



Angles of trust in transboundary water cooperation: Capturing the multidimensional and dynamic nature of trust in the Sava and Syrdarya river basins

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ABSTRACT

Trust is frequently invoked to explain cooperation or conflict in interstate relations over shared water resources. Drawing on qualitative research in the Sava River Basin in Southeastern Europe and the Syrdarya River Basin in Central Asia, this article suggests three key dimensions through which trust can be better understood – its sources, levels, and intensities. We combine these three dimensions, or angles, into a Trust Angles Framework that builds on existing conceptualisations and provides an empirically grounded analytical lens for examining trust as a multidimensional and dynamic process. Our findings indicate how different sources of trust (risk-minimising, value-shaping, and psychosocial), governance levels (interpersonal, interorganisational, interstate), and varying intensities (from mistrust to high trust) interact unevenly over time. The Sava case illustrates how cooperation can emerge through strong interorganisational and interpersonal trust despite persistent interstate mistrust, while the Syrdarya case reveals how high-level rapprochement may not translate into stronger inter-organisational or interpersonal trust when institutional reliability remains weak. By foregrounding trust as a relational, historically embedded, and spatially differentiated practice, the article contributes to scholarship on transboundary water governance and debates in international relations.

1. Introduction

The growing pressure on water resources has intensified concerns about tensions among water users, both within and across national borders. Although cooperation on transboundary rivers prevails, the pace of reaching new agreements and establishing joint institutions has slowed over the last two decades (Turgul et al., 2024). Understanding how cooperation is sustained, particularly in politically sensitive and historically fragmented regions, therefore remains a central challenge in transboundary water governance.

Transboundary water cooperation refers to the use of strategic, institutional, and technical governance arrangements to manage shared watercourses and realise mutual benefits, typically formalised through legal agreements and implemented via joint institutions such as river basin organisations or basin-wide planning processes (Sehring et al., 2022). In practice, cooperation often hinges on mundane yet

consequential interactions: whether hydrologists pick up the phone to clarify data discrepancies, whether agencies exchange draft plans informally, prior to their official approval and circulation, or whether technical meetings proceed despite political tensions. Because such cooperation depends on continuous coordination, discretion, and implementation across political and organisational boundaries, it is inherently relational, making trust an important factor in how cooperation functions in practice.

Trust and mistrust among riparian states, organisations, and individuals are widely recognised as key factors in shaping conflict and cooperation over shared waters (Dinar & Wolf, 1994; Hoffman, 2006; Keskinen et al., 2023). Trust has also become a prominent concern in policy and practice, as reflected in several trust-focused thematic sessions at water-related events such as World Water Weeks and World Water Forums. Yet, despite its frequent invocation, trust is often treated as a taken-for-granted background condition rather than an object of

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systematic empirical analysis, particularly in relation to how cooperation is sustained in practice.

This treatment sits uneasily with research across other disciplines, which understands trust as multidimensional, relational, context-dependent, and dynamic (Axelrod, 1984; Coleman, 1988; Hoffman, 2006; Kydd, 2005; Rempel et al., 1985). Trust may arise from different sources, operate unevenly across governance levels and coexist with mistrust. Neglecting these distinctions limits our ability to explain why cooperation sometimes persists despite interstate mistrust, or conversely, why formal agreements and institutions fail to generate confidence among the actors responsible for implementing them.

To contribute to addressing this puzzle, this article examines how trust is produced and negotiated in practice through everyday interactions, institutional arrangements, and shared histories in two transboundary settings: the Sava River Basin in Southeastern Europe and the Syrdarya River Basin in Central Asia. States in both basins emerged from the dissolution of larger geopolitical entities (Yugoslavia and the USSR, respectively). They share a legacy that may foster trust in water cooperation through, for example, linguistic and cultural similarities, a history of geopolitical unity, and the endurance of social and professional ties among water officials. Yet, beneath these shared aspects lie different cooperation trajectories. In the Syrdarya Basin, relations between riparians have remained largely peaceful since independence in 1991, but disputes over water allocation persist in this arid, water-stressed context (Hu et al., 2019; Lioubimtseva & Henebry, 2009). In contrast, in the Sava Basin, violent conflicts followed Yugoslavia's dissolution in the early 1990s, but today, joint management of the Sava Basin is widely seen as a success story (Komatina & Grošelj, 2014; Matić, 2011; United Nations Economic Commission for Europe, 2015). This juxtaposition – of a post-war basin achieving effective joint management and a peaceful yet politically sensitive basin struggling over water allocation – offers a compelling setting to explore dynamics of trust across various dimensions.

Drawing on qualitative evidence from these basins and existing conceptualisations of trust, we develop the Trust Angles Framework (TAF). The framework differentiates trust according to three complementary dimensions, or “angles”: (1) the sources from which trust emerges; (2) its intensity; and (3) the governance levels at which it operates. This differentiation makes it possible to explain how similar forms of cooperative behaviour may rest on different relational foundations, why trust at one governance level may coexist with mistrust at another, and why institutional arrangements do not necessarily generate confidence in practice. Applied across historical phases in the two basins, the framework retrospectively examines how participants understand these configurations to have formed and changed over time.

The article proceeds by situating our study within existing trust research and outlining our methodology. We then explore the sources of trust in the Sava and Syrdarya basins and analyse them across their intensities and levels, which allows us, at the same time, to develop and apply the Trust Angles Framework. The Discussion and Conclusion sections reflect on the implications of our research and summarise the main findings.

2. Trust: Research context and rationale

Trust is widely used to explain why cooperation occurs under conditions of uncertainty and vulnerability. The term is commonly defined as positive expectations regarding another actor's intentions, behaviour, and reliability (Mayer et al., 1995; Pursiainen & Forsberg, 2021; Rathbun, 2009; Rousseau et al., 1998). Trust is related to, but distinct from, cooperation. Cooperation describes coordinated or mutually adjusted behaviour, and trust is one possible basis for undertaking or sustaining it. Actors may also cooperate because of legal obligations, material necessity, power imbalances, or external pressure, including where trust is weak or mistrust persists. Treating cooperation as evidence of trust therefore risks obscuring the different conditions under which

cooperative behaviour occurs.

This distinction is particularly important in transboundary water cooperation. Cooperation is formally negotiated between states but enacted through river basin organisations, national agencies, technical working groups, monitoring systems and informal professional networks. Trust may consequently develop between individual professionals, organisations or states, and these levels may not move together. Personal relationships may support information exchange despite interstate tensions, while high-level declarations of friendship may not generate confidence among the organisations responsible for implementation. Trust in transboundary water cooperation is therefore not a single attribute of relations between states, but a relational condition produced across interconnected sites and levels of governance.

Existing studies help explain why trust cannot be separated from the settings in which it develops. Rather than approaching trust as a portable psychological attribute, geographical scholarship understands it as historically and spatially situated: the meaning assigned to a rule, organisation, cooperative gesture or source of knowledge depends on previous interactions, social affiliations and expectations about future relationships (McDermott, 2012; Withers, 2018).

This relational understanding supports viewing water governance as a historically and geographically specific interaction between water, institutions, knowledge and society (Linton and Budds, 2014): trust is not an external input that can simply be added to an otherwise technical governance process. It is formed through the institutional practices, professional relationships and political histories through which transboundary waters are governed.

Supporting this argument, Horowitz (2010) shows that confidence in scientific information is shaped not only by its technical credibility but also by social affiliations and expectations about long-term social and economic relationships. Budds (2009) similarly demonstrates that environmental knowledge does not enter water governance as a politically neutral representation of material conditions – its credibility is mediated by the institutional relationships through which it is produced and interpreted. Trust in knowledge may therefore also depend on trust in the people and organisations presenting it.

Formalisation (e.g., through signing an agreement or establishing regulations) does not necessarily remove this relational dependence. McDermott (2012) shows that prescriptive standards may make behaviour more controllable without resolving distrust rooted in differences in values, perceived integrity or affective relations. In transboundary water governance, rules, monitoring and agreements may increase predictability without generating confidence across all actors and governance levels. Conversely, professional relationships may sustain communication where formal arrangements remain weak.

Political ecology and emotional geography also draw attention to the lived and affective dimensions of environmental relations. Sultana (2011) demonstrates that water relations are experienced through emotions, embodied encounters and everyday interactions, as well as through formal rights and material interests. In transboundary professional settings, familiarity, anxiety, embarrassment, linguistic comfort and a sense of mutual understanding may similarly influence whether interaction feels possible and whether institutional or political risks appear manageable.

International relations scholarship provides complementary explanations of how trust and cooperation develop under uncertainty. Rationalist approaches emphasise incentives, information and credible commitments; constructivist approaches foreground shared norms and identities; and psychological approaches direct attention to perceptions, intentions and interpersonal relationships (Kydd, 2005; Rathbun, 2009; Ruzicka & Keating, 2015; Wheeler, 2018). Together, these approaches indicate that willingness to rely on another actor may arise from different and potentially overlapping foundations.

The rationalist account has important antecedents in the international regimes literature. Regimes organise expectations through principles, norms, rules and decision-making procedures (Krasner, 1982).

Institutions may facilitate cooperation by providing information, regularising interaction, monitoring compliance and making commitments more predictable. Under repeated interaction, a sufficiently long “shadow of the future” may make reliable behaviour strategically rational because present defection can carry reputational or reciprocal costs in future encounters (Axelrod, 1984; Axelrod and Keohane, 1985; Keohane, 1984).

