approach to managing the river basin (Poff et al. 2010; Tharme 2003; Richter et al. 2003). In the four typologies of cooperation and benefits suggested by Sadoff and Grey (2002), this type of outcome is related to 'environmental river' (type 1), which is to increase benefits to the river and is related to bringing an outcome that is ecologically sustainable (Sadoff and Grey 2002).

The economically optimal way of managing the river is referred as 'economic river' by Sadoff and Grey's (2002) categorization and referred to as type 2 in table 1. One such benefit is related to understanding the ecosystem services that the river is able to offer to the riparian population. Also, other commercial benefits from the use of the river's water include hydropower dams and irrigation. Sediments from the river also bring economic benefits to riparian populations in terms of fertile soil for agriculture, preventing downstream and coastal erosion, and direct extraction of sediments for building purposes.

One of the methodologies to determine ecologically 'optimal' output is the environmental flow. Determining the environmental flow would involve not only scientific processes using hydrological data, but also social processes for determining 'acceptable' ecological conditions (Poff et al. 2010). According to ELOHA (Ecological limits of hydrologic alteration), environmental flow assessments need to identify the relationship between flow alteration and ecological characteristics (Poff et al. 2010). An assessment of ecosystem and biodiversity within the river basin can also provide a way to determine the potential outcome as a result of the management practices of the river.

In integrating both ecologically and economically optimal outcomes from the river, understanding and best utilizing ecosystem services can provide another useful criterion. The report produced by TEEB suggests 4 categories of ecosystem services, which can serve as indicators for assessing economically and ecologically optimal outcomes (de Groot et al. 2010).

In addition to output, outcome, impact and compliance as elements of the concept of institutional effectiveness, one should also look at the 'non-intended effects'. Especially policies at the national level at times reach their intended target, but also show a large array of negative 'side-effects' (Biermann, 2007). Table 9 provides dimensions, variables and indicators for the analysis of outcomes and impacts.

Table 9 Dimensions, variables and indicators for the analysis of outcomes and impacts

Dimension	Variable	Indicators
Solutions	New solutions	Development and implementation of new solutions
	Customary solutions	Solutions that are created without formal agreement
Ecologically optimal outcome	Environmental flow[35]	Existence of environmental flow assessment
		Scientific quality of environmental flow assessment; analysis of relationships between flow alteration and ecological characteristics for different river types
		Recommended level of environmental flow
		Current situation of environmental flow, how much is actually flowing
		Process of determining environmental flow; who was involved; level of stakeholder participation; evidence-based decision-making
	Ecosystem	Existence of ecosystem assessment, e.g. by government of NGO
		Quality of ecosystem assessment; key criteria; scientific methodology
		Recommendations from the ecosystem assessment, e.g. on conservation
		Water management practice which takes ecosystems into account
Economically optimal outcome	Economy	Mentioning of rivers' resources in socio-economic development plan
		Economically optimal outcome from using the river
	Use of natural resources for economic activities (non-water)	Ecosystem services provisions[36], including: provisioning services, regulating services, habitat or supporting services, cultural services
	Use of water for economic activities	Extent of river water used for irrigation; optimal level in terms of outputs
		Extent of hydropower development; planned in optimal levels in terms of hydropower outputs
		Extent of river water used for domestic use; distributed at optimal level; system of allocation
		Extent of river water used for industrial use; optimal distribution; system of allocation
Non-intended impacts	Non-intended impacts	Unforeseen negative or positive consequences of an intervention
Creation of behavioral norms/ expected behaviors[37]	Behavioral norms	Existence of behavioral norms; creation of any behavioral norms/expected behaviors due to water cooperation
Interdependency[38]	Interdependency	Increased interdependencies among riparian states; among riparian residents
		Maximization of the benefits from interdependency due to cooperation

7.7 Zone of Possible Effective Cooperation (ZOPEC)

The result of an analysis of each component and their relationships will support the identification of a zone of possible effective cooperation (ZOPEC). 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, 333). 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.

8. Example of framework application on the Brahmaputra basin

In this chapter[39], we provide an example of the application of the framework in the Brahmaputra Basin, which is one of the case study basins under the 'Water Diplomacy: Making Water Cooperation Work' project. The information in this chapter is derived from the Brahmaputra Basin Report, which is one of the project deliverables (forthcoming, 2017). The case study was chosen as a research method since it is suitable for explaining linkages over time and for conducting an in-depth analysis[40].

As part of the Brahmaputra Basin Report, a number of relevant action situations have been identified and analyzed based on the framework described in this report:

- Action situation 1: India-China bilateral cooperation
- Action situation 2: India-Bangladesh cooperation through the Joint Rivers Commission
- Action situation 3: Cooperation between India-Bhutan
- Action Situation 4: Bhutan-Bangladesh cooperation
- Action Situation 5: Bhutan-China cooperation
- Action situation 6: China-Bangladesh cooperation
- Action situation 7: Ecosystems for Life
- Action situation 8: Brahmaputra Dialogue

In this chapter, we have selected Action Situation 1 on India-China bilateral cooperation as an illustration of the framework's application. The analysis uses information gained through interviews conducted in China and India through the Water Diplomacy project, as well as literature and online information sources. A total of 21 interviews were conducted in China and 18 interviews in India, with informants from government, civil society, academia, private sector and donors. A combination of stakeholder mapping and snowball sampling methods were adopted in identifying appropriate interviewees for this study. Preliminary research results were validated during the Brahmaputra multi-stakeholder workshop (8-9 November 2016, Bangkok) conducted under the Water Diplomacy project, bringing representatives from 4 basin countries together. The preliminary research findings were presented and validated at the workshop with some additional inputs to the study by the participants. The workshop was conducted using Chatham house rules. Inputs from interviewees and workshop participants are cited anonymously.

