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Enacting Cross-Border Cooperation: Insights from Regional Flood Risk Practitioners

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ABSTRACT

Managing flood risk in transboundary river basins requires cooperation across political borders. Such cooperation occurs across multiple governance levels, from supra-national and national to regional and local. Despite their pivotal role, regional governance actors responsible for the management of sub-basins and river systems remain underexamined in research on European water cooperation. The 2021 floods in the Benelux+ region exposed this gap, revealing breakdowns in regional cooperation and underscoring the need to understand how cooperation is interpreted and carried out by those working in regional cross-border river basins.

This study examines how regional flood risk managers perceive and enact cross-border cooperation in the Dutch-German-Belgian border area. Focusing on regional river basins where responsibilities of a variety of actors intersect, it adopts a practice-theoretical perspective that views cooperation as situated practices.

Qualitative interviews, embedded in a Q-sort exercise, explore the perceived relevance of cooperative practices. Purposive and snowball sampling identified practitioners directly involved in cross-border work, including hydrologists, flood forecasters, policy advisors, project managers, and strategic leads. Data collection is ongoing, with 11 interviews completed to date.

Emerging insights reveal differences in how cooperation is conceptualized across actors. Operational practitioners view cooperation as task-oriented and operational, while tactical and strategic actors hold broader ambitions for cooperation but struggle to translate them into concrete goals. While these differences may be a natural reflection of practitioner roles, it highlights a gaps between strategic expectations and operational realities. Strategic actors' vague goals provide limited guidance for operational implementation, and in combination with a narrow conceptualisations of cooperation among operational actors, valuable forms of cooperation may remain underexplored because they fall outside current conceptual frames of cooperation

KEYWORDS: Flood risk management, Cross-border cooperation, Regional governance, Transboundary river basins

1 INTRODUCTION

Transboundary lakes and river basins, referring to waterways that cross country borders, comprise 47% of the world's surface (McCracken and Wolf 2019). The need for cooperative governance approaches to tackle interdependent and transboundary risks in these cross-border river basins is well established in the literature (e.g. Thaler et al. 2019; Garrick et al. 2018; Clegg et al. 2021; Krishna Prabhakar 2022). This is echoed in practice, where cooperation is been formally recognized and institutionalized. Global agreements such as the 1997 UN Watercourses Convention and the EU Water Framework Directive and the EU Flood Directive set out clear expectations for cooperation in shared

river basins, requiring equitable use, integrated planning and coordinated action between countries, sectors, and governance levels (Baranyai 2019; Directive 2000). While these frameworks establish formal obligations for cooperation, they are not able to determine how to enact such cooperation in practice.

Cross-border flood risk management takes place through integrated actions across jurisdictions, often with varying institutional capacities and priorities (Pahl-Wostl, 2007). In the European context, responsibilities for cross-border cooperation are distributed across governance levels (Klein &Van den Vat 2024). National governments contribute to cross-border cooperation in major river basins through their participation in river commissions, transnational agreements and negotiations of basin-wide goals (Pfeiffer et al. 2013). In smaller transboundary tributary basins, regional authorities, such as provinces, municipalities, and subnational agencies hold primary responsibility for the enactment of operational cross-border flood-risk management, and are additionally expected to contribute to strategic planning for the region (Klein &Van den Vat 2024). This multilevel distribution of cooperation responsibilities creates a complex governance landscape in which regional actors play a pivotal yet often underexamined role in cross-border flood risk management.

The devastating floods of July 2021 in the Benelux+ region exposed the critical importance of the regional cross-border cooperation. Evaluations of the event, which caused an estimated EUR 34 billion in damages (Mohr et al. 2023) and left over 240 people dead (Hagenlocher et al. 2022), highlighted fragmented crisis governance and breakdowns in coordination among regional authorities (Hagenlocher et al. 2022). Despite their central role in implementing cross-border flood risk management, cooperation among regional practitioners have received relatively little attention in the literature (Baranyai 2019), resulting in limited understanding of how cooperation at the regional scale can best be supported.