Trust is widely presented as essential to water diplomacy and the durability of transboundary cooperation, but it frequently remains under-conceptualised. Studies often assume that dialogue, data exchange, joint projects or institutionalisation build trust without specifying who trusts whom, what that trust is based upon, how strongly it is held or whether it extends beyond the particular relationship in which it emerged (Voogd et al., 2022; Keskinen et al., 2023). Trust is consequently invoked to explain cooperation while the internal composition of trust remains analytically opaque.

Critical hydropolitics further demonstrates why observing cooperation alone cannot tell us whether trust exists or how it operates. Cooperation and conflict may coexist, and formal institutions may operate within continuing political tension or asymmetrical relationships (Zeitoun & Mirumachi, 2008; Cascão & Zeitoun, 2010). An agreement may indicate an ability to coordinate without demonstrating trust across the organisations and individuals involved. Conversely, interpersonal or technical cooperation may continue despite pronounced interstate mistrust. Approaches that aggregate trust at the level of “relations between states” struggle to account for these apparently contradictory configurations.

Trust sources are not politically neutral. Institutional safeguards may reduce risks for some actors while transferring costs or uncertainty to others; shared values may reflect dominant narratives; and established professional networks may privilege those already included. Analysing trust therefore also requires asking whose risks are minimised, whose values are institutionalised, and who can shape the terms of cooperation (Cascão & Zeitoun, 2010; Hussein et al., 2023).

A differentiated conceptualisation is therefore needed for four reasons. First, actors may rely on different sources of trust: institutional assurances that reduce risk, shared values and understandings that make cooperation meaningful, or psychosocial relationships that make interaction more comfortable. These sources are not interchangeable, but formal procedures may compensate for weak personal relationships, while interpersonal confidence may temporarily compensate for unreliable institutions.

Second, trust must be located at the level at which reliance occurs. Interpersonal, interorganisational and interstate trust can reinforce one another, but they may also diverge. Identifying these differences helps explain how practical “islands of cooperation” persist under political tension and why trust established among individual professionals does not necessarily become organisational or interstate trust.

Third, trust varies in intensity and can coexist with mistrust. Actors may rely cautiously on a counterpart in one area while remaining suspicious in another. Distinguishing strong trust, limited trust, lack of trust and active mistrust avoids treating relations as simply trusting or non-trusting.

Fourth, trust is dynamic. Repeated interaction does not automatically improve trust: experience may confirm expectations of reliability, but can also deepen mistrust. Temporal analysis is therefore necessary to identify not only whether trust exists, but how particular configurations form, persist or erode.

The Trust Angles Framework developed and used in this article addresses these limitations by distinguishing three complementary dimensions: the sources from which trust is derived, its intensity, and the governance level at which it operates, while examining how their configuration changes over time. Its purpose is not to assign a single trust score to a basin or to treat trust as an independent causal variable. Rather, it makes visible the different relational foundations that may underlie outwardly similar cooperative behaviour. The framework’s

contribution lies in integrating these dimensions rather than in the novelty of any individual dimension. It brings these dimensions together to examine empirically how their alignment and misalignment shape cooperation.

This differentiation helps explain how cooperation can continue alongside mistrust; why reliable institutions do not necessarily generate interpersonal or interstate confidence; why personal relationships may sustain cooperation but remain institutionally fragile; and why the same intervention may strengthen one source or level of trust without affecting others. It therefore shifts analysis from the general question of whether trust is present to the more revealing questions of who relies on whom, on what basis, how strongly, and how it changes over time.

On this basis, trust is conceptualised here as a way of relating to others that is grounded in confidence in their intentions and reliability, and supports willingness to initiate, sustain or deepen cooperation under conditions of uncertainty and potential vulnerability. Mistrust refers to an active expectation of unfavourable behaviour, expressed through suspicion or doubt, whereas lack of trust denotes a more neutral condition in which neither positive nor negative expectations provide a firm basis for reliance. The framework offers a structured means of examining the situated relationships through which transboundary water cooperation is practised.

3. Methodology

This qualitative study adopts a comparative case study design to explore trust in transboundary water cooperation. The research draws on semi-structured expert interviews, participant observation, and autoethnographic insights, allowing for an in-depth analysis of how trust and mistrust are produced, negotiated, and experienced across different governance levels. This multi-method approach is particularly suited to capturing relational and processual phenomena such as trust, which are often difficult to observe through formal institutional analysis alone.

3.1. Case studies

The two case studies, the Sava River Basin and the Syrdarya River Basin, were selected because of their intriguing blend of shared historical legacies and divergent cooperation trajectories. Both basins were formerly embedded in larger geopolitical entities (Yugoslavia and the USSR, respectively) and inherited highly interconnected water management systems, professional networks, and institutional arrangements. These shared legacies provide a valuable basis for examining how trust is shaped by institutional transformations and historical experience.

Sava River Basin

The Sava River Basin, covering 97,700 km², is a major basin of Southeastern Europe and the second largest sub-basin of the Danube. Home to approximately 9 million people, it spans six countries. However, given that only a minor part lies in Albania, the basin is generally considered to be shared by the five successor states of former Yugoslavia: Bosnia and Herzegovina, Croatia, Montenegro, Serbia, and Slovenia (Komatina & Grošelj, 2014; International Sava River Basin Commission, 2022). The dissolution of Yugoslavia in the 1990s was accompanied by armed conflict and created enduring challenges for the region. As the Sava River was transformed from the largest national river into an international watercourse, water management became fragmented into national systems. Water-related economic activities, particularly navigation, declined sharply, and overall political stability weakened considerably.

After the end of the Yugoslav wars, the countries initiated a negotiation process that led to the adoption of the Framework Agreement on the Sava River Basin (FASRB) in 2002 and the establishment of the International Sava River Basin Commission (ISRBC, or Sava Commission), as its implementing body, in 2005. The legal basis for cooperation has since been expanded through four additional protocols to the FASRB,

regulating specific water management issues of shared interest in greater detail. This legal and institutional framework marked a major step towards restoring basin-wide water resources management, fostering sustainable development and contributing to regional political stability. Despite challenges to its development and implementation, it has enabled structured cooperation among the Sava Basin countries – a process that is widely regarded internationally as a good-practice example of transboundary water governance (Komatina, 2025).

Syrdarya River Basin

The Syrdarya River Basin spans 485,000 km² and is one of Central Asia's most important transboundary water systems, sustaining the livelihoods of over 30 million people. Together with the Amudarya, it forms the Aral Sea Basin. Following the dissolution of the Soviet Union in 1991, the newly independent riparian states – Kazakhstan, Kyrgyzstan, Tajikistan, and Uzbekistan – inherited a highly integrated and interdependent water management infrastructure, previously overseen by Moscow under a centralised regime. The shift to sovereign water governance resulted in competing national interests, particularly between upstream and downstream states, over hydropower generation and irrigation demands.

Between 1992 and 1995, the countries signed several multilateral agreements and established key regional institutions for the Aral Sea Basin – the Interstate Commission for Water Coordination (ICWC) and the International Fund for Saving the Aral Sea (IFAS), as well as the Basin Water Organisation “Syrdarya”. While these frameworks enabled continued dialogue on water allocation, tensions have persisted, particularly over seasonal water releases and resource distribution (Dadabaev et al., 2023; Ziganshina & de Schutter, 2022). The need to restructure the basin's legal and institutional frameworks has long been acknowledged by all member states, but progress remains limited. In recent years, cooperative developments have occurred primarily at the bilateral level and through short-term trilateral agreements, reflecting incremental but fragile advancements in regional water cooperation (Ziganshina, 2023).

The comparison does not treat the two basins as institutionally equivalent or seek to isolate trust as an independent cause of cooperation. It uses their shared legacies but divergent political, economic, and institutional trajectories to examine how trust is configured under different conditions.

3.2. Data collection

Data for this research were collected through complementary methods: expert interviews, participant observation, and a collaborative autoethnographic component. These sources did not have equal evidentiary weight: interviews constituted the primary dataset, while participant observation and practitioner-authors' insights were used to contextualise, corroborate, qualify, and occasionally challenge patterns identified in the interviews.

Semi-structured interviews were conducted with officials from both basins who are or have been involved in transboundary water cooperation, including river basin organisations personnel and national water officials. These actors occupy key positions at the interface between technical water management and political decision-making, making them particularly well placed to reflect on trust-related practices and perceptions. A total of 65 interviews were conducted: 41 in the Sava Basin and 24 in the Syrdarya Basin in 2022–2024, either in person or online (see Appendix A), including two authors.

Participant observation was employed to capture trust-related interactions as they unfold in practice, particularly in settings where informal exchanges complement formal cooperation. The principal researcher attended four regional events in the Sava Basin (October–December 2022) and three in the Syrdarya Basin (June–November 2023). This method enabled observation of everyday practices, interpersonal dynamics, and informal norms that are often difficult to elicit through interviews alone (Schatz, 2009). Field notes were recorded

during events and subsequently organised through a nine-cell matrix combining three governance levels (interpersonal, interorganisational, interstate) with three cross-cutting categories: formalities, practices, and affective cues.

The collaborative autoethnographic component drew on the prior practitioner experience of two authors in transboundary water cooperation in the Sava and Syrdarya basins. The authors interviewed each other using the same interview guide applied to other participants. These interviews were transcribed, coded, and retained as separately identifiable sources within the dataset. Their practitioner knowledge was also used reflexively to interpret institutional terminology, practices, and politically sensitive processes that might be difficult for an external researcher to recognise (Brigg & Bleiker, 2010; Burnier, 2006). However, their accounts were not treated as privileged or self-validating evidence, and no broader empirical pattern was established solely on the basis of these accounts.

