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Trust in Transboundary Waters: Identifying Trust-Building in Water Diplomacy Literature

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ABSTRACT: Trust-building, one of the key tools in diplomatic negotiations and peace processes, is an essential way to promote cooperation over transboundary waters shared by several countries. Combining water-related know-how with diplomatic mechanisms and foreign policy, water diplomacy provides a particularly relevant context in which to approach trust over transboundary waters. This paper examines trust and trust-building activities in literature related to water diplomacy, linking them to conceptualisations of trust in the fields of international relations and natural resource management. The reviewed publications and key informant interviews emphasise the importance of trust in water diplomacy processes. The literature and interviews also allow us to identify ten categories of potential trust-building activities in water diplomacy. Based on this, we propose a basic conceptualisation for approaching trust and trust-building in water diplomacy. The findings indicate that, while trust is considered an important element in water diplomacy processes, the discussion would benefit from a more systematic approach. At the same time, transboundary waters provide a unique context for studying the role of trust and trust-building in international relations.

KEYWORDS: Water diplomacy, transboundary waters, shared waters, water cooperation, trust, trust-building, international relations, natural resource management

INTRODUCTION

Water is an essential and irreplaceable resource crossing human-made boundaries. Globally, almost 60% of all freshwater sources are transboundary, and over 150 countries share at least one freshwater source (UN-Water, 2021). The intricate ways in which water is linked to both economic and social development make water also a very political resource, with the politics cutting across geographical and institutional scales. While both political and water-related factors have provoked discussion about water-related tensions (e.g. Katz, 2011; Molnar et al., 2017; The Guardian, 2021), the evidence suggests that sharing transboundary waters leads more often to cooperation than to violent conflicts (e.g. Wolf, 1999; Yoffe and Wolf, 1999; Strategic Foresight Group, 2017; Grech-Madin et al., 2018).

Thus, transboundary waters – or better, shared waters – can be seen as a potential catalyst for peace and regional cooperation, which is at the heart of the emerging concept of water diplomacy.¹ Water diplomacy can be briefly defined as a politically oriented process to prevent the escalation of water-related disputes and to promote water cooperation by utilising the practices and mechanisms of both foreign policy and water resource management (Keskinen et al., 2021; Sehring et al., 2022). As an extension from water cooperation into the field of diplomacy, water diplomacy can bring together theories and practices from different fields, ranging from international relations and international law to hydrology and natural resource management.

In transboundary waters, trust is repeatedly mentioned as an important ingredient for both fostering and sustaining diplomatic cooperation (e.g. Abu-Zeid, 2014; Cogels, 2014; Hanasz, 2017; Huntjens and de Man, 2017; Molnar et al., 2017). Trust has been seen as a key factor for interaction between parties in water diplomacy processes (Susskind and Islam, 2012; Klimes et al., 2019), and trust-building skills are listed among the vital qualities of water diplomacy actors (van Genderen and Rood, 2011; Huntjens et al., 2012). This also means that a lack of trust is seen to hinder water diplomacy: in a study of water diplomacy in the Eastern Nile, for example, lack of trust was seen as the most critical factor hindering cooperation between the riparian states (Al-Saidi and Hefny, 2018; see also Barua, 2018).

While the concepts 'trust' and 'trust-building' do often appear in the literature on transboundary waters, both concepts are typically mentioned on a rather general level, without further conceptualisation of what 'trust' means and how it can actually be built. At the same time, a strong and evolving research tradition exists on the concept of trust in the field of international relations (e.g. Väyrynen, 2000; Hoffman, 2002; Wheeler, 2013, 2018; Ruzicka and Keating, 2015; Haukkala et al., 2018) and to some extent also in natural resource management (e.g. Stern and Coleman, 2015; Voogd et al., 2022), providing a more structured way to understand and analyse trust.

In this article, we examine trust and trust-building in the evolving literature related to water diplomacy. The research has three main contributions. First, we analyse how water diplomacy-related literature both refers to and views trust. Second, we identify potential trust-building activities related to water diplomacy and group them into ten main categories, illustrating the diversity of ways that trust can be built in different water diplomacy contexts. Third, we discuss how trust and trust-building could be conceptualised in relation to shared waters, approaching our findings through the theories of trust from the fields of international relations (IR) and natural resource management (NRM).

This study seeks to contribute to the increasing literature on water diplomacy by discussing the specific role of trust and trust-building in transboundary waters with the help of theories from IR and NRM. At the same time, we seek to introduce water diplomacy as a relevant context in which to analyse trust and trust-building in international relations.

RESEARCH CONTEXT AND CONCEPTUALISATIONS

Water diplomacy

In this article, we define 'water diplomacy' as a politically oriented process that aims at mitigating water-related tensions and supporting positive interactions around transboundary waters by making simultaneous use of water-related know-how and diplomatic tools across multiple diplomacy tracks and

¹ Recent years have seen a rapid increase in both scientific and practice-related literature on water diplomacy, focusing on transboundary waters such as rivers shared by two or more riparian countries (Sehring et al., 2022). It should be noted, however, that water diplomacy can take place in differing contexts and at various scales, from the local to the regional (supranational) scale. This also means that the actors engaged in water diplomacy can range from individuals and communities to water user sectors and riparian states. In this article, we focus on transboundary waters shared by several countries, using the terms 'transboundary waters' and 'shared waters' interchangeably (while noting the positive connotations of the latter term).

institutional scales (Klimes et al., 2019; Keskinen et al., 2021; Sehring et al., 2022). Water diplomacy can thus be regarded as a two-fold process which, on the one hand, brings water-related questions into the field of diplomacy and foreign policy and, on the other hand, utilises foreign policy and diplomatic tools in the context of transboundary waters and their management (Keskinen et al., 2014; Molnar et al., 2017).

The interest in water diplomacy has been increasing in recent years. This is partly due to the close links between shared waters and economic and political relations between countries. This is particularly the case in the development of significant projects having transboundary impacts, such as construction of large hydropower dams. However, it is also due to the difficulties that lie in addressing those broader aspects solely with water-focused interactions and frameworks (e.g. Molnar et al., 2017; Zeitoun et al., 2020; Cascão, 2021).

Water diplomacy is closely related to 'transboundary water cooperation', which can be defined as the use of different types of cooperative governance (e.g. strategic, institutional, technical) to harvest the benefits of a watercourse being transboundary (Sehring et al., 2022: 213; see also Kittikhoun and Schmeier, 2020). Indeed, one of the main objectives of water diplomacy is to promote and strengthen transboundary water cooperation, and diplomatic negotiations are often a prerequisite for water cooperation to be institutionalised – for example through multilateral agreements. Water diplomacy therefore complements the practices of transboundary water cooperation with diplomatic mechanisms, including both preventive and restorative elements such as peace-building and negotiation techniques (Keskinen et al., 2021).

Referring to its definition as a multi-track diplomacy process, water diplomacy may include a variety of actors. While multi-track diplomacy can be separated into as many as nine tracks (Diamond and McDonald, 1996), the interaction over transboundary waters typically centres around two main diplomacy tracks. The official Track 1 refers to diplomacy at the level of riparian states, while the Track 2 covers non-state stakeholders such as civil society, business actors, and academia. The so-called Track 1.5 refers to interactions that include both state and non-state actors (see e.g. Marshall et al., 2017; Klimes et al., 2019). In some cases, an external third party, such as a state, an organisation, or an individual consultant, may be invited to facilitate a water diplomacy process. For a governmental third-party actor, water diplomacy can be a means of foreign policy, either as a multi-sectoral thematic frame or as a niche (van Genderen and Rood, 2011).

In both water diplomacy and transboundary water cooperation, trust is considered to be an important element. That is also why this article looks at the role of trust in the literature related to water diplomacy: we argue that water diplomacy provides a particularly interesting context for the study of trust as it links the theory and practice of diplomacy and international relations with the realm of transboundary waters. However, given the intertwined nature of water diplomacy and water cooperation – and noting that most of the reviewed publications do not make a clear distinction between the two concepts – the study also has relevance for the discussion of transboundary water cooperation.

Trust and its conceptualisations

Trust is an important ingredient in almost any human interaction, and the concept of trust – and its flip side, lack of trust or mistrust/distrust² – has been studied in a diversity of fields (see e.g. Rousseau et al., 1998; Hardin, 2002; Ostrom and Walker, 2003; Hoffman, 2006; Wheeler, 2018; Gehrig et al., 2023). While both the contexts and conceptualisations of trust are diverse, 'trust' can generally be understood as a psychological state in which one actor (the 'truster' or 'subject of trust') accepts some level of

² There are different terms for describing the absence of trust, including 'lack of trust', 'trust deficit', 'mistrust', and 'distrust'. The terms have somewhat differing connotations, with e.g. 'mistrust' indicating situations where there are historically sensitive experiences of misplaced trust, while 'distrust' is a more comprehensive depiction of the overall condition of the relationship (Juntunen and Pesu, 2018: 149). For clarity (and noting that the reviewed publications use different terms without explicit definitions or distinctions), we refer in this article to 'lack of trust' as a general term that covers all these terms.

vulnerability, based on positive expectations of the actions or intentions of another actor (called the 'trustee' or 'object of trust'), despite the uncertainties inherent in those expectations (e.g. Rousseau et al., 1998; Stern and Coleman, 2015; Bauer, 2019; Voogd et al., 2022). In its most basic form, trust has therefore been described as a relationship in which A trusts B to do X, where X stands for a certain action (Hardin, 2002). While actors A and B typically consist of individuals, they can also be considered groups of individuals, such as organisations or even states (Stern and Coleman, 2015; Bauer, 2019).

'Trust-building' – another key concept in this article – can be generally understood as a gradual process that aims to increase levels of trust by establishing confidence in mutual integrity and loyalty between actors through a variety of activities. Trust-building links to the ideas of a trusting relationship and a 'decision to trust'. According to Wheeler (2012), a 'trusting relationship' is one in which the actors enter to gain benefits that would otherwise not be available to them, while at the same time knowing that this increases their vulnerability in front of the other actors whose behaviour they do not control. A trusting relationship requires, therefore, a decision by one or both parties to make themselves vulnerable in order to communicate their trustworthiness (Wheeler, 2012).