Cross-border flood risk management in the Benelux+ regional river basins depends on a diverse set of actors, with varying mandated and responsibilities carrying out interdependent tasks, from technical data exchange and local project implementation to strategic planning and crisis coordination (Klein &Van den Vat 2024). Cooperation is shaped by how actions integrate into existing practices and roles, how practitioners conceptualise cooperation and how they understand the motivations and requirements for cooperation (Boholm et al. 2012). From this perspective, cooperation is enacted through situated practices, making practitioners' lived experiences central to understanding how cross-border collaboration actually works. Building on this perspective, the study examines how regional practitioners conceptualise and prioritise cooperation in practice. By focusing on these practical processes, the research aims to uncover the operational dynamics of cooperation and identify opportunities to strengthen cooperation across borders.

The study addresses the following questions: *How do regional practitioners conceptualise, and prioritise cross-border cooperation in regional flood risk management, and how does this influence cooperative flood risk management in cross-border regions?* To address this question, the study employs a qualitative analysis of interviews with regional flood risk managers in Germany, the Netherlands, and Belgium. The interviews were part of a Q-sort, an exercise in which participants were asked to rank the relevance of statements representing action of cross border cooperation. In doing so, the study provides an operationalisation of cooperation, providing insights into how regional practitioners conceptualise and prioritise cooperative tasks. The research identifies gaps between actor perceptions, which act as potential leverage points for strengthening cooperation in border regions. The paper proceeds with an overview of the conceptual framing, followed by the methodology, preliminary findings on practitioners' perspectives, and a reflection on potential implications for strengthening regional cross-border cooperation.

2 THEORY

To better understand how regional practitioners conceptualise and prioritise cross-border cooperation, this paper explores the conceptual landscape of cooperation. Bringing together insights from actor-layer perspectives and practice theory, it approaches cooperation as context-dependent and shaped by actors' roles, goals, and interpretations. By adopting a practice-oriented lens, the paper reframes cooperation as situated action, enabling an empirical analysis of how regional practitioners prioritise cooperative tasks and where misalignments may emerge within cross-border governance.

The interactions that make up cross-border governance are often conceptualised as collaboration, cooperation, or coordination, with these terms sometimes used interchangeably (Castañer, 2020; Morris and Miller-Stevens, 2015 Barbara Gray's (1985) foundational work defines collaboration as constructive engagement among actors with differing perspectives aimed at mutually beneficial solutions. Later work, including Morris and Miller-Stevens (2015), elaborates a spectrum of interaction types, highlighting gradations from low-intensity cooperation to high-intensity integration characterized by shared resources, negotiated goals, and joint decision-making.

While these conceptualisations strengthen our understanding of the structural features and relational ambitions of cross-border interactions, they offer limited insight into what cooperation should accomplish nnnnnnnn is achieved or what its concrete goals should be within specific management contexts. In flood risk management, these goals are not uniform: upstream and downstream actors face different risk profiles, regulatory obligations, and societal expectations, which shape what they consider meaningful or beneficial cooperation (Seher & Löschner. 2018). As a result, the aims of cooperation is situated within the frames of actors. Cooperation, then, cannot be understood simply in terms of ideal interaction types but must be explored in terms of how practitioners interpret what needs to be achieved and how they fit their tasks together across borders. To reflect the language of practitioners, this paper will use the term cooperation, not as an ideal type, but rather to describe a broad set of interactions between actors.

Research on cooperation in flood risk asset management shows that an actor's role strongly shapes both the goals of cooperation and the practices used to achieve them. Heijer et al. (2023) conceptualise these roles across three layers; strategic, tactical, and operational, each with distinct responsibilities. Each actor-layer faces unique challenges. Strategic actors are expected to hold clear or supported visions, tactical actors are asked to delineate responsibilities; and operational actors must navigate ambiguous and evolving rules and objectives.

According to Heijer et al. (2023) what constitutes meaningful cooperation vary depending on actor layers, the task, or goal to be achieved, and actors' objectives and expected benefits. Cooperation is therefore situated and adaptive. There is no central authority establishing priorities in cooperation, whether between strategic and operational goals, upstream and downstream interests, or differing organizational success indicators. Actors must deliberately negotiate, coordinate, and adapt their cooperative arrangements to align their goals and activities. Because each actor pursues distinct goals and works with different responsibilities, cooperative efforts only succeed when these goals can be meaningfully connected to the practices that make up cooperation. As a result, cross-border flood risk management hinges on deliberate, context-sensitive cooperation that aligns actors' goals with practical implementation.

