The Impact of Social Cohesion in a Disaster Context:

A Case Study of the 2021 Floods in Germany

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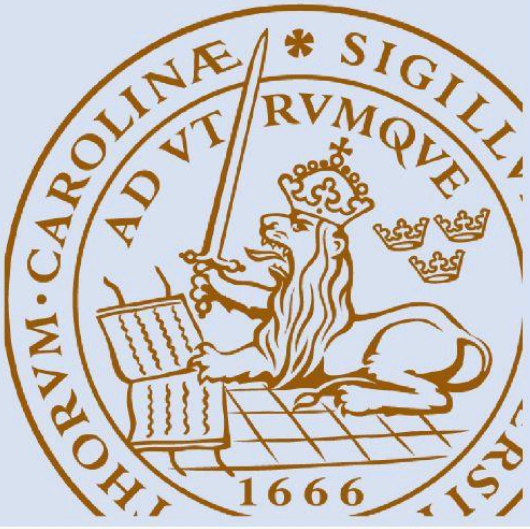

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Abstract
Social cohesion has been defined in multiple ways by the literature, depending on the disciplinary perspective and context. Existing definitions commonly emphasize trust, solidarity, shared values, and social networks, treating social cohesion as a relatively stable condition. However, there remains a limited understanding of how social cohesion is experienced and constructed, specifically within disaster contexts, and how disasters shape social cohesion over time. This thesis aims to address this gap by researching social cohesion during and after the 2021 floods in Germany among three stakeholder groups: research professionals, field professionals, and affected citizens. The study is guided by the following research questions: *How do different stakeholder groups in Germany experience social cohesion during and after a flood disaster?* and *How do different stakeholder groups in Germany construct the meaning of social cohesion during and after a flood disaster?* Using 20 qualitative semi-structured interviews and an abductive thematic analysis, the findings show that social cohesion was experienced through solidarity, trust, social networks, inclusion, willingness to help, shared responsibility, collective identity, place attachment, and the capacity to cooperate. Support emerged through family members, neighbors, volunteers, local communities, organizations, and governmental institutions. The findings further demonstrate that social cohesion operates across micro, meso, and macro levels and plays multiple roles within disaster risk management, including enabling coordination, collective action, resource sharing, and providing emotional support. Simultaneously, tensions, distrust, and inequalities also shaped experiences of social cohesion. Overall, the thesis conceptualizes social cohesion as a dynamic and evolving process rather than a fixed condition.

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Executive Summary

This thesis examines how social cohesion was experienced and understood during and after the devastating 2021 floods in Germany. While the floods destroyed much of the physical environment, social relations and community interactions remained central throughout the disaster. The research addresses two key questions*: How do different stakeholder groups in Germany experience social cohesion during and after a flood disaster?* and *How do different stakeholder groups in Germany construct the meaning of social cohesion during and after a flood disaster?* Focusing on the 2021 floods in Germany, the study explored the perspectives of three stakeholder groups, namely research professionals, field professionals, and affected citizens. Through 20 qualitative semi-structured interviews and an abductive thematic analysis, the thesis contributes to a more nuanced understanding of social cohesion in disaster settings. Existing literature commonly defines social cohesion through concepts such as trust, solidarity, shared values, social networks, and collective belonging. However, these definitions present social cohesion in a static manner and through a positive lens. This thesis instead investigates how social cohesion is both experienced and defined within the complex realities of disaster response and recovery.

The study highlights important findings. First of all, it demonstrated that social cohesion played an important role throughout the response and the recovery processes of the flood. Participants described strong feelings of togetherness, solidarity, and mutual support. This was shown in various ways, such as support emerging through assistance and shared resources from family, neighbors, volunteers, local communities, organizations, and governmental institutions, for example, by forming self-organized volunteering actions, donations, and mental support.

At the same time, the study shows that social cohesion should not be shaped as a concept that is only formed through a positive lens. Alongside the cooperation led through solidarity, people experienced downsides such as distrust, conflict, and exclusion. These tensions were linked to institutional responses, unequal recovery processes, coordination struggles, and the influence of ideologically motivated groups. Rather than existing separately, solidarity and conflict were shown to coexist and shape social cohesion throughout the disaster process.

The thesis further contributes to the conceptualization of social cohesion by demonstrating the diversity of meanings attached to it. Participants associated social cohesion with solidarity, trust, social networks, inclusion, willingness to help, shared responsibility, collective identity,

place attachment, and the capacity to cooperate during times of crisis. The findings also show that social cohesion operated across multiple levels, including the individual, community, and institutional dimensions, where different forms of cohesion are experienced simultaneously.

Moreover, the research highlights the varying roles social cohesion played across different disaster phases. Social cohesion enabled practical coordination and resource sharing, but also created space for emotional support throughout this devastating shared experience. This sense of togetherness allowed for rapid and collective action, where bottom-up support and volunteer systems were set up after the disaster. However, the study also demonstrates that disasters do not automatically generate social cohesion, as outcomes are continuously shaped through the interaction between solidarity and conflict.

The findings, therefore, suggest that social cohesion should be understood as a dynamic, evolving process rather than a fixed social condition. Notably, experiences of social cohesion shifted over time: participants often described an initial surge of solidarity and collective engagement immediately after the floods, which weakened during longer-term recovery. At the same time, some participants reported the emergence of lasting networks and stronger long-term community ties, while others experienced little or no cohesion at all. Based on these findings, the thesis developed a model illustrating the reciprocal relationship between disasters and social cohesion, showing how disasters continuously reshape social relations and vice versa.

The study also identified several factors that contributed to the formation and strengthening of social cohesion during and after the floods. These included trust, geographical attachment, inclusive participation, social networks, leadership and coordination, altruism, religion, shared experiences, and individual motivations.

As the floods occurred during the COVID-19 pandemic, many participants described the disaster response as creating renewed opportunities for participation and social interaction at a time marked by social restrictions and social isolation. In this sense, the flood response temporarily reactivated forms of solidarity and engagement during the pandemic.

While this research focuses specifically on the response and recovery phases of the 2021 floods in Germany, the findings highlight the importance of further research into social cohesion across all phases of DRM. Future studies could explore how social cohesion influences prevention and preparedness efforts, as well as examine its role across different disaster contexts, including cascading disasters and across different countries.

Table of Contents

List of Abbreviations

BMI:	Bundesministerium des Innern (Federal Ministry of the Interior)
DRM:	Disaster Risk Management
EWS:	Early Warning System
GDPR:	General Data Protection Regulation
IPCC:	Intergovernmental Panel on Climate Change
NGOs:	Non-Governmental Organizations
OECD:	Organisation for Economic Co-operation and Development
THW:	Technisches Hilfswerk (Federal Agency for Technical Relief)
UNDP:	United Nations Development Programme

1. Introduction

Climate-related disasters are becoming increasingly frequent and severe worldwide, exerting growing pressure on both physical infrastructure and the social fabric of communities (Intergovernmental Panel on Climate Change [IPCC], 2022). While many regions worldwide have been depicted as more vulnerable due to their exposures to hazards, Europe is also confronted by natural hazard risks, such as severe heatwaves and heavy precipitation, driven by climate change (IPCC, 2022). In Europe, flooding has emerged as one of the most damaging natural hazards, with its impacts intensified by climate change and altered precipitation patterns. These events highlight not only vulnerabilities in infrastructure but also the challenges faced by communities in preparedness, response, and recovery (Guerreiro et al., 2018).

Beyond the physical destruction disasters cause, significant disruptions to social relations within communities often occur. Research has shown when disasters occur, the initial responders are often not official emergency services but individuals already present at the scene, such as neighbors, family members, and local residents, who provide immediate assistance (Aldrich, 2012; Dynes, 2002). These acts of support demonstrate the importance of social relationships and collective action in crisis situations. At the same time, disasters can also expose fractures within communities, as the stress and uncertainty may lead to individuals' prioritization of personal survival over collective well-being (Bonanno et al., 2010). Consequently, disasters can both strengthen and weaken social ties, highlighting the complex dynamics of social cohesion in times of crisis.

The concept of social cohesion is frequently discussed in disaster research. Broadly understood as the “glue that holds society together” (Broadhead, 2022), social cohesion refers to the relationships, trust, and shared norms that enable individuals and groups to cooperate and support one another (Chan et al., 2006). However, the concept remains difficult to define consistently. Different academic fields emphasize different aspects of cohesion, such as trust, participation, solidarity, and social networks (Chan et al., 2006; Fonseca et al., 2018), whereas in the disaster risk management (DRM) literature, the focus is on social capital (Prandini & Villani, 2026). As a result, scholars continue to debate whether social cohesion should be defined narrowly with specific measurable components or broadly as an overarching concept (Aldrich & Meyer, 2015), resulting in limited consensus on how social cohesion should be conceptualized, specifically in disaster contexts.

To address this conceptual gap, this thesis seeks to explore how social cohesion is experienced and conceptualized by different stakeholders who were affected by a disaster event. Using the 2021 floods in Germany as a case study, this research employs qualitative semi-structured interviews and an abductive analytical approach to examine how various groups (research experts, field practitioners, and affected citizens) understand and construct the meaning of social cohesion during and after a flood disaster. By incorporating perspectives from multiple social groups, this study aims to contribute to a more grounded and context-sensitive understanding of social cohesion in disaster situations.

The following research questions guide this study:

> How do different stakeholder groups in Germany experience social cohesion during and after a flood disaster?
>
> How do different stakeholder groups in Germany construct the meaning of social cohesion during and after a flood disaster?

2. Background

This section outlines the study's background, focusing on the 2021 multilayered crisis in Germany and the response that followed.

2.1 Compound Crisis in Germany

This section focuses on the compound crisis experienced in Germany in 2021, focusing on the key aspects of the floods and the impact of the COVID-19 pandemic on social interactions.