Given that water diplomacy brings foreign policy together with water management, we utilise two frameworks for conceptualising trust, stemming from the fields of international relations (IR) and natural resource management (NRM).³ While the conceptualisation from IR introduces three approaches to trust focusing mainly on relations among states (Ruzicka and Keating, 2015), the conceptualisation from NRM considers four forms of trust relevant to collaborative natural resource management (Stern and Coleman, 2015). In the following, we introduce concise definitions for both frameworks.

The **three approaches to trust** consist of rational, social, and psychological approaches, providing a way to view and understand trust in international relations (Ruzicka and Keating, 2015; see also Haukkala et al., 2018). The three approaches have differences in their ways of understanding trust. The rational approach to trust underlines the role of rational choice and calculation. In rational terms, trust requires the ability to predict the trustworthiness of the other, and the ability to trust is based on the information available about the other's interests and preferences (Ruzicka and Keating, 2015). From the perspective of the social approach, trust is described as a belief or a shared understanding that the other does what is right. Social trust, therefore, is based on socially constructed elements, such as shared norms and values, that may be embedded in joint institutions and agreements. In social terms, trust stems from a recognition that the other is in a fundamental sense similar to oneself. Finally, the psychological approach to trust emphasises that trust is built through individual experience and action, even in the realm of international politics. Psychological trust is primarily illustrated by individual aspects, such as emotions, intuitions, and feelings. It thus focuses on individuals who – often as part of established institutions and activities – build their own belief as to whether the other is trustworthy or not. Noting that trust is ultimately understood as an actor's psychological state, psychological trust can be considered a foundation on which the other two approaches are built.

The **four forms of trust** elaborated by Stern and Coleman (2015) suggest a framework that they see as particularly relevant for collaborative and other forms of natural resource management: dispositional trust, rational trust, affinitive trust, and procedural trust. Each form has its own characteristics as well as so-called antecedents related to the truster (characteristics such as disposition, vulnerability, and values towards the trustee's action), the trustee (characteristics such as ability, integrity, and benevolence), and the trustee's action (the context in which the action occurs, including the history between truster and trustee, control systems, and contextual norms). Out of the four forms, the dispositional trust indicates

³ There are also other possible conceptualisations of trust in the field of IR, such as predictive and fiduciary trust (Hoffman, 2002), materialistic and non-materialistic trust (Väyrynen, 2000), and strategic, generalized, and relational trust (Weinhardt, 2015). While trust has not been extensively studied in the field of NRM, there are publications that focus on selected aspects of trust in environmental management (e.g. Davenport et al., 2007; Smith et al., 2013) and more recently also in water governance (see Voogd et al., 2022, for an extensive review on trust).

an individual's general tendency to trust (or distrust) another in a particular context, based on, for example, innate tendencies, personal history, or cultural norms. It thus typically sets the baseline before forming other types of cognitive or affective assessments of trust. Rational trust is then a primarily cognitive form of trust, stemming from the calculative expectations of personal benefit in the form of reciprocity and/or perceived utility in strategic interactions. While rational trust focuses on the calculations of an expected outcome, affinitive trust considers more the qualities of the trustee in determining whether they are trustworthy or not. Affinitive trust is built on the truster's perceptions of the social characteristics (such as benevolence and integrity) of the trustee and their interactions, being primarily based on the truster's emotions and associated judgements towards the trustee. Finally, procedural trust emphasises trust in the procedures and other systems that decrease the truster's vulnerability, enabling action even in cases of the absence of other forms of trust (Stern and Coleman, 2015).

The two conceptualisations were chosen for this study because they illustrate the research on trust in their respective fields, synthesise a vast body of existing literature on trust, and consider trust from differing but complementary viewpoints. While both conceptualisations include a nuanced understanding of trust, they also provide a clear structure – a typology, even – for considering the main aspects of trust. The three approaches to trust and the four forms of trust can thus be considered to ultimately aim for the same thing: illustrating relevant aspects of the nature of trust so that it can be understood and studied more systematically. Although sharing evident parallels (both include rational trust, and the definitions of social and affinitive trust share similarities), the two conceptualisations have slightly differing emphases: while IR's three approaches to trust focus on how trust can be generally understood and approached, NRM's four forms of trust view trust more as a process, including the consideration of trust antecedents and existing levels of trust, as well as procedures and systems that can build and maintain trust. Together, the two conceptualisations thus provide us with a general framework for discussing trust and trust-building in the specific context of water diplomacy – and eventually allow us to suggest our own conceptualisation (see Section 5, Discussion).

MATERIALS AND METHODS

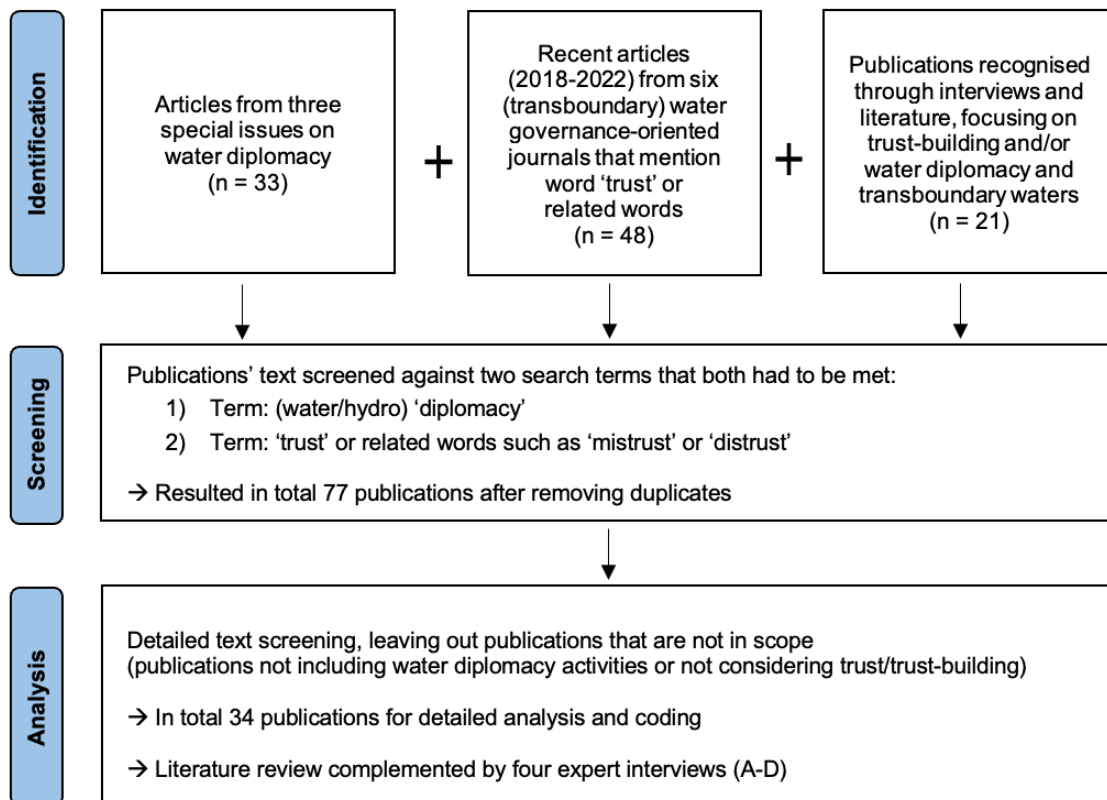
Our study builds on a review of selected literature related to water diplomacy, complemented by a set of key-informant interviews. The publications for the literature review were identified through three complementary criteria: 1) the articles of three special issues focusing on water diplomacy⁴; 2) recent (2018-2022) articles from six journals⁵ related to (transboundary) water governance and mentioning 'trust' or related words; and 3) other relevant publications identified through the interviews and literature (Figure 1). These three criteria resulted in a total of 77 publications, after removing duplicates and screening against the search terms of 'water/hydro diplomacy' and 'trust' or related words. These publications were then screened in detail for their relevance, resulting in 34 publications that include a relevant contribution to this theme: Table A1 in Appendix A provides a list of these 34 publications.

Four key informant interviews were conducted on the role of trust in water diplomacy and potential trust-building activities, complementing the literature review. The interviewed experts were selected to represent organisations influencing water diplomacy processes and/or studying transboundary water issues and water diplomacy, with a focus on European-based experts. The interviews were conducted in autumn 2020 by the second author.

⁴ *Journal of Hydrology* Special Issue "Water diplomacy: The intersect of science, policy and practice" (Vol. 575 in 2019), *Water International* Special Issue "Power in water diplomacy" (Vol. 45 in 2020), and *Environmental Science and Policy* Special Issue "New Directions in Hydrodiplomacy to Meet Global Water Challenges: Learning from the Past, Shaping the Future" (Vol. 124 in 2021).

⁵ The six journals were: *Water International* (12 articles); *Journal of Hydrology* (10); *Water* (10); *Water Policy* (6); *International Journal of Water Resources Development* (5); and *Water Alternatives* (5).

Figure 1. The identification and screening of the literature for analysis and coding.



The analysis of the reviewed literature and the interview transcriptions included two main parts. The first part included a simple classification of the 34 publications, indicating the ways in which trust is generally described and viewed in each publication, including the possible related actors. This part included defining whether the publications viewed trust positively (e.g. trust as enhancing interaction) or negatively (e.g. lack of trust as creating challenges for interaction), as well as how trust was primarily considered (Voogd et al., 2022): as an outcome (something the activities should aim at, e.g. stakeholder engagement helping to build trust) or as an explanatory factor (something that explains actions, e.g. trust facilitating confidential discussions). This part of the analysis was done independently by three of the authors, with the first author coordinating and synthesising the work: Table A1 in Appendix A synthesises the main findings from this part.

The second part of the analysis applied open coding (Corbin and Strauss, 2012) to derive a selection of potential trust-building activities from the literature and interview transcripts, which were then grouped together into categories. The initial coding of individual activities was done independently by each author, while the categories were defined by the first and second authors in collaboration with other authors. Table 1 lists the ten categories and selected examples of trust-building activities, while Table A2 in Appendix A shows more detailed information about this part of the analysis. The key trust-building categories emerging from the literature are also described in Section 4, Findings, and complemented with insights from the key informant interviews. Finally, we used the findings to suggest a basic conceptualisation for viewing trust and trust-building in relation to shared waters (see Section 5, Discussion).