3.3. Data analysis

Interview recordings were transcribed, while observation notes were organised and all coded using a combined inductive-deductive coding strategy supported by ATLAS.ti software. Initial coding was guided by sensitising concepts from the trust literature, including trust sources, levels, and intensities. Subsequent rounds of coding allowed empirical patterns to emerge from the data, ensuring that the analytical framework was grounded in participants' experiences and practices rather than imposed a priori.

The framework was applied through three complementary interpretive questions. Trust sources were identified from the stated basis of reliance, governance levels from the relationship concerned, and intensity from the degree and conditions of reliance expressed in the wider account, not from frequency of mentions. The three source categories are not mutually exclusive, and individual passages could inform more than one source or governance level. For each period, however, each source-level combination was assigned one intensity category. The figures therefore synthesise interpreted trust configurations rather than presenting frequency scores or measurements. Each cell represents the authors' synthesis of the relevant accounts and observations rather than a unanimous view. Where evidence indicated different intensity levels, we assigned the less trust-positive category unless the higher level was supported across source types. Important differences between accounts are discussed in the text. The principal researcher coded all interviews, while two co-authors with experience in the respective basins reviewed the assigned codes and interpretations. Differences were resolved through discussion. The co-authors reviewed the coding and interpretations rather than independently recoding the full dataset – statistical inter-coder reliability was therefore not calculated.

Data integration proceeded in three stages. First, all interview transcripts, including the two practitioner-author interviews, were coded using the same combined inductive-deductive coding procedure. Each item retained a source identifier specifying basin, actor category, and data-source type, allowing practitioner-author accounts to remain distinguishable from other interviews throughout the analysis.

Second, participant observation notes were organised and coded using the matrix described above. Observational material was used to examine whether themes identified in interviews were also visible in interactional practices and institutional routines. For example, interview claims about close professional relationships could be considered alongside observed informal exchanges, while claims about institutional openness could be compared with meeting practices and patterns of participation.

Third, findings were compared across source types within each basin and thematic category. Convergence between interviews and observations strengthened confidence in an interpretation; complementary evidence helped explain its institutional or relational context; and discrepancies were retained and examined rather than resolved by

privileging one source automatically. Differences between formal statements and observed practices were themselves analytically relevant because they could indicate divergence between officially presented cooperation and its everyday enactment. Negative cases were retained rather than absorbed into dominant patterns. Accounts contradicting other respondents or expressing scepticism were examined as evidence of variation within each basin.

Interpretation also distinguished relatively direct trust assessments from more context-dependent formulations. Statements such as “a very trustworthy organisation”, “a highly reliable person”, or “strong trust among states” provided explicit indications of respondents’ assessments. More culturally specific or figurative formulations required contextual interpretation. For example, the Russian expression “I would go on reconnaissance with him” (“я бы с ним в разведку пошёл”), broadly meaning “I would trust him with my life”, was coded as indicating high interpersonal trust. Ambiguous and culturally specific formulations were reviewed comparatively against the surrounding interview context and discussed among the authors before assigning their final interpretation.

It is important to note that in the analysis, trust was not inferred from the presence of cooperation, agreements, or joint institutions. It was identified through participants’ explicit assessments of reliability and trustworthiness, their expressed willingness or reluctance to rely on counterparts, and accounts of practices involving vulnerability, discretion, and expectations of future behaviour. Cooperative activity provided the setting in which trust was examined, but was not itself treated as evidence that trust existed. Similarly, institutional performance was analysed as a source through which participants formed expectations of reliability, rather than as an independently measured explanation of basin-level cooperation. Lack of trust indicated uncertainty or insufficient grounds for reliance without negative expectations, whereas mistrust involved explicit suspicion, anticipated harm or unreliability, and defensive practices. Ambiguous statements were interpreted within the wider interview context rather than classified in isolation.

The temporal analysis is retrospective, implying that interviews conducted in 2022–2024 elicited participants’ accounts of earlier periods, and the historical configurations presented in the analysis therefore represent retrospective reconstructions rather than contemporaneous measurements of trust. Such accounts may be influenced by recall bias and by respondents’ present-day interpretations of earlier events.

4. Dimensions of trust in the Sava and Syrdarya basins

Trust manifests in transboundary water cooperation through a wide range of practices, interactions, and institutional arrangements: from informal exchanges of information between long-standing colleagues to the establishment of joint bodies, formal arrangements, and shared projects. Our empirical data indicated that trust is produced and negotiated through multiple changing and interacting dimensions that shape how cooperation unfolds in practice.

To capture this complexity, we analyse trust through three complementary angles: sources, intensity, and levels. We then examine how their configuration changes over time. Together, these angles form the Trust Angles Framework (TAF), drawing on existing trust research and patterns emerging from the two case studies.

We begin by examining trust sources – the factors that enable actors to accept vulnerability and engage in cooperation. We then analyse how these sources are differently relied upon (trust intensity) across governance levels. Then we discuss how this constellation changes with time. Analysed together, these angles make it possible to add depth and more clarity to our understanding of trust in transboundary water cooperation.

4.1. Angle 1 – Trust sources

Across both basins, interviewees described trust not as an abstract

attitude, but as something grounded in concrete factors that shape their willingness to engage with counterparts. Drawing on these accounts, we identified three broad forms of trust sources that build positive expectations and enable cooperation under conditions of uncertainty: we call them risk-minimising, value-shaping, and psychosocial trust sources. These categories resonate with the rational, social, and psychological strands of trust literature in international relations (see Section 2), but are defined here empirically based on how water experts themselves explain *why* they trust (or hesitate to trust) others in practice.

Risk-minimising sources refer to factors that reduce perceived personal, organisational, or political risks associated with water-related cooperation. In the Sava Basin, such sources have gradually consolidated over time, following the establishment of the Framework Agreement on the Sava River Basin in 2002 and the Sava Commission in 2005. Interviewees consistently described these arrangements as providing protection and predictability, emphasising that “the Sava agreement has all the regulations”, that “we follow protocols”, and that cooperation is grounded in “what’s on paper”. As these rules and procedures became routinised through repeated use, they increasingly enabled experts to engage in activities such as data sharing or joint planning while feeling shielded from potential blame or political repercussions.

In this sense, the Sava arrangements extended the “shadow of the future” by embedding interaction in continuing institutional relationships and making counterparts’ behaviour more observable and predictable. The findings therefore support the regime-theoretical expectation that institutions can facilitate cooperation by stabilising expectations across repeated encounters.

In contrast, in the Syrdarya Basin, risk-minimising trust has shifted rather than accumulated. In the early post-Soviet period, interviewees recalled a firm reliance on basin-wide institutions established in the 1990s, reflecting continuity from inherited Soviet management structures. Over time, however, this confidence has eroded as institutions failed to deliver predictable or equitable cooperation. As a result, risk minimisation today relies less on horizontal institutional reliability and more on hierarchical authorisation, with experts repeatedly referring to the importance of “instructions to cooperate from above” and following “what my boss says”.

The Syrdarya case shows that the expectation of continued interaction is not sufficient by itself: where institutional commitments are inconsistently implemented and reciprocity is not considered credible, repeated interaction may reproduce disappointment and mistrust rather than progressively deepen cooperation.

Value-shaping sources refer to shared values and beliefs that influence how actors perceive and justify cooperation. In the Sava Basin, such sources have strengthened over time alongside the consolidation of cooperative practice. Interviewees frequently referred to a collective conviction that cooperation through the Sava Commission “works well” and “is good for everyone”, noting that “we all see benefits from this cooperation”. These shared evaluations of institutional performance and cooperative outcomes have become increasingly taken for granted, helping to stabilise expectations about counterparts’ priorities and commitments. References to “brotherhood” and shared regional identity – “we are relatives”, “Balkans are one family” – further illustrate how historical and cultural narratives are actively reinforced through ongoing cooperation.

In the Syrdarya Basin, we could observe a similar language of family and kinship, yet value-shaping sources have evolved more unevenly over time. Interviewees recalled that cooperative ideals and shared regional narratives were more salient during earlier phases of post-Soviet cooperation, when basin-wide institutions were first established. In more recent periods, however, these value-based orientations appear less firmly anchored in everyday cooperative practice. While many interviewees stressed the feeling of brotherhood and that “we don’t have another choice, we need to cooperate”, fewer expressed confidence in the effectiveness or fairness of existing institutions, revealing a growing gap between shared rhetorical commitments and practical experiences

of cooperation.

Psychosocial sources encompass factors that reduce emotional strain and foster comfort in interaction, thereby facilitating trust without directly addressing risks or shared goals. Linguistic commonality was particularly salient in both basins as a durable psychosocial support, though its meaning has shifted over time. In the Sava Basin, interviewees repeatedly noted that “*we speak the same language*” and “*we understand each other*”, referring not only to linguistic proximity but to a shared communicative style that has been maintained and normalised through repeated interaction since the early phases of cooperation.

In the Syrdarya Basin, the continued use of Russian was similarly described as easing communication (“*luckily, we still speak Russian*”), but interviewees also noted that this shared language reflects a generational legacy that may weaken over time as younger professionals enter cooperation without the same linguistic or social background. Informal social practices, such as sharing meals, travelling together, or “*going for beers*”, were highlighted in both basins as moments where formal roles temporarily recede, and interpersonal rapport develops. While these practices have remained important across time, interviewees suggested that their availability and significance fluctuate with personnel turnover and changing political climates. These interactions do not eliminate political or institutional constraints, but they create relational spaces in which trust can be tentatively extended and, in some cases, sustained despite broader uncertainty.