8.1 Basin wide context

The Brahmaputra River originates from the Tibetan plateau of China, flowing through the north eastern part of India where the river meets tributaries flowing from Bhutan and continuing to flow into Bangladesh, where it meets with the Ganges and Meghna river, which forms the Ganges-Brahmaputra-Meghna (GBM) region. The Brahmaputra river is called Yarlung-Tsangpo in China, however, for the sake of consistency, we refer to it as the Brahmaputra in this chapter. The GBM region comprises approximately 1.7 million square kilometers, making it the largest river basin sourcing from the Hindu-Kush Himalayas (HKH)[41] and the third largest river basin following the Amazon and Congo, respectively[42]. The river supports the livelihoods of 620

million people along the river through its fertile agriculture land and aquatic resources[43]. The upper catchment of the river also provides opportunities for electricity generation through hydropower. Currently, some hydro-power dams are operating in China, Bhutan and India, and there are more plans for future development.

The basin is at the center of a complex geopolitical situation. Four riparian countries, namely China, India, Bhutan and Bangladesh, claim sovereignty over various parts of the basin and so there are international dimensions to the management and distribution of the resources. Historically, there have been disputes between India and Bangladesh over the sharing of water of 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. Most commentators view India's relationship with Bhutan as relatively harmonious, with long traditions of cooperation, and deep cultural ties. More recently, there have been emerging concerns about the utilization of the Brahmaputra between India and China.

The resource management of the river is at an important juncture. Currently, track I cooperation over the Brahmaputra is focused on bilateral cooperation between China-India, India-Bangladesh, Bangladesh-China and Bhutan-India. Several regional economic cooperation mechanisms exist that have the potential to expand into a regional water cooperation mechanism, such as the BBIN (Bangladesh, Bhutan, India Nepal) cooperation. There are some track II and III initiatives that have facilitated dialogues among riparian countries, including the on-going Brahmaputra Dialogue facilitated by an Indian NGO called SaciWaters; and a IUCN facilitated project, 'Ecosystems for Life' that aimed to facilitate the process of India-Bangladesh cooperation over the shared ecosystem and produced a number of joint scientific publications.

8.2 Action situation, output and outcome: China-India cooperation

Currently, China and India cooperate over the Brahmaputra on a bilateral basis and have been doing so since the early 2000s. In 2002, the first MoU between China and India, on provision of hydrological information on the Brahmaputra River in flood season, was signed for the initial duration until 2007. This MoU was renewed twice, in 2008 and 2013. Data is collected from three stations (Nugesha, Yangcun and Nuxia) during the period from 15th May until 15th October[44]. As these hydrological stations are located in remote areas where the Chinese authority does not have any stations, the Indian government pays approximately 850,000 Chinese Yuan per year to compensate for the cost incurred for this data collection[45].

In addition to the MoU related to the hydrological data, India and China signed a MoU in 2013 on strengthening cooperation on transboundary rivers. The MoU suggests further strengthening cooperation on transboundary rivers through the existing Expert Level Mechanism between two countries, the provision of flood-season hydrological data, and emergency management[46]. The Expert Level Mechanism consists of delegations of technical experts from research institutes, governments and foreign ministries. Since 2006, approximately twenty meetings have been held among experts. The topic of discussion varies each year but is focused mostly in the area of hydrology information sharing, discussing how to monitor and share information, and how to build hydrology models[47].

Among the interviewees, there were two divergent opinions related to the status of this cooperation. One was that cooperation is working effectively, particularly considering the fact there is a territorial dispute between China and India[48]. One of the interviewees commented that the current cooperation is sufficient in addressing the needs for cooperation, indicating that, compared to other basins such as the Mekong River, the Brahmaputra river, particularly on the Chinese side, is sparsely populated and development is limited - thus the current level of cooperation is enough[49].

Another opinion was that the current cooperation is inadequate, considering the fact there are concerns from downstream countries over the development upstream of the Brahmaputra river[50]. Some interviewees acknowledged that concerns raised from other countries would be an important incentive for China to move towards cooperation[51], referring to the 'responsive' nature of China's transboundary water cooperation[52].

In the following section, we discuss how various factors affect bilateral cooperation between China and India, using the analytical framework. The diagram (figure 9) illustrates how the components of the framework interact with each other to create the current status of cooperation.