FINDINGS: TRUST AND TRUST-BUILDING IN WATER DIPLOMACY

The role of trust and trust-building in water diplomacy-related literature

The reviewed literature includes 34 publications that cover different geographic areas, levels, scales, and initiatives, making it possible to discuss, on a general level, the role of trust in water diplomacy-related literature (see Table A1 in Appendix A). The first finding relates to the definition of 'trust' per se. Despite referring to trust, none of the reviewed publications explicitly defines 'trust' or 'trust-building', nor do they indicate or apply a clear conceptualisation of trust. At the same time, most of the reviewed publications view trust from the perspective of trust-building – i.e. focusing on specific conditions, events, or initiatives that enhance trust.

Most of the publications therefore consider trust to be an outcome, indicating different variables and activities that can build trust or lead to more trusting relations between different actors. At the same time, around half of the publications view trust (or, more often, a lack of trust) as an explanatory factor, which can, for example, enable joint commitment to treaties (Mumme, 2020) and facilitate confidential discussions (Haapala and Keskinen, 2022) – or, in the case of a lack of trust, hinder or even prevent joint actions and cooperation (Hanasz, 2017; Pohl et al., 2017; Barua and Vij, 2018; Al-Muqdad, 2022). The analysis therefore suggests that trust can be seen simultaneously as an outcome and as an enabler of water diplomacy-related activities – with several of the reviewed publications also noting both of these characteristics (Table A1 in Appendix A; see also Voogd et al., 2022). Similarly, the reviewed literature views trust as having both positive and negative aspects. Most of the publications discuss trust positively, seeing it as something that brings benefits such as enhanced interaction or better water management (Table A1 in Appendix A). On the other hand, several articles also note, even predominantly, the negative aspects of trust, noting how a lack of trust, distrust, mistrust, or a trust deficit may hinder water diplomacy processes (e.g. Pohl et al., 2017; Klimes et al., 2019).

Such findings link to the different situations in which trust is built and maintained. The reviewed publications included various contexts related to shared waters, including bilateral settings such as the US and Mexico (Wilder et al., 2020) or Finland and Russia (Haapala and Keskinen, 2022), transboundary river basins such as Brahmaputra (Barua, 2018) or the Nile (Al-Saidi and Hefny, 2018), as well as regions with several shared waters such as Central Asia (Pohl et al., 2014) or Central America (Koff et al., 2020). Several of the reviewed publications refer to situations where the very starting point for water diplomacy and transboundary cooperation is challenging due to a lack of trust between the key parties. Such parties are most commonly the riparian states and their representatives (e.g. Al-Saidi and Hefny, 2018; Barua, 2018; Yasuda et al., 2018), but lack of trust is also described as existing between state and non-state actors or between different water-related sectors (e.g.; Klimes et al., 2019; Grünwald et al., 2020). It thus seems that the importance of trust is recognised particularly when there is a lack of it. (For a similar discussion in IR see Haukkala et al., 2018.)

The reviewed literature provides a diverse view on the potential actors engaged in trust-related activities in water diplomacy. Most articles discuss the actors involved in rather general terms, with an emphasis on relations between riparian states, referring to 'riparian countries', 'states', or 'parties' – the states predominantly seen as unified, monolithic actors. On the other hand, trust and trust-building are seen to be important beyond state-to-state interactions, particularly as 'stakeholders' and sometimes also, for example, 'civil society' and 'communities' are mentioned as key actors (Table A1 in Appendix A). In several publications, the engagement of non-state actors and broader dialogue processes are explicitly described as important aspects of trust-building, complementing the more formal interactions between riparian states and their representatives.

Of the reviewed publications, only a few make an explicit distinction between truster and trustee – and if they do, the situation is linked to a lack of trust. Hanasz (2017), for example, describes how India (as a truster) has not trusted the World Bank-led Abu Dhabi dialogue process, while Vetter (2016) notes

a general mistrust towards upstream riparian countries, and Vij et al. (2020) note how some Bangladeshi actors lack trust towards India. Similarly, only a handful of the publications define the specific roles that different actors can have in trust building. For example, Pineda Pablos et al. (2020) refer to two water commissioners' roles in mediating the interests of the stakeholders, while other publications note the general trust-building roles of women (Huntjens and de Man, 2017; Barua et al., 2019) or youth (Vojno et al., 2022).

Potential trust-building activities in water diplomacy

This sub-section presents the findings of the analysis of potential trust-building activities⁶ identified in the literature and through the key informant interviews. The analysis resulted in the identification of ten main categories that also form the structure of this sub-section. The categories are summarised in Table 1 and illustrated in more detail in Table A2 in Appendix A.

Table 1. Ten trust-building categories and selected examples of potential trust-building activities as indicated in the reviewed literature.

Trust-building categories	Examples of trust-building activities from the literature
Data and information	Sharing of information Transparency in data-sharing and intentions regarding future infrastructure Joint fact-finding Scientific analyses and basin-wide research Trade-off analyses Shared monitoring and early warning systems
Rules and agreements	Transparent rules and procedures Existence of a transboundary water institutional mechanism Legal approach Principle of prior notification
Joint organisations	Joint governance committees Generative institutions Multinational institutions Formalisation of cooperation through a river basin organisation
Joint processes over water	Decision support tool to specify basin needs and define mutual benefits Joint risk assessments Joint water monitoring systems Operating or holding jointly owned companies Undertaking joint actions
Cooperation beyond water	Linking water to higher political goals Evolving processes of economic cooperation Democratic institutions and trade-related economic interdependence Trade, technical cooperation, and agricultural technologies

⁶ By 'trust-building activities' we mean different types of actions, mechanisms, processes, and practices that can increase trust between different actors, while the term 'potential' refers to the notion that such activities are always context-dependent and do not automatically increase trust. This uncertain nature is also visible in the reviewed literature, which discusses trust-building activities mainly indicatively (i.e. a certain activity *may* enhance trust).

Interaction and learning	Addressing beneficial issues such as technical cooperation and investments Multi-track and multilateral dialogue Long-term interaction and communication True exchange of opinions and feelings (safe places) Informal 'picnic table talks' Social learning
Stakeholder engagement	Role of non-state actors Participation Track II dialogue Involvement of non-traditional stakeholders Interactions between decision makers and civil society actors
Collective identity	Role of women Localisation Sub-regional cooperation Bringing young water diplomacy specialists together
Interpersonal relations	Trust-based personal relations Trusted advisors Long-term relationships between key persons Commissioners' role as conveners
Conflict resolution	Dispute prevention and dispute resolution tools Engagement of 'third-party' actors The role of deliberation, mediation, negotiation and dispute resolution

Note: See Table A1 in Appendix A for details.

Data and information

The reviewed publications indicate that there is a strong emphasis on activities related to data and information as possible means to building trust between the parties. The findings include activities related to both data exchange and joint data production between the key actors. The sharing of information and enhancement of information symmetry (Sadoff et al., 2008: 27) were mentioned as potential activities for building trust, while the Global High-Level Panel on Water and Peace (2017: 77) emphasises the investments in and cooperation for improved water data as a basis for trust-building. Several of the reviewed publications also note how joint fact-finding missions and various means of data collection such as joint research can provide ways to enhance trust in the interactions over transboundary waters (Sadoff et al., 2008: 27, 70; Wolf et al., 2014: 151; Huntjens and de Man, 2017: 5; Islam and Susskind, 2018: 594; Vij et al., 2020: 269).

Riparian states and their organisations are typically seen as key actors in joint production, analysis, and/or the sharing of data and information. Yet, data and information can also be produced in parallel with such formal processes. For example, some of the reviewed literature mentions the role of the media, noting how the media can facilitate a more objective, fact-based discussion and thus alleviate mistrust between riparian states and their citizens (Vetter, 2016: 17; Barua et al., 2019: 13) – but the (local) media can also fuel distrust by, for example, providing one-sided and nationalistic views on transboundary water issues (Yasuda et al., 2018). Even more prominent is the importance of science-driven knowledge production processes for building "networks and channels of communication and trust" (Milman and Gerlak, 2020: 138). Susskind and Islam (2012), for example, note that joint scientific analyses may help parties to "learn to trust the process and each other", while Varady et al. (2021: 58) point out that the

use of scientific knowledge may allow riparian countries to balance their asymmetrical capacities related to knowledge production. This can also be linked to the availability of scientific data and information: while the data produced in formal processes may not be publicly available, an increasing number of scientific studies are published as open-access publications, often with their data openly available as well. At the same time, shared knowledge can also be built through multistakeholder processes such as basin-wide dialogue processes, which can also facilitate trust between a variety of stakeholders as well as between the riparian states and civil society (e.g. Barua et al., 2019: 6).

Data and information link closely to the issue of transparency and openness. As noted by Jiménez et al. (2020: 12): "Transparency is vital to the underlying trust in a transboundary relationship, where access to data can be strategically withheld or manipulated to strengthen the negotiating positions of one or more countries". Indeed, information may in some situations be asymmetrical and/or insufficient and there might also be intentional spreading of disinformation related to shared waters (Interviewees B and D). These kinds of challenges are particularly common in the contexts of increasing uncertainties – for example, when considering the implications of climate change or the impacts of major development projects such as large hydropower dams. In such situations, the availability and transparency of both water-related data and broader information on future infrastructure plans become an important element for building trust (Pohl et al., 2014: 35).

Rules and agreements

In the reviewed literature, procedures and structures promoting joint rules and agreements are mentioned as tools for building trust. Overall, the rules are seen important, as they help to enhance both predictability and transparency in transboundary water interactions (e.g. Molnar et al., 2017: 5; see also Huntjens et al., 2012). For example, Al-Saidi and Hefny (2018: 828) note that, while legally based rules and agreements result in an increased formality of cooperation, they also lead to a higher level of trust between riparian countries.

Rules and agreements link to other trust-building categories, too. Joint rules and agreements may be part of establishing a joint organisation or other forms of interaction and guide joint processes over data and information. One possible mechanism for increasing the transparency of future plans is the principle of prior notification (Mianabadi et al., 2021: 13), which encourages, and may even require, the parties to exchange information on their relevant development plans (see also discussion on such principles established under the Mekong River Commission, e.g. Rieu-Clarke, 2015; Middleton, 2022).