These three types of trust sources are not mutually exclusive and frequently operate in combination, reinforcing one another in practice. At the same time, they do not provide the same degree of confidence across contexts or actors. In the Sava Basin, risk-minimising sources were gradually consolidated, while also creating conditions in which value-shaping and psychosocial sources could strengthen as complementary supports. In the Syrdarya Basin, by contrast, psychosocial familiarity and positive high-level political rhetoric are present, but tend to be weaker or conditional in the absence of reliable institutional safeguards, limiting their capacity to stabilise cooperation beyond interpersonal interaction. These contrasts highlight the need to move beyond identifying trust sources alone and to examine how strongly different trust sources are manifested, which is the focus of the following section.

4.2. Angle 2 – Trust intensity

The previous section showed that trust in transboundary water cooperation is assembled from different sources (risk-minimising, value-shaping, and psychosocial), each supporting cooperation in distinct ways. However, identifying trust sources alone does not capture how strongly or weakly these sources support confidence in a counterpart in practice. Our empirical findings indicate that trust varies in degrees of depth, strength and quality – from tentative positive predisposition towards a new counterpart to deeply embedded trusting relationships between organisations and their experts. To capture this variation, we developed the five interpretive categories described below.

High trust intensity indicates strong reliance on trust, when one or more trust sources actively support cooperation as a routine basis for action. In such situations, risk-minimising sources (e.g., clear mandates, procedures, or institutional backing) are relied upon to reduce exposure to risk, value-shaping sources align expectations about the purpose and benefits of cooperation, and psychosocial sources ease interaction. Actors are willing to initiate engagement, share information beyond formal requirements, or proceed without extensive safeguards, even under conditions of uncertainty or political sensitivity.

Medium trust intensity indicates conditional reliance on trust, where trust supports cooperation but does not yet function as a fully routine basis for action. In such situations, some trust sources are present and relied upon, while others remain weak or uneven. Risk-minimising sources (e.g., partial procedures, project-based mandates, or selective institutional backing) reduce uncertainty to a limited extent, value-

shaping sources support cooperation in specific issue areas or among particular actors, and psychosocial sources facilitate interaction primarily where prior experience exists. Actors are willing to engage and share information, but typically within defined boundaries, relying on additional safeguards, monitoring, or issue-specific assurances when uncertainty or political sensitivity increases.

Low trust intensity indicates weak reliance on trust sources, where trust plays only a marginal role in supporting cooperation. In such situations, risk-minimising sources are weak, incomplete, or inconsistent, providing little assurance against uncertainty. Value-shaping sources offer limited alignment of expectations, and psychosocial sources may ease communication at a basic level without generating confidence. Actors may engage with counterparts and comply with formal requirements, but are reluctant to share information, exercise discretion, or proceed without extensive controls. Cooperation remains cautious, highly formalised, and easily disrupted when uncertainty, political sensitivity, or external pressures increase.

Lack of trust refers to situations in which trust sources are largely absent, so that trust does not meaningfully support cooperation. Risk-minimising sources may exist formally, but they are not perceived as reliable or sufficient to reduce uncertainty. Value-shaping sources provide little shared understanding of the purpose or benefits of cooperation, and psychosocial sources do not extend beyond basic professional interaction. Actors may still interact or cooperate when required by necessity, obligation, or external pressure, but engagement remains narrow, highly constrained, and oriented toward avoiding risk rather than enabling collaboration. Trust neither facilitates nor actively undermines cooperation; instead, cooperation proceeds in its absence.

Mistrust refers to active negative expectations that undermine reliance, even where potential trust sources are formally present. Here, risk-minimising, value-shaping, and psychosocial sources all fail to provide a basis for engagement, leading actors to anticipate negative consequences from cooperation, interpret counterparts’ actions with suspicion, or avoid engagement altogether. Even where formal frameworks exist, mistrust constrains or blocks cooperative practice.

The five trust intensity categories range from mistrust and lack of trust to three degrees of trust. The highest category is defined as high trust, rather than “absolute” or “full” trust, reflecting the fact that actors rarely rely on counterparts across the full range of interactions, each of which involves different skills, capacities, and intentions. This also underscores the issue-specific nature of trust: actors may trust counterparts’ intentions while remaining sceptical of their technical capacities (Kydd, 2005). We further distinguish between lack of trust and mistrust, which are sometimes used synonymously. While lack of trust is often framed negatively in the literature, we treat it as a neutral condition in which no strong positive or negative expectations are projected. By contrast, mistrust involves active negative expectations that constrain or preclude cooperation. This distinction allows us to trace how trust and mistrust may coexist and shift over time, even though a detailed analysis of the sources of mistrust lies beyond the scope of this study.

Crucially, different intensities of trust can coexist within the same basin and at the same moment in time. In the Sava Basin, interviewees frequently described cooperation as strongly supported by trust of water experts in established arrangements and routines, even while broader political relations were characterised by enduring suspicion and sensitivity. Trust was thus actively relied upon in some arenas of cooperation, while remaining absent or withheld in others. These contrasting patterns illustrate that trust intensity cannot be inferred from general claims about cooperation, but must be understood as uneven, selective, and context-specific.

To make these variations in trust intensity analytically visible, the following section introduces governance levels as an additional angle within the Trust Angles Framework. Examining how different intensities of trust align or diverge across these levels allows for a more systematic analysis of trust dynamics within and between the Sava and Syrdarya basins.

4.3. Angle 3 – Trust levels

The discussion of trust intensity in the previous section showed that trust intensity is uneven, selective, and often contradictory within the same basin, with trust being strong in some arenas of cooperation while remaining weak or absent in others. To understand these patterns, it is necessary to consider not only how strong trust is, but also where it is situated within transboundary water cooperation. Our empirical material indicates that trust operates through interactions among different sites of governance that are connected yet not necessarily aligned. We therefore analytically distinguish three governance levels at which trust is generated and manifested: the interpersonal level among water experts, the interorganisational level among water-related agencies and basin institutions, and the interstate level among national governments and political leadership. Introducing trust levels as an analytical angle thus enables a more precise examination of misalignments and partial alignments in trust relations that cannot be captured through trust sources or intensity alone.

Interpersonal trust refers to the extent to which individual actors involved in transboundary water cooperation, such as water experts, technical staff, and mid-level officials, rely on counterparts under conditions of uncertainty. At this level, trust is not a general attitude but is enacted through everyday practices, such as direct communication, informal clarification of data, and discretionary coordination beyond formal procedures.

In the Sava Basin, interpersonal trust has strengthened gradually over time and is now often strongly relied upon, particularly where risk-minimising sources provide a stable backdrop for interaction. Interviewees described frequent direct communication with counterparts, noting that *“if I have a question, I call my colleague directly – we know each other, so it’s easier”*. Value-shaping sources have reinforced this reliance over time. Many interviewees expressed shared convictions that cooperation through the Sava Commission *“is working so smoothly”* and *“Sava Commission proved it is trustworthy”*, which supports proactive engagement. Psychosocial sources further facilitate interpersonal trust through linguistic proximity and ease of communication. Informal practices such as travelling together or sharing meals were described as humanising cooperation.

In the Syrdarya Basin, interpersonal trust has followed a more uneven and weakening trajectory and is generally expressed with caution. Risk-minimising sources are weak, with cooperation frequently dependent on hierarchical approval. Value-shaping sources remain present but are also weak. Interviewees often stressed necessity rather than confidence, noting that *“we all need water to survive”*, without expressing strong belief in the effectiveness of existing arrangements: *“ICWC proves that we cooperate”*. Psychosocial sources continue to support interaction, particularly through shared language, yet interviewees also noted that this reflects a generational legacy that is gradually eroding. As one expert observed, while personal interaction remains easy, its practical scope is limited: *“we can talk easily about life, but when it comes to work, everything becomes formal again”*. Taken together, these accounts challenge an overly consensual interpretation: they present cooperation as necessity rather than confidence and show that personal familiarity does not necessarily extend to trust in work-related interactions.

Interorganisational trust refers to the confidence that water-related organisations, such as national water agencies or river basin organisations, place in one another’s reliability and commitment to agreed rules, procedures, and objectives. Unlike interpersonal trust, which is often personalised, interorganisational trust is closely linked to perceptions of institutional performance, procedural predictability, and accountability, and tends to evolve as organisations accumulate experience with cooperative arrangements over time.

In the Sava Basin, interorganisational trust has strengthened progressively since the early 2000s and is now often strongly relied upon in practice. Over time, risk-minimising sources, including clear procedures, agreed rules, and institutional continuity, enabled organisations to

engage confidently in basin-wide initiatives without excessive concern over political or reputational risk. Value-shaping sources reinforced this growing trust, with psychosocial sources playing a supportive but limited role at this level. While meetings were often described as collegial and occasionally reinforced through informal interaction, organisational engagement remained grounded primarily in formalised arrangements rather than interpersonal comfort.

In contrast, interorganisational trust in the Syrdarya Basin has weakened over time. Interviewees recalled that in the early post-Soviet period basin-wide institutions initially inspired greater confidence, reflecting continuity from inherited management systems. However, as institutional authority eroded and cooperation outcomes became less predictable, trust in these organisations declined.

Risk-minimising sources are therefore weak at this level, and organisations tend to prioritise national interests and vertical accountability to national authorities over horizontal collaboration. Value-shaping sources are also weak, with interviewees expressing scepticism about the effectiveness of basin-wide cooperation despite acknowledging its formal existence. Psychosocial sources provide some facilitation (e.g., meetings were described as polite and cordial), but do not compensate for the absence of reliable institutional safeguards. As a result, interorganisational trust in the Syrdarya Basin remains fragile and situational, rarely serving as a foundation for sustained basin-wide cooperation.

Interstate trust refers to the extent to which trust is relied upon in relations among national governments and political leadership involved in transboundary water cooperation. At this level, trust is expressed primarily through diplomatic engagement, political signalling, and formal commitments, rather than through everyday operational interaction.