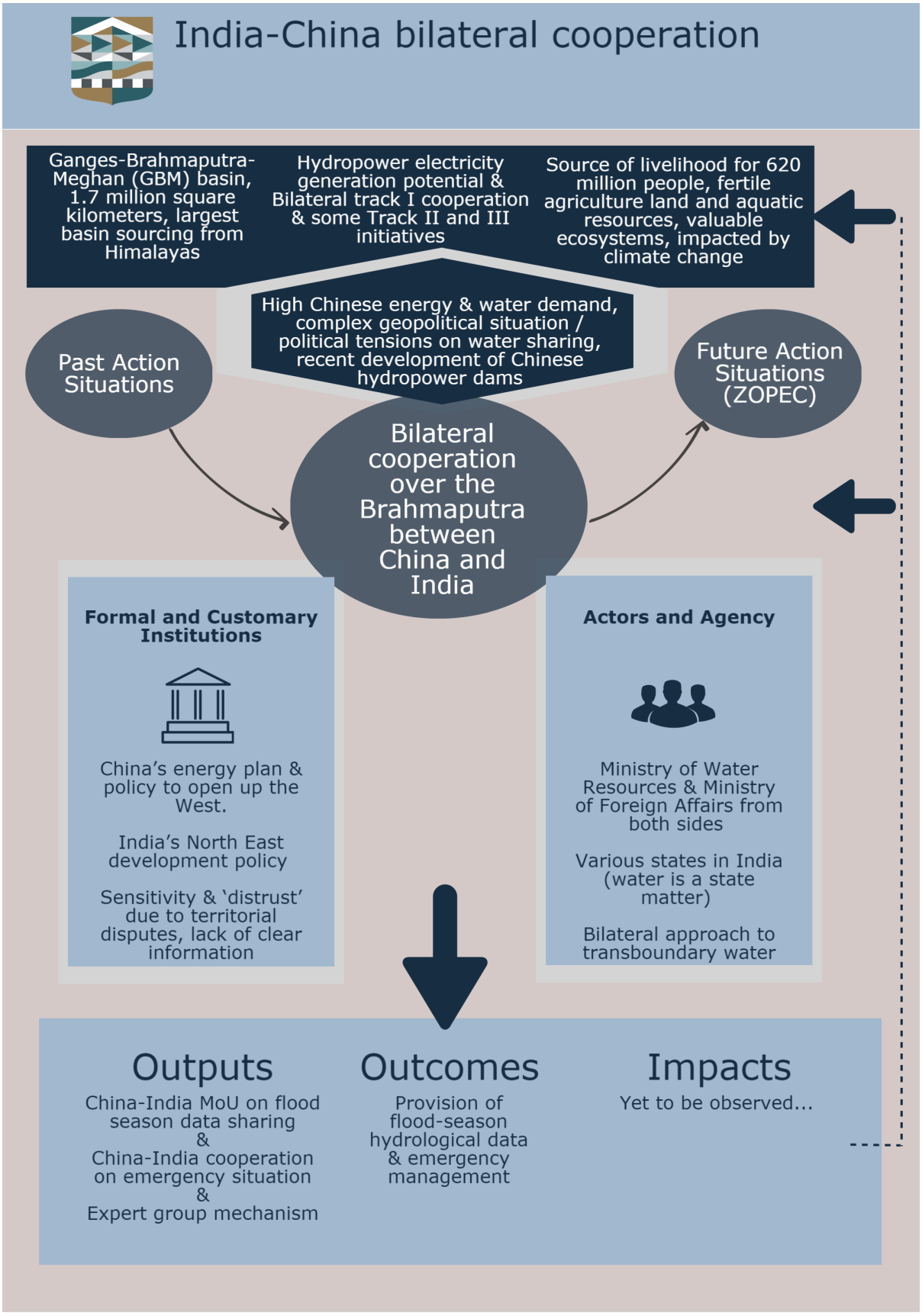


Figure 9 Factors affecting bilateral cooperation between China and India

8.3 Contextual factors related to action situation

China is located at the most upstream point of the Brahmaputra river and approximately 50% of the total catchment area is within China[53]. The river originates from the glacier mass of Chema-Yung-Dung in southern Tibet, with an elevation of 5300 meters[54]. The area is remote from large cities of China and the river was left undeveloped until 5-10 years ago[55]. Since then, there have 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 140km southeast from Lhasa and approximately 500 km from the border of India[56]. According to the energy plan for the 12th five-year plan (planning for the period 2010-2015), there are three more hydropower dams planned along the river: Da gu (大古), Jie Xu (街需) and Jia Cha (加查) dams[57].

There are several possible reasons for the recent development of hydropower dams in the region. One of them is China's increasing energy demand. According to the energy demand scenario by the State Grid Energy Research Institute, total primary energy demand will reach 4840-5070 Metric Tons Carbon Equivalent (MTCE) in 2020, and 5580-5870 in 2030[58]. A further analysis of energy demands for 2020 indicates that China's imports of coal, oil and natural gas continue to increase[59]. Improved technology for electricity transmission in recent years is another reason for this development as it allows the transmission of electricity through the grid system with minimum loss[60]. The technology enabled opportunities for the Western provinces to produce electricity and sell them to large cities, mostly located in the eastern coastal part of China.

