

Unpacking joint sensemaking in transboundary crisis management

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Transboundary crises are becoming increasingly frequent and complex, challenging traditional disaster risk management systems that were primarily designed for bounded and localized negative events. Transboundary crises cut across geographical, sectoral, and jurisdictional boundaries, generating high levels of uncertainty, fragmented information, and coordination challenges among a wide array of actors operating at multiple governance levels. In such settings, the ability to establish and sustain joint sensemaking - the process through which actors develop a shared understanding of evolving situations - becomes a fundamental prerequisite for effective crisis management. This paper examines how joint sensemaking can be fostered in the context of transboundary crises, focusing on prevention and preparedness activities within multilevel disaster risk governance. Bringing together research on crises and organizational sensemaking, the paper clarifies how communication, interaction, situational awareness, and coordination challenges shape sensemaking processes before and during crises. In addition, it demonstrates that joint sensemaking is both essential and difficult to achieve in transboundary settings, where actors hold diverse frames of reference, operate under asymmetric information conditions, and face blurred lines of responsibility. The paper identifies key challenges for shaping joint sensemaking and argues that efforts to strengthen it must begin in the pre-crisis phase. Suggestions include developing multilevel information, sharing platforms, establishing boundary-spanning roles, enabling adaptive governance arrangements, and investing in strategic communication to counter misinformation and disinformation. These measures enhance the ability of actors to create a coherent picture of crisis development, detect weak signals, and coordinate responses effectively across borders. By unpacking the dynamics of joint sensemaking in transboundary crises, the paper contributes to a deeper understanding of how crisis management systems can be organized to better anticipate, prepare for, and respond to complex and interconnected disruptions.

Keywords: Complexity, Disaster risk management, Joint sensemaking, Transboundary crises, Uncertainty.

1. Introduction

There is widespread scientific recognition that crises have become increasingly transboundary in nature. Transboundary crises span from creeping events like pandemics and climate change to fast-onset events like cyber and terrorist attacks. The latest COVID-19 pandemic called for massive international cooperation due to its intertwined societal and economic consequences. Climate change concerns not only how to adapt to a changing climate, but also how to deal with extreme weather events and their effects on infrastructure, economies, and health. Transboundary crises underpin complexity and uncertainty, since they cross sectoral, geographical, and policy boundaries. They are compounded and impact several nations, organizations, or sectors. As such, they challenge

traditional disaster risk and crisis management by requiring, for instance, greater coordination and cooperation to manage them effectively. Due to these characteristics and regardless of the type of the crisis, responses must entail establishing a shared and clear picture of the situation through interaction and communication among policymakers and disaster risk and crisis managers at various administrative and geographical levels. According to the crisis literature (see Ansell et al. 2010), this process equates to *distributed* or *joint sensemaking*. However, joint sensemaking needs to be enhanced before the actual crisis, during prevention and preparedness activities in multilevel disaster risk governance, such as risk analysis, contingency planning, and training.

This paper aims to pinpoint the implications and challenges for joint sensemaking as a key issue for prevention and preparedness activities related to transboundary crises, building on two streams of research: crisis research and organizational sensemaking. The paper contributes to a better understanding of joint sensemaking processes by uncovering linkages among communication, interaction, situational awareness, and the ability to provide coordinated responses through prevention and preparedness activities that concern transboundary crisis management. The paper does not dive into crisis typologies (see Gundel 2005, 't Hart and Boin 2001) to uncover possible features of joint sensemaking as it should be tailored to the peculiarities of the crisis. It rather addresses overarching and shared challenges related to joint sensemaking in transboundary crises attaining prevention and preparedness measures.

The paper is organized as follows: we start by presenting the characteristics of transboundary crises and their challenges. The following section provides an explanation of sensemaking. We then discuss how transboundary crises affect joint sensemaking and, finally, propose a range of suggestions for policymakers and disaster risk and crisis managers on how to achieve joint sensemaking in such complex crisis settings.

2. What is a Transboundary Crisis?

A transboundary crisis is usually defined as a crisis that transcends traditional boundaries - be they geographical, political, legal, or sectoral - thus outstripping the capacity of any single authority or administrative structure to effectively address it. Consequently, a transboundary crisis necessitates networked responses. By crossing geographical and political boundaries, a transboundary crisis often affects several seemingly unconnected sectors at multiple governance levels (see Ekengren and Rhinard 2014). Transboundary crises cross state borders and administrative or sectoral boundaries, despite their rapid or slow onset and development. As such, their effects are less predictable and more difficult to manage than those of a crisis that unfolds within national borders or concerns a single sector, like transport. The disruptive event makes it difficult for authorities or organizations to manage it effectively. Recent years have witnessed an increase in transboundary crises, driven by greater interconnection among

states and sectors, such as the climate crisis, the so-called 2015 migration crisis, and the COVID-19 pandemic. Cybersecurity threats on digital infrastructure that affect multiple nations and sectors, economic shocks that ripple through global markets, and conflicts in the Middle East and Ukraine, are other examples of transboundary crises.