The literature also suggests that establishing a shared normative framework can be viewed as a trust-building activity, given that the absence of a transboundary institutional mechanism may create a trust deficit between the parties (Klimes et al., 2019: 1366). Ratifying an international water treaty is considered an opportunity to increase the ability to make strategic calculations of the actions of the other (Interviewee A). Rules and agreements link to trust – and also the other way round, as they can be considered prerequisites to trust. For example, Barua and Vij (2018: 1031) note that the first step in building cooperative transboundary institutions requires an enabling environment, with trust and confidence between the riparian countries.

Joint organisations

Several reviewed publications consider the formalisation of transboundary water cooperation through joint water bodies and multinational organisations to be an important way of building trust between the actors – most importantly, the riparian states and their representatives (Susskind and Islam, 2012; Al-Saidi and Hefny, 2018: 828; Honkonen and Lipponen, 2018: 327; Varady et al., 2021: 60). Such formalisation typically happens through different agreements, linking this category to the previous category on rules and agreements. Once established, the joint organisations can also provide a platform for other trust-building activities, including those related to data and information as well as interaction

and learning. Indeed, joint organisations can help to develop new social practices that can serve as a forum for building trust (e.g. Sadoff et al., 2008: 66). The role of a joint organisation can therefore be significant both at the beginning of a trusting relationship and for maintaining trust in the long term.

While agreements typically establish joint water bodies such as river basin organisations, such bodies also provide the possibility of agreeing on additional rules and mechanisms between the parties. A joint organisation may, for example, provide a resolution mechanism for mitigating potential disputes (Interviewees A and D), as it can establish and coordinate mechanisms and tools that promote both conflict resolution and cooperation among the parties (Honkonen and Lipponen, 2018: 327). An example of such a mechanism is the context of the Danube River Protection Convention, where the existence of joint bodies (a secretariat and expert groups) and a clear platform for solving the issues facilitate trust between the parties (Interviewee A). In general, the establishment of a joint water body is typically regarded as one of the key outcomes in water diplomacy, requiring long-term interaction and trust between the parties.

Joint processes over water

One potential way to increase trust is to specify the basin's needs and enhance the definition of mutual water-related benefits. This can be conducted through activities that support joint water-related processes and collaborative approaches (e.g. Al-Muqdad, 2022: 14). Such joint processes may include specific decision-support tools that help to address common goals and opportunities (Klimes et al., 2019: 1368), joint risk assessments (Pohl et al., 2014: 35), and shared water monitoring systems (Pohl et al., 2014: 42).

In general, the reviewed literature suggests that focusing on joint actions and uncontested issues that provide complementary benefits from the shared waters can emphasise the added value of cooperation and thus can build trust (e.g. Grünwald et al., 2020: 10). As practical examples, Pohl et al. (2017: x) propose focusing on issues such as dam safety, improved irrigation practices, joint water quality monitoring, or shared management of smaller sub-basins, while Sadoff et al. (2008: 32-33) note that jointly funded projects, such as jointly owned operating or holding companies, can enhance shared benefits and facilitate trust. While questions about water quantity and water allocation may be challenging, cooperation around water quality and water protection may bring parties together in a less politicised context (Interviewee C; Haapala and Keskinen, 2022).

Cooperation beyond water

The reviewed literature indicates that one potential activity for building trust is to discuss water in a broader geographical, economic, and/or political context, shifting the focus beyond water per se. For example, Koff et al. (2020: 282) suggest that the so-called policy framework shift may promote cooperation and trust, as it helps to consider shared waters part of higher (and, nationally, often more relevant) political goals such as environmental security or disaster prevention. Similarly, the evolving processes of economic cooperation (Yasuda et al., 2018: 643), as well as the value of democratic institutions and trade-related economic interdependence (Mumme, 2020: 127), are seen to have the potential to build trust in transboundary waters.

Water is both impacted by and has an impact on – and is thus closely related to – several other sectors and policies. This means that multisectoral approaches such as the water-energy-food security nexus and related processes such as trade, technical cooperation, and agricultural technologies can provide contexts for building trust (Al-Saidi and Hefny, 2018). Such processes may bring additional benefits beyond water, providing possibilities for enhancing trust, particularly in contexts where the questions related directly to water are controversial or contested (e.g. Klimes et al., 2019: 1366). As a practical example, Mianabadi et al. (2021: 13) discuss a joint agricultural analysis related to wheat production

across riparian countries as a potential step towards trust-building between two countries sharing a transboundary river.

Interaction and learning

Both the literature and the interviewees emphasise that facilitating interaction between representatives from different riparian countries is potentially an important way of building trust. This kind of formal, or Track 1, interaction can happen in many kinds of settings, including established settings such as joint planning processes as well as in more relaxed settings such as events and meetings. Examples mentioned in the literature include multi-track and multilateral dialogues (Barua and Vij, 2018: 1027; Yasuda et al., 2018: 658) as well as informal 'picnic-table talks' on water between decision makers (Ide and Detges, 2018: 77).

Interaction also links to joint learning, which in its different forms is also seen to have the potential to build trust. For example, Varady et al. (2021: 58) note the role of co-production of science in promoting learning and trust among riparian countries, while specific educational programmes and tailor-made trainings can also build trust (Barua et al., 2019: 749). Learning can also be regarded as a broader social process that enhances shared understanding and builds trust over transboundary waters (Wilder et al., 2020: 191). One concept for informal dialogue is to organise field trips for the parties of a shared water source to visit a relatable transboundary watershed, where cooperation has been working well, to consider and exchange ideas on best practices for enhancing cooperation and trust between the parties (Interviewees A and D).

Stakeholder engagement

The reviewed literature indicates the importance of stakeholder engagement as an important way of building trust over shared waters, linking closely to Track 2 diplomacy. Several of the publications (e.g. Susskind and Islam, 2012; Klimes et al., 2019; Mumme, 2020) note that enhancing the relationship between formal or governmental actors is not enough for building trust but requires the engagement of various non-state actors as well. Such stakeholders can range from water users, nongovernmental organisations, and universities to local people and other citizen stakeholders (Barua, 2018: 67; Honkonen and Lipponen, 2018; Islam and Susskind, 2018: 593). This also means that stakeholder engagement can considerably broaden the more formal interactions between riparian country representatives.

While most publications talk about stakeholder engagement in general terms, some of the publications also emphasise the importance of engaging 'non-traditional' stakeholders, noting that such stakeholders might include the business sector, media, and funding institutions as well as often-marginalised groups such as women (Huntjens and de Man, 2017; Barua, 2018). While stakeholder engagement is regularly mentioned as a potential way to build trust, the literature typically considers the actual processes of engagement only at a general level. These include, for example, referring to engagement, participation, dialogue, or multi-track processes (e.g. Sadoff et al., 2008: 86; Huntjens and de Man, 2017: 5; Barua et al., 2019: 3; Klimes et al., 2019: 1363).

Collective identity

The literature also talks about utilising the feeling of 'togetherness' to build trust, as different (local) groups and individuals identify themselves through a shared watershed. This links to stakeholder engagement, as different stakeholders can also feel strongly connected to their shared watershed, and collaboration between local stakeholders can be a crucial way to build trust (Sadoff et al., 2008: 59; Islam and Susskind, 2018: 593). Honkonen and Lipponen (2018: 329-330) note the importance of so-called localisation, in which local communities living on both sides of a border river are actively engaged in the management of the shared watershed. Such processes may enhance collective identity and offer a way

to build trust. This kind of sub-regional cooperation can provide a practical training ground for trust-building, especially if there are challenges to achieving consensus at other levels (Pohl et al., 2017: 91).

Collective identity and inclusivity are related to both gender and generational aspects in water diplomacy. While women tend to have a crucial role in water management in many communities worldwide, they are often underrepresented at the decision-making tables and in water diplomacy processes. Yet, both the literature and the interviewees pointed to the potential of women's inclusion for enhancing trust in a shared watershed (Barua, 2018; see also Carmi et al., 2019). For example, networks of women in water diplomacy may have a significant role in building trust (Interviewee D). Another possible trust-building activity mentioned by key informants is to bring together young water diplomacy professionals across the basin and from different parts of the world to exchange ideas and build networks. Creating interpersonal ties among the potential future water diplomats might be a useful strategy to strengthen trust and address water-related tensions (Interviewees A and C; see also Vojno et al., 2022).

Interpersonal relations

Both the literature and the interviewees note how individual actors in different roles can have a significant influence on both building and ensuring trust in water diplomacy processes, emphasising the role of individuals as well as that of interpersonal relations. The processes of transboundary water interactions include various experts and other professionals, who create interpersonal bonds over years of interaction. This may result in trustworthy professionals serving as discussants and facilitators between different actors. For example, Pineda Pablos et al. (2020: 4) mention the crucial role that two individual commissioners played in a river basin, where their technical skills and ability to work as interlocutors were seen as key for broader trust-building. Experts and chairpersons can also be in their positions for long periods of time, allowing them to build long-term relationships that enable confidential discussions and enhance trust between the parties (Haapala and Keskinen, 2022). Interpersonal encounters between riparian country representatives may also enable a better understanding of the value and meaning of water to the other and facilitate discussion of both emotions and trust (Interviewee D).

This category can also include activities by individuals that are external to the formal water diplomacy processes, such as mediators who work between different stakeholders. Islam and Susskind (2018: 594), for example, note that it is possible for stakeholders to jointly select qualified advisors who will support joint fact-finding exercises by providing a non-politicised view on the various sources of evidence. This use of external advisors can be seen as a trust-building activity, if the advisors facilitate trust in the science and shared knowledge (Milman and Gerlak, 2020: 143). Vojno et al. (2022: 488) emphasise the potential role of young experts as trusted advisors who can influence the political system through communication, networking, and advocacy.

Conflict resolution

Trust-building is particularly important in contested situations, where the riparian states and/or other actors face tensions – and as our literature review indicates, there are several such situations related to transboundary waters. The reviewed literature underlines the importance of conflict resolution as one way to build trust in such situations. Different types of dispute prevention and resolution tools can thus be seen as possible trust-building activities in water diplomacy (e.g. Honkonen and Lipponen 2018: 327). While such tools are often linked with joint agreements and related organisations, they can also be used in other settings, borrowing practices from the fields of peace mediation and conflict resolution.