Another debate related to the development of the Brahmaputra river concerns the idea of diverting Himalayan water to water-scarce parts of China. There are three routes for a water diversion project in China: the east, middle and western routes. The east and the middle routes divert water from the Yangze and the Han Rivers to the Yellow River in the North of China and these routes have already been completed[61]. The Western route diverts the water from the Brahmaputra river to the Yellow river through a series of canals and through blasting some mountains[62]. The idea has been debated among scientists for many years; however, it is currently on hold.

The recent activities of China upstream of the Brahmaputra river has led to concerns from Indian society[63]. Another concern arises from changes observed in water levels in India. In 2012, the water level of the Brahmaputra suddenly receded significantly at Pasigwat town in Arunachal Pradesh, leading to the Indian community suspecting possible water diversion by China[64]. In 2000, a naturally formed dam in one of the tributaries of the Brahmaputra broke and flooded Arunachal Pradesh and Assam (both states in the north eastern part of India) with 3-4 billion cubic meters of water, killing 30 people and leaving 50,000 homeless[65]. This incident was a catalyst for cooperation on data sharing between China and India[66].

8.4 Structure / Institutions

8.4.1 Formal institutions

As discussed in the previous section, China's energy demand is one of the key driving forces for the recent development upstream of the Brahmaputra river, leading to concerns from downstream India that resulted in the current cooperation between the two countries.

China's energy plan is based on China's Five-Year Plan that provides blueprints for China's social, political and economic goals[67]. Current plans for hydropower development are based on the 12th Five-Year Plan that covers the period from 2010-2015[68]. The plan promotes energy from non-fossil sources, and as part of this includes constructing 160GW of hydropower capacity, raising the national hydropower capacity to 290GW[69]. Under this plan new power sources are planned in the western part of China where the Brahmaputra also originates. It further illustrates that these areas are considered as one of the main energy sources for other parts of China[70]. One of the interviewees commented that one of the technological reasons that enabled this strategy is the technology to minimize loss during transmission through the national grid. According to the interviewee, Chinese technology has significantly improved in recent years and is currently the best in the world[71].

Under this energy plan, three new hydropower dams on the middle reaches of the upper Brahmaputra river were approved in 2013, including Jia Cha (加查), Da gu (大古), Jie Xu (街需) dams[72]. As the Zangmu (藏木) dam is already built[73], this has increased the number of hydropower dams on the main steam of the Yalung-Tsangpo in Chinese territory to four[74].

Another formal institution driving hydropower development in upper Brahmaputra is the Chinese government's policy to '*open up the West* (西部大開発)', launched in 2000 to encourage the development of the impoverished western part of China[75]. The idea follows the vision proposed by Deng Xiaoping, the Chinese leader who succeeded Mao Zedong in 1978, to develop the coastal area of China first, followed by the inner (Western) part of China[76].

In India, the Brahmaputra river flows through the north eastern part of the country. Historically, this area was at the forefront of economic trade through sea routes; however, after Indian independence and the partition of East Pakistan (current Bangladesh) in 1947, the northeastern part of India was virtually disconnected from mainland India. This geographic separation from mainland India created political fragmentation and led to the emergence of violent insurgence[77]. The region is economically less developed compared to mainland India, thus the Indian government has various policies and measures in place to improve the region's economic development. In 1996, the Prime Minister announced 'New initiatives for North Eastern Region' that enabled at least 10% of the budget of the central ministries and departments to be earmarked for the development of the North Eastern States[78]. The Brahmaputra River plays a crucial role in the development of the region, as it provides water needed for agriculture and 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 with the river.

8.4.2 Customary institutions

As an informal institution affecting the cooperation, a number of interviewees pointed out that distrust between China and India affects cooperation between the two countries[79]. This distrust arises from territorial disputes that have not been resolved between China and India that originate from the war in 1962[80]. In 1962, China started a war against India, creating the border disputes between two countries[81]. To date, negotiation attempts have not been successful in finding a solution to the issue. Another source of distrust arises from lack of

communication, as Amano (2015) points out that China was denying the existence of the hydropower development on the Brahmaputra river until 2010[82].

Another factor that creates distrust is the history of conflict in the region. During the multi-stakeholder workshop conducted in November 2016, one of the workshop participants pointed out that, compared to the Southeast Asia region, South Asia has a lot of historical baggage among the nations. This baggage may be one of the factors affecting the cooperation.

8.5 Actors/Agency

Key actors related to cooperation over the Brahmaputra river are the Ministry of Water Resources and the Ministry of Foreign Affairs from each government. Both governments, in principle, take bilateral approaches in managing transboundary rivers, except for the recent Chinese multilateral cooperation initiative over the Lancang-Mekong River.

India is geographically located as a middle riparian and its borders face every riparian country of the Brahmaputra river. This geographic condition is one factor that affects India's bilateral approach regarding transboundary rivers. In addition, India is a federal country which consists of various states. Water is a state matter, which creates conflicts between states[83]. As India has to manage its complicated state relationships and disputes over water, this hinders its ability to take a multi-lateral approach to transboundary rivers, leaving India to often take a bilateral approach.