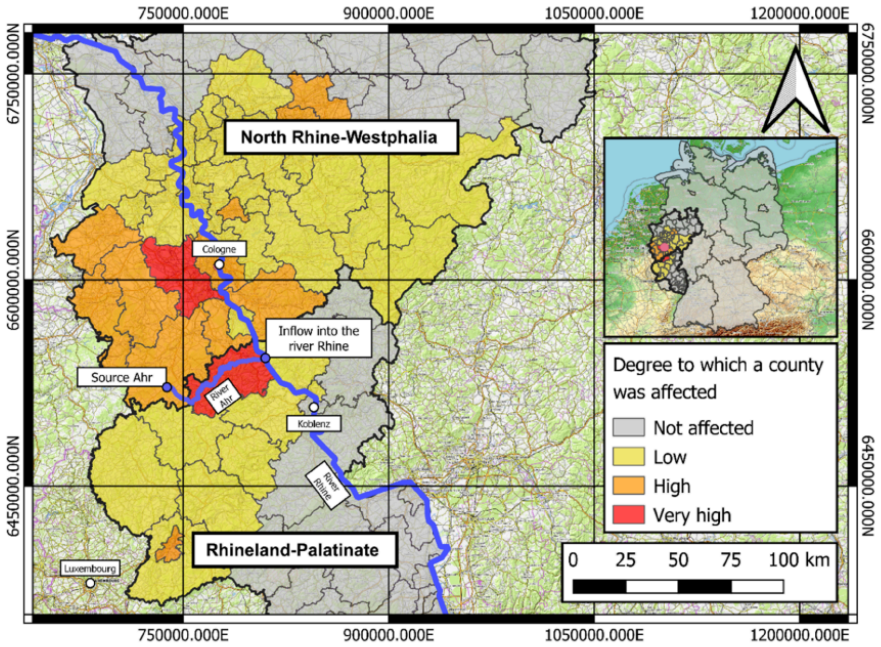
2.1.1 The 2021 Floods in Germany: An Overview

The 2021 floods in Europe are a remarkable example that resulted in devastating and long-lasting effects, making it one of the most severe catastrophes in Europe in the last half-century (Mohr et al., 2023). A low-pressure system, Bernd, which brought intense rainfall from the 12th to the 19th of July, flooded several river basins in western, central, and northern Europe (Kron et al., 2022). The scale of the events in 2021 is comparable to historical floods in 1804 and 1910, with peak discharge reaching similar levels observed during those two floods in Dernau (Lehmkuhl et al., 2022; Roggenkamp & Herget, 2015). Though rare, such events can cause catastrophic damage, including loss of life, financial harm, and widespread destruction, as seen in Germany, Belgium, and the Netherlands in 2021.

Germany is among the most affected, with over 180 casualties and 800 injuries, and with financial losses of €33 billion, making it the most costly disaster to date in Germany (Bundesministerium des Innern [BMI], 2022; Kron et al., 2022). The water levels rose in the rivers Ahr, Erft, Inde, and Rur, causing severe damage to not only residential and commercial buildings but also critical infrastructure in two German federal states of North Rhine-Westphalia and Rhineland-Palatinate (Fekete & Sandholz, 2021; Koks et al., 2022). The impact of the floods is particularly evident in the Ahr Valley, where economic losses reached €20 billion and around 40% of the population lost most of their property (BMI, 2022; Silva et al., 2025). Figure 1 shows the affected areas during the July 2021 flood in Germany, with the Ahr Valley located at the Ahr River (Wüthrich et al., 2024).

Figure 1

Affected areas during the July 2021 flood in Germany.



Note. From "*Field survey assessment of flood loads and related building damage from the July 2021 event in the Ahr Valley (Germany),*" by D. Wüthrich, P. A. Korswagen, H. Selvam, J. Oetjen, J. Bricker, & H. Schüttrumpf, 2024, *Journal of Flood Risk Management*, 18(1) p. 2.

This widespread destruction was also visible in transport and critical infrastructure, significantly limiting access to affected areas (Thiebes et al., 2022; Windsheimer & Schobert, 2021). Large sections of roads, railways, and bridges, especially in the Ahr Valley, were destroyed (Fekete & Sandholz, 2021; Hiroki, 2022; Koks et al., 2022; Thiebes et al., 2022). Rail infrastructure suffered extensive damage, with repair costs estimated at up to €2 billion. At the same time, electricity, gas, and water systems were heavily impacted: around 200,000 people lost power, and full restoration took time (Fekete & Sandholz, 2021; Hiroki, 2022; Koks et al., 2022; Thiebes et al., 2022). Gas networks and water services were severely disrupted, leading to contamination issues and prolonged outages, while communication networks failed and took weeks to recover.

Beyond the infrastructure damage, the social infrastructure was heavily affected. Schools and daycare centers were damaged, disrupting education, while hospitals were flooded and evacuated, reducing healthcare capacity (Hiroki, 2022; Koks et al., 2022; Thiebes et al., 2022). The ongoing COVID-19 pandemic further complicated evacuations and care (Fekete & Sandholz, 2021; Hiroki, 2022; Thiebes et al., 2022; Windsheimer & Schobert, 2021).

Damages to utilities also disrupted medical services nationwide, with many healthcare providers unable to operate normally for extended periods (Koks et al., 2022).

A key factor behind the devastating impacts was the failures in early warning systems (EWS) (Kron et al., 2022). Although EWS are intended to provide timely alerts and guide protective actions such as evacuation, their effectiveness was limited in several ways (Martens, 2024; Silva et al., 2025). Warning messages did not reach large parts of the population, partly due to delayed system improvements during the COVID-19 pandemic (Dittmer & Lorenz, 2024) and the dismantling of sirens (Kron et al., 2022), leaving many people unaware of the risk. In addition, fragmented responsibilities between weather and flood authorities led to inconsistent warning dissemination across regions (Kron et al., 2022). Even when warnings were received, they often lacked clear guidance, with many individuals unsure how to respond (Silva et al., 2025).

The floods left long-lasting impacts on Germany and its communities, affecting both the physical environment and social well-being. Physically, the disaster was destructive, displacing many residents, and reconstruction continued for years (Nick et al., 2023). Many people lost personal belongings and faced prolonged displacement while communities struggled to restore basic services and economic activity. Despite these challenges, many residents chose to rebuild in the Ahr Valley due to a strong attachment to their homes and communities (Truedinger et al., 2023). At the same time, the disaster had significant psychological and social consequences. Studies show 42.6% of people in the heavily affected areas reported high to very high levels of mental burden (Klör et al., 2025), and 28.2% showed indications of post-traumatic stress disorder (Zenker et al., 2024). Overall, the disaster not only caused severe physical damage but also affected community structures and mental well-being, making recovery both a physical and social process.

2.1.2 COVID-19 in Germany: Context and Societal Impacts

Germany experienced a compound crisis in 2021, as the flood occurred during the COVID-19 pandemic. This global health crisis had already reshaped social life and governance in Germany since early 2020 (Finne et al., 2025). Public health measures such as mobility restrictions, limits on gatherings, and physical distancing altered everyday interactions and placed pressure on institutions and communities (Banulescu-Bogdan & Ahad, 2021; Schröder et al., 2022). In the early phases, a temporary increase in solidarity and institutional trust was observed, often described as a “rally-round-the-flag” effect (Schröder et al., 2022). Mutual aid

initiatives and neighborhood support networks emerged, while higher trust in government facilitated compliance with containment measures (Banulescu-Bogdan & Ahad, 2021).

Over time, these dynamics weakened. Prolonged restrictions reduced broader social interactions and shifted communication to digital spaces, strengthening close ties but limiting wider connections (Banulescu-Bogdan & Ahad, 2021). At the same time, pandemic fatigue and political tensions increased, leading to growing opposition to public health measures, including the rise of protest movements such as the "Querdenker" movement, which includes people who involve themselves in conspiracy theories (Kühne et al., 2020; Schulz & Faus, 2022).

2.2 Disaster Response and Civil Participation

This section reviews the disaster response to the 2021 floods in Germany, focusing on governance structures, operational response, and the significant role of civil society in supporting the affected regions in the first phase of the response.

2.2.1 Disaster Governance in Germany

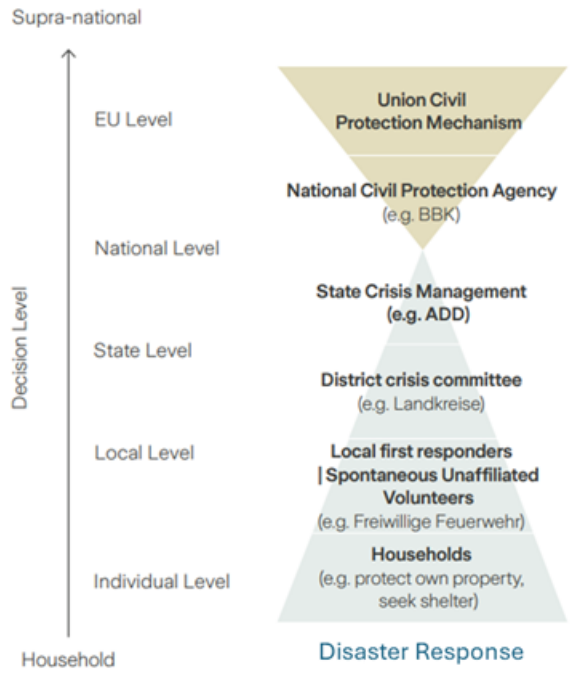
In Germany, disaster management during peacetime is primarily the responsibility of the sixteen federal states (Länder), which regulate civil protection and crisis response within their jurisdictions (Monstadt & Schmidt, 2019). Operational responsibility lies mainly at the municipal and district (Landkreise) levels and follows a subsidiarity principle, meaning that response should be organized as locally as possible (Szönyi et al., 2022). This, for example, is achieved through the district crisis committee, the local first responders and volunteers, and households themselves. When a disaster exceeds local capacities or affects several municipalities, coordination is transferred to the district or regional authority (State Crisis Management), whose head assumes overall responsibility for crisis management (Nick et al., 2023).

At this level, disaster response is typically organized through two complementary structures: an operational–tactical unit and an administrative–organizational unit (Nick et al., 2023). The operational–tactical unit, usually led by the head of the local fire department, manages on-site emergency operations such as rescue operations, hazard control, and the deployment of personnel and equipment (Nick et al., 2023). The administrative–organizational unit coordinates governance-related tasks, including communication with higher authorities, resource allocation, and logistical support (Nick et al., 2023).

Although disaster response is largely decentralized, higher administrative levels may step in when lower-level capacities are exceeded (Nick et al., 2023; Szönyi et al., 2022). If a situation surpasses the capabilities of a federal state, additional assistance can be requested from other states or international partners (Nick et al., 2023). National institutions, such as the Bundesamt für Bevölkerungsschutz und Katastrophenhilfe (German Federal Office of Civil Protection and Disaster Assistance), as well as European mechanisms (Union Civil Protection Mechanism), mainly fulfill coordinating and supporting roles. The multi-level structure of disaster response, ranging from households and local first responders to national and supranational coordination mechanisms, is illustrated in Figure 2 (Szönyi et al., 2022).

Figure 2

Multi-level governance structure of disaster response in Germany



Note. Adapted from *PERC Flood event review 'Bernd'* by Szönyi et al., 2022, p. 16, *by Zurich Insurance Company*.

2.2.2 Disaster Response during the 2021 Floods

Following the flood, the multi-level disaster response system was activated with large-scale assistance increasing between July 15 and July 17, two to three days after the flood (Fekete & Sandholz, 2021; Nick et al., 2023). A broad range of actors were involved, including local fire brigades, emergency medical services, police forces, and municipal authorities, supported by

civil protection organizations, federal agencies such as the Technisches Hilfswerk (Federal Agency for Technical Relief, THW), and non-profit organizations, such as Deutsche Lebens-Rettungs-Gesellschaft (German Life Saving Association) and Deutsches Rotes Kreuz (German Red Cross).

The operational–tactical crisis teams coordinated on-site rescue operations, while administrative–organizational teams managed coordination across governance levels and communication with state authorities (Nick et al., 2023). Early warning responsibilities were shared among institutions, including Deutscher Wetterdienst (German Weather Service), flood control centers, and state-level crisis management bodies (Ommer et al., 2024). Moreover, due to the severity, federal assistance was requested, including support from the Bundeswehr (German Armed Forces) (Juling, 2022). The Bundeswehr provided logistical and engineering support, including helicopters, temporary bridges, transport vehicles, satellite communication systems, and mobile water treatment facilities.