Possible conflict resolution mechanisms and tools can include, for example, deliberation, mediation, negotiation, and dispute resolution, which e.g. Jiménez et al. (2020: 12) see as important instruments for building trust between riparian states in shared waters. The category of conflict resolution is also closely linked with the engagement of so-called third-party actors who can play a crucial role in building trust

while facilitating the water diplomacy process (Keskinen et al., 2021: 2; see also van Genderen and Rood, 2011).

DISCUSSION

This section has three parts. We first discuss the implications of our findings, reflecting them against the conceptualisations of trust in international relations (Ruzicka and Keating, 2015) and natural resource management (Stern and Coleman, 2015). Based on this discussion, we then suggest a basic conceptualisation that could be used for approaching trust and trust-building in relation to water diplomacy. Third, we discuss the limitations of our analysis and suggest some ways forward for increasing the understanding of trust and trust-building in water diplomacy and transboundary water cooperation.

Considering trust and trust-building in water diplomacy

Our findings indicate that, while trust is seen as an important factor in water diplomacy, it remains conceptually ambiguous. The concept of trust is often presented in both positive and negative terms (i.e. trust facilitating positive actions and lack of trust hindering them), and trust is considered both an outcome and an enabler of water diplomacy (see Voogd et al., 2022). This suggests that the relationship between trust and water diplomacy is often reciprocal: trust is needed to both initiate and maintain water diplomacy activities, while such activities help to enhance trusting relationships between different actors. The findings also indicate that a lack of trust is clearly seen to hinder interactions over shared waters, emphasising the need to both build and maintain trust between the parties.

Indeed, the reviewed literature had a strong emphasis on trust-building, suggesting a variety of ways in which trust could be enhanced in different water diplomacy contexts (see also Huntjens et al., 2012). This enabled us to recognise a number of potential trust-building activities from the literature and the key-informant interviews, which we grouped into ten trust-building categories (Table 1 and Table A2 in Appendix A). What do these trust-building categories then tell us about trust in relation to water diplomacy, and how do they link to broader conceptualisations of trust? We see three conclusions related to this as particularly interesting.

Firstly, the identified trust-building categories cover the key aspects of trust relatively well. The categories range from more rationally oriented activities (e.g. data and information, rules and agreements) to more socially oriented activities (e.g. interaction and learning, stakeholder engagement), and also include more psychologically oriented activities (e.g. collective identity, interpersonal relations). This indicates that the identified categories do correspond quite nicely with the three IR-related approaches to trust introduced by Ruzicka and Keating (2015).⁷ Yet, as trust and trusting relations are inherently psychological, psychological trust can be seen to form the foundation that the other two approaches both build on and contribute to. The ten categories and their interlinkages are also reminders that trust and trust-building are dynamic and interrelated concepts that change and evolve over time.

Secondly, the findings indicate that several institutional levels – and related actors – are relevant for trust-building in water diplomacy. Given the focus on transboundary waters shared by several riparian countries, the relations at the state-to-state level (including both formal Track 1 interactions and Track 2 interactions with different stakeholders) form a central institutional level. The literature and interviews also noted the importance of the organisational level, with an emphasis on joint organisations such as river basin organisations. Together, these two institutional levels and their related actors were mentioned in most of the reviewed literature. Yet, some of the publications also noted the importance of personal relations and the role of individuals in building and maintaining trust in water diplomacy. As

⁷ Ruzicka and Keating (2015) also note the need for a more systematic characterisation of trust-building, noting that while trust-building processes are often equated with increased cooperation, particularly social and psychological approaches to trust indicate that cooperation alone is not enough to signify a trusting relationship.

noted by Ruzicka and Keating (2015), this personal level is very important (although somewhat neglected) when viewing trust in international relations: states and organisations are, after all, represented by individuals who either trust or distrust their counterparts. Or, as noted by Wheeler (2018): the interpersonal is the international.

Thirdly, and related to the above, the literature reflects the different situations and contexts for building trust. Several publications note how the very starting point for water diplomacy is challenging due to the lack of trust between key parties – especially between riparian states and their representatives. Such a finding is important, as the existing level of trust is likely to have a major influence on the possibilities for both initiating differing trust-building activities and maintaining them in the longer term. Drawing on the concept of dispositional trust by Stern and Coleman (2015), the existing level of trust can thus be described as context-dependent, being based on the trustor's intrinsic tendencies and earlier experiences including their historical relationship with the trustee.⁸

Suggesting a conceptualisation for approaching trust in water diplomacy

Our findings and the three conclusions discussed above encourage us to consider how trust and trust-building could be better understood and conceptualised in the context of water diplomacy over shared waters. We see that such a conceptualisation should do two things: illustrate the diverse forms of trust and link them to potential trust-building activities related to water diplomacy. Figure 2 presents our suggestion for a simplified conceptualisation of understanding trust in water diplomacy processes.

At the centre of Figure 2 are three spheres that illustrate the three main types of trust: rational trust, social trust, and psychological trust (Ruzicka and Keating, 2015). However, given that psychological trust can be seen to form the basis for all trusting relationships, it is located in the background of the other two spheres. Reflecting the different institutional levels and actors related to trust-building, the two spheres representing rational and social trust also include three institutional layers: the state level, the organisational level, and the personal level. While all these levels can be considered important for trust-building activities in water diplomacy, the personal level and interpersonal relationships can be seen to form the foundation for trusting relationships at other levels.

On the left of the diagram is a box indicating existing levels of trust, visualised as a starting point for trust-building and linking to the idea of dispositional trust by Stern and Coleman (2015). Noting the importance of a variety of actors and interactions involving shared waters, the term 'existing levels of trust' is in plural. It thus indicates the level of trust between riparian states and their representatives, but also between different water use sectors or between civil society and the government, for example. Consistent with three types of trust, the existing levels of trust are also established through a combination of rational, social, and psychological aspects and experiences.

Figure 2 also includes an arrow that both contributes to and cuts through all three spheres, illustrating the dynamic process of trust-building and the combination of various trust-building activities that can exist in shared waters to enhance trust between different actors. Here the idea of procedural trust by Stern and Coleman (2015) provides an additional dimension to consider. In the contexts where trust-building activities are relatively established and considered as legitimate by the key parties (e.g. through a clear institutional arrangement), the activities can form a positive control system that builds procedural trust. Such trust can become particularly important in the absence of other forms of trust. Figure 2 also includes examples of possible trust-building activities, consisting of – but not limited to – the ten trust-building categories recognised in our study.

⁸ Stern and Coleman (2015) discuss dispositional trust from a partly differing, more individual angle, noting that context- or trustee-specific trust can relate to, for example, the authority or legitimacy of certain actors (e.g. a government agency) or knowledge products (e.g. maps). They also emphasise that dispositional trust – which seeks to encapsulate terms such as general trust, routine trust, and propensity – can also be context-independent, being based on a general predisposition to trust others that links, for example, to innate tendencies and cultural norms.

Figure 2. A basic conceptualisation for viewing trust and trust-building in water diplomacy processes. For explanation, see text.

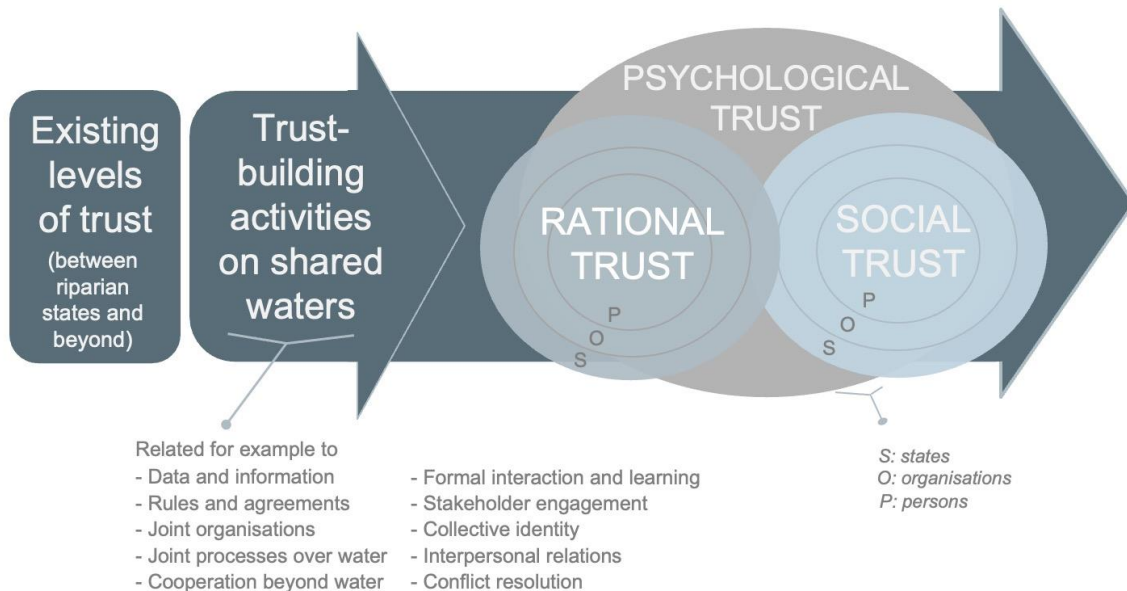


Figure 2 seeks to capture trust’s dual role in processes of water diplomacy in shared waters. On one hand, trust enables interaction, and at least some level of trust is usually needed to initiate meaningful trust-building activities. On the other hand, trust is not static: it needs to be both built and maintained through a variety of activities that can contribute to one, two, or even all three types of trust. While Figure 2 provides a basic conceptualisation for viewing trust and trust-building, it presents a rather static snapshot of the situation. Figure 2 can therefore be complemented by Figure A1 in Appendix A, which seeks to visualise trust and trust-building’s dynamic nature, showing how they can change and evolve over time.