When it comes to transboundary rivers, China tends to take a bilateral, rather than multilateral, approach[84]. One of the reasons for this is that many of the transboundary rivers flowing through China only go through two countries[85], thus not requiring China to take a multi-lateral approach. Ho (2014) argues that a multilateral approach would threaten its sovereign rights as China is upstream in most of its transboundary rivers[86]. The exception to this approach is the Mekong river, where China has recently established the Lancang-Mekong Cooperation Mechanism and had its first leaders' meeting in 2016[87].

8.6 Zone of possible effective cooperation (ZOPEC) for the Brahmaputra Basin

Based on the framework application in the Brahmaputra Basin, including a detailed analysis of all action situations, a zone of possible effective cooperation (ZOPEC) has been identified. Full details can be found in the Brahmaputra Basin Report.

Below, we provide a summarized overview of high-low ranking of priorities for cooperation (based on voting by participants during the multi-stakeholder workshop in Bangkok on 8-9 November 2016). Given that the workshop had 22 participants, including 19 representatives from all riparian countries and three external experts, a scoring of more than 15 votes indicates a high level of consensus.

Communication:

1) Knowledge Platform (19 votes) > Important note: platform considered as mechanism to facilitate joint research (see following category)
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)

Joint research:

1) Create comparative studies based on same 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)

Decision-making (at multiple tracks):

1) Develop platforms (regional or basin specific), for example knowledge platform 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 (6 votes), e.g. broad and horizontal stakeholder participation, integration of local interests, bottom-up approaches
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.

The framework's initial application to the Brahmaputra basin uniquely identifies a viable zone of effective cooperation, and has already gained the strong commitment from delegates representing all riparian countries, for example to identifying and developing benefit-sharing arrangements across sectors. 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.

9. Conclusion

The framework helps to diagnose 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.

The framework has great potential to build a sound bridge from actual or potential conflict to effective cooperation and practical solutions. Its initial application to the Brahmaputra basin uniquely identifies a zone of possible effective cooperation (ZOPEC), and has already gained the strong commitment from delegates representing all riparian countries (including China, India, Bangladesh and Bhutan), for example to identifying and developing benefit-sharing arrangements across sectors. 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.

The framework presented in this publication has several potential uses in practice:

- First, decision-exploring, decision-making and evaluating steps at different levels of water cooperation can be made more effective through diagnosis of key issues and possible zones of collaboration.
- Second, the framework should be useful for exploring new, and refining existing, approaches and strategies for cooperation over shared waters by drawing more attention to the governance, political economy and legal dimensions of water-related conflicts. In particular, it elucidates the decision-making process behind particular interventions beyond the technical domain. This can help to overcome the frequent neglect of power relations and interests in the making of water policies.
- Third, the framework will be useful not only to planning agencies and governments, but also to community-based and private sector organizations that are interested in working proactively with other stakeholders on water cooperation at multiple levels.

The multi-track water diplomacy framework presented in this publication will be fine-tuned by applying the proposed methodology in the Brahmaputra and Jordan basins. For this purpose, the proposed approach has been operationalized into a questionnaire for field research (see annex 1). The results of the field research will be discussed in multi-stakeholder dialogues and focus group meetings with stakeholders from all riparian states. While our analytical framework is based on literature on effective/ineffective cooperation and political economy analysis, our case studies may reveal additional factors that have played an important role in cooperation, which we will consider and integrate into the proposed methodology, taking both an inductive and deductive approach.

Glossary

Concept	Description	Source
Action situation	An action situation is a situation when two or more individuals are faced with a set of potential actions that jointly produce outputs and outcomes	Ostrom (1999:42; 2005:13)
Action	Action is behavior informed by the actor's intentions. Actors initiate and steer what they do in relation to their intentions. Intentions are purposes, ('goals' or 'end') which actors want to achieve by their actions. Because actors can initiate and direct their own behavior relative to their intentions, they are subjects not just objects.	Parker et al., 2003
Agency	Agency is the capacity to make a difference to outcomes, intentionally and/or unintentionally. Collectives and non-human animals can be agents. Actors may be morally responsible agents of their actions when they understand their likely consequences, and could have done other than they did.	Parker et al., 2003
Compliance	Besides output, outcome, and impact, scholars have also looked at *'compliance'* as an indicator for the effectiveness of institutions. If a regime stipulates that participants have to reduce a certain emission by 30 percent, and if participants do this within the prescribed time frame, then one could speak of full 'compliance' with the regime, which some scholars extend then to the 'effectiveness' of the institution.	Biermann, 2007
Context	The interpret the subjective meaning which actors give their actions and situations, we must locate these within a wider social and historical context. This requires a skillful widening and deepening of the background context which may include highly influential factors which help us to make better sense of what is happening. But context has no fixed boundary; there are not rules for getting it right in some final sense.	Parker et al., 2003
Effective water cooperation	A collaboration in which two or more parties find a negotiated compromise on maximizing mutual gains and achieving joint wins for all parties involved, resulting in the availability of an acceptable quantity and quality of water for health, livelihoods, ecosystems and production, coupled with an acceptable level of water-related risks to people, environments, and economies.	Source: This publication
Impact	The ultimate touchstone for truly effective environmental institutions is whether the state of the environment would be worse off without the institution. This type of effectiveness is also often called the *'impact'* of institutions, is difficult to measure in many cases. […]When it comes to explaining regime effectiveness-regardless of how it might have been assessed-the analysis gets even more complicated. Anthropogenic sources of environmental problems result from deeply rooted social practices and intersect with numerous factors outside the respective regime.	Biermann, 2007
Institutionalization	An institution is an organized way of doing things, the outcome of a process of institutionalization, whereby preferred ways of doing things are progressively reinforced, making them relatively reliable. This process usually involves conflict and the exercise of social power.	Parker et al., 2003
Institutions	Deeply embedded patterns of social practices or norms that play a significant role in the organization of society. Institutions can include diverse areas of social activity, from the family to basic aspects of political life. In some	Calhoun, 2002