2.2.3 Civil Participation and Informal Response

Alongside formal response mechanisms, civil society played an important role during the floods. Previous research suggests citizens are often the first to respond, with official disaster response teams subsequently taking over similar tasks (Barton, 1969). This pattern was also evident during the 2021 floods (Fekete & Rhein, 2024). Various social groups, including local associations, sports clubs, and religious communities, mobilized spontaneously to support affected areas (Bier et al., 2023). In addition, spontaneous volunteers such as residents, farmers with heavy machinery, and forest workers assisted communities alongside official responders (Fekete & Sandholz, 2021). Digital initiatives also emerged rapidly to coordinate volunteer activities and donations. For example, the “Helfer-Shuffle” system was developed to organize volunteer deployment, while online platforms and information hubs connected volunteers with local needs (Bier et al., 2023).

However, the formal disaster management system was not designed to systematically integrate large numbers of spontaneous volunteers. This created coordination challenges and operational risks in some situations, such as safety concerns and congestion on access routes to affected areas (Ommer et al., 2024; Szönyi et al., 2022).

3. Theoretical Framework

This chapter develops the theoretical framework for the study by examining how social cohesion has been conceptualized in existing literature and how it is understood and applied within DRM.

3.1 Conceptual Ambiguity of Social Cohesion

Social cohesion is a highly debated and contested concept, commonly agreed upon more through metaphor than through a single, unified definition. Even within this metaphorical framing, scholars frequently mention two distinct images that emphasize different dimensions of the concept (Broadhead, 2022; Moustakas, 2023). The first conceptualizes social cohesion as *glue*, referring to the stable, often invisible bonds that hold societies together. These bonds are typically grounded in shared values, collective goals, or mutual trust (Broadhead, 2022). In contrast, the second metaphor describes social cohesion as *sugar*, emphasizing its active, relational, and everyday nature (Broadhead, 2022). From this perspective, cohesion is continuously produced through routine social interactions and small acts of mutual support. While the former conceptualization views social cohesion as a static condition, this approach understands it as something enacted and reinforced through daily social practices.

Together, these metaphors represent two ends of a conceptual continuum. As noted by Saggar in the British Academy Report (2019), social cohesion can be understood at a macro level as glue, reflecting structural and societal bonds, and at a micro level as sugar, reflecting interpersonal relationships and everyday social processes. The coexistence of these metaphors illustrates the absence of a unified conceptual understanding. Rather than agreeing on a clear definition, scholars rely on metaphors to capture the complexity and multidimensionality of social cohesion.

While metaphors are useful heuristics, they cannot function as operational definitions as these shortcuts lack precision, overgeneralize, and can have a subjective feeling to them. In response to the ambiguity between concepts and definitions, Bayfield et al. (2019) argue scholars must be explicit about how they define and apply the concept. In particular, they urge researchers to clarify whether social cohesion is used descriptively, to characterize social conditions, or analytically, as an ongoing societal process.

3.2 The Rise of Social Cohesion as a Research and Policy Concept

Although social cohesion has gained increasing prominence in recent decades, the concept itself is not new. Its roots can be traced back to Émile Durkheim's work on social solidarity in *The Division of Labour in Society* (1893), in which he examined the bonds connecting individuals through shared norms and similarities (Wickert, 2025). Interest in social cohesion grew significantly from the 1980s onward, particularly among international institutions and policymakers, who viewed it as relevant for addressing economic tensions, migration, and cultural conflict (Burns et al., 2018).

A substantial body of research associates social cohesion with a range of positive societal outcomes, including more stable democratic systems, higher economic productivity, improved quality of life, and greater inclusivity and tolerance (Beauvais & Jenson, 2002; Dhéret, 2015; Langer et al., 2016; Pervaiz et al., 2013). It is further linked to stronger conflict management, post-crisis recovery, and better health outcomes. However, scholars also point to potential downsides. Strong cohesion can sometimes reinforce boundaries between social groups, increasing the risk of exclusionary attitudes toward migrants and minority groups rather than fostering broader social integration (Green & Janmaat, 2011).

Given its strong societal relevance, social cohesion has increasingly been defined in policy-oriented terms by international organizations. Several institutions, such as the Council of Europe (2008) and the Organisation for Economic Co-operation and Development (OECD, 2011), conceptualize it as the capacity of a society to promote the well-being of all its members while reducing inequalities and preventing marginalization.

The United Nations Development Programme (UNDP, 2020) adopts a multidimensional approach without offering a single formal definition, distinguishing between vertical and horizontal social cohesion. Vertical cohesion refers to relationships between citizens and institutions, including trust in government, public services, and institutional processes (UNDP, 2020). Horizontal cohesion concerns relationships among individuals and groups within society, including trust, interaction, and social networks across different identities (UNDP, 2020). Together, these dimensions capture both objective elements (e.g., networks and inclusion) and subjective aspects (e.g., attitudes, trust, and sense of belonging).

3.3 Defining Social Cohesion

This section outlines different aspects of social cohesion in the literature: dimensions, levels, and geographical and contextual factors to gain a deeper understanding of the concept.

3.3.1 Dimensions of Social Cohesion

Some scholars approach social cohesion primarily as a social phenomenon. Rather than as a single, fixed concept, it is increasingly understood as a set of interrelated social dimensions that shape how societies function and respond to shared challenges (Moustakas, 2023).

In this sense, Beauvais and Jenson (2002) define social cohesion as an ongoing process rooted in group structures, shared values, solidarity, and mechanisms for conflict resolution. They identify five key dimensions: belonging, inclusion, participation, recognition, and legitimacy. Similarly, Dragolov et al. (2013, p. 8) describe social cohesion as "the manifestation of an intact society," characterized by solidarity, helpfulness, and a collective sense of purpose that enhances societal sustainability.

More recent empirical studies operationalize these dimensions through observable social dynamics. Zhao and Van de Walle (2024) conceptualize cohesion in terms of social relationship density, trust, and social support. Zahnow (2024) emphasizes indicators, such as willingness to help others, sense of belonging, and social ties, highlighting the mediating role of social cohesion in the relationship between social infrastructure and well-being.

3.3.2 Levels of Social Cohesion

Another central debate concerns the level at which social cohesion should be conceptualized. Many scholars argue that social cohesion is a property of social units rather than individuals, existing at the collective level while influencing individual behavior (Delhey et al., 2018; Dragolov et al., 2016). Others, such as Bottoni (2018), include the micro level, defining cohesion in terms of the density of social relationships, interpersonal trust, and social support.

The majority of the literature agrees that social cohesion manifests at multiple levels: the micro, meso, and macro levels (Moustakas, 2023). The micro level focuses on individual interactions, including face-to-face communication, trust, sense of belonging, inclusion, individual participation, and recognition (Fonseca et al., 2018). The meso level concerns communities and social groups, encompassing shared values, mutual support, social capital,

collective goals, social bonds, and oral behaviors and norms (Fonseca et al., 2018). The macro level relates to institutions and governance, including civic participation, life satisfaction, trust in institutions, social order, and the reduction of inequalities and exclusion (Fonseca et al., 2018).

3.3.3 Geographic and Contextual Factors of Social Cohesion

Definitions of social cohesion vary across geographic and contextual settings. Burns et al. (2018) note that some studies emphasize bonds between citizens or social groups, particularly in diverse societies, while others focus on relationships between individuals and institutions. Over time, the literature has shifted toward broader geographically and society-wide perspectives, rather than defining social cohesion solely in terms of interpersonal or group relations. For example, Berger-Schmitt (2002, p. 3) defines social cohesion as "the strength of social relations, shared values and communities of interpretation, feelings of a common identity and a sense of belonging to the same community, trust among societal members as well as the extent of inequality and disparities". This reflects a broad understanding of social cohesion as an aspect of society as a whole. However, even within society-level approaches, scholars differ in how widely social cohesion should be defined. Larsen (2014), for example, focuses on social trust and national identification, defining cohesion as the belief that citizens share a moral community that enables mutual trust. While this remains a broader perspective than approaches that center only on interpersonal or group relations, it locates social cohesion primarily within the boundaries of a nation or state.

These differences highlight the challenge of establishing a universal definition, as Bruhn (2009) argues, variations in political systems, societal structures, and local challenges require context-sensitive conceptualizations. In response to this conceptual diversity, several integrative frameworks have been developed. One influential and widely used framework was developed by the Bertelsmann Foundation (Dragolov et al., 2013; Dragolov et al., 2016), in which they define social cohesion based on three core dimensions, namely, social relations, connectedness, and orientation toward the common good:

> The quality of social cooperation and togetherness of a collective, defined in geopolitical terms, that is expressed in the attitudes and behaviors of its members. A cohesive society is characterized by resilient social relations, a positive emotional connectedness between its members and the community, and a pronounced focus on the common good (Dragolov et al., 2016, p. 6).

3.4 Synthesizing Perspectives on Social Cohesion

Despite considerable variation, recurring elements appear across many definitions of social cohesion, including trust, inclusion, participation, and solidarity (Chan et al., 2006; Fonseca et al., 2018). Moustakas's (2023) literature review expands this list to include shared values, shared experiences, civic participation, mutual help, social networks, social order, acceptance of diversity, equality, well-being, and social mobility.

In response to this conceptual diversity, Schiefer et al. (2012) and Schiefer and van der Noll (2016) sought to systematize the core elements of social cohesion. These researchers identify six recurring dimensions: social relations, referring to the quality of interactions, including trust, tolerance, and participation; sense of identification, capturing the feelings of belonging to a community or society; orientation toward the common good, reflecting responsibility toward others and acceptance of social order; shared values, denoting consensus around norms and beliefs; equality, concerning the distribution of resources and access to opportunities; and quality of life, includes both objective and subjective aspects of well-being, such as health and living conditions.

Social cohesion can thus be understood through diverse lenses, such as dimensions, levels, and geographic and contextual factors; therefore, it remains a quasi-concept that is often vaguely defined in both research and practice in spite of its widespread use (Bernard, 2002; Raw et al., 2022). As mentioned before, some scholars advocate for broad definitions. However, this includes the risk of definitions becoming overly broad or to conflate core meanings with causes or consequences, thereby reducing analytical clarity (Chan et al., 2006; Schiefer & van der Noll, 2016). Others emphasize more focused, context-specific interpretations (Moustakas, 2023). Schiefer et al. (2012) and Schiefer and van der Noll (2016) argue that narrower conceptualizations improve analytical clarity and empirical applicability. This perspective aligns with more recent research, which shows that studies increasingly agree on a set of core dimensions, particularly belonging, social relations, and orientation toward the common good (Moustakas, 2023), such as in the following definition:

> Social cohesion is a state of affairs concerning both the vertical and the horizontal interactions among members of society as characterized by a set of attitudes and norms that include trust, a sense of belonging, and the willingness to participate and help, as well as their behavioral manifestations (Chan et al., 2006, p. 290).