The management of both a more traditional bounded crisis (Boin 2019) and a transboundary crisis shares some common features to respond to contingencies characterized by their level of (un)predictability (Gundel 2005) and development speed ('t Hart and Boin 2001). However, transboundary disaster risk management is presumed to take a different approach from the bounded crisis (Boin 2019), which is a manageable, localized crisis with clear boundaries, particularly within the transboundary political and administrative aspects of the crisis.

Boin (2019: 95) depicts a transboundary crisis as a nightmare for crisis managers, due to the amplification of certain crisis features: it crosses borders and boundaries, since it is not confined to one country, region, or sector. It is complex and interconnected, often involving economic, social, and environmental systems, and induces cascading effects by revealing intricate interdependencies that amplify vulnerability and complicate the response. It carries uncertainty and ambiguity, since information is often incomplete or rapidly changing, rendering decision-making challenging. In addition, it can shift its scope and impact as it spreads. It requires multilevel crisis governance, since no single actor can manage it alone: cooperation among governments, international organizations, and private actors becomes essential. In addition, since no single authority has jurisdiction across all affected domains, responsibility is diffused, presenting major coordination, legitimacy, and rapid information-sharing challenges.

These characteristics have the deepest consequences in the management of the crisis, since a transboundary crisis necessitates an aggregate-level response from actors belonging to various impacted sectors, systems, hierarchical levels, and states, which are bound to establish a crisis management network to effectively cope with the crisis. Several countries, sectors, or jurisdictions are expected to coordinate responses across borders.

Before a transboundary crisis unfolds, i.e., in the pre-crisis phase (Kruke 2012), disaster risk management should have established certain forms of international collaboration, rapid information-sharing for situational awareness, and flexible governance structures. A transboundary crisis reveals the limitations of traditional disaster risk and crisis management frameworks, showing gaps in prevention, preparedness, and response. It demands effective multilevel disaster risk and crisis governance through cooperation spanning local, national, regional, and international levels and combining public, private, and civil society capacities. It requires different administrative capacities that are more flexible and adaptable, capable of rapid sensemaking, coordination, communication, and decision-making across several actors. Nonetheless, crisis planning is not the same as crisis management (Perry and Lindell 2003), since the latter impacts crisis sensemaking.

3. What is Crisis Sensemaking?

Initially conceptualized by Karl E. Weick, a key scholar in the field of organizational studies, in the 1970s and 1980s, sensemaking consists of “turning circumstances into a situation that is comprehended explicitly in words and serves as a springboard for action” (Weick et al. 2005: 409) while staying in contact with context (Weick 2009: 33). It indicates the process by which people give meaning to their collective experiences, allowing them to understand ambiguous, complex, equivocal, or confusing issues or events to guide action (Brown et al. 2015, Colville et al. 2012, Weick 1995). Sensemaking is a critical cognitive and social activity because such events often involve uncertainty, incomplete information, time pressure, and high stakes, as summarized by Boin et al. (2017: 23) with the iconic expression: “What the hell is going on?” Sensemaking aims to reduce uncertainty, identify priorities and coordinate responses when disruptive events undermine normal routines and assumptions. Indeed, sensemaking begins when expectations fail, and something unexpected happens. Weick (1995) proposed several characteristics of sensemaking, including retrospective meaning-making, the social construction of reality, and the pursuit of credibility or plausibility over objective accuracy. Retrospection refers to past practices that may

prove useful in addressing the present situation, while the social construction of reality underpins how individuals construct narratives amid volatility and incomplete information. Plausibility is often easier to achieve than accuracy, since individuals tend to rely on what they see and understand rather than to look for accuracy, which is more time consuming.

Subsequent research by scholars like Maitlis and Sonenshein (2010) extended Weick’s insights, emphasizing that sensemaking is fundamentally social and anchored in shared meaning-making. It is not just an individual cognitive process, but involves dialogue, negotiation, and shared interpretation among actors, who look back to interpret what happened (retrospective meaning-making, retrospection) and forward (plausibility, ongoing understanding) to anticipate what might occur next. It is often constructed through frames and narratives, mental models, and organizational norms and cultures to interpret signals and decide what matters. Maitlis and Christianson (2014) argue that crisis sensemaking frequently involves emotional processing and collective framing to render experiences actionable. They identify sensemaking as the organizational process by which actors interpret anomalous or expectation-violating events, underscoring the creation of shared narratives and the intentional enactment of environments through discourse.