	cases they acquire an organized or bureaucratized administrative structure, in which case they become institutions in something closer to the common use of the term	
Non-intended effects	In addition to output, outcome, impact and compliance as elements of the concept of institutional effectiveness, one should also look at the '*non-intended effects*'. Especially policies at the national level at times reach their intended target, but also show a large array of negative 'side-effects'.	Biermann, 2007
Outcome	Therefore, most scholars have turned to other indicators of regime effectiveness, and focused on observable political effects and behavioral changes of actors. This change in the behavior of actors is often referred to as the '*outcome'* of institutions.	Biermann, 2007
Output	Another dimension is what institutions produce, such as declarations, meetings, publications, knowledge distribution, finances, et cetera. These elements-often referred to as the '*output'* of institutions-may, or may not, affect the behavior of the relevant actors and eventually the environment. In addition, the output of a water management regime has been defined as the level of policy learning being identified in existing strategies or plans.	Biermann, 2007. Huntjens et al, 2011
Practice	Practice is 'what people do, as distinct from what they say they do, or what the larger societal norms or structures identified by social scientists imply they usually do'	Calhoun, 2002: 379
Social structure	A structure is an organization of components. A social structure is an organization of social positions with consequences for social interaction. There are many ways in which interaction is socially structured. A given person is located in a number of social structures which condition their interests and actions, sometimes in contradictory ways.	Parker et al., 2003
Stakeholders	Stakeholder includes all persons, groups and organizations with an interest or "stake" in an issue, either because they will be affected or because they may have some influence on its outcome. This includes individual citizens and companies, economic and public interest groups, government bodies and experts.	Huntjens, 2011
Water diplomacy	Water diplomacy includes all measures by state and non-state actors that can be undertaken to prevent or peacefully resolve (emerging) conflicts and facilitate cooperation related to water availability, allocation or use between and within states and public and private stakeholders.	Source: This publication
Water governance	Water governance refers to the range of political, social, economic and administrative systems that are in place to develop and manage water resources, and the delivery of water services, at different levels of society.	Global Water Partnership, 2003
ZOPA	Zone of possible agreement. 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, 333
ZOPEC	Zone of possible effective cooperation. 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.	Source: This publication

Endnotes

1. Cross-sectoral dynamics include for example: the transboundary political-economy/ geography processes, the legal dimensions, the impact of non-traditional actors of the processes of cooperation

2. World Health Organization, UN Water (2014) UN-water global analysis and assessment of sanitation and drinking-water (GLAAS) 2014 – report: Investing in water and sanitation: increasing access, reducing inequalities, 2014

3. "A New Climate for Peace: Taking Action on Climate and Fragility Risks", an independent report commissioned by members of the G7, identifies seven compound climate-fragility risks that pose serious threats to the stability of states and societies in the decades ahead. Based on a thorough assessment of existing policies on climate change adaptation, development cooperation and humanitarian aid, and peacebuilding, the report recommends that the G7 take concrete action, both as individual members and jointly, to tackle climate-fragility risks and increase the resilience of states and societies to them.

4. Where will the world's water conflicts erupt? A heat map of war over water. In: Popular Science: The Water Issue, June 2014. Retrieved 10 Dec 2014, from *http://www.popsci.com/article/science/where-will-worlds-water-conflicts-erupt-*infographic?src=SOC&dom=tw Map based on the Transboundary Freshwater Dispute Database by the Department of Geosciences, Oregon State University.

5. We define Water Diplomacy here as following: "Water diplomacy includes all measures by state and non-state actors that can be undertaken to prevent or peacefully resolve (emerging) conflicts related to water availability, allocation or use between and within states and public and private stakeholders."

6. Sadoff, Claudia W., and David Grey. 2005. "Cooperation on International Rivers: A Continuum for Securing and Sharing Benefits." Water International 30 (4): 420-427. Copyright © International Water Resources Association, reprinted by permission of Taylor & Francis Ltd, www.tandfonline.com on behalf of International Water Resources Association.