In the Sava Basin, interstate trust has remained consistently weak and often characterised by mistrust since the dissolution of Yugoslavia. Although formal agreements on water cooperation were concluded in the early 2000s, interviewees stressed that political engagement at the interstate level has remained limited, episodic, and cautious. Risk-minimising sources of trust are therefore weak at this level, as political leaders rarely provide strong or sustained backing for cooperative initiatives beyond what is formally required.

Value-shaping sources are similarly limited. While symbolic references to shared regional futures or European integration occasionally surface, the majority of interviewees suggested that these narratives do not translate into durable political confidence or long-term commitment to deepened cooperation. Psychosocial sources play little role at the interstate level, as informal interaction among political leaders remains rare and mostly constrained. As a result, interstate trust in the Sava Basin is not relied upon as a practical basis for cooperation. Instead, cooperation has stabilised despite persistent political mistrust, relying primarily on institutionalised arrangements and professional practice at lower governance levels.

In contrast, interstate trust in the Syrdarya Basin has fluctuated over time and has reportedly increased since around 2016. Interviewees frequently referred to improved relations among political leaders, more frequent high-level meetings, and a renewed rhetoric of regional friendship and cooperation.

However, risk-minimising sources at the interstate level remain weak. Interviewees repeatedly noted that political goodwill has not been accompanied by sustained institutional reform or clear mandates that would reduce uncertainty for implementing agencies. Psychosocial trust is also limited, as interstate engagement remains largely formal and performative rather than grounded in informal familiarity. Consequently, while interstate trust in the Syrdarya Basin is more visible than in the past, it is relied upon selectively and remains shallow, with limited capacity to stabilise cooperation beyond diplomatic signalling.

4.4. The Trust Angles Framework

The preceding sections examined trust sources (Section 4.1), trust intensity (Section 4.2), and trust levels (Section 4.3) as distinct analytical angles. In this section, we bring these angles together by examining how they combine into structured trust configurations in the Sava and Syrdarya river basins, and how these configurations have evolved over time. The Trust Angles Framework enables analysis of the degrees of intensity of different sources of trust across governance levels, and how these patterns of reliance stabilise, shift, or fragment in response to institutional and political change.

We anchor this synthesis in 2024, the final year of our empirical analysis, take the year of the first agreement as a starting point and use the middle between both as an additional time for assessment. We use each moment as an analytical snapshot of how trust is configured across levels and sources in each basin. Building on these snapshots, we then retrospectively reconstruct perceived changes in each configuration, highlighting periods of accumulation, stagnation, and recalibration. This integrated approach allows us to examine not only *where* trust is relied upon, but also *how* and *why* these patterns have taken shape.

4.4.1. Sava River Basin – consolidation of trust through bottom-up institutionalisation

Fig. 1 summarises how trust in the Sava River Basin is configured across governance levels and trust sources in 2002, 2013, and 2024. Read horizontally, the figure traces a gradual consolidation of trust at interpersonal and interorganisational levels. Read vertically, it shows the persistent weakness of trust at the interstate level.

In 2002, when the Sava Framework Agreement was signed, trust intensity at the interstate level in the Sava Basin was characterised by mistrust, rooted in the sociopolitical events preceding cooperation, including the Yugoslav wars and the absence of post-war collaboration. Interstate engagement was cautious, and expectations regarding counterparts' intentions remained negative. At the same time, the perceived necessity to cooperate, together with incentives and facilitation by international development partners, led to negotiations and ultimately to the signing of the Sava Framework Agreement.

At the interorganisational level, there was no prior experience of cooperation among the newly independent states. Although many water professionals knew each other from the Yugoslav period, organisations approached cooperation cautiously. This is reflected in a general lack of trust intensity across all trust sources, as formal mandates, procedures, and institutional backing were not yet in place.

At the interpersonal level, early interactions during negotiations were described as friendly, with positive expectations regarding future cooperation even before the agreement was signed. This corresponds to low trust intensity generated through value-shaping and psychosocial sources, alongside a lack of trust in risk-minimising sources, given the absence of formal protections or institutional guarantees.

By 2013, water-related organisations in the Sava Basin had accumulated practical experience with cooperation and demonstrated increasing reliability. This resulted in rising trust intensity at the interorganisational level, moving toward medium to high intensity in risk-minimising sources as procedures and routines became established. Value-shaping and psychosocial trust sources also strengthened, though more modestly, reflecting growing but still cautious confidence in cooperation outcomes.

At the interpersonal level, trust intensity increased through repeated joint activities, expanding professional networks, and the emergence of shared understandings of the value of cooperation. This shift is reflected in low to medium trust intensity across risk-minimising and psychosocial sources, and medium trust intensity in value-shaping sources, as experts became more open to exploring new cooperative initiatives.

At the interstate level, however, mistrust persisted due to unresolved political tensions, constraining the intensity of trust despite progress at lower governance levels. From 2013 onward, and through the reference year of 2024, trust intensity gradually increased across interpersonal and interorganisational levels and across trust sources. Nonetheless, mistrust in risk-minimising sources at the interstate level remained, underscoring the enduring separation between political relations and the operational consolidation of cooperation in the Sava Basin.

4.4.2. Syrdarya River Basin: fluctuating and constrained trust

Fig. 2 summarises how trust in the Syrdarya River Basin is configured

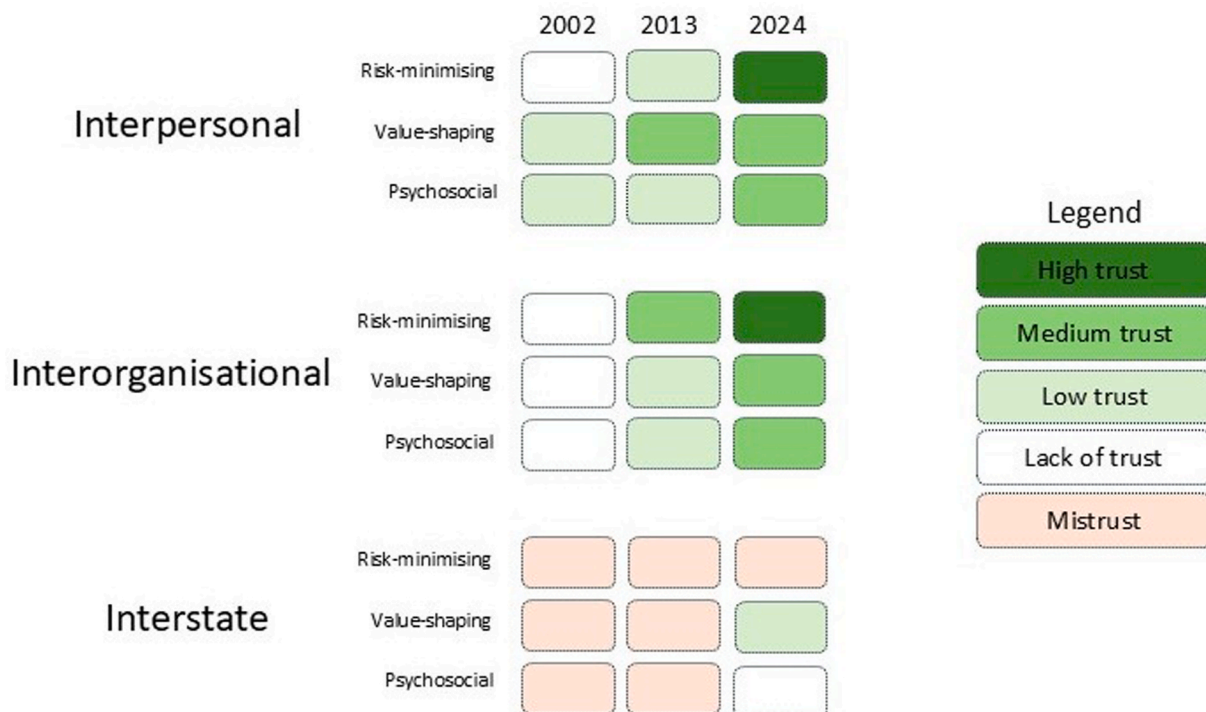


Fig. 1. Retrospective reconstruction of perceived trust configurations in the Sava River Basin.

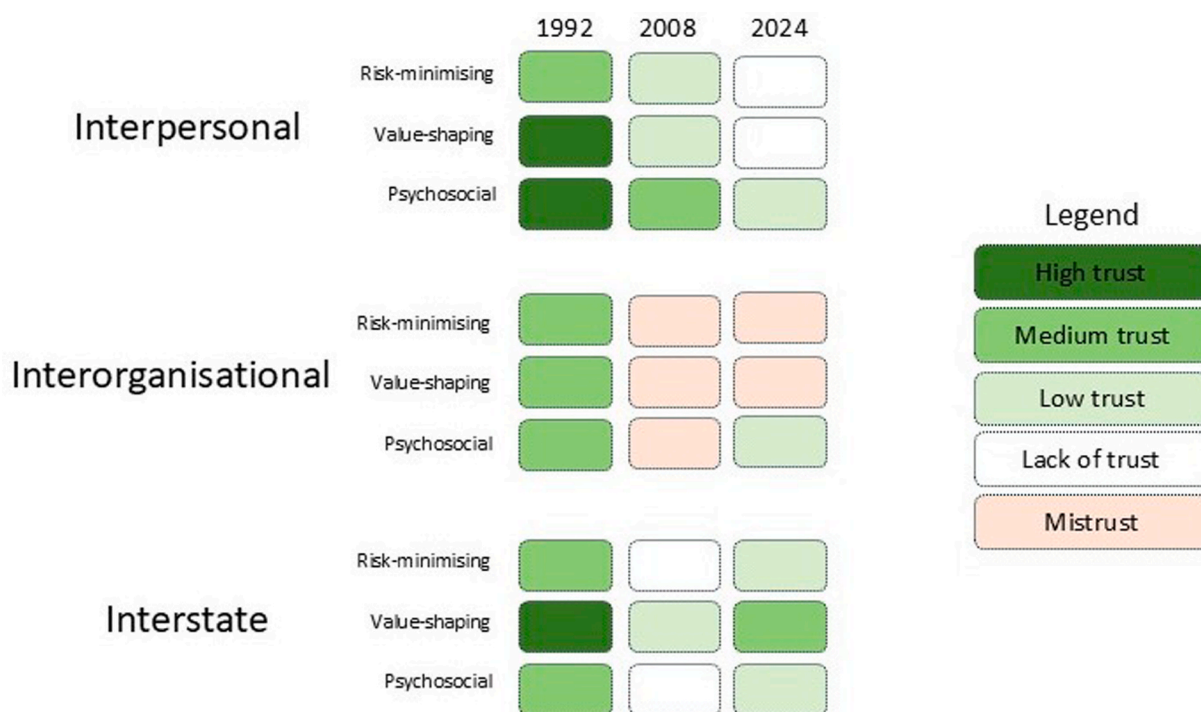


Fig. 2. Retrospective reconstruction of perceived trust configurations in the Syrdarya River Basin.