Insights from research on the practice of risk governance further emphasise that governance processes unfold through the everyday activities of practitioners. Studies of risk governance highlight that actors do not simply implement predefined governance arrangements; rather, they actively interpret risk problems, negotiate responsibilities, and translate policy objectives into concrete actions within their organisational and professional contexts (Boholm et al 2012). From this perspective, governance is enacted through situated practices such as interpreting monitoring data, coordinating across organisations, and negotiating how risks should be managed in practice.

. A practice-theory perspective therefor offers an analytical lens that renders these interpretations empirically visible. It understands cooperation as a dynamic process performed through practitioners' routines, tools, and institutional contexts (Nicolini 2012; Feldman & Orlikowski 2011). Practices are socially and materially embedded ways of doing, shaped by professional norms, organisational expectations, and available technologies (Feldman & Orlikowski 2011). A practice lens therefore highlights how sociomaterial elements, such as models, monitoring systems, communication platforms, and forecasting tools, influence how actors interpret information, exchange insights, and coordinate decisions across borders (Orlikowski & Scott 2008).

Taken together, these insights suggests that cross-border flood risk management depends on how practitioners make sense of the aim of cooperation and how it should be enacted. By viewing cooperation

as situated and performed, a practice-theory lens provides a means to operationalise fit-for-purpose governance by showing where actors' understandings align or diverge, and where existing cooperative arrangements may need adjustment. This study therefore explores how diverse actors across organisations and roles conceptualise cooperation and its purpose. This forms a foundation for identifying opportunities to strengthen cross-border governance. and enables the design of context-sensitive governance aligned with the principles of fit-for-purpose governance.

3 METHOD

This study investigates how regional practitioners perceive and prioritise the enactment of cross-border cooperation in flood risk management in the Benelux+ region, focusing on sub-river basins along the borders of Germany, the Netherlands, and Belgium. It captures the perspectives of practitioners across strategic, tactical and operational roles involved in a broad range of tasks related to flood risk. The study follows an interpretivist epistemology, which views cooperation as shaped through the meanings, routines, and situated practices of practitioners. This aligns with a practice-theoretical lens, emphasizing how cooperation and knowledge practices are enacted in everyday work rather than solely in formal institutional arrangements.

Data is being collected through interviews as well as document analysis and observations conducted within the broader research context. Interviewees are identified through purposive sampling sampling identified practitioners directly involved in cross-border cooperation, including hydrologists, flood forecasters, policy advisors, project managers, and strategic leads across municipalities, counties, water authorities, and coordinating organisations. Snowball sampling is used to reach additional relevant actors within the cooperation network. To date, 11 Q-sort interviews with practitioners have been conducted, as part of an ongoing data collection effort. Participants represented a range of perspectives, including upstream (n=5) and downstream (n=6) actors, covering roles such as hydrologist, flood forecaster, policy advisor, project manager, strategic lead, and risk communication/early warning specialists. Data collection is continuing, with approximately 15 additional interviews planned to expand representation across governance levels and river basins.

Interviews are conducted online via Microsoft Teams, recorded, and transcribed verbatim. The post-sort interviews followed a Q-sort exercise in which participants order 36 statements representing cross-border knowledge management practices according to relevance from their professional perspective (Watts & Stenner 2012). The statements covered a range of cooperative practices, for example:

- co-developing basin-wide hazard maps, risk assessments, or damage models;
- conducting joint scenario exercises or cross-border crisis-response trainings;
- establishing and maintaining formal cross-border communication channels
- developing and maintaining shared digital dashboards for real-time data exchange;

During the exercise, participants reflected on their choices aloud, followed by a 20-minute debrief discussion. This study focuses on the qualitative reflections from these Q-sort interviews. A qualitative thematic analysis is used to identify recurring patterns in practitioners' accounts. The analysis is predominantly inductive, allowing themes to emerge while remaining sensitized by the practice-theoretical lens. Themes were compared across roles, organisational types, and countries to explore variation in practices and perspectives. The analysis presented in this paper reflects **preliminary qualitative patterns emerging from the current dataset**.