7. Conca 2011

8. Stakeholder includes all persons, groups and organizations with an interest or "stake" in an issue, either because they will be affected or because they may have some influence on its outcome. This includes individual citizens and companies, economic and public interest groups, government bodies and experts

9. See for example the references collected in: http://dlc.dlib.indiana.edu/dlc

10. Based on Helmke and Levitsky 2004; Williamson 2009; Yasuda 2015

11. Based on Aggestam and Sundell-Eklund 2014; Swain 2004

12. Based on Swain 2004

13. Price 2014
14. Based on Wigfield and Eccles 2000; Johnston 1998
15. Huntjens et al. 2016
16. Huntjens et al. 2016
17. Helmke and Levitsky 2004; Williamson 2009; Yasuda 2015
18. Huntjens et al. 2016
19. Heilmann 2008; Sanderson 2002; Huntjens et al. 2012
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27. Voß and Kemp, 2006; Raadgever et al. 2008
28. Raadgever et al. 2008
29. Young, 2002
30. Helmke and Levitsky 2004; Williamson 2009; Yasuda 2015
31. Huntjens et al. 2012
32. Ibid
33. Ibid
34. Ibid
35. Poff et al. 2010, Tharme 2003, Richter et al. 2003
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37. Conca 2011
38. Ibid
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46. Central Water Commission of India and Bureau of Hydrology and Water Resources of China. 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; CH13. 2016. Interview with CH 13 on 27th April 2016.

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49. CH14. 2016. Interview with CH14 on 27th April 2016; CH21. 2016. E-mail communication with CH21 on 1st May 2016.

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Annex 1: Questionnaire for field research

A: Overview of key dimensions for the context

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?

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	Are stakeholders– in particular vulnerable groups – involved in (a)

		groups) in (a) decisions on large scale projects and (b) the development of water laws and policies	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 principle of equitable and reasonable use	Do the rules of allocation correspond with the 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	What is the relationship between formal

		formal and informal rules; complementary or contradictory	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 access to decision-making regarding the river	Who was invited to participate, and who attended? Who spoke or wrote? What venue?
		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	Was information presented in an authoritative or facilitative way that stimulates reflection by the

		an authoritative way, but in a facilitative way, to stimulate reflection by the stakeholders about what is possible and what it is they want	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 in order 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, how much is actually flowing	What is the reality (current situation) of managing environmental flow?
		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	Ecosystem services provisions, including:	What are the main ecosystem services the river provides? The

	economic activities (non-water)	provisioning services, regulating services, habitat or supporting services, cultural services	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 2: Key features of existing PEA frameworks

Key features of existing PEA frameworks

	DFID's *How To Note on Political Economy Analysis* (2009)	**ODI's PEA for operations in water and sanitation (2012)**	**World Bank's Problem-Driven Governance and PEA Good Practice Framework (2009)**	**World Bank's PEA for Groundwater Governance (2012)**	**World Bank's *How To Note for Political Economy Assessments at Sector or Project Levels* (Poole 2011)**	**The Hague Institute's PEA for water conflicts (2014)**	**IRS' framework for analyzing institutional and political contexts of water resources management projects (Beveridge et al. 2012)**	**UNDP's Institutional and Context Analysis Guidance Note (2012) (UNDP 2012)**
Key purpose	Provide DFID staff with PEA guidance and overview over range of tools available	Enabling context-specific interventions to improve access to WASH services through PEA	Improving contextual understanding to allow Bank staff to design more effective programs aimed at addressing local governance to unlock development	Improving groundwater governance through more rigorous analysis of current impediments to improved groundwater management and how those can be overcome	Improve effectiveness of sector-specific projects by creating a better understanding of local formal and informal structures at the intersection between economics and politics	Developing policy relevant recommendations for the prevention and the resolution of water-related conflict	Adapt IWRM projects in a way that makes them more fitting for institutionalizing the context of their implementation	Analyzing the mixture of incentives and constraints of different societal actors to support or block development programs
Scope	Broad scope across development models and	Problem-driven approach to PEA	Summary of analytic tools and proposal of set of	Application of PEA to groundwater governance	Problem-driven; no sector-specific focus, but	Problem-driven approach to water	Focus on IWRM, but within that sector broad	No sector-specific lens, but focus on actors,

	sectors, but focused on DFID's work		standards for Bank-wide GPE diagnostics	across different levels	tailored to assist Bank's operational teams	conflict and cooperation	scope	institutions and incentive structures
Analytical focus	Effectiveness of development programming in general	Operational challenges/development problems	Emphasis on problem-driven (diagnostic) approach; focus on specific challenges to reform	National developmental problems (e.g. specific poor sector outcomes)	Underlying causes and PE drivers of poor or distorted project outcomes	Conflicts embedded in the local physical, socio-economic, political and legal-institutional structure	Focus on IWRM, but very general analytical focus and broad applicability	Political and institutional factors, as well as processes concerning use of resources
Key concepts	*Drivers of Change*; incentives for/obstacles to change; pro-growth coalitions; formal institutions and informal practices; political intelligence	Socio-political risk and opportunity factors; theories of change; incentives; enabling environment; local structures and institutions; political culture	Windows of opportunity and vulnerability; institutions and governance structures; political economy drivers; historical legacies	Common pool resources; incentive frameworks; individual appropriation; local institutions; adaptive resource management	Rents and rent distribution; historical legacies; formal and informal 'rules of the game'; path dependency; winners and losers; veto players	Common pool resources; incentive frameworks; individual appropriation; local institutions; adaptive resource management	Power; contestation; perceptions; context-sensitivity; adaptation; learning;	Incentive systems and constraints; enabling environment; institutions and context; power and interests; formal and informal rules
Field of application	No specific field; several country and sector case studies	WASH sector, particularly sector- and context-specific governance	No specific field; very general overview over ways in which GPE can be used to enhance the	Governance of groundwater and transboundary aquifers	No specific field; framework outlines three levels of PE analysis (country, sector, and	Legal, institutional and political economy perspective on the water and agricultural	Integrated water resource management	No specific field or sector; framework outlines three levels of analysis (country, sector, project)