across governance levels and trust sources in 1992 (the year after independence when the first agreements were signed), 2008, and 2024. Read horizontally, the figure reveals a decline and fragmentation of trust intensity at interpersonal and interorganisational levels; read vertically, it highlights a partial recovery of trust intensity at the interstate level in recent years.

The cells for 1992 in Fig. 2 indicate that expectations for cooperation among Central Asian countries were overall very positive across governance levels and trust sources, which we interpret as medium to high trust intensity. Despite the absence of prior experience with cooperation as independent states, early post-Soviet cooperation was characterised by optimism, strong value-shaping narratives of regional unity, and dense psychosocial ties among water experts.

In subsequent years, however, trust intensity declined markedly. By 2008, water cooperation had slowed as the water-energy exchange mechanism between upstream and downstream countries ceased functioning and IFAS proved unable to effectively mediate emerging disagreements. Expectations for future cooperation became less positive, which is reflected in lower trust intensities across all three governance levels. This period also coincided with the emergence of the Rogun dam dispute between Uzbekistan and Tajikistan, which further undermined confidence in basin-wide cooperation.

At the interorganisational level, declining institutional performance and ineffective regional projects limited the ability to envision future cooperation and constrained new basin-wide initiatives. This is reflected in low trust intensity and, in some cases, mistrust across risk-minimising and value-shaping sources by 2008. Interstate relations remained uneven: while relations among some countries remained cooperative, tensions among others led to a decline in regional meetings, indicating an overall lack of trust in risk-minimising and psychosocial sources and low trust intensity in value-shaping sources.

At the interpersonal level, expectations remained more forward-looking, particularly among the older generation of water experts, drawing primarily on psychosocial trust sources such as shared language and professional background. However, increasing reluctance of governmental agencies to cooperate constrained interpersonal interaction, resulting in low trust intensity related to risk-minimising and

value-shaping sources.

From 2016 onward, interstate relations improved and several new regional initiatives were launched, leading to a partial recovery of trust intensity at the interstate level, as reflected in Fig. 2 for 2024. However, continued reluctance to reform institutional and legal frameworks indicates persistent mistrust at the interorganisational level. At the same time, generational turnover among water experts, through retirement and the recruitment of new staff, has weakened previously established professional networks, contributing to lower trust intensity at the interpersonal level.

These trust configurations are also shaped by unequal and issue-specific forms of power. Upstream states possess leverage over the timing of water releases and hydropower generation, while Uzbekistan has historically exercised greater political and economic influence in regional relations. Downstream dependence on water for irrigation simultaneously creates vulnerability. Risk-minimising arrangements therefore do not simply neutralise uncertainty: they may protect some interests while leaving others exposed. Similarly, narratives of brotherhood and regional unity may coexist with distributional struggles over who controls water and who bears the costs of seasonal releases. Mistrust in this context reflects not only perceptions or institutional weakness, but also actors' unequal capacity to shape the terms of cooperation.

Overall, the Syrdarya case demonstrates how trust intensity can fluctuate without consolidating. While interstate trust intensity has partially recovered, its limited alignment with trust at interpersonal and interorganisational levels constrains its practical impact. Unlike the Sava Basin, where trust intensity accumulated through institutional performance, trust in the Syrdarya Basin remains shallow, fragmented, and vulnerable to reversal, highlighting the importance of alignment across governance levels for trust to become operationally meaningful.

4.4.3. Comparative interpretation: alignment, misalignment, and resilience

Comparing the Sava and Syrdarya river basins reveals how different configurations of trust sources, levels, and intensity shape the stability and vulnerability of transboundary water cooperation over time. While both basins exhibit uneven distributions of trust across governance

levels, the direction and consequences of these patterns diverge.

These contrasting trajectories cannot be attributed to trust or institutional performance alone. In the Sava Basin, post-war reconstruction, international facilitation, European integration incentives, and the perceived benefits of restoring basin-wide cooperation supported institutionalisation. In the Syrdarya Basin, seasonal hydropower-irrigation interdependence, competing national priorities, power asymmetries, and changing bilateral relations constrained basin-wide arrangements. These conditions shape the risks, dependencies, and expectations through which actors assess the reliability of cooperation. The framework therefore examines how they are reflected in trust configurations.

In the Sava Basin, trust has gradually consolidated as a routine basis for cooperation at the interpersonal and interorganisational levels, despite the persistence of weak or absent interstate trust. This configuration reflects a high degree of alignment between risk-minimising and value-shaping sources at lower governance levels, which has enabled trust to be relied upon consistently in everyday practice. Crucially, this alignment has generated resilience: cooperation remains stable even when political relations are strained, as institutionalised routines and professional norms compensate for the absence of political confidence. Trust in the Sava Basin has therefore accumulated “from below”, anchored in institutional performance rather than political reconciliation.

In contrast, the Syrdarya Basin is characterised by persistent misalignment across governance levels. While interstate trust has increased moderately in recent years through renewed political engagement and symbolic signalling, this shift has not been matched by strengthening trust at interorganisational or interpersonal levels. Weak risk-minimising sources, fragmented institutional arrangements, and strong vertical accountability constrain the extent to which trust can be relied upon in practice. As a result, trust remains shallow and situational, with limited capacity to stabilise cooperation beyond episodic political goodwill. The absence of downward translation from interstate trust to operational practice leaves cooperation vulnerable to reversal.

Viewed comparatively, these cases demonstrate that the presence of trust at a single governance level is not sufficient for sustained transboundary cooperation. Instead, what matters is how trust is configured across levels and sources, and whether these configurations produce alignment or compensate for misalignment. In the Sava Basin, strong trust at lower levels compensates for political mistrust, enabling durable cooperation. In the Syrdarya Basin, increased interstate trust without corresponding institutional consolidation, even in such a pronounced top-down governance system, fails to generate similar stability.

These findings underscore the analytical value of examining trust not as a unitary or linear phenomenon, but as a relational configuration that evolves over time. By making visible how trust is unevenly relied upon across sources and levels, the three dimensions of the Trust Angles Framework can be useful in attempts to explain why cooperation can persist under conditions of political mistrust in some contexts, while remaining fragile despite political rapprochement in others. This comparative perspective highlights the importance of institutionalised risk reduction and routinised practice in transforming trust from symbolic rhetoric into a reliable foundation for cooperation.

5. Discussion: trust as configuration, process, and governance condition

This study set out to move beyond binary understandings of trust/mistrust in transboundary water cooperation by examining how trust operates in practice across different sources, levels, and intensities. By looking at two river basins through the three trust angles and their evolution over time, the analysis demonstrates that trust is best understood as a configuration of relational dynamics that is unevenly distributed, historically shaped, and continuously recalibrated.

Trust as a configurational phenomenon

The findings show that trust does not operate uniformly across

governance levels, nor does it draw on the same sources in different contexts. In both basins, trust emerges through specific combinations of risk-minimising, value-shaping, and psychosocial sources that are themselves shaped by unequal capacities to define risks, institutionalise particular priorities, and influence the terms of cooperation. They interact differently at interpersonal, interorganisational, and interstate levels. These configurations help explain how similar institutional arrangements are interpreted and relied upon differently across governance contexts.

When looking at the recent years of cooperation, in the Sava Basin, the alignment of risk-minimising sources with strong interorganisational routines and dense interpersonal interaction has enabled cooperation to stabilise despite persistent political mistrust at the interstate level. In contrast, the Syrdarya Basin illustrates how trust expressed at the interstate level may coexist with weak organisational and interpersonal trust, limiting the translation of diplomatic goodwill into operational cooperation. These findings challenge assumptions that trust cascades automatically from political leadership to implementation.

Trust as a temporal and historically situated process

A key contribution of this study lies in its explicit attention to temporal dynamics. Rather than treating trust as a static condition, the analysis shows how participants retrospectively understood trust configurations to have evolved in relation to institutional performance, political change, and accumulated experience. In the Sava Basin, participants' accounts suggest that trust gradually accumulated at lower governance levels through routinised cooperation and institutional reliability, becoming increasingly resilient to political fluctuation. In the Syrdarya Basin, by contrast, trust has remained episodic and uneven, oscillating in response to leadership change and geopolitical context, without becoming deeply institutionalised.