3.5 Application of Social Cohesion in the Context of DRM

Within the context of DRM, social cohesion is understood as an important social resource that enables communities to mobilize collective action (Aldrich & Meyer, 2015; Dynes, 2002). Increasingly, DRM policies recognize that social factors such as social cohesion play a critical role in shaping how individuals and communities prepare for, respond to, and recover from disasters (Aldrich & Meyer, 2015; Hikichi et al., 2016). Although disasters often disrupt existing social networks and exacerbate inequalities, they can simultaneously foster new forms of solidarity and a shared sense of belonging (Kaniasty & Norris, 1999).

Social cohesion within DRM research is often conceptualized in relation to social capital (Aldrich & Meyer, 2015; Behera, 2021). Social capital refers to the networks, trust, and norms that facilitate cooperation within and between groups (Aldrich & Meyer, 2015). It can take different forms, including bonding ties within homogeneous groups such as families or close-knit communities, bridging ties that connect different social groups, and linking ties that connect individuals to institutions and authorities (Aldrich & Meyer, 2015). Moreover, social capital is often used as an indicator of social cohesion (Carrasco & Bilal, 2016). Research has shown that higher levels of social capital are associated with more effective DRM outcomes (Aldrich & Meyer, 2015). Trust, strong networks, and shared norms enable coordination and collective action, which are essential in disaster contexts (Aldrich, 2012). In this sense, social cohesion can be understood as the broader framework within which social capital represents one component rather than an analytically independent concept (Prandini & Villani, 2026).

The effect of social cohesion can be observed across all phases of DRM: prevention, preparedness, response, and recovery (Bonfanti et al., 2024; Meyer, 2018). In the prevention phase, many studies show that social cohesion is closely linked to effective, active participation in preventive actions. For example, Dynes (2006) argues that social networks motivate individuals to take preventive action, such as evacuation. Regarding disaster preparedness, Lo et al. (2015) argue that strong social cohesion, including trust within communities and close ties with families and friends, enhances individual disaster preparedness. Furthermore, Ma et al. (2022) found a positive correlation between community trust and participation behavior in community preparedness activities.

During the response phase, social cohesion enables rapid, often informal support. In communities with strong social networks, residents frequently engage in search-and-rescue efforts, share information, and distribute essential resources such as food and clothing

(Aldrich & Meyer, 2015; Braun & Aßheuer, 2011; Nakagawa & Shaw, 2004). Trust within communities has also been linked to higher levels of volunteerism in disaster relief efforts (Choo & Yoon, 2022), while trust in institutions is often associated with the perceived effectiveness and capacity of governments (Lo et al., 2016). On the other hand, distrust in institutions can result from dissatisfaction with the outcome of public services (Appleby‐Arnold et al., 2020). These social dynamics can significantly enhance response capacity and reduce the overall impact of disasters (Meyer, 2018).

Social cohesion is particularly important in the recovery phase, where it supports physical reconstruction and psychosocial well-being. Strong community ties facilitate mutual support, improve mental health outcomes, and contribute to faster and more effective recovery processes (Adeola & Picou, 2012; Wind & Komproe, 2012). Communities with higher levels of social cohesion tend to experience quicker reconstruction and greater satisfaction with recovery outcomes (Meyer, 2018; Nakagawa & Shaw, 2004; Sadri et al., 2018). The level of trust in institutions depends on how effectively governments and political actors manage extreme events, making it a fundamental element of recovery processes (Antronico et al., 2020; Joerin et al., 2018). Furthermore, social capital promotes civic participation in decision-making processes, enabling more inclusive and collaborative recovery efforts (Aldrich & Meyer, 2015; Dynes, 2002).

The relationship between social cohesion and disasters is not unidirectional. While social cohesion influences DRM outcomes, disasters can also reshape it in complex ways. Research highlights mixed effects, showing that disasters may strengthen, weaken, or have no lasting impact on social cohesion (Meyer, 2018). On the one hand, disasters can foster solidarity, cooperation, and a shared sense of identity, for instance, through grassroots volunteering organizations (Bonfanti et al., 2024; Monteil et al., 2020). On the other hand, the increase in social cohesion may be temporary in some cases. Even though the shared experience of disaster can create a sense of common fate that enhances cooperation and collective identity, these effects often diminish over time (Kuper & Kröpelin, 2006; Ntontis et al., 2020), which can result in a temporary state of social cohesion.

3.6 Research Gap

While existing literature highlights the relation between social cohesion and DRM outcomes, it largely treats social cohesion as a static condition rather than a dynamic process. As a result, there is a limited understanding of how social cohesion influences DRM processes and how

disasters reshape social cohesion over time. This study is therefore designed to examine the interaction between social cohesion and disasters, focusing on their mutual influence during and after flood events. This research addresses this gap by interviewing diverse stakeholders about how they experience and observe the effects and changes in social cohesion during the response and recovery phases. By examining these changes, the study contributes to a more context-specific understanding of social cohesion and thereby offers insights into its role and positioning within DRM policies and planning.

4. Methodology

This section presents the methodological framework of the study, including the research purpose and questions, research design and approach, participants and sampling, data collection procedures, transcription and translation processes, data analysis methods, and methodological considerations and limitations.

4.1 Research Purpose and Questions

The research focused on how social cohesion was understood and experienced by different stakeholders during and after the floods, namely, research professionals, field professionals, and affected citizens. Instead of working with a fixed definition, this research aimed to explore what social cohesion means to people based on their own experiences. The study aimed to contribute to a better understanding of how people understand, define, and experience coming together and facing challenges during and after a disaster. The findings were intended to help reposition the role of social cohesion in future disaster response and recovery efforts and support stronger, more connected communities in the face of future crises.

The research questions are as follows:

1. How do different stakeholder groups in Germany experience social cohesion during and after a flood disaster?

2. How do different stakeholder groups in Germany construct the meaning of social cohesion during and after a flood disaster?

4.2 Research Design and Approach

This research adopted a qualitative research design combined with an abductive analytical approach. A qualitative design was selected because the study seeks to capture socially constructed interpretations of social cohesion, which cannot be adequately measured through quantitative indicators (Blaikie, 2010). Data were collected through semi-structured interviews, as discussed in Section 4.4.

The study followed an abductive research strategy, which involved the continuous interaction between empirical observations and existing theoretical perspectives (van Hulst & Visser, 2024). An abductive approach was particularly relevant for this study because the concept of social cohesion was defined in diverse and sometimes ambiguous ways in the literature. By moving iteratively between theory and empirical observations, the research sought to clarify how social cohesion is understood in practice and how these understandings related to existing conceptualizations. This process involved engaging with the literature, analyzing the empirical data, and returning to the literature to inform and optimize the conclusion of the study.

4.3 Participants and Sampling

A purposive sampling strategy was used to ensure variation within the defined groups. Tulin et al. (2018) argue that social relationships and networks are typically constructed across multiple groups. To capture how social cohesion is experienced and observed from different social positions, this study included three participant groups: research professionals, field professionals, and affected citizens. The study decided on defining these different groups with the hypothesis that these groups have different perceptions of social cohesion in a disaster context. With this, if a difference is seen, a comparison of these experiences will be made. These categories were predefined before sampling based on the definitions presented in Table 1. Based on these definitions, people were included only in one category and excluded from the others.

Table 1

Definitions categories: Research Professional, Field Professional, and Affected Citizen

Category	**Definition**
Research Professional (RP)	A person with advanced knowledge, skills, or experience related to the floods and their context, usually gained through education, training, or long-term practice. An expert may advise, analyze, or make judgments based on that specialized understanding, even if they are not part of emergency services.

Field Professional (FP)	A trained professional, volunteer, or community-based responder who actively contributed on site during or after the flood disaster in Germany in 2021. This includes individuals involved formally or informally in prevention, preparedness, response, relief, recovery, coordination, technical support, logistics, health services, safety, communication, or community assistance
Affected Citizen (AC)	An ordinary member of the public who is not acting in a professional, volunteer, or expert capacity. A citizen may observe, report, or be affected by the flood events, but does not have formal or informal responsibility in the area.

The sampling strategy included multiple approaches. Firstly, contacts were received through two colleagues of the Master's program (independent of each other) who have contacts in the field due to their work experience. Secondly, organizations were contacted through their websites, based on their position and function regarding the floods of 2021. Thirdly, experts were contacted via LinkedIn based on their prior experience with the floods. Fourthly, contacts were identified through regional Facebook groups, including Hochwasser in AW – freiwillige Helfer Ahrweiler, Wir im Kreis Ahrweiler, and Flutnacht 14. Juli 2021 – gegen das Vergessen. These groups have approximately 61,000, 9,100, and 9,500 members, respectively. These are open community forums and are not organized around specific ideologies, stakeholder groups, or particular viewpoints.

Through all these entry points, the snowballing effect occurred, and contact information from relevant actors got transferred. Sampling continued until thematic saturation was reached within each participant group. A total of 20 interviews were conducted, including 4 with research professionals, 12 with field professionals, and 4 with affected citizens. The categories are not equally represented, reflecting the study's context. The number of research professionals was limited, as the aim was to include a small group with relevant expertise rather than achieve numerical balance. A larger number of field professionals were interviewed because many individuals were involved in providing assistance during the event. Although some people were affected themselves, several identified their primary role as helping others rather than being affected citizens, which resulted in fewer participants in the category of affected citizens.

4.4 Data Collection

The data were gathered through semi-structured interviews with participants from the three participant groups. This approach allowed participants to articulate their own understanding of social cohesion, grounded in their lived experiences rather than predefined academic definitions.

An interview guide was developed in accordance with Creswell's (2013) recommendations. The semi-structured format provided flexibility to adapt questions to each participant group while ensuring that the core themes were addressed. Interview questions were developed based on a literature review, encouraging participants to shape their views of social cohesion by not initially using the term but instead asking about relevant social aspects. Although the questions varied slightly depending on the participant's role and relevance to the floods, all interviews covered key topics, including participants' definitions of social cohesion, their observations and experiences during and after the floods, and the ways in which they believed social cohesion was either supported or undermined. Follow-up questions were asked when necessary to gain different or deeper insights. The interview questions are presented in Annex 1.

Interviews were conducted online and lasted between 30 and 60 minutes. Participants had the choice to speak in either German or English, depending on their level of comfort. In total, 11 interviews were conducted in German, and 9 in English. The sessions were audio-recorded with consent. All interview recordings were securely stored on a Lund University OneDrive account, and the study was conducted in accordance with the General Data Protection Regulation (GDPR).

To ensure confidentiality, partial anonymity was applied by assigning each interviewee a coded identifier based on the relevant category. Research professionals were labeled as RP (e.g., RP4), field professionals as FP (e.g., FP2), and affected or involved citizens as AC (e.g., AC3). This approach allowed for the analysis of differences between groups while protecting participants' identities.

4.5 Transcription and Translation

All interviews were transcribed using the program *Klang AI*. After the transcription, the text was double-checked by either of the researchers to verify the accuracy of the transcription.