Since its conceptualization, sensemaking has become a popular term in crisis scholarship as “the collecting, analyzing and sharing of critical information that helps to generate a shared picture of the situation” (Boin et al. 2016: 10). This definition implies that sensemaking includes three information-related stages: collection, analysis, and sharing. First, actors must gather information about the crisis, then verify it, and finally connect the dots. These stages are often intertwined in practice to guide situational awareness and risk assessments. Subsequently, information must be communicated, distributed, and shared with other involved actors. Under uncertainty, sensemaking provides a basis for action when information is incomplete or contradictory and, at the same time, becomes an incentive for enhancing coordination across boundaries through shared understanding among diverse actors - government agencies, private firms, NGOs - especially in transboundary crises. These stages not only contribute to

understanding of the crisis at hand but also can be precious for detecting its development. Detection means that actors recognize that a crisis is occurring (Boin et al. 2014: 15). However, early detection in particular helps identify weak signals and emerging threats before they escalate into a full-fledged crisis. Endsley (1995) uses the term perception to describe the first stage of situational awareness. When the crisis is over, sensemaking can contribute to learning and adaptation, enabling organizations to build resilience.

Sensemaking facilitates decision-making and coordination by extracting and framing signals, developing interpretations that shape how subsequent data is understood, and fostering a collective understanding across diverse actors via a constant process of looking backward and forward that reflects retrospective and prospective dimensions. This process directly addresses key challenges in disaster risk management: detecting threats early, building situational awareness, synchronizing actions across organizational boundaries, and maintaining flexibility amid evolving threats.

Nonetheless, sensemaking also concerns organizing, since “sensemaking and organization constitute one another” (Weick et al. 2005: 410). Weick argues for organizing as sensemaking, organization through sensemaking, or organizing for sensemaking (Weick 2001: 95). Sandberg and Tsoukas (2015) clarify that organizing is achieved to the extent that sensemaking is accomplished. Thus, the involved actors strive to make sense of the crisis and generate a shared picture of the situation, but sensemaking also depends on how actors organize their joint effort: how they organize themselves for sensemaking.

According to Weick, institutions shape “sensemaking at more macro levels” (Weick 1995: 70). Weber and Glynn (2006: 1657) state that “institutions are woven into sensemaking” through three ‘mechanisms’: 1) priming (providing social cues from the situational context which enable to interpret subsequent, ambiguous information and shape understanding); 2) editing (through processes of retrospective feedback of filtering, selecting, and organizing information to make a situation plausible); and 3) triggering (posing dilemmas or puzzles, which can be contradictory and confusing and need to be interpreted). Vlaar et al. (2006) contend that formalization - i.e., processes and outcomes

associated with the negotiation of contracts, rules, and procedures - enables sensemaking in interorganizational relationships through focused attention. Thus, formalization forces articulation, deliberation, and reflection, instigating and maintaining interaction and reducing judgment errors, biases, and inconsistencies.

Through these processes, joint sensemaking is more likely to emerge. Joint sensemaking means that actors involved in the management of the crisis need to give the same meaning to their collective experiences (Weick et al. 2005: 409) within a certain context to be able to respond smoothly and properly and “... to create order and make retrospective sense of the situation in which they find themselves” (Weick 2001: 11). Understanding entails an extremely complex common acceptance of what has happened, what is happening, and what may happen next in a crisis (Endsley 1995). Without proper detection and understanding, decision-making may rest on flawed premises, with potentially dangerous consequences for both crisis management (Boin and Renaud 2013) and the values at stake.

4. Challenges for Shaping Joint Sensemaking in Transboundary Crises

A transboundary crisis poses unique challenges for shaping sensemaking. Unlike a localized or bounded crisis, the detection and understanding of a transboundary crisis involve a far broader range of actors than those engaged in a traditional crisis, with different frames of reference, priorities, and cultural contexts, complicating the possibility of shaping joint sensemaking. These factors influence what actors perceive as relevant and how they interpret risks, signals, and threats.