These contrasting trajectories highlight that time alone does not produce trust. Trust accumulation depends on whether cooperative practices become embedded in everyday routines and supported by credible institutions. Where such embedding is absent, trust remains fragile, regardless of repeated political engagement.

Mistrust as a factor in sustaining cooperation

Importantly, the findings also challenge normative assumptions that mistrust necessarily undermines cooperation. In both basins, elements of mistrust coexist with functional cooperation and, in some cases, actively shape how cooperation is organised. In the Sava Basin, persistent political mistrust has reinforced the reliance on formal rules, procedures, and institutional mandates, contributing to a cautious but stable form of cooperation. In the Syrdarya Basin, scepticism regarding institutional reliability has led actors to rely on safeguards, hierarchical authorisation, and selective engagement.

These patterns resonate with recent critical scholarship that conceptualises mistrust as a rational and historically informed response to power asymmetries and past experience, rather than as a governance failure (Cascão, 2025). Recognising mistrust as an active condition helps explain why cooperation may persist without high reliance on trust, and why attempts to “build trust” without addressing underlying institutional and political constraints may have limited impact.

Because participants were predominantly officials working in politically sensitive and hierarchical settings, some may have moderated direct criticism. The relative scarcity of explicit statements of mistrust should therefore not be interpreted as evidence of its absence.

Contribution to debates on trust, cooperation, and hydropolitics

The findings of this study contribute to several ongoing debates in the scholarship on transboundary water governance, particularly concerning the relationship between cooperation, trust, and affect. First, by demonstrating that cooperation may persist in the absence of high interstate trust, the analysis reinforces and extends work that challenges linear assumptions about conflict-cooperation dynamics (e.g., Zeitoun & Mirumachi, 2008). While earlier studies conceptualised conflict and cooperation as coexisting along a continuum, the Trust Angles Framework adds analytical depth by showing how specific trust configurations

across governance levels stabilise or constrain cooperative practices, rather than assuming that cooperation reflects shared trust.

Second, the study speaks to debates on the politics of cooperation and depoliticisation in water governance. Critical scholarship has shown that technocratic framings of water governance and institutionalised modes of engagement can obscure power asymmetries and unresolved political tensions by shifting contestation into managerial and technical domains (e.g., Mehta et al., 2019; Swyngedouw, 2011). The Sava case illustrates how institutionalisation can sustain cooperation despite persistent interstate mistrust. Formal rules and routines can therefore have practical benefits without resolving the underlying political tensions.

Third, by explicitly distinguishing between lack of trust and mistrust, the findings contribute to emerging debates in transboundary water cooperation that conceptualise mistrust as a constitutive element of governance rather than its failure (Cascão, 2025). In both basins, mistrust could motivate reliance on safeguards, formal procedures, and cautious engagement strategies. Rather than undermining cooperation, such managed mistrust shapes how cooperation is organised and stabilised under conditions of uncertainty and asymmetry, challenging normative discourses that frame trust building as an unqualified good.

Fourth, and importantly, the analysis contributes to a growing body of work that foregrounds the affective dimensions of cooperation in transboundary water governance. Recent studies have highlighted how emotions, relational atmospheres, and affective experiences, such as brotherhood, friendship, and pride, shape willingness to engage, perceptions of counterparts, and the durability of cooperation (Dadabaev et al., 2023; Keskinen et al., 2023; Seide & Fantini, 2023). The Trust Angles Framework complements this literature by showing how affective factors are not separate from institutional or political dynamics, but are embedded within psychosocial trust sources and interact with risk-minimising and value-shaping foundations.

In both basins, affective elements, such as ease of communication, shared language, or informal sociability, shape how trust is experienced and expressed at interpersonal and interorganisational levels. However, the analysis also demonstrates that affective comfort alone is insufficient to sustain cooperation in the absence of institutional reliability or shared expectations of effectiveness. This finding shows possibility of situating emotions and relational atmospheres within broader trust configurations.

The framework's transferability should nevertheless be treated cautiously because both basins share peculiar historical legacy. While its analytical questions may apply elsewhere, the specific sources and configurations of trust must be established empirically in each context.

6. Conclusion

This article has argued that trust in transboundary water cooperation is a complex and dynamic process. Drawing on a comparative empirical analysis of the Sava and Syrdarya river basins, we have shown that trust operates as a multidimensional, relational, and historically situated process, shaped by specific configurations of sources, levels, and intensities.

By looking at trust and its evolution across the three angles (trust sources, intensities and levels), the study demonstrates how cooperation can be sustained under conditions of political mistrust, as well as why political rapprochement does not necessarily translate into effective governance. The Trust Angles Framework does not seek to measure trust or prescribe how it should be built. Instead, it provides a structured way of diagnosing where trust is present, where it coexists with mistrust, and how these conditions interact across governance levels and over time.

The findings have three broader implications. First, they caution against equating cooperation with trust, highlighting the need to examine the relational and institutional foundations of cooperative practices. Second, they underscore the importance of temporal analysis in trust research, as trust configurations evolve unevenly and may stabilise, stagnate, or regress. Third, they invite a reconsideration of mistrust not as a pathology to be eliminated, but as a constitutive element of governance that can shape cautious and rule-based cooperation.

For future research, studying different trust dimensions comparatively and in historical perspective may further illuminate how trust and mistrust interact with institutional change, power relations, and environmental stress. For practitioners, the framework does not prescribe particular trust-building interventions or assume that reliable institutions can be produced through policy design alone. Instead, it can help diagnose which relational and institutional conditions currently support cooperation, where trust remains fragile or uneven, and where historically embedded constraints limit the effects of particular interventions.

CRedit authorship contribution statement

Bota Sharipova: Writing – review & editing, Writing – original draft, Methodology, Investigation, Conceptualization. **Jennifer Sehring:** Writing – review & editing, Supervision, Methodology, Conceptualization. **Dejan Komatina:** Writing – review & editing, Visualization, Validation. **Marko Keskinen:** Writing – review & editing, Conceptualization.

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Ethical review statement

The research design was reviewed and approved by the Research Ethics Committee of IHE Delft Institute for Water Education. Prior to participation, all interviewees provided full, informed consent and were clearly informed that their data would be treated with strict anonymity, in full compliance with the General Data Protection Regulation and relevant data protection standards. Participants were also notified that any data collected would be analysed in aggregate form, ensuring no individual could be identified, and that they retained the right to withdraw from the study at any stage.

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Appendix A. List of interviewees

Table A1

Code	Country or basin, and type of organisation	Format	Date of interview
Interviewee 1	Syrdarya, river basin organization (RBO)	Online	5 October 2022
Interviewee 2	Kyrgyzstan, national agency	Online	6 October 2022
Interviewee 3	Sava, RBO	Online	6 October 2022
Interviewee 4	Sava, RBO	In-person	11 October 2022
Interviewee 5	Sava, RBO	In-person	11 October 2022
Interviewee 6	Sava, RBO	In-person	13 October 2022
Interviewee 7	Sava, RBO	In-person	13 October 2022
Interviewee 8	Sava, RBO	In-person	14 October 2022
Interviewee 9	Bosnia and Herzegovina, national expert	Online	18 October 2022
Interviewee 10	Sava, international organisation	In-person	20 October 2022
Interviewee 11	Slovenia, national agency	In-person	1 October 2022
Interviewee 12	Slovenia, national agency	In-person	1 October 2022
Interviewee 13	Slovenia, national agency	In-person	2 November 2022
Interviewee 14	Slovenia, national agency	In-person	2 November 2022
Interviewee 15	Serbia, national agency	In-person	7 November 2022
Interviewee 16	Serbia, national agency	In-person	7 November 2022
Interviewee 17	Serbia, national agency	In-person	7 November 2022
Interviewee 18	Serbia, national agency	In-person	7 November 2022
Interviewee 19	Serbia, national agency	In-person	9 November 2022
Interviewee 20	Danube, RBO	In-person	11 November 2022
Interviewee 21	Bosnia and Herzegovina, national expert	In-person	15 November 2022
Interviewee 22	Bosnia and Herzegovina, national agency	In-person	17 November 2022
Interviewee 23	Bosnia and Herzegovina, national agency	In-person	21 November 2022
Interviewee 24	Bosnia and Herzegovina, national agency	In-person	21 November 2022
Interviewee 25	Sava, RBO	In-person	15 November 2022
Interviewee 26	Bosnia and Herzegovina, national expert	In-person	15 November 2022
Interviewee 27	Montenegro, national agency	In-person	24 November 2022
Interviewee 28	Montenegro, national agency	In-person	25 November 2022
Interviewee 29	Slovenia, national agency	In-person	1 December 2022
Interviewee 30	Croatia, national agency	In-person	6 December 2022
Interviewee 31	Croatia, national agency	In-person	6 December 2022
Interviewee 32	Croatia, national agency	In-person	7 December 2022
Interviewee 33	Sava, RBO	Online	7 February 2023
Interviewee 34	Syrdarya, RBO	In-person	4 October 2023
Interviewee 35	Syrdarya, RBO	In-person	4 October 2023
Interviewee 36	Uzbekistan, national agency	In-person	4 October 2023
Interviewee 37	Uzbekistan, national agency	In-person	5 October 2023
Interviewee 38	Uzbekistan, national agency	In-person	6 October 2023
Interviewee 39	Kazakhstan, national agency	In-person	16 October 2023
Interviewee 40	Kazakhstan, national agency	In-person	17 October 2023
Interviewee 41	Kazakhstan, national agency	In-person	18 October 2023
Interviewee 42	Kazakhstan, national agency	In-person	18 October 2023
Interviewee 43	Kazakhstan, national agency	In-person	18 October 2023
Interviewee 44	Kyrgyzstan, national agency	In-person	25 October 2023
Interviewee 45	Kyrgyzstan, national agency	In-person	26 October 2023
Interviewee 46	Kyrgyzstan, national agency	In-person	28 October 2023
Interviewee 47	Tajikistan, national agency	In-person	7 November 2023
Interviewee 48	Tajikistan, national agency	In-person	7 November 2023
Interviewee 49	Tajikistan, national agency	In-person	7 November 2023
Interviewee 50	Syrdarya, international organisation	Online	23 November 2023
Interviewee 51	Uzbekistan, national agency	Online	12 December 2023
Interviewee 52	Syrdarya, RBO	Online	13 December 2023
Interviewee 53	Syrdarya, RBO	In-person	17 January 2024
Interviewee 54	Serbia, national agency	In-person	17 January 2024
Interviewee 55	Sava, RBO	In-person	17 January 2024
Interviewee 56	Kyrgyzstan, national agency	In-person	18 January 2024
Interviewee 57	Sava, RBO	In-person	18 January 2024
Interviewee 58	Uzbekistan, national expert	In-person	18 January 2024
Interviewee 59	Sava, international organisation	Online	26 January 2024
Interviewee 60	Sava, international organisation	Online	2 February 2024
Interviewee 61	Uzbekistan, national expert	Online	5 March 2024
Interviewee 62	Slovenia, national agency	Online	6 March 2024
Interviewee 63	Serbia, national agency	Online	6 March 2024
Interviewee 64	Slovenia, national agency	Online	7 March 2024
Interviewee 65	Syrdarya, RBO	Online	21 November 2024