The recordings were transcribed verbatim to ensure accuracy. When the interviews were conducted in German, the transcripts were translated into English to enable unified data analysis. The translation was also done by the program *Klang AI*. One of the researchers is a native German speaker and reviewed the interviews after translation to verify that they encompass culturally specific terms and meaning-based statements.

4.6 Data Analysis

The data were analyzed using thematic analysis combined with an abductive research strategy, involving continuous interaction between empirical observations and theory (van Hulst & Visser, 2024). Abductive reasoning moves iteratively between data and theory: empirical findings shape theoretical interpretation, while theoretical insights guide the identification of patterns in the data. Following Creswell (2013), the process began with an open-ended exploration of participants' experiences. Emerging codes and themes were then interpreted in relation to literature on social cohesion. Unexpected findings prompted a return to both the empirical material and theoretical frameworks to develop more plausible, theoretically informed explanations (van Hulst & Visser, 2024).

The collected data were analyzed using a thematic analysis. This led to the systematic identification, analysis, and interpretation of patterns across the data, which were developed into themes. The research followed the approach by Braun and Clarke (2006) involving familiarization with the data, systematic coding, development of themes, and interpretation of patterns across the data.

For the analysis, the software *NVivo* was used to organize, manage, and analyze the data and to support the development of themes. The analysis proceeded in several structured steps. First, all interview transcripts were read multiple times to ensure familiarity with the data and to obtain an overall understanding of recurring topics and patterns. Second, the transcripts were imported into *NVivo*, where an initial coding phase was conducted. During this phase, participants' statements were labeled with codes that closely reflected their original wording and were considered relevant to the research objectives. Half of the interviews were independently coded by one of the researchers.

Following this initial coding round, the third phase focused on grouping the identified codes into broader categories and themes. A shared coding manual was then developed, following the guidelines of Creswell (2013). In this stage, the researchers reviewed the preliminary

codes together and agreed on a set of general codes and subcodes. Afterward, a second round of cross-coding was conducted, during which both researchers reviewed the interviews they had not previously coded. This process allowed for verification and refinement of the coding scheme in accordance with the coding manual.

After completing the coding process, a comparative analysis was undertaken. The main themes were systematically compared across the three participant groups. In the final step, a conceptual understanding of social cohesion was defined.

4.7 Methodological Limitations and Considerations

The methodological approach of this study involves limitations related to data collection, interpretation, sampling, and ethics.

4.7.1 Challenges in Capturing Social Cohesion through Interviews

Social cohesion is partially observable, such as through community participation, but key dimensions, including trust, informal support, and belonging, are less visible and difficult to capture through online interviews. Consequently, some aspects may remain underexplored.

Moreover, social cohesion is inherently subjective and shaped by individual interpretation (Creswell, 2013; Crotty, 1998). Responses may be influenced by social desirability bias, leading participants to present socially acceptable views rather than personal experiences (Bergen & Labonté, 2019; Nederhof, 1985). To mitigate these risks, interview questions were formulated neutrally and designed to encourage open reflection.

4.7.2 Subjectivity, Interpretation, and Language-Related Bias

As a qualitative study, the research is subject to interpretive limitations. Interviews were conducted in English or German; translating German interviews into English may result in a loss of nuance. This risk was reduced through verification by the native German-speaking researcher. Although both researchers independently coded the material using a shared coding manual, coding inevitably reflects interpretive frameworks. Continuous discussion and comparison of coding decisions helped ensure consistency and accurate representation of participants' perspectives (Creswell, 2013).

4.7.3 Sampling, Accessibility, and Inclusivity Limitations

Recruiting the various participant groups was challenging due to limited networks and time constraints, which potentially restricted the sample size. Vulnerable groups, such as elderly individuals or migrant communities, may be underrepresented, leading to a partial depiction of local networks and experiences (Creswell, 2013). To address this challenge, recruitment efforts aimed to reach and include as many participants from different backgrounds and groups by having several sampling methods. Despite these efforts, some groups remained difficult to access within the study period.

In addition, conducting interviews only in German and English may exclude individuals who are not fluent in these languages (Creswell, 2013). As German is the nationally spoken and predominant language in the study area, offering the interview in German ensured accessibility for the majority, with English as a backup. Although additional languages could not be accommodated within this project, recruitment efforts aimed to minimize systematic exclusion on linguistic grounds.

4.7.4 Generalizability Limitation

This study examined social cohesion, exclusively in the context of the 2021 flood in Germany; the findings could not be fully generalized beyond this specific context. This is due to various confounding factors, such as socioeconomic status, existing infrastructure, and external support, that are likely to influence disaster response and recovery processes. It is therefore important to note that the aim of this research is not to produce findings directly applicable to other settings (Creswell, 2013) but rather to explore how social cohesion was experienced among different stakeholder groups, within this particular context.

4.7.5 Ethical Considerations (Sensitivity, Data Protection, and Anonymity)

Participants received clear information about the study's purpose, procedures, and data use both prior to and at the start of the interview. Participation was voluntary, and the participants had the right to skip questions or withdraw at any time (Creswell, 2013), for example, due to the sensitivity of talking about flood-related experiences (Grimm et al., 2014), which may pose emotional challenges. The interview questions were reviewed in advance to ensure clarity and sensitivity.

Interview data were stored temporarily and would be deleted after project completion. AI-supported transcription and analysis tools were reviewed for data protection in accordance with the GDPR, and uploaded data were removed once the analysis was completed.

Participants were anonymized using numerical identifiers (e.g., RP1). Identifying information does not appear in research outputs, and professional roles were described only in general terms where relevant. Only data directly related to the research objectives were used.

5. Results

The results section presents the outcomes of the interviews based on the codes identified during the thematic analysis. Overall, only minor differences were found between the three stakeholder groups during the interviews. These differences will be further explored in Section 6.1.

5.1 Flood Experience regarding Social Cohesion

The participants described various personal experiences related to social cohesion during and after the flood. These experiences included both general, overall experiences of social cohesion, as well as different types of conflicts. The conceptual definitions in Table 2 informed the interpretation of these codes.

Table 2

Flood Experience Regarding Social Cohesion: Code, Definition, and Coverage by Interviewees

Code	Definition	Coverage by
General Feeling or Experience	Feelings of, not limited to, a specific moment, but rather a general atmosphere and experiences.	RP1, RP2, RP3, RP4, FP1, FP2, FP3, FP4, FP5, FP6, FP7, FP8, FP9, FP10, FP11, FP12, AC1, AC2, AC3, AC4
Conflict	Disagreements and tensions between actors.	RP1, RP2, RP3, RP4, FP1, FP2, FP3, FP4, FP5, FP6, FP7, FP8, FP9, FP10, FP11, FP12, AC1, AC2, AC3, AC4

5.1.1 General Feeling or Experience of Social Cohesion

Throughout the disaster response and recovery phases, many participants described a positive atmosphere characterized by a strong sense of togetherness and solidarity. This was often linked to the significant amount of support received, not only from governmental actors but also from volunteers across Germany and neighboring countries. There were also donations from those unable to participate in person, with several participants describing how everyone did what they could.

In addition to external support, helping practices emerged within communities themselves. Participants referred to initiatives such as community kitchens and a coffee-laundry space, which functioned as sites where people could gather and support one another.

Participants also emphasized the importance of places. Certain locations, such as restored cemeteries and rebuilt bridges, were described as spaces of retreat or symbolic significance, leading many participants to report experiencing a strong sense of community.

5.1.2 Conflict

Alongside the strong sense of cohesion described by many participants, the interviews also revealed a range of conflicts that emerged during and after the floods. These tensions involved different actors, motivations, and forms of interaction, occurring at multiple levels: between individuals, within communities, between organizations, and between citizens and state institutions. However, interviewees consistently emphasized that such conflicts remained limited in comparison to the overall sense of togetherness.

Several participants highlighted the presence of politically and ideologically motivated groups, including far-right actors such as Alternative für Deutschland, so-called Reich citizens, neo-Nazi networks, and conspiracy-oriented groups. These actors were described as attempting to exploit the crisis by spreading misinformation, undermining trust in state institutions, and promoting narratives of state failure. Reported tactics included the circulation of fake news, false alarms, such as warnings about gas leaks or additional flooding, and religious or ideological messaging, for instance, claims that “redemption is near”, aimed at influencing affected populations.

Additionally, social and cultural tensions were evident. These included gendered perceptions of roles in leadership, religious messaging, and disagreements between locals and external

actors, such as media representatives or “disaster tourists”, who were criticized for exploiting the situation by taking photos or reporting on others’ suffering.

More broadly, questions of responsibility were closely tied to a growing sense of distrust toward the German state and its handling of the disaster. Additionally, instances of opportunistic and exploitative behavior, such as fraudulent insurance schemes, unqualified contractors, and theft of resources, were reported, further undermining trust within affected communities.

Conflicts also emerged from resource distribution and recovery processes. Unequal access to financial support, reconstruction progress, and aid led to feelings of resentment and competition. Disputes arose over who was responsible for the disaster and how recovery efforts should be prioritized. In some cases, this created divisions not only between residents but also between organized responders and spontaneous volunteers.

5.2 Social Support Factors

Following the floods, participants described a wide range of social support, which can be divided into sources of support (community, family, neighborhood, organizational, volunteer, and non-verbal support) and forms of support (internal and external resources). The conceptual definitions in Table 3 informed the interpretation of these codes.

Table 3

Social Support Factors: Codes, Definitions, and Coverage by Interviewees

Code	Definition	Coverage by
Community Support	Support provided by individuals or groups beyond the immediate neighborhood, often at a broader community or regional scale.	RP1, RP3, RP4, FP2, FP3, FP4, FP5, FP6, FP7, FP8, FP9, FP10, FP11, FP12, AC2, AC3, AC4
Family Support	Support provided by family members, including partners and blood relatives,	FP3, FP7, F9, AC2, AC3

	based on pre-existing close personal relationships.	
Neighborhood Support	Support provided by geographically close neighbors within the immediate local area.	RP4, FP11, FP12, AC1, AC2, AC3, AC4
Organizational Support	Support provided by formal organizations or institutions (e.g., government agencies, Non-Governmental Organizations, or private services), typically structured and often paid or professionalized under normal circumstances.	RP1, RP2, RP4, FP1, FP2, FP3, FP4, FP5, FP6, FP7, FP8, FP9, FP10, FP11, FP12, AC1, AC2, AC3, AC4
Volunteer Support	Support provided by individuals or groups on a voluntary basis, without financial compensation, often organized informally or through volunteer networks.	RP1, RP3, RP4, FP1, FP2, FP3, FP5, FP6, FP7, FP8, FP9, FP10, FP11, FP12, AC1, AC2, AC3, AC4
Non-verbal Support	Support expressed without direct verbal communication.	FP4, FP5, FP6, FP10, AC3
Internal Resources	Material or practical support shared within the affected community or social network.	RP1, FP1, FP3, FP5, FP6, FP7, FP10, FP11, FP12, AC1, AC2, AC3, AC4
External Resources	Material or practical support provided from outside the affected community.	RP1, RP3, FP1, FP3, FP5, FP6, FP7, FP8, FP9, F10, FP12, AC1, AC2, AC4

5.2.1 Community Support

Community support emerged as immediate, informal, and extended beyond pre-existing relationships. Help was provided not only by friends and family, but also by neighbors, wider networks, and strangers. In general, the community was also sensed through the organization of help. A central aspect was the provision of basic needs and shelter. Food was shared spontaneously through collective cooking, barbecues, and distribution of perishable goods, which also created opportunities for conversation and coordination. Informal gatherings often evolved into organized meetings where needs were identified and tasks allocated, facilitating connections across the community and lowering barriers to asking for help.