A first challenge is the fragmented information environment resulting from information asymmetries across different geographic areas, policy sectors, and political jurisdictions (Kuipers and Boin 2015). Data may be incomplete, delayed, or contradictory since actors have different ways to collect, analyze, and share information. Political sensitivities and technological disparities also play a role here. This fragmentation hampers the creation of joint sensemaking and a shared situational picture (Weick et al. 2005: 409), leading to divergent interpretations and delayed decision-making. As Ansell et al. (2010) and Boin et al. (2013) point out, a transboundary crisis is difficult for national and international authorities to make sense of due

to information overload from many sources across national and policy borders and to challenges related to how to deal with this overload through proper information management (Rosenthal and 't Hart 1991).

A second challenge arises from the characteristics of the transboundary crisis itself. Its dynamic development is often characterized by uncertainty and unpredictability, with cascading effects across sectors (e.g., a cyberattack triggering financial instability, a heat wave, or a pandemic disrupting societies and regions). Joint sensemaking must be continuous and adaptable to a dynamic crisis. However, institutional structures often favor static plans and hierarchical communication, which slow down both prevention and preparedness activities in the pre-crisis phase and response efforts once the crisis has manifested. For instance, the incubation (Turner 1976) of a transboundary crisis can be perceived differently depending on the crisis manager's perception.

An example is COVID-19: the World Health Organization distributed the first information about an unknown virus spreading in China at the end of December 2019; however, in February 2020, the European Centre for Disease Prevention and Control still considered the spread of the virus in Europe a low risk. Perceptions of the virus's severity were even more diverse among European states (Sætren et al. 2023). Thus, some actors may perceive weak signals in the incubation phase as real and act accordingly, while others may not see the accumulation of latent conditions in the incubation phase (Turner 1976) and fail to take action at the early stages of an impending crisis. When actors do not share the same perception of the threat, the speed of development of the transboundary crisis is perceived differently. Thus, its manifestation in systems and domains occurs at different temporal scales and in different ways, hindering joint sensemaking and delaying or resulting in insufficient coordination, i.e., the management of dependencies (Malone and Crowston 1994).

A third challenge is related to the jurisdictional complexity and ambiguous authority during a transboundary crisis, which blur the lines of responsibility. No single actor has full authority, creating coordination gaps and legitimacy challenges. Competing narratives may emerge as actors seek to assert control or protect reputational interests, undermining joint

sensemaking. A transboundary crisis is challenging to coordinate across jurisdictional, policy, and national borders, even for planned and trained response actors, but especially for ad hoc and self-organized structures. As such, before the management of a transboundary crisis, responsibilities must be clarified, mandates accepted, and a common understanding of the response structures established. A worst-case scenario for joint sensemaking in a transboundary crisis would be an unpredictable, fast-developing crisis spreading across national borders and administrative and sectoral boundaries, requiring an ad hoc network response by a multitude of actors that must coordinate at the national and international levels. Thus, contingency planning, training, and exercises, as fundamental prevention and preparedness activities in the pre-crisis phase (Kruke 2012), are crucial for joint sensemaking in a transboundary crisis.

Finally, especially in recent years, media and public pressure have become a relevant factor for joint sensemaking. In particular, social media coverage amplifies uncertainty and politicizes interpretations, accelerating the spread of misinformation and forcing crisis managers to combat competing frames in real time, while actively shaping narratives, in their approach to risk and crisis communication (Boin et al. 2017, Coombs et al. 2010, Ulmer et al. 2011).

5. How to Foster Joint Sensemaking

To address these challenges and enhance joint sensemaking, policymakers and risk and crisis managers must establish mitigation measures tailored to the characteristics of transboundary crises, by implementing governance arrangements and procedures that consider crisis dynamics. This is not an easy task, but we argue that, despite the type of the transboundary crisis, there are certain common measures, activities and plans that need to be developed and implemented in the pre-crisis phase, before a transboundary crisis is triggered. Preventing and preparing for a transboundary crisis is a difficult undertaking, while seeing the signs of crisis development in the post-crisis phase is much easier (Kruke 2012) in terms of what Weick calls retrospective sensemaking (Weick 2001: 11) to "make order and make retrospective sense of the situation." Learning in the post-crisis phase provides insight for preventing future crises and

improving preparedness for the transboundary crises we cannot prevent.

Despite the high degree of uncertainty characterizing transboundary crises, it may be possible to detect their rise, prevent the most serious consequences, and put in place relevant preparedness measures (Boin et al. 2017). Prevention and preparedness activities should be organized in ways to achieve joint sensemaking among response actors at all levels: local, regional, national, and international, organizing for sensemaking (Weick et al. 2005). Thus, transboundary crisis necessitates a vast number of actors working together, which also represents another challenge for joint sensemaking. Hence, the foundation for a reliable transboundary crisis response rests in joint sensemaking, shaped and enhanced during the pre-crisis phase through coordination and cooperation among actors, through Weber and Glynn's (2006: 1657) three 'mechanisms' of priming, editing and triggering.