Data availability

Due to the sensitive nature of the interview topics, making the data available would risk compromising participant confidentiality and privacy.

References

- Axelrod, R., 1984. *The Evolution of Cooperation*. Basic Books.
- Axelrod, R., Keohane, R.O., 1985. Achieving cooperation under anarchy: Strategies and institutions. *World politics* 38 (1), 226–254.

- Brigg, M., Bleiker, R., 2010. Autoethnographic international relations: exploring the self as a source of knowledge. *Rev. Int. Stud.* 36 (3), 779–798.
- Budds, J., 2009. Contested H2O: Science, policy and politics in water resources management in Chile. *Geoforum* 40 (3), 418–430.
- Burnier, D., 2006. Encounters with the self in social science research: a political scientist looks at autoethnography. *J. Contemp. Ethnogr.* 35 (4), 410–418.
- Cascão, A.E., 2025. The role of distrust in transboundary water relations. In: *Routledge Handbook of Water Diplomacy*. Routledge, pp. 202–214.
- Cascão, A.E., Zeitoun, M., 2010. Power, hegemony and critical hydropolitics. *Transboundary Water Manage. Principles Practice* 27, 42.
- Coleman, J.S., 1988. Social capital in the creation of human capital. *Am. J. Sociol.* 94 (Supplement), S95–S120.
- Dadabaev, T., Sehring, J., Djalilova, N., 2023. Central Asian water neighbourhood: a constructivist reconceptualisation of hydropolitics in Central Asia. *Water Altern.* 16 (3), 930–948.
- Dinar, A., Wolf, A.T., 1994. International markets for water and the potential for regional cooperation: Economic and political perspectives in the Western Middle East. *Econ. Dev. Cult. Chang.* 43 (1), 43–66.
- Hoffman, A.M., 2006. *Building Trust: Overcoming Suspicion in International Conflict*. State University of New York. Suny Press.
- Horowitz, L.S., 2010. “Twenty years is yesterday”: science, multinational mining, and the political ecology of trust in New Caledonia. *Geoforum* 41 (4), 617–626.
- Hu, Z., Chen, X., Chen, D., Li, J., Wang, S., Zhou, Q., Guo, M., 2019. “Dry gets drier, wet gets wetter”: a case study over the arid regions of central Asia. *Int. J. Climatol.* 39 (2), 1072–1091.
- Hussein, H., Poplawsky, M., Mohapatra, T., 2023. The political context of change in transboundary freshwater agreements. *Environmental science & policy* 149, 103572.
- International Sava River Basin Commission, 2022. *Sava River Basin Management Plan (2022–2027)*. International Sava River Basin Commission, Zagreb.
- Keohane, R.O., 1984. *After hegemony*, 54. Princeton university press, Princeton.
- Keskinen, M., Häkkinen, E., Haapala, J., Sharipova, B., 2023. Trust in transboundary waters: Identifying trust-building in water diplomacy literature. *Water Altern.* 16 (3).
- Komatina, D., 2025. Water diplomacy in support of sustainable development – the case of the Sava River Basin. In: Islam, S., Smith, K., Klimes, M., Salzberg, A. (Eds.), *Routledge Handbook of Water Diplomacy*. Routledge, London, England, pp. 541–556.
- Komatina, D., Grošelj, S., 2014. Transboundary water cooperation for sustainable development of the Sava River Basin. In: Milačić, R., Ščančar, J., Paunović, M. (Eds.), *The Handbook of Environmental Chemistry*, Vol. 31. Springer, pp. 1–25.
- Krasner, S.D., 1982. Structural causes and regime consequences: regimes as intervening variables. *International organization* 36 (2), 185–205.
- Kydd, A.H., 2005. *Trust and Mistrust in International Relations*. Princeton University Press.
- Linton, J., Budds, J., 2014. The hydrosocial cycle: Defining and mobilizing a relational-dialectical approach to water. *Geoforum* 57, 170–180.
- Lioubimtseva, E., Henebry, G.M., 2009. Climate and environmental change in arid Central Asia: Impacts, vulnerability, and adaptations. *J. Arid Environ.* 73 (11), 963–977.
- Matić, J.K., 2011. The framework agreement on the Sava River Basin (FASRB). In: Montini, M., Bogdanović, S. (Eds.), *Environmental Security in South-Eastern Europe*. Springer https://doi.org/10.1007/978-94-007-0228-8_15.
- Mayer, R.C., Davis, J.H., Schoorman, F.D., 1995. An integrative model of organizational trust. *Acad. Manag. Rev.* 20 (3), 709–734.
- McDermott, C.L., 2012. Trust, legitimacy and power in forest certification: a case study of the FSC in British Columbia. *Geoforum* 43 (3), 634–644.
- Mehta, L., Huff, A., Allouche, J., 2019. The new politics and geographies of scarcity. *Geoforum* 101, 222–230.
- Pursiainen, C., Forsberg, T., 2021. Relations of trust and mistrust. *Psychol. Foreign Policy* 299–336.
- Rathbun, B.C., 2009. It takes all types: social psychology, trust, and the international relations paradigm in our minds. *Int. Theory* 1 (3), 345–380.
- Rempel, J.K., Holmes, J.G., Zanna, M.P., 1985. Trust in close relationships. *J. Pers. Soc. Psychol.* 49 (1), 95–112.
- Rousseau, D.M., Sitkin, S.B., Burt, R.S., Camerer, C., 1998. Not so different after all: a cross-discipline view of trust. *Acad. Manag. Rev.* 23 (3), 393–404.
- Ruzicka, J., Keating, V.C., 2015. Going global: trust research and international relations. *J. Trust Res.* 5 (1), 8–26.
- Schatz, E., 2009. *Political Ethnography: What Immersion Contributes to the Study of Power*. University of Chicago Press.
- Sehring, J., Schmeier, S., ter Horst, R., Offutt, A., Sharipova, B., 2022. Diving into water diplomacy—exploring the emergence of a concept. *Diplomatica* 4 (2), 200–221.
- Seide, W.M., Fantini, E., 2023. Emotions in water diplomacy: negotiations on the grand Ethiopian renaissance dam. *Water Altern.* 16 (3).
- Sultana, F., 2011. Suffering for water, suffering from water: Emotional geographies of resource access, control and conflict. *Geoforum* 42 (2), 163–172.
- Swyngedouw, E., 2011. Depoliticized environments: the end of nature, climate change and the post-political condition. *Royal Inst. Philos. Suppl.* 69, 253–274.
- Turgul, A., McCracken, M., Schmeier, S., Rosenblum, Z.H., de Silva, L., Wolf, A.T., 2024. Reflections on transboundary water conflict and cooperation trends. *Water Int.* 49 (3–4), 274–288.
- United Nations Economic Commission for Europe, 2015. **Policy guidance note on the benefits of transboundary water cooperation: Identification, assessment and communication**. UNECE. https://unece.org/fileadmin/DAM/env/water/publications/WAT_47_Benefits/ECE_MP.WAT_47_PolicyGuidanceNote_BenefitsCooperation_1522750_E.pdf_web.pdf.
- Voogd, R., Rudberg, P.M., de Vries, J.R., Beunen, R., Espiritu, A.A., Methner, N., Larsen, R.K., Fedreheim, G.E., Goes, S., Kruger, E., 2022. A systematic review on the role of trust in the water governance literature. *Water Res.* X 16, 100147.
- Wheeler, N.J., 2018. *Trusting enemies: Interpersonal relationships in international conflict*. Oxford University Press.
- Withers, C.W., 2018. Trust—in geography. *Prog. Hum. Geogr.* 42 (4), 489–508.
- Zeitoun, M., Mirumachi, N., 2008. Transboundary water interaction I: Reconsidering conflict and cooperation. *Int. Environ. Agreem.: Politics Law Econ.* 8, 297–316.
- Ziganshina, D., 2023. Water infrastructure in Central Asia: Legal and institutional frameworks. *Front. Clim.* 5, 1284400.
- Ziganshina, D.R., de Schutter, J.L., 2022. Paving the way for evidence-driven transboundary water cooperation in Central Asia. *JAWRA J. Am. Water Resour. Assoc.* 58 (6), 1149–1161.