4 PRELIMINARY FINDINGS

The findings presented here reflect preliminary patterns from the Q-sort interviews conducted so far with regional practitioners. As data collection and analysis are ongoing, the results should be understood as early insights into how actors conceptualise and prioritise cross-border cooperation. Further analysis will refine these findings as the full dataset is completed.

While actors generally consider cross-border cooperation to be important in flood risk management, they differ in what they expect to achieve through cooperation and which practices they

consider relevant to engage in. Preliminary insights indicate that regional actors hold divergent conceptualisations and goals for cross-border cooperation, shaped by their roles, responsibilities, and tasks, as well as their perceived influence over outcomes and their attitudes towards challenges. These differences closely mirror the actor layers identified by Heijer et al. (2023), with distinct patterns emerging between operational and tactical, or strategic roles. The following sections first explore how operational actors conceptualise cooperation as addressing immediate, task-focused needs, before turning to tactical and strategic actors, who frame cooperation in terms of influence, learning, and basin-wide co-management. Together, these findings illustrate how differences across actor layers shape the translation of cooperative ambitions into practice and help explain where gaps in regional cross-border cooperation may emerge.

4.1 Task-focused cooperation anchored in immediate needs among operational actors

Operational actors involved in flood preparedness and response, including hydrologists, modelers, forecasters, and crisis response staff, describe cooperation primarily as a means to improve forecasts and gain coherent information of basin dynamics. Their main goal is reliable access to interpretable data, information, and knowledge under time pressure, enabling timely and well-informed decisions during flood events. Building cross-border relationships to support communication channels are highly valued among these actors. However, the depth of the relationship is less important than simply predictable and dependable contact in critical moments.

Operational actors describe their roles in terms of narrow, concrete, and siloed responsibilities, and as a result focus on cooperation for modular tasks, such as exchanging raw data, which provide immediate operational value. While they recognize that more systemic cooperation, with joint learning and basin-wide co-management could reduce flood risk overall, they generally do not consider such initiatives part of their scope due to limited authority, resources, and institutional support. This suggests that actors ambition in cross-border cooperation is stifled by actors perceived influence and capacity to act.

More complex cooperation, such as developing real-time cross-border forecasting dashboards, require alignment across regions with differing protocols and risk tolerances. For actors with narrower mandates, these tasks appear to be outside what whey consider their scope of work, with is used as a justification to consider such actions less relevant. As a result operational actors may be less likely to anticipate, request, or initiate cooperative practices designed to strengthen relationships, foster shared understanding or basin-wide coordination over time, which may limit the further development of more integrated forms of cross-border cooperation .

Reactions to the Q-sort statements illustrate this situated view on cooperation. Some operational actors were surprised by the range of possible enactments of cooperation, noting that joint practical training or exchanges would be interesting but are not part of current practice and not typically what they thought of as cooperation. This suggests that potentially valuable forms of cooperation remain underexplored, not due to lack of relevance, or difficulty of implementation, but because they fall outside actors' current frames. Broadening understandings of what cooperation can include may expand the repertoire of practices that support shared interpretation, trust-building, and basin-wide preparedness, beyond strategic actors and in to the operational domain.

The perceived cost of engaging in cooperation in the form of data and information exchange is low among actors, and no major differences in motivation have been observed between upstream and downstream actors so far. At the same time, it was observed that regions with longer histories of cooperation articulate higher ambitions and report fewer barriers for cooperation. This suggests that cooperation may function as a positive feedback loop in which early successes build confidence and normalise more ambitious practices over time. These differences indicate that the maturity of cooperation shapes how actors interpret what is feasible and worthwhile, influencing both the depth and scope of the cooperative practices they consider relevant.

4.2 Cooperation as influence among strategic actors

Throughout the interviews strategic and tactical actors, including policy officers, civil servants, and leadership figures in regional administrations and waterboards, frame cooperation as a means to shape basin-wide outcomes through joint learning and co-management. Their conceptualisation of cooperation extends beyond their immediate responsibilities, focusing on how upstream and downstream actions interact and how coordinated interventions can reduce flood risk at a systems level. Cooperation was expressed to rely on strong relationship building, and learning about not just technical details, but about processes and practices across different organisations. Strategic actors often described cooperation in normative terms, referring to expected indirect or long-term benefits for the basin as a whole. However, the specific outcomes they expect to achieve are frequently vague, and concrete goals are rarely articulated.