In practice, policymakers and risk and crisis managers should establish multilevel joint sensemaking platforms not only for real-time information exchanges before a crisis unfolds but also as arenas for building institutional and governance contexts (priming), for facilitating processes of feedback (editing) to trigger sensemaking (Weber and Glynn 2006). Since a transboundary crisis requires shared situational awareness across multiple jurisdictions and sectors, integrated crisis dashboards, joint information centers, and cross-border coordination hubs can enable actors to aggregate and validate data from diverse sources in real time, share interpretations and emerging narratives to reduce ambiguity, and facilitate rapid feedback loops at local, national, and international levels. However, designing platforms that balance speed with accuracy and accommodate different technological capacities and languages remains a significant challenge.

Secondly, due to the nature of transboundary crises, policymakers and risk and crisis managers should bridge cultural and organizational divides by introducing and then formalizing boundary-spanning roles (e.g., liaison officers, international coordinators, experts, host nation support teams), promoting joint planning, training, and exercises that involve the relevant actors as Vlaar et al. (2006) point out. These activities play a critical role in connecting actors across institutional,

cultural, and sectoral boundaries by shaping a common jargon, building trust and networks, and fostering collaboration.

Thirdly, since transboundary crises exacerbate some bounded crises' characteristics, such as (un)predictability (Gundel 2005) and development speed ('t Hart and Boin 2001), the establishment of flexible governance arrangements that allow rapid adaptation and shared authority should also be pursued. Rigid hierarchical structures often fail in transboundary crises. Flexible governance models - such as networked crisis cells or adaptive task forces - allow decentralized decision-making while maintaining strategic coherence, a reallocation of roles as the crisis evolves, the inclusion of non-state actors (NGOs, private sector) in joint sensemaking, and the utilization of the full spectrum of knowledge and capacities in the response.

Finally, strategic communication to align narratives and counter misinformation and disinformation should be fostered. Sensemaking shapes public perception and the belief in legitimacy that needs to be achieved through clear and consistent messages from accountable sources across borders and platforms. Doing so requires a proactive fight against misinformation, disinformation, and competing narratives on social media and in other outlets, as well as the use of trusted communication channels. Nonetheless, the complexity of transboundary crises and unclear communication strategies may create conflicting messages and inadequate responses.

Successful joint sensemaking in transboundary crises depends on pre-crisis organization and planning. Information platforms, boundary-spanning roles, flexible and shared authority governance and communication strategies need to be fostered in prevention and preparedness. These elements are mutually reinforcing since platforms surface cues, boundary spanners translate and align frames, flexible governance legitimizes rapid cross-actor decisions, and strategic communication consolidates plausible narratives.

6. Conclusion

A transboundary crisis is a high-impact, evolving disruption that defies traditional boundaries - geographical, political, or sectoral - and demands

integrated, multilevel, and transnational governance approaches. Conventional crisis mechanisms, oriented toward contained jurisdictional threats, become inadequate. Academic research calls for innovative, networked administrative models, enhanced cooperation, and legitimacy across actors to address these increasingly prevalent global challenges. A transboundary crisis necessitates responses that transcend national capacities and thus require an international network response based on joint sensemaking to manage the situation.

As such, joint sensemaking is difficult to achieve unless planned in the pre-crisis phase. This general concern applies to crisis response systems and organizations: how to plan and organize sensemaking (Weick 2001) and generate a shared picture of the situation to make sense of an (un)predictable, dynamic crisis. However, as pointed out by Perry and Lindell (2003), crisis planning is not the same as crisis management. Joint sensemaking in the pre-crisis phase does not automatically guarantee that all parties will share the same picture of the situation when a dynamic crisis unfolds. Thus, a prerequisite for the joint ability to provide a coordinated response to transboundary crises is extensive knowledge of the response system itself, how the various response actors work together, and updated knowledge about the current situation in the crisis area.

As several scholars point out, transboundary crises are becoming the new normal. We argue that a reliable response to these crises heavily relies on our ability to establish structures and roles to sustain joint sensemaking in the pre-crisis phase. Thus, we call for further research that focuses on critical, in-depth analyses of sensemaking processes, which are often examined in post-crisis reports and evaluations. In addition, further research can deepen the issue of crisis typologies - from creeping to rapid-onset crises - and study to what extent and how the type of transboundary crisis affects the solutions we proposed to foster joint sensemaking.

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