It could be argued that different trust-building activities and related categories contribute mainly to a certain type of trust. For example, 'Data and information' or 'Rules and agreements' could be seen to contribute particularly to rational trust, as these categories help to predict the trustworthiness of the other and enhance the joint knowledge base. This emphasises the cognitive aspects of trust. 'Interaction and learning' or 'stakeholder engagement', in turn, could mainly contribute to social trust (as they build common relations and shared understanding), while 'Collective identity' and 'Interpersonal relations' could be linked to psychological trust (as they influence the individual perceptions and emotions). Yet, given that all three types of trust are complementary, and most trust-building activities can contribute to at least two different types of trust, we do not want to make such a strong distinction. (For example, 'Rules and agreements' also contribute to social trust by enabling joint actions, which, may also have psychological implications.) Instead, the visualisation indicates that the different trust-building activities can contribute to all three types of trust, with differing emphases.

Our findings on the trust-building activities related to water diplomacy also link to broader discussions in the IR literature about the logic of states’ actions in the international arena. While so-called 'realists' have viewed the state mainly as a rational actor making decisions based on risk-and-benefit calculations, their view has increasingly been complemented by the notion of the 'constructivists' that socially constructed habits and practices have a major effect on the reasoning of actions (e.g. Pouliot, 2008; Hopf, 2010). At the same time, the so-called 'emotional turn' in IR has an enriched understanding of the

inseparability of rationality, practices as constructs, and emotions as logics of action (Beattie et al., 2019; see also Mercer, 2006). This paper has illustrated that trust-building activities in water diplomacy address multiple types of reasoning that underlie state behaviour. At the same time, we see that water diplomacy provides an interesting arena for studying the role of trust and its different aspects in international relations, given its specific characteristics: water is a tangible resource that connects riparian states in very concrete terms. In addition, many transboundary water bodies have well-established mechanisms of interaction, and water can also be used as a politicised and securitised resource which can be linked to the concept of the security dilemma (see Wheeler, 2012).

Limitations and ways forward

This study has methodological and ontological aspects that limit the applicability of our findings. First, the elusive nature of trust makes it difficult to consider it either as a standalone factor or a variable. This is due to the methodological limitations in identifying, tracking, and measuring trust. Indeed, trust can be described as a slippery concept to study, due to its relational, contextual, and experience-based nature. This is also visible in the reviewed literature, where trust is not always mentioned as an aim per se but rather as a by-product of achieving other, more tangible objectives related to water diplomacy and cooperation. This indicates that the reviewed literature considers trust and trust-building in varying, even partly contradictory ways.

The elusive nature of trust has an impact on our findings, including the ten trust-building categories we recognised. While presented as distinct entities, the categories are in reality partly overlapping, as noted in the Findings (Section 4). The more detailed activities derived from the literature could have been grouped in other ways, too (including a larger or smaller number of categories), and some of the activities could belong under several categories. It should be noted that the conceptualisation we suggest in Figure 2 is indeed a simplification, and it does not consider all the nuances included in Ruzicka and Keating (2015) or Stern and Coleman (2015). And while both those publications summarise a broad array of theories from their respective fields, several other conceptualisations do exist as well (see Footnote 4).

The methodological choices we made also cause some limitations. First, the decision to build the study on a literature review and related analysis limits the applicability of our findings. While the literature review was complemented by a set of four key-informant interviews, the analysis remains strongly dependent on the descriptions available in the reviewed publications and the variety of contexts they describe. It is also important to note that the reviewed literature did not focus on trust and trust-building per se but on considered trust as only one, often minor aspect in the broader context of water diplomacy and transboundary waters.

Our focus on literature related to water diplomacy brings limitations as well. As the concept of water diplomacy is fairly new, our study had a relatively small number of reviewed publications – each of which approached water diplomacy in its own way. Some publications did not even focus on water diplomacy per se but on shared waters more broadly. Considering the long history of research on transboundary water cooperation, extending the analysis to such literature would provide a more extensive basis for studying the role of trust in transboundary waters. In addition, studying trust and trust-building systematically through specific case studies – for example, focusing on a set of transboundary river basins – would provide a more nuanced understanding of actual trust-building activities. It would also enable more of a process type of view on trust and trust-building, considering how different types of trust as well as different trust-building activities have evolved over time (see also Figure A1 in Appendix A).

CONCLUSIONS

Our study has looked into the role of trust and trust-building in the emerging field of water diplomacy, building on a literature review and key informant interviews. Given the close linkages between water

diplomacy and both international relations and natural resource management, the study also made use of complementary conceptualisations of trust from those two fields.

The findings indicate that trust is considered important for water diplomacy processes in shared waters – and that its importance is particularly evident in situations where trust is lacking. Trust has a dual role in such processes, being an important starting point and an enabler for positive interactions between the key parties such as riparian states. Yet, most of the literature considered trust first and foremost to be an outcome of a variety of activities, emphasising the importance of trust-building. We identified ten main trust-building categories related to water diplomacy, each consisting of a set of potential trust-building activities. While many of those activities are linked to interactions between riparian states and their organisations, the list included an array of other activities related to actors across multiple diplomacy tracks and institutional scales (Table 1). Observing that none of the reviewed publications explicitly defined trust or trust-building, we suggest a basic conceptualisation that combines the three types of trust (rational, social, and psychological) with existing levels of trust as well as potential trust-building activities (Figure 2). Noting the dynamic nature of both trust and trust-building, we also developed a visualisation showing how they could be viewed over time (Figure A1 in Appendix A).

We also see that our study has broader implications when discussing water diplomacy and transboundary water cooperation. While some of the identified trust-building activities emphasise relatively obvious themes such as data and information, joint institutions, and the importance of interaction and stakeholder engagement, many of the activities relate to the values and meanings attached to water and note the importance of personal relations and emotions over the shared waters. Whereas the hydrological role of water is rather stable, its societal meanings are under constant social (re)construction. The role of water as an invaluable and potentially scarce resource makes it an inherently political resource. Thus, given that they connect societies in all over the world in a very concrete manner, we see that transboundary waters provide a unique arena for the study of trust in international relations.

This also means that trust as a concept forms one possible way to consider the affective dimensions of water diplomacy. The different ways to build trust in shared waters emphasise not only the rational and social elements of trust, but also its psychological aspects. Studying trust-building can therefore provide one way to strengthen and make visible the diversity of affective factors that influence interactions over transboundary waters (see also Seide and Fantini, 2023). Trust also emphasises the ways in which waters are shared between different groups. While the focus of water diplomacy is often on state-to-state interactions, different trust-building activities also consist of interorganisational and interpersonal levels, including actors across different diplomacy tracks. This, in turn, calls for further conceptual clarity and methodological diversity when studying trust and trust-building in transboundary waters.

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APPENDIX A: TABLES A1 AND A2 RELATED TO LITERATURE REVIEW

Table A1. Synthesis of general information on trust in the reviewed publications

Article	Trust seen positively	Trust seen negatively	Providing definition for trust	Trust seen as an outcome (O) or explanatory (E) variable	The actors (trustors and/or trustees)
Al-Muqdadi (2022)	X	X	No	O, E	Riparian countries
Al-Saidi and Hefny (2018)	X	X	No	O	Not clearly mentioned; riparian countries
Barua (2018)	X	X	No	O, E	Riparian countries; basin communities
Barua and Vij (2018)	X	X	No	O	Riparian countries; stakeholders
Barua et al. (2019)	X	X	No	O	Riparian countries; stakeholders
Global High-Level Panel on Water and Peace (2017)	X		No	O	States; participants
Grünwald et al. (2020)	X	X	No	O	States
Haapala and Keskinen (2022)	X	X	No	E	Riparian countries
Hanasz (2017)	X	X	No	O	Riparian countries
Hellegers and van Halsema (2019)	X		No	O	Stakeholders
Honkonen and Lipponen (2018)	X		No	O, E	Parties; stakeholders
Huntjens and de Man (2017)	X	X	No	O	Parties; stakeholders
Ide and Detges (2018)	X	X	No	O	Riparian countries; decision-makers and civil society
Islam and Susskind (2018)	X	X	No	O, E	Riparian countries; stakeholders; parties
Jiménez et al. (2020)	X		No	O, E	Riparian states
Keskinen et al. (2021)	X		No	O, E	Parties
Klimes et al. (2019)	X	X	No	O, E	Riparian countries; stakeholders
Koff et al. (2020)	X		No	O	Not clearly defined
Mianabadi et al. (2021)			No	O	Riparian countries
Milman and Gerlak (2020)	X		No	O, E	Riparian countries
Mirumachi (2020)	X	X	No	O	States
Molnar et al. (2017)			No	O	Riparian states (countries or provinces)
Mumme (2020)	X		No	O, E	Riparian states
Pineda Pablos et al. (2020)	X		No	O, E	National sections of a water commission
Pohl et al. (2014)			No	O	Stakeholders; parties
Pohl et al. (2017)	X	X	No	O, E	States; sub-regional actors
Sadoff et al. (2008)	X		No	O	States; stakeholders
Susskind and Islam (2012)	X	X	No	O, E	Parties; riparian countries
Varady et al. (2021)	X	X	No	O, E	Countries; national and institutional actors
Vetter (2016: 17)		X	No	E	Riparians
Vij et al. (2020)	X	X	No	O	Riparian countries
Vojno et al. (2022)	X	X	No	O, E	Countries; between young people and institutions
Wilder et al. (2020)			No	O	Not clearly defined
Yasuda et al. (2018)	X	X	No	O, E	Countries; actors within countries

Table A2. Potential trust-building activities and related quotations from the reviewed publications, structured according to the ten trust-building categories.