Participants also described being offered housing, sometimes by strangers, and emphasized the emotional openness that developed, including shared expressions of grief such as crying and hugging. These interactions fostered a strong sense of togetherness, strengthening existing ties and forming new ones. Community support was further characterized by self-organization, where individuals contributed according to their abilities, creating a "snowball effect" of mutual aid and informal social control. The situation was described as "beautiful" despite the devastation, emphasizing the strength of social cohesion that emerged.

Inclusivity was another key dimension, with people from diverse social, cultural, and religious backgrounds coming together in solidarity. One interviewee compared the situation to "Woodstock", explaining that "Christians, non-Christians, Muslims… they were all helping". There was an important mention of people adding to the community by doing what they do well, such as children helping out with feeding animals or housewives making their signature dish. One interviewee stated: "There is no person who can do everything, me neither, I still don't manage things. But there is also no person who can do nothing".

5.2.2 Family Support

Family support was mentioned less frequently but remained important, particularly for coping and decision-making. Families provided emotional reassurance, shared the burden of tasks, and supported each other both within and outside the affected area, for example, by assisting with administrative tasks or supplying goods.

5.2.3 Neighborhood Support

Neighborhood support involved both familiar and unfamiliar individuals helping one another. Participants described immediate actions such as sharing coffee, checking on neighbors, and

assisting with evacuations. One mentioned going up to her neighbor and stating, “I thought, I’m not leaving here until I get her out of the house.” Communication remained active during the disaster, even under extreme conditions, and in some cases, neighborly warnings were credited with saving lives. After the flood, support continued through the sharing of resources such as food, clothing, and generators, as well as through mutual aid in recovery efforts. Trust within neighborhoods also contributed to informal social control.

5.2.4 Organizational Support

Support from formal organizations played a significant role. Participants mentioned emergency services, military units, aid organizations, Non-governmental organizations (NGOs), and specialists such as doctors, therapists, catastrophe managers, and technical officials. Additional support came from supermarkets, religious institutions, insurance companies, and the state, particularly in the form of donations and financial assistance.

Organizational support was not only directed toward affected populations but also experienced internally. Respondents described solidarity within and between organizations, as well as practical and emotional support for responders, such as time off work or provisions during deployments.

5.2.5 Volunteer Support

Volunteer support was widespread and often spontaneously organized. Volunteers came from both nearby and distant regions, motivated by personal connections, media exposure, or social media. Someone mentioned, “They simply said then, yes, I'm going on vacation now, and no, why don't we just go there?” Their contributions included physical labor, the provision of goods, and financial support. People felt a great willingness to help, as shown in statements such as: “They said, we'll come back tomorrow, there's still so much to do,” and “Or here, we'll send friends.”

In some cases, volunteer efforts were quickly coordinated through informal systems, such as daily meetings to allocate tasks. While early stages were sometimes described as chaotic, these systems generally became more efficient over time. Participants expressed strong gratitude for volunteer contributions.

5.2.6 Non-verbal Support

Non-verbal forms of support were also significant. During the flood, signs such as lights in houses indicated safety. Afterward, shared silence, presence, and symbolic acts, such as rebuilding bridges or restoring cemeteries, provided emotional support and a sense of normality, enabling people to grieve and reflect.

5.2.7 Internal Resources

Within the affected communities, essential resources such as food, water, clothing, blankets, generators, and equipment were shared. One interviewee mentions: “We only had the clothes we were wearing, our nightwear, what they had on their bodies, and nothing else.” Informal distribution systems were established, and communal spaces were used for activities such as cooking and laundry. Shared ownership and collective use of resources were common. “What we had, of course, we shared.”

5.2.8 External Resources

External resources were provided by organizations, volunteers, NGOs, and private donors. These included food, water, medical supplies, communication tools, sanitation facilities, and residential containers for temporary housing. Donations arrived from across the country and were often delivered quickly in response to requests. Insurance support also contributed to recovery.

5.3 Attitudes toward Formal Institutions

Institutional trust and distrust, a core element of social cohesion, emerged as a pattern from the interviews. Both trust and distrust in authority were described by the participants. The conceptual definitions in Table 4 informed the interpretation of these codes.

Table 4

Attitudes Toward Formal Institutions: Codes, Definitions, and Coverage by Interviewees

Code	Definition	Coverage by

Trust	Trust in formal institutions, including how it affected participants to perceive the effort/action made by the authority.	FP3, FP9, FP12, AC4
Distrust	Distrust in formal institutions, including how it affected participants' perception of the effort/action made by the authority.	RP1, RP2, RP3, RP4, FP2, FP3, FP4, FP5, FP6, FP8, FP9, FP12, AC1, AC3

5.3.1 Trust

Participants showed trust in authority, as the government provided a lot of help, especially through funding, and implemented counseling with pastoral care, psychiatrists, and psychologists to ensure that all those who needed mental health support could receive the service. In addition, one participant noted that trust in THW encouraged people to make evacuation decisions.

5.3.2 Distrust

On the other hand, participants also expressed distrust in authority, which appears to have developed through both disaster response and recovery processes. During the disaster response phase, many participants perceived the state as ineffective, citing the inadequate EWS and the inability to provide emergency assistance. In the post-disaster response, while local residents and spontaneous volunteers played a central role, the formal response team only arrived later and introduced more bureaucratic procedures into contexts where local coordination had already been established. This generated frustration among people. As a result, distrust towards authority increased, accompanied by anger towards politicians. This led to conflicts between local residents and formal disaster response actors as well as the attribution of responsibilities to the state. These tensions were further reflected in political movements that criticized the state's failure.

5.4 COVID-19 Pandemic

As the flood occurred during another ongoing crisis, an additional important theme that emerged from interviews concerned the COVID-19 pandemic. The conceptual definitions in Table 5 informed the interpretation of the code.

Table 5

COVID-19 Pandemic: Code, Definition, and Coverage by Interviewees

Code	Definition	Coverage by
COVID-19 Pandemic	Any influence of the COVID-19 pandemic on social cohesion.	RP1, RP2, RP3, RP4, FP1, FP2, FP3, FP4, FP5, FP6, FP7, FP8, FP9, FP10, FP11, FP12, AC1, AC2, AC3, AC4

Although the flood occurred in mid-June 2021 during the COVID-19 pandemic, with vaccination efforts still ongoing, several participants described the pandemic as having little to no impact on the response and recovery processes. Specifically, participants who worked on site wore masks, but only because of the dust, not because of the pandemic. Furthermore, a few participants suggested that the social isolation experienced during the pandemic may even have increased people's willingness to help others.

During the pandemic, people were largely limited to staying at home and distancing themselves from others, which created feelings of helplessness. In contrast, during and after the flood, individuals were able to provide direct support, such as rescuing people and cleaning mud from affected houses.

5.5 Conceptualizing Social Cohesion

During the interviews, social cohesion was addressed from different perspectives, namely, definition, levels, and roles. The conceptual definitions in Table 6 informed the interpretation of these codes.

Table 6

Conceptualizing Social Cohesion: Codes, Definitions, and Coverage by Interviewees

Code	Definition	Coverage by
Definition of Social Cohesion	What social cohesion means to the participants.	RP1, RP2, RP3, RP4, FP1, FP2, FP3, FP4, FP5, FP6, FP7, FP8, FP9, FP10, FP11, FP12, AC1, AC2, AC3, AC4
Levels of Social Cohesion	At what level, the participants experience social cohesion (e.g., individual, community, institution).	RP1, RP2, RP4, FP2, FP4, FP8, FP9, FP10, AC3, AC4
Roles of Social Cohesion	What role social cohesion plays in the 2021 floods (e.g., enabled people to stand together).	RP3, RP4, FP1, FP2, FP3, FP4, FP6, FP8, FP9, FP10, FP11, FP12, AC1, AC2, AC3, AC4

5.5.1 Definition of Social Cohesion

Participants defined social cohesion in a wide range of key words. Firstly, social cohesion was expressed through general feelings or abstract concepts, such as important, beautiful, solidarity, basic needs, things you cannot live without, and the glue that holds people together.

Secondly, social cohesion concerns the social environment. Several interviewees linked the space where there is willingness to help, or where people can get support from others, to social cohesion. Several participants raised similar points that if they are in a crisis, they can expect help from neighborhoods or communities. Some emphasized the importance of an inclusive society, where marginalized groups, such as the elderly and people with disabilities, are not excluded from society. Similarly, others noted that equal access to basic needs and services, such as education, energy, and water supply, should be ensured regardless of nationality, religion, or social status. Less frequently mentioned but noteworthy is that strong social networks and shared community ideas and goals were also shown to be cohesive.

Thirdly, participants associated social cohesion with the capacity of individuals or communities. Many mentioned that the general capacity to cooperate with others is an essential component of a cohesive society. Others also described social cohesion as the coordination capacity. One notable example is that a participant had a connection across diverse professional capacities, such as the police, military, and logistics, enabling them to coordinate an effective disaster response without the formal organizational structure.

Fourthly, social cohesion was described as closely connected to local traditions or identities. Several participants mentioned that, since the affected region has long practiced the wine industry, there is a culture of working together and contributing to the community by doing what each can. Similarly, other participants described the place of attachment as constituting their identity, making them feel responsible for protecting the community.

Lastly, participants illustrated social cohesion as not always present or active, but as emerging or becoming more visible in emergencies. One participant noted that even if they had not talked to each other before, they immediately understood that they had to work together to recover from the disasters. Another participant said, “It does not always have to be just a really big disaster. That could also be someone who wants to organize a village festival and can’t do it alone, and others automatically feel responsible for helping them”. These statements exemplified that social cohesion is not always visible, but that shared responsibility and collective action can quickly emerge in response to large-scale disasters and to small-scale community needs.

5.5.2 Levels of Social Cohesion

Participants also referred to different levels at which social cohesion existed during and after the floods. Some emphasized the importance of the individual level, where social cohesion emerged from even a single small act of kindness, such as helping others repair their cars. Others regarded the community level as important for social cohesion because communities or groups usually shared ideas, missions, paths, and goals, which not only brought people together but also ensured their sustainability rather than being dependent on others.

Furthermore, some emphasized the importance of the institutional level, highlighting that formal structures provide support mechanisms in which, if one actor or institution is unable to fulfill its responsibilities, others can step in to support or complement those duties. It is also noted that when several institutions come together, the impact is greater. While the

participants understood social cohesion at different levels, some mentioned that all levels are deeply interconnected, together creating a stronger sense of social cohesion.