			Bank's work		project)	sector		
Object of explanation	Pro-poor change and aid effectiveness	Overcoming of governance challenges in WASH service delivery	Success and failure of Bank's development programming	Failure of groundwater governance arrangements	Reform failures and poor project outcomes	Water conflicts	Problem- and people-oriented reform in IWRM governance	Determinants of success or failure in development programming
Logic of explanation	Successful development programming hinges on the clear understanding of the political and institutional (formal and informal) context	Positive change in WASH service delivery and access must be embedded in given political and institutional context and cannot be achieved through the 'transfer' of best practices detached from context	Effective and sustainable development programming depends on a clearer diagnostic of *why* pro-development reforms do or do not happen in specific contexts, and how the Bank can better respond to these factors	Groundwater appropriation has taken place mostly unregulated driven by individual PE interests; reversal of the status quo through better governance arrangements is thus very difficult to achieve	Pre-planning analysis should not only focus on stakeholders and institutions, but aim to drill down to level of PE factors impacting change, e.g. rents, incentives, social forces et.	Water management is a complex and inherently political process with assumed game-changing potential: It may prevent an acute water crisis from turning into a large-scale violent conflict or it may exacerbate the situation further.	Only by accepting the importance of power and the political nature of IWRM processes and embedding interventions in socio-political contexts can attempts to improve IWRM be successful	Successful development depends on change in power relations/incentive systems of key actors; all of them have incentives and constraints; understanding those is crucial for altering them through projects
Explanation of change	Better understanding of political economy landscape	Thorough PEA will enable more context-specific and hence more effective interventions by	More rigorous analysis of PE factors and dynamics in a given context is essential for	Better understanding of groundwater's unique place and constraints	Only if there is a better understanding not just of the 'who' but the 'why' of poor	An appropriate analysis of conflicts and suggestions for conflict	An inductive, bottom-up approach to assessing IWRM contexts is key to	While supporting pro-change actors is important, it is even more important to

	will allow for more effective programming through forging of pro-growth coalitions	taking into account local political and institutional structures and modelling incentives for change based on this knowledge	better addressing local/national governance to unlock development	in IWRM is a precondition for effective governance reform programs, at national and local levels	reform outcomes (i.e. the PE drivers/obstacle like rents, patronage etc.) can attempts to improve operations be effective	resolutions should be based on an integrated analysis of the conflicts, not only looking at water related issues but also at the historical, political, institutional, legal and societal context	generating a more favorable institutional context for IWRM activities so solutions are not eroded or coopted by local political structures	know who will potentially lose from project success to adapt programming and anticipated spoilers
Timing of political economy work	PEA should inform program design and choice of modalities from outset	Program design and evaluation phases, as well as critical transition moments in the sector	Use of PGPE analysis to create 'political intelligence' to inform strategies and operations, and feasibility		Early on to feed into the project design process; however: generally useful at different stages	PEA should inform program design and choice of modalities from outset		Project formulation (situation and risk analysis) and design (scenario formulation)

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- Cover/ page vi: Aerial view of the Brahmaputra River Basin in Bangladesh (Shamim Shorif Susom)
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- Page xvi: Brahmaputra River, Shigatse Tibet. Boqian Liao
- Page 6: Water pours into a rice field in Sapa, a part of efforts to increase access in regions of Viet Nam. UN Photo, Kibae Par
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- Page n: Irrigation in Zambia. RTO Africa.com

Water diplomacy will play an increasingly important role in preventing, mitigating and resolving a growing number of water-related conflicts around the world.

However, the theory and practice of cooperation over shared waters and the implementation of multi-track water diplomacy are not sufficiently developed. Concepts and approaches such as multi-level water governance, adaptive water governance, the mutual-gains approach and instruments for benefit sharing need to be further developed and operationalized.

The objective of this publication is to specify a conceptual and analytical water diplomacy framework that identifies the key factors that affect water cooperation. Knowledge of these key determinants of cooperation not only contributes to the existing body of academic knowledge, but can also help to bolster cooperation over shared waters.

This framework helps to diagnose 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.

The framework has great potential to build a sound bridge from actual or potential conflict to effective cooperation and practical solutions.

Its initial application to the Brahmaputra basin uniquely identifies a zone of possible effective cooperation (ZOPEC), and has already gained strong commitment from delegates representing all riparian countries (including China, India, Bangladesh and Bhutan), to identifying and developing benefit-sharing arrangements across sectors. 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.

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

"The multi-track water diplomacy framework presented here is a timely and innovative tool to move [water diplomacy] forward."
Irina Bokova, Director-General of UNESCO

"This framework, not only has academic value, but will also bolster transboundary water cooperation."
Henk Ovink, Special Envoy for International Water Affairs, Kingdom of The Netherlands

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