Potential trust-building activity	Trust-building category	Publication	Relevant quotation
Investing in and cooperating for improved data	Data and information	Global High-Level Panel on Water and Peace (2017: 51)	"Investing in and cooperating for improved water data should be used for trust building and broader cooperation, and thus contribute to the prevention of potential conflicts."
Trade-off analyses	Data and information	Hellegers and van Halsema (2019: 517)	"Valuing water can provide insights into distributional issues and alternative ways to balance efficiency, equity and sustainability. Such trade-off analyses can make the bargaining game more transparent; they can support negotiations and help build trust among stakeholders."
Joint fact-finding	Data and information	Islam and Susskind (2018: 594)	"[Joint fact-finding] JFF can also be a helpful way to build trust and enhance relationships among parties, even those who have a long history of disagreement and mistrust (...)"
Transparency, access to data	Data and information	Jiménez et al. (2020: 12)	"Transparency is vital to the underlying trust in a transboundary relationship, where access to data can be strategically withheld or manipulated to strengthen the negotiating positions of one or more countries."
Exchange of information and plans	Data and information	Molnar et al. (2017: 21)	"By exchange of information and plans, forecasting can be improved, preparedness to flood risks can be enhanced, and therefore tensions can also be reduced as trust and information symmetry is established."
Transparency in data-sharing	Data and information	Pohl et al. (2014: 35)	"Trust can only be built through long-term transparency in terms of data-sharing and intentions regarding future infrastructure, which in turn requires long-term engagement."
Information symmetry	Data and information	Sadoff et al. (2008: 27)	"Greater information symmetry may also help to build trust, confidence and a greater willingness to cooperate in the future."
Joint plan for data-gathering projects	Data and information	Sadoff et al. (2008: 70)	"Mekong Committee's first five-year plan, which consisted almost entirely of data-gathering projects, effectively precluding future data disputes and providing an opportunity for the riparians to develop cooperation and trust."
Joint scientific analyses	Data and information	Susskind and Islam (2012)	"...parties to undertake these scientific analyses together. This helps them learn to trust the process and each other."
Co-production and use of science	Data and information	Varady et al. (2021: 58)	"These iterative relationships, which rely on co-production and use of science, allow for member countries to adjust for asymmetrical capacities (technical/financial/human). As a result, they tend to promote social learning and trust among the involved countries."
Media's role for fact-based discussion	Data and information	Vetter (2016: 17)	"Mistrust towards upstream riparians is widespread. (...) The media can play a constructive role here by contradicting the propagation of such stereotypes and speculations and contribute to triggering and supporting a more objective, fact-based discussion."
Joint basin-wide research	Data and information	Vij et al. (2020: 269)	"Joint basin-wide research on the Brahmaputra River can create momentum to build trust, and such small steps of cooperation could gradually transform the relationship between Bangladesh and India."
Legal approach: rules, agreements	Rules and agreements	Al-Saidi and Hefny (2018: 828)	"The 'hard' or legal-based approach entails various instruments such as substantive and procedural rules, bilateral and multilateral agreements, regional organizations, etc. (...) It results in increased formality of cooperation, but a higher level of trust."
Principle of prior notification	Rules and agreements	Mianabadi et al. (2021: 13)	"Prior notification was not made for this dam, but in general can give riparian state(s) the opportunity to cooperate together on the potential impacts of that project by exchanging data and information needed to mitigate potential harm and conflict over that project. This principle can also lead to consultation and trust-building between notified riparian state(s) (...)"
Transparent rules and procedures	Rules and agreements	Molnar et al. (2017: 5)	"Trust can be built if water is relevant in the political context and if transparent rules and procedures apply to a shared water resource."
(Generative) institutions	Rules and agreements	Sadoff et al. (2008: 66)	"...these institutions can provide a means for signatory states to meet and discuss issues, promote information sharing between signatory countries, coordinate water resources development and management plans, and serve as a platform from which to secure donor assistance. They can also serve as a forum for building trust, confidence and capacity for the resolution of conflicts between signatory states."

River basin organisation	Joint organisations	Al-Saidi and Hefny (2018: 828)	"The formalization of transboundary water cooperation through a RBO, which can enhance trust and cooperation, is under discussion."
Joint bodies and their tools	Joint organisations	Honkonen and Lipponen (2018: 327)	"More generally, joint bodies often play a significant role in preventing and resolving conflicts among riparian states. Even in the absence of well-established dispute resolution mechanisms the commissions usually have a good selection of tools available to promote cooperation and trust among the parties and thus work towards reducing the likelihood of conflicts emerging and escalating (...)"
Joint Committee	Joint organisations	Susskind and Islam (2012)	"...water professionals have kept working together through the Joint Committee. And with this important trust-building component of the agreement, the parties have been able to return to some of the issues that were uncertain or too politically sensitive to deal with when the treaty was first signed."
Multinational institutions	Joint organisations	Varady et al. (2021: 60)	"Negotiations have proven most fruitful when there exist venerable, trusted, multinational institutions such as international river basin organizations to implement treaties and resolve high-profile disputes." (...) "IBWC has promoted binational trust and generated political will for reaching agreements, validating the importance of effective institutional mechanisms"
Collaborative approach	Joint processes over water	Al-Muqdad (2022: 14)	"This phase [of water negotiations] involves trust building, where the upstream actor believes in a collaborative approach (i.e., a non-zero-sum game). The downstream actor will accept water projects in the shared catchment under certain guarantees and conditions to secure sufficient water resources."
Undertaking joint actions	Joint processes over water	Grünwald et al. (2020: 10)	"Here, strategic actors agree to undertake joint actions but lack shared goals. (...) Although this level of cooperation is fragile and based mostly on promises and provisional consents, it is still considered as the first step to build mutual trust, undertake joint research and formulate common goals, without excessive effort (...)"
Specifying needs and defining mutual benefits	Joint processes over water	Klimes et al. (2019: 1368)	"...a decision support tool providing practical methods to specify basin needs and define mutual benefits. By enhancing Afghanistan and Pakistan's abilities to jointly apprehend and assess common goals and opportunities, such tools can help build greater trust indispensable to improved cooperation."
Small-step diplomacy	Joint processes over water	Pohl et al. (2017: 19)	"It is important to bear in mind that rebuilding trust will take time and require a sequence of successes. There is hence a need for 'small-step diplomacy', building on successful examples of cooperation."
Focusing on uncontested issues	Joint processes over water	Pohl et al. (2017: X)	"Start by focusing on uncontested issues that provide complementary benefits to actors and embrace mutually shared interests: These could, for example, include topics like dam safety, improved irrigation practices, joint water quality monitoring or shared management agreements on smaller sub-basins. Such an approach assists in building the trust that provides the basis for any deeper cooperation."
Technical cooperation and investments	Cooperation beyond water	Al-Saidi and Hefny (2018: 830)	"There are beneficial and not-difficult issues that represent low-hanging fruits in transboundary cooperation (e.g. technical cooperation, technology transfer, and investments in Nile resources). Addressing these issues can help build trust, showcase cooperation benefits, and help, although indirectly, foster regional integration."
Economic cooperation, politics and security	Cooperation beyond water	Keskinen et al. (2021: 9)	"It also means that the benefits from cooperation are typically seen to be more significant than the benefits from water resources management alone, extending from water use to broader issues of economic cooperation, politics and security, and facilitating trade-offs beyond water sector. At the same time, the interaction can be considered as a means to build mutual understanding and trust between the parties both in relation to shared waters and more broadly."
Trade, technical cooperation and agricultural technologies	Cooperation beyond water	Klimes et al. (2019: 1366)	"...three priority WEF nexus issues, i.e. trade, technical cooperation and agricultural technologies, are cross-sectoral and less directly connected with the river flow, in addition to being relatively low cost, politically feasible, and able to elevate the common challenge of climate change resilience. These three issues are identified as low-hanging fruit in transboundary cooperation in the Nile, which can help build trust, showcase cooperation benefits, and may indirectly foster regional integration."

Higher political goals	Cooperation beyond water	Koff et al. (2020: 282)	"...this policy framework shift aimed at promoting cooperation and trust in water discussions by linking this resource to higher political goals [of environmental security and disaster prevention] linked to citizens' needs and national interests."
Joint analysis of potential changes in wheat production	Cooperation beyond water	Mianabadi et al. (2021: 13)	"One potential opportunity involves joint analysis of potential changes in wheat production across both countries. For this purpose, using quantitative evaluation models such as developed in this research can be seen as the first step towards mutual fact-finding and trust-building"
Trade-related economic interdependence	Cooperation beyond water	Mumme (2020: 127)	"With respect to the political-contextual and economic factors (...) the value of democratic institutions and trade related economic interdependence in co-riparian compacting countries for establishing requisite inter-sovereign trust enabling joint commitment to treaties and treaty mechanisms."
Positive spill-overs from climate change adaptation pressures	Cooperation beyond water	Pohl et al. (2014: 10)	"Climate change adaptation pressures can thereby generate positive spill-overs, serving as an entry point for building trust and engaging in politically thorny regions."
Jointly owned operating or holding companies	Cooperation beyond water	Sadoff et al. (2008: 32–33)	"Jointly owned operating or holding companies (e.g., a joint power transmission company) can provide direct financial benefits and build trust through an ongoing partnership."
Cooperation in several areas	Cooperation beyond water	Varady et al. (2021: 59)	"Stepping up cooperation in areas such as flood control, disaster mitigation, irrigation, and navigation through a multitrack water diplomacy framework —while following a scientific, adaptive approach to learning (Varady et al., 2016)— can help integrate the multiple dimensions and interests of different stakeholders while reducing the trust deficit among countries."
Evolving processes of economic cooperation	Cooperation beyond water	Yasuda et al. (2018: 643)	"More broadly, evolving processes of economic cooperation can enhance the potential for building trust and workable institutions, which could then enhance cooperation on water."
Multi-track and multilateral dialogue processes	Interaction and learning	Barua and Vij (2018: 1027)	"Drawing from the Brahmaputra Dialogue, this paper aims to highlight the merit of multi-track and multilateral dialogue processes for building trust and confidence between the riparian countries – paving a way towards transboundary cooperation."
Lack of dialogue and interaction	Interaction and learning	Barua and Vij (2018: 1028)	"The lack of dialogue, interaction and engagement has resulted in tension and friction among co-riparian nations and mistrust at political level."
Official educational programmes or tailor-made training	Interaction and learning	Barua et al. (2019b: 749)	"Teaching water cooperation and diplomacy or related topics also provides unique opportunities to bring parties together with the potential to contribute to mutual understanding and trust. This can be facilitated through official educational programmes or tailor-made training."
Informal 'picnic table talks' between decision makers	Interaction and learning	Ide and Detges (2018: 77)	"The informal 'picnic table talks' on water between decision makers from Israel and Jordan served as one means to build trust (...)"
Science co-production fostering social learning	Interaction and learning	Milman and Gerlak (2020: 138)	"...when science is co-produced, the science-production process contributes to cooperation by fostering social learning and fomenting repeated interactions between actors that serve to build networks and channels of communication and trust"
Social learning	Interaction and learning	Wilder et al. (2020: 191)	"Sustained interactions of this type [social learning] contribute to building trust among disparate interests (...)"
Engagement of non-traditional stakeholders	Stakeholder engagement	Barua (2018: 68)	"To develop trust and confidence between the riparian countries of the Brahmaputra there has to be long-term interaction and communication between different actors. These should include non-traditional stakeholders - such as the business sector, media, and funding institutions- and marginalised groups, women in particular."
Long-term interaction between different stakeholders	Stakeholder engagement	Barua et al. (2019a: 9)	"In order to develop trust and confidence between the riparian countries of the Brahmaputra and to work on the aforementioned issues and potential development agendas, there has to be long-term interaction and communication between different stakeholders, which should also include non-traditional stakeholders, such as the private sector, media, funding institutions, and marginalized groups, including women."
Track 2 dialogue as a long-term strategy	Stakeholder engagement	Hanasz (2017: 468)	"...Track II dialogue is a long-term strategy; it cannot build trust between conflicting parties immediately."
Engagement of non-traditional stakeholders	Stakeholder engagement	Huntjens and de Man (2017: 5)	"...trust comes with a true exchange of opinions and feelings. This exchange should explicitly involve non-traditional stakeholders, such as the business