5.5.3 Roles of Social Cohesion

Participants moreover described the various roles that social cohesion played during and after the flood. Support from neighbors and volunteers, as well as a willingness to help, provided people with hope and helped them endure the devastating losses and damages and recover collectively. More specifically, self-organized spaces created a safe environment where people could share their feelings or support one another, which even led some participants to describe the experience of coming together as positive. In addition, participants noted that social cohesion led to more effective coordination during the disaster response by fostering a sense of agency among the community and enabling people to employ their capacities and skills in meaningful ways.

5.6 Transition of Social Cohesion

Social cohesion was described by participants as a dynamic process that changed before, during, and after the floods. Based on these temporal changes, the following codes were developed, with the definitions presented in Table 7.

Table 7

Transition of Social Cohesion: Codes, Definitions, and Coverage by Interviewees

Code	**Definition**	**Coverage by**
Negative and Declining	Social cohesion experienced as low, with increasing fragmentation, conflict, or distrust.	RP1, RP2, RP3, FP2, FP8, FP9, FP11, AC1
Negative to Positive	Social cohesion is initially weak or limited but improves over time, with stronger relationships and increased mutual support emerging.	RP1, FP5, FP7, FP8, FP10, F11, AC1, AC2, AC3, AC4

Positive and Increasing	Social cohesion is experienced as strong, with mentions of social ties, trust, and feelings of togetherness.	RP1, RP2, RP3, RP4, FP1, FP2, FP3, FP4, FP5, FP6, FP7, FP8, FP10, FP11, FP12, AC1, AC2, AC3, AC4
Positive to Negative	Social cohesion is initially strong, but declines over time as solidarity fades and tensions or individual concerns re-emerge.	RP2, RP3, FP2, FP3, FP4, FP6, FP7, FP8, FP9, AC1, AC2

Social cohesion during and following the flood was not static, but dynamic, evolving in both positive and negative directions. Many participants described an initial increase in social cohesion. However, over time, the narrative changed, both strengthening and weakening, as well as more complex shifts between the two. Some interviewees mentioned certain experiences resulting in a change from a strong feeling of social cohesion to a weaker version, for example, through feeling not supported by friends and family, but also vice versa. This showed that certain encounters can result in an instant change.

Mainly after the immediate aftermath, a positive development of social cohesion was reported. Participants described how people “grew closer together”, forming new relationships, strengthening existing ones, and engaging in sustained mutual support. This resulted in long-lasting networks and communities in many cases. Some participants noted that close ties already existed before the flood, while others described a shift from previously distant relationships with limited interaction to stronger cohesion. The shared experience of the flood brought people together through collective experience and action.

However, many participants also mention a decline in cohesion over time, with strong solidarity during and right after the flood being temporary. As everyday life resumed, individual concerns reemerged, and the collective feeling diminished. Some people wanted to return to everyday life, even forgetting that it all happened. As a result, there was an increase in conflicts over unequal recovery speeds, access to resources, and perceived injustices.

Additionally, some findings point to more persistent negative impacts on social cohesion. Structural inequalities, particularly affecting marginalized groups, challenged cohesion and, in some cases, contributed to outmigration, with people leaving the community. Furthermore,

distrust in institutions and unresolved questions of responsibility added additional strain to social relations.

5.7 Factors that led to Social Cohesion

During the interviews, participants identified various factors that contributed to the emergence of social cohesion during and after the floods in Germany. For this thesis, the following codes were developed with the definitions presented in Table 8.

Table 8

Factors that led to Social Cohesion: Codes, Definitions, and Coverage by Interviewees

Code	Definition	Coverage by
Geographical Attachment	A sense of connection coming from shared or perceived ties to a place. This may include living in the affected area, prior visits, family connections, or even symbolic familiarity (e.g., media exposure).	RP2, RP3, RP4, FP2, FP4, FP7, FP8, FP9, AC1
Inclusive Participation	The involvement of diverse social groups and individuals, where different roles and capacities are recognized and valued (e.g., across age, gender, religion, or skill sets).	RP1, RP3, RP4, FP2, FP3, FP4, FP7, FP8, FP9, FP10, FP11, AC1, AC2, AC4
Leadership and Coordination	Forms of formal or informal leadership that provide direction, organize resources, and structure collective action. The emphasis is placed on how leadership practices facilitate cooperation, rather than solely on outcomes.	RP2, RP3, FP2, FP3, FP4, FP5, FP6, FP7, FP8, FP9, FP12, AC4

Social Networks	Pre-existing or emergent relationships between individuals or groups that provide access to support, information, and resources.	FP1, FP3, FP4, FP8, FP9, F10, FP12,
Individual Relevance	The extent to which individuals feel emotionally or morally connected to those affected, regardless of direct ties, leading to empathy-driven engagement and support.	RP4
Religion Affiliation and Practices	Shared religious beliefs, identities, or practices that bring individuals together, offering both organizational structures and moral frameworks that encourage collective action.	FP3, FP5, FP8, FP9
Altruism and Community Commitment	A motivation to contribute to the well-being of a community, driven by a sense of duty, solidarity, or moral responsibility.	RP2, RP3, RP4, FP2, FP3, FP4, FP6, FP7, FP8, FP9, FP10, FP11, FP12, AC1, AC2, AC3, AC4
Shared Experiences and Practices	Shared experiences and collective activities through which individuals interact, support one another, and engage in joint practices. These are reinforced by shared objectives, values, and narratives on collective purpose and unity.	RP1, RP3, RP4, FP1, FP2, FP3, FP4, FP6, FP7, FP8, FP9, FP10, AC1, AC2, AC3, AC4
Trust	Confidence in others' intentions, reliability, and actions.	RP3, RP4, FP2, FP3, FP4, FP6, FP8, FP12, AC2

5.7.1 Geographical Attachment

A strong sense of place attachment played an important role in shaping social cohesion. Participants described a deep attachment to the affected areas, such as in the Ahr Valley or different neighborhoods, which fostered a clear sense of belonging and responsibility. This attachment often stemmed from long-term residence, shared history, and existing social ties, alongside a strong desire to rebuild and remain in the community. As one participant noted, this sense of belonging created a distinction between those "by the Ahr" and those outside it.

For others, geographical attachment extended beyond residency. Connections through tourism, regional identity, or even exposure to the disaster through media created a sense of responsibility to help. "No one asked them. I would say that is social cohesion, because they see themselves as responsible for also having to do something". In these cases, belonging through space was constructed at broader levels, such as national or human solidarity, reinforcing social cohesion across geographic boundaries.

5.7.2 Inclusive Participation

Inclusion emerged as a key driver of cohesion. Participants emphasized the importance of involving people from diverse backgrounds, including different age groups, professions, and cultural or religious contexts. This diversity contributed to a shared sense of "we can do this", where individuals felt valued for their specific skills and contributions.

People contributed in various ways, from physical labor to cooking and organizing, highlighting that everyone had the capacity to contribute. Generally, it was stated that it was important to find out who can do what: "There is no person who can do everything. Me neither. But there is also no person who can do nothing". This resulted in creative problem-solving and strengthened the collective identity. As a result, participants often described a transformation into a community, sometimes referred to as "one big family".

5.7.3 Leadership and Coordination

Leadership was essential in coordinating the largely bottom-up response after the flood. In many cases, individuals either naturally took on leadership roles or were informally assigned to guide efforts, particularly in situations where communities were cut off from external support. These leaders were responsible for organizing key activities such as construction work, distribution of goods, waste management, and task allocation.

Leadership was generally not described as hierarchical decision-making, but rather as providing direction and ensuring that decisions were made when necessary. While some support systems emerged organically, participants emphasized that leadership improved efficiency, especially when many volunteers were willing to help but lacked guidance. This need was also reflected at the organizational level, where coordination and leadership structures helped prevent duplication and improve cooperation. This all contributed to social cohesion as it resulted in social ties and trust formation: “It was really interesting to see how they were able to integrate the different capacities. And at the same time, the social cohesion and social capital of the small village created something unique”.

5.7.4 Social Networks

Pre-existing and newly formed networks played a crucial role in facilitating support. Participants highlighted the importance of knowing individuals across various sectors, including emergency services, logistics, healthcare, and infrastructure. These connections enabled rapid access to resources and expertise, improving the effectiveness of the response. At the same time, networks contributed to social cohesion by bringing together people from different spheres. Through collaboration and shared efforts, new relationships were formed, and in some cases, lasting friendships developed based on trust and mutual support.

5.7.5 Individual Relevance

Social cohesion was also framed from an individual perspective in relation to personal vulnerabilities. One participant emphasized its importance by considering what would happen if they themselves were affected, highlighting that being part of a cohesive community is essential for accessing help, information, and support in times of need.

5.7.6 Religion Affiliation and Practices

Religion was identified as another contributing factor. Religious institutions, particularly churches, provided physical spaces for gathering, distributing aid, and offering support. They also offered moral frameworks that guided helping behaviors, such as the principle of subsidiarity. Participants described how both religious and non-religious individuals were motivated by shared moral or faith-based values, contributing to collective action.

5.7.7 Altruism and Community Commitment

A strong aspect across the interviews was the role of altruism and a sense of collective responsibility. Participants frequently described helping others as a natural and intrinsic human response, even when it involved personal sacrifice. This orientation was often expressed through a shared sense of "we", reinforced by the common goal of recovering from the disaster.

The scale of the crisis required collective effort, with participants emphasizing that no individual could manage this alone. This shared responsibility fostered unity and motivated people to contribute according to their abilities. Additionally, those who received help often expressed a desire to give back. Acts of gratitude, both verbal and symbolic, further strengthened social bonds. Participants also suggested that the crisis revealed fundamental human values such as solidarity and compassion, with some describing it as a moment where "decency and humanity returned".

5.7.8 Shared Experiences and Practices

Shared experiences and everyday practices were central to building cohesion. The collective experience of the flood created a strong sense of unity, as people felt bonded by having "gone through the same thing". Collaborative problem-solving also emerged, including the organization of shared facilities such as first aid tents, laundry stations, and power supply systems. A shared goal of rebuilding with the ambition to improve, further strengthened cohesion.

This sense of togetherness was also visible through joint activities such as sharing meals, organizing barbecues, gathering around campfires, and supporting one another in daily routines. These practices extended beyond the immediate aftermath, with participants describing continued social interaction through community events, gatherings, and celebrations.

5.7.9 Trust

Trust was described as a fundamental and most important component of social cohesion. Participants emphasized the necessity of trusting others to contribute, fulfill responsibilities, and act in good faith. This included trusting strangers, particularly in situations where resources were shared freely and could potentially be misused.

Trust enabled cooperation, reduced conflict, and facilitated the sharing of goods, sharing of living spaces, and responsibilities. It also created a sense of security, with participants describing it as essential to maintaining social cohesion, as “the real disaster is people turning against each other, people losing their fundamental values, people not believing anymore in society and working together on something meaningful”.