This lack of clarity regarding the goals of cooperation makes it difficult to translate strategic intentions into concrete, prioritised actions, and several actors reported uncertainty during the Q-sort exercise about which cooperative practices should be prioritised. This challenge appears to be linked to the systems perspective through which strategic actors enact their role, which emphasises steering basin-wide outcomes rather than advancing discrete actions. Tactical and strategic actors consistently emphasised the interdependence of the cooperative tasks they consider important. For example, developing a shared forecasting dashboard requires agreement on risk indicators, harmonised terminology, and a shared understanding of data interpretation. Because each task depends on the completion of several others, no single action generates meaningful effect on its own. This creates a chain-like structure of cooperation, in which progress can stall if one link is missing. This stands in contrast to the modular and immediately useful forms of cooperation described by operational actors, such as routine data exchange or updating contact networks. Recognising this interdependence helps explain why strategic ambitions tend to remain broad: achieving system-wide objectives requires coordinated movement across multiple fronts simultaneously.

Motivation to cooperate exists on both sides of the border, but the underlying drivers of cooperation and the institutional conditions under which actors operate differ. Downstream actors described strong incentives to collaborate, rooted in their dependence on upstream regions for managing flood risk. These incentives align with established roles and mandates for cross-border cooperation, which are supported by dedicated resources and organisational backing, enabling downstream actors to pursue more ambitious cooperative practices. Upstream actors also expressed motivation to cooperate, but their motivation is grounded less in direct risk dependency and more in professional responsibility and neighbourly solidarity. However, these motivations are not supported by adequate mandates, or resources. Upstream actors reported more limited formal mandates for cooperation, greater political constraints, and hierarchical decision-making structures that restrict their capacity to act on cooperative ambitions. As a result, a gap emerges between upstream actors' strategic aspirations and their ability to implement cooperative practices, posing a risk to sustained progress toward long-term, basin-wide initiatives.

4.3 IMPLICATIONS

The emerging findings suggest that differences in how cooperation is interpreted and enacted across actor layers are influenced by how practitioners situate cooperative tasks within their own professional identities and spheres of influence. Operational actors tend to anchor cooperation in concrete, time-sensitive responsibilities, prioritising data exchange and dependable communication channels. Strategic actors, by contrast, link cooperation to longer-term basin alignment and learning. This divergence is perhaps expected, yet it raises questions about how strategic agendas translate into operational practice. When operational actors face constraints such as limited mandate, budget, or tools, they may de-prioritise cooperative actions that fall outside their immediate responsibilities. This risks creating a gap between strategic aspirations for joint basin management and the operational realities that shape in particular crisis preparedness and crisis response cooperation. Strategic actors' limited ability to articulate concrete goals may reinforce this gap, as vague ambitions offer little guidance for

implementation and make it harder to connect cooperative practices to measurable outcomes. These reflections point to the importance of understanding not only what actors want from cooperation, but also what they believe they can realistically achieve.

5. CONCLUSION

This study provides initial insight into how regional practitioners conceptualise and enact cross-border cooperation in flood risk management. The preliminary findings suggest that cooperation is not uniform, but situated within actors' professional roles, responsibilities, and mandates. Divergent conceptualisations across actor layers highlight a challenge in aligning strategic ambitions with operational realities. Vague strategic goals combined with operational actors' focus on their defined tasks can make it difficult for strategic and operational layers to connect, limiting the translation of ambitions into concrete practices and the achievement of basin-wide cooperation objectives.

Understanding both what actors aim to achieve through cooperation and what they perceive themselves able to enact is therefore critical for designing fit-for-purpose governance arrangements. By focusing on cooperative practices, this study makes differences in how cooperation is conceptualised visible, helping to identify opportunities to bridge strategic and operational perspectives, expand practitioners' frames of cooperation, and strengthen context-sensitive governance in regional river basins. Further analysis of the Q-sort data will refine these insights by clarifying where cooperative efforts can be more effectively prioritised and operationalised across actor layers and borders.

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