			sector and marginalised groups, including women. For this to happen, a safe place is needed, where openness and cooperation is stimulated."
Interactions between decision makers and civil society actors	Stakeholder engagement	Ide and Detges (2018: 66)	"Furthermore, once water cooperation is established, it increases interactions between decision makers and civil society actors (...) Such interactions can, in turn, stimulate the building of trust and understanding."
The role of non-state actors	Stakeholder engagement	Klimes et al. (2019: 1363)	"As trust is a key component to water diplomacy, non-state actors have an important role in contributing to improved dialogue among riparian countries by clarifying misunderstandings and acknowledging ambiguities and uncertainties – information, action, and perception – pertaining to water management decisions."
Broader collection of stakeholders	Stakeholder engagement	Klimes et al. (2019: 1366)	"The inclusion of a broader collection of stakeholders in the [Brahmaputra Dialogue] BD has built trust and confidence through increased transparency".
Deliberative spaces beyond Track 1 diplomacy	Stakeholder engagement	Mirumachi (2020: 88)	"Alternative tracks can curtail power asymmetry between states that override negotiations and limit possibility for sustainable change (...) It is implied that deliberative spaces also enhance trust building."
The role of stakeholders and other actors	Stakeholder engagement	Mumme (2020: 132)	"Instructive in both the Colorado River and Tijuana River cases is the diligent work of citizen stakeholders, environmental organizations, and local governments in building awareness of each nation's concerns, sharing information, generating binational trust, exploring incentives of interest to each country, building local and regional support, and generating the requisite political will."
Collaboration among local communities	Stakeholder engagement	Sadoff et al. (2008: 59)	"Successful collaboration among local communities will help build trust and show the benefits of transboundary management."
Participation	Stakeholder engagement	Sadoff et al. (2008: 86)	"Participation builds trust, ownership and common understanding among stakeholders – the value of this process cannot be overstated."
The role of non-state actors	Stakeholder engagement	Susskind and Islam (2012: 10)	"Building relationships between governments, however, is not enough. There is an important role for 'non-state' actors, such as water users, nongovernmental organizations, and networks of scientists and universities, to play in treaty implementation that can add an important dimension to trust-building efforts."
Dialogue	Stakeholder engagement	Yasuda et al. (2018: 658)	"...the trust engendered by the Brahmaputra Dialogue among various participants in the basin must be recognized as an important step forward."
Connecting local people	Collective identity	Honkonen and Lipponen (2018: 329–330)	"The active and participatory work of the Finnish-Swedish Commission has contributed to connecting local people on both sides of the border and encouraged them to act 'for the benefit of the border region' in the management of the transboundary watershed. The applied method of 'localisation' of the conservation and management of the shared water basin has brought about many benefits to the transboundary cooperation: built-in trust in the relations between and within the Commission and different stakeholders."
Personal relations	Collective identity	Huntjens and de Man (2017: 5)	"...trust and distrust is the result of long-term interaction between people, it depends on personal relations and is influenced by past performance"
Collective identity	Collective identity	Islam and Susskind (2018: 593)	"Even when agreement is not reached, collective identity can lead to a better understanding of the implicit conflicts due to competing stakeholder interests; increased political buy-in and legitimacy for decisions; better relationships and more trust among contending parties identification of mutually advantageous proposals; and learning that has value beyond the process of direct consultation (...)"
Trust-based personal relationships	Interpersonal relations	Haapala and Keskinen (2022: 114)	"The turnover of experts and chairpersons in the Commission has been slow, which has allowed for long-term relationships; these relationships are increasingly trust-based and this, in turn, has enabled confidential discussions."
Use of independent consultants	Interpersonal relations	Milman and Gerlak (2020: 143)	"Use of consultants also has implications in terms of how the science is perceived by member countries. Where an issue is particularly contentious, use of consultants who are viewed as removed from the politics of the basin can build legitimacy and trust in the science, facilitating the use of the science in hydrodiplomacy."

Commissioners' role as conveners	Interpersonal relations	Pineda Pablos et al. (2020: 48)	"The two commissioners served as convenors and interlocutors between Colorado Basin state interests, the foreign ministries, DOI officials, key water user associations, and environmentalists. Their technical skills were an asset in representing each nation's interests to water managers in each country and validating environmentalists' data and claims, important trust-building functions that enabled both countries to make concessions facilitating agreement."
Dispute prevention tools	Conflict resolution	Honkonen and Lipponen (2018: 327)	"...the commissions usually have a good selection of tools* available to promote cooperation and trust among the parties (*The tools of dispute prevention including monitoring, dialogue and exchange of information; and the tools of dispute resolution including negotiation, mediation, arbitration and resolution by the joint body)"
Deliberation, mediation, negotiation, and dispute resolution mechanisms	Conflict resolution	Jiménez et al. (2020: 12)	"For instance, the role of deliberation, mediation, negotiation and dispute resolution mechanisms are key instruments in water conflict management and in improving transboundary water cooperation processes, by building trust between riparian states of shared waters."
Engagement of third-party actor	Conflict resolution	Keskinen et al. (2021: 2)	"... the engagement of so-called third-party actors such as external countries, networks or organisations in the water diplomacy processes. (...) These actors can build trust and facilitate water diplomacy related processes through e.g., joint capacity- and knowledge-building, network activities, facilitation and mediation."

APPENDIX B: VISUALISATION OF THE DYNAMIC NATURE OF TRUST AND TRUST BUILDING

While Figure 2 in the Discussion (Section 5) provides a basic conceptualisation for viewing trust and trust-building in water diplomacy, it doesn't really capture how they could evolve over time. Figure A1 below is a complementary visualisation for Figure 2, seeking to describe the dynamic processes related to both trust and trust-building. The figure captures, in the same simplified diagram, the possible ways the three types of trust may change over time (three thick lines with changing levels of trust, as described by the Y-axis) as well as the potential trust-building activities and their changes over time (grey arrows named Activity A-D). A solid line in the arrow indicates a stronger/more formal activity and a dotted line a weaker/more informal activity; the activities also start and end at different points in time. The trust-building activities are directed upwards, thus aiming to strengthen the different types of trust. While visually separate, the three types of trust are also connected, with each of them potentially contributing to other types of trust: this is visualised with three connected dots in the diagram.

Figure A1. A visualisation showing an example on how the three types of trust and trust-building could change over time. For details, see text.

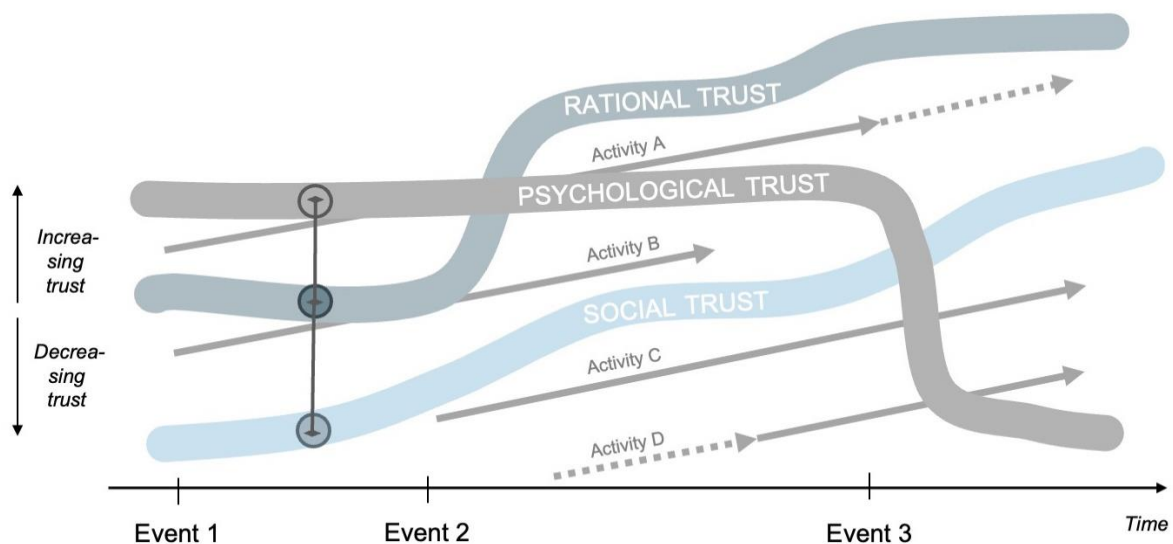


Figure A1 also includes examples of possible events that can influence both trust and trust-building. Building on the findings from our study, such an event could, for example, be a multistakeholder meeting (Event 1) that establishes a regular dialogue process (Activity B) and contributes particularly to an increasing level of social trust, or an intergovernmental agreement (Event 2) that establishes a data-sharing process (Activity C) and leads to enhanced levels of both rational and social trust. Events can also be related to broader political dynamics beyond shared waters and may influence trust negatively. For example, a new political leadership with a hostile view towards a neighbouring country (Event 3) could, at worst, lead to a decreased level of psychological trust and result in the reduction of formal meetings between the riparian countries (Activity A). Together, the different elements included in the figure seek to portray the interlinkages between and possible changes in both trust and trust-building.

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