5.8 Absence of Social Cohesion

While many participants experienced social cohesion, there were also some instances in which it was absent. The code for the absence of social cohesion was developed, and its conceptual definition in Table 9 informed the interpretation of the code.

Table 9

Absence of Social Cohesion: Code, Definition, and Coverage by Interviewees

Code	**Definition**	**Coverage by**
Absence of Social Cohesion	Feeling of loneliness, experience of being alone, and no feeling of grouping.	RP1, FP2, FP6, FP7, FP11, FP12, AC1, AC3

Some participants pointed out experiencing no social cohesion. An example of this was an interviewee who recently moved to the area during the COVID-19 pandemic, resulting in limited social contact before the flood. This consequently resulted in experiencing little to no social cohesion during the response phase. Other participants described patterns of individual prioritization and limited engagement. With this, some observed that other civilians focused primarily on their own lives or only engaged when encountering others, resulting in low levels of interaction and weak social ties. This was further linked to a weak sense of collective responsibility. Participants noted instances in which individuals refused to cooperate, stating that “this is not my responsibility” but rather that of formal institutions such as the fire department. Moreover, tensions sometimes emerged over expectations to contribute to collaborative efforts, creating divisions between those who helped and affected residents, thereby fragmenting social structures. Finally, some participants highlighted patterns of exclusion, particularly affecting marginalized groups, who were not always welcomed or included in some self-organized spaces within the community.

6. Discussion

This section discusses the two research questions of this study through a critical synthesis of the reviewed literature and the empirical findings, highlighting similarities, differences, and emerging insights.

6.1 Experience of Social Cohesion during and after a Flood Disaster

This section addresses the following research question: *How do different stakeholder groups in Germany experience social cohesion during and after a flood disaster?* Three stakeholder groups were identified in this study: research professionals, field professionals, and affected citizens. While the differences between stakeholder groups were not substantial, the findings address the first part of the research question by illustrating the limited variations in the experience of social cohesion. Affected citizens, for example, often described a sense of togetherness with their neighborhoods. In contrast, research and field professionals usually experienced gratitude from affected people or support from their own and other organizations. These differences suggest that social cohesion is shaped not only by the disaster context itself, but also by the positional roles and interactional environments of each stakeholder group. However, as pointed out in the methodology, the sample size of the different groups is limited, which has to be considered.

The following sections focus on the second part of the research question by exploring how interviewees experienced social cohesion during and after the flood disaster. The discussion is structured around general experiences of social cohesion, followed by a more detailed examination of its positive and negative dimensions. This section concludes by synthesizing these perspectives.

6.1.1 General Experiences of Social Cohesion

Flood literature characterizes major flood events in Germany as highly destructive, with long-lasting consequences. These impacts include casualties, financial losses, property damage, and adverse mental health outcomes (BMI, 2022; Klör et al., 2025; Kron et al., 2022; Mohr et al., 2023; Silva et al., 2025). These reports frame floods primarily in terms of their devastating effects on individuals and communities. The experiences shared by interviewees in this study reflect many of these impacts. Participants frequently described distressing

situations, emotional strain, and significant personal losses. However, alongside these narratives of devastation, a contrasting dimension emerged: many interviewees emphasized a strong sense of social cohesion and support during and after the flood. Despite the severity of the disaster, a generally positive social atmosphere was often described.

This sense of cohesion manifested through a wide range of support mechanisms. Interviewees mentioned receiving help from family members, neighbors, local communities, organizations, and volunteers. Support took multiple forms, including the provision of goods, help with repairs and renovations, sharing of tools and equipment, physical and emotional assistance, and financial contributions. In some cases, even non-verbal gestures were perceived as meaningful forms of support. These findings align with existing literature highlighting the involvement of diverse actors in disaster response, including emergency services, governmental bodies, civil society organizations, pastoral care, specialists, and spontaneous volunteers, as well as the resources provided (Fekete & Rhein, 2024; Fekete & Sandholz, 2021; Nick et al., 2023). Gratitude was another prominent aspect of participants' experiences, frequently expressed in relation to both received and provided support.

A central perspective from the interviews is that social distinctions appeared to matter less. Differences in age, religion, or prior relationships appeared to lose significance, with individuals describing an increased sense of unity and mutual reliance. One interviewee captured this by stating, "There is no person who can do everything… but there is also no person who can do nothing." This reflects a shared sense that people could rely on each other, building trust and allowing them to cooperate more easily and spontaneously. In many cases, this led to a "snowball effect," where helping behaviors spread quickly through communities.

However, at the same time, social cohesion was not universally experienced. Some interviewees reported conflicts, ranging from interpersonal tensions to disagreements over the organization of the disaster response. Others noted attempts by external actors to spread distrust and polarizing narratives about the German state. Additionally, a minority of participants described a lack of cohesion, mentioning individualistic attitudes, limited engagement, or perceptions that collective responsibility was not relevant in this context.

These findings broadly align with the literature on social cohesion in DRM, which identifies social connectedness as a critical resource for mobilizing collective action (Aldrich & Meyer, 2015; Dynes, 2002). Existing research suggests that disasters can both disrupt and strengthen social networks (Kaniasty & Norris, 1999). This dynamic is evident in this study, where moments of conflict coexist with the emergence of new forms of solidarity and belonging.

The literature states that social cohesion plays different roles across the various phases of a disaster, which was also reflected in the interviews. In the preparedness and early response phases, existing social ties tend to facilitate timely evacuation and decision-making (Dynes, 2006; Lo et al., 2015). This was illustrated by one interviewee who advised a neighbor to evacuate, which contributed to their survival. Similarly, trust within family relationships influenced decision-making processes, as one father relied on his children to help guide important decisions. During the response phase, strong social networks enabled rapid informal support systems, allowing for efficient sharing of resources, information, and labor (Aldrich & Meyer, 2015; Braun & Aßheuer, 2011; Nakagawa & Shaw, 2004). Many interviewees emphasized that without such support, coping with the immediate impacts of the flood would have been significantly more difficult, which is in line with Meyer (2018) stating that social dynamics significantly enhance the response capacity.

In contrast, the role of social cohesion during the recovery phase was not in line with the previous research. While some participants reported ongoing support and continued social interaction, others described tensions related to unequal recovery processes, including feelings of resentment and frustration. Although literature highlights the importance of social cohesion for long-term recovery and mental health (Adeola & Picou, 2012; Wind & Komproe, 2012), only limited evidence of this was found in the interviews.

To conclude, the findings suggest that the experience of social cohesion during and after the flood was shaped by a complex mix of togetherness, disruption, and social interaction. While many participants described moments of strong support, solidarity, and collective effort, these experiences were not uniform and often shifted over time. The flood was not only a physical and material crisis but also a social one.

6.1.2 Positive Experiences of Social Cohesion

Aside from the devastating consequences, the disaster resulted in a positive experience of social cohesion across stakeholder groups. Many participants described a shared sense of togetherness and solidarity, expressing a positive atmosphere that emerged during both the response and recovery phases.

Participants described experiencing social cohesion through a wide range of groups, including family, neighborhood, community, volunteer, external organizational, and governmental support. While expressions of gratitude for the support also emerged as a form of cohesion, sharing resources, such as food and shelter, was the most common form of cohesion. This is

consistent with the literature associating strong social cohesion with resource sharing (Aldrich & Meyer, 2015; Braun & Aßheuer, 2011; Nakagawa & Shaw, 2004). However, the findings extend existing research by identifying additional forms of cohesion experienced, particularly non-verbal support and the provision of external resources (Aldrich & Meyer, 2015). Participants described feeling emotional reassurance through non-verbal cues, such as seeing lights in neighboring houses while trapped, as well as solidarity through receiving large donations and resources from across Germany and neighboring countries. These dimensions have received limited attention in prior studies, suggesting that the experiential scope of social cohesion, particularly in terms of how it is experienced, may be broader than previously conceptualized.

Place attachment also played a critical role in fostering social cohesion. Participants referred to locations such as restored cemeteries and rebuilt bridges, as well as broader historical and cultural traditions, as important anchors of collective identity and shared meaning. This finding aligns with literature that highlights the importance of shared values, identity, and community belonging in shaping social cohesion (Berger-Schmitt, 2002; Larsen, 2014). These findings suggest that collective identity is not abstract but embedded in concrete places and shared cultural references, through which social cohesion is strengthened.

6.1.3 Negative Experiences of Social Cohesion

The findings indicate that, next to a widely reported sense of togetherness, the flood also generated multiple forms of tension and conflict among stakeholder groups. These conflicts emerge at different levels and question the narrative of a purely cohesion-focused disaster response.

First, interviewees described the presence of ideologically motivated groups that sought to exploit the crisis. These included far-right and conspiracy-oriented groups attempting to spread misinformation and foster skepticism and distrust in state institutions. While such dynamics are largely absent from the reviewed literature, they align with broader observations that crises can be used to create polarization, and so hinder the effectiveness of response and recovery operations (Ertan et al., 2022). Importantly, distrust toward the German state was not only externally driven but also emerged internally, as affected residents questioned responsibility and perceived failures in disaster management. This is according to the literature, as Antronico et al. (2020) and Joerin et al. (2018) state that trust in governments is based on how they effectively manage extreme events, and distrust can be formed due to poor management of these situations (Appleby‐Arnold et al., 2020).

Second, tensions arose between locally organized response efforts and formally deployed governmental structures. The literature emphasizes that disaster management in Germany follows a decentralized, subsidiarity-based model, in which local actors take initial responsibility and higher administrative levels intervene when capacities are exceeded (Juling, 2022; Nick et al., 2023; Szönyi et al., 2022). During these floods, local municipalities and citizens played a central role in the immediate response, particularly during the early phase when external assistance was delayed due to logistical and organizational constraints. However, by the time formal operational–tactical teams were fully deployed, locally established systems were already in place. This led to disagreements over authority, coordination, and appropriate response strategies. While existing research acknowledges coordination challenges, particularly regarding the integration of spontaneous volunteers (Ommer et al., 2024; Szönyi et al., 2022), it pays limited attention to the conflicts that arose between the different response structures and actor groups. In this case, such tensions intensified by the growing distrust towards authorities, which resulted from perceived shortcomings in EWS, delays in the initial provision of emergency assistance, and the introduction of bureaucratic procedures that slowed recovery efforts (Kron et al., 2022; Ommer et al., 2024; Szönyi et al., 2022). Social cohesion within societies is reduced by these tensions and distrust.

Third, conflicts between citizens were frequently linked to recovery processes. Unequal access to financial support and differences in reconstruction progress resulted in feelings of resentment and competition. These findings contrast with dominant narratives in the flood literature, which focus on shared loss, community attachment, and collective recovery (Truedinger et al., 2023), as well as the significant psychological burden experienced by affected populations (Klör et al., 2025; Zenker et al., 2024). While these studies highlight important dimensions of post-disaster life, they overlook how recovery inequalities can strain social relations within neighborhoods and communities, increasing vulnerabilities among certain groups, including marginalized ones.

Finally, the results reveal social and cultural tensions, including conflicts on gender roles in leadership, the role of religion, and friction between residents and external factors such as media or volunteers. These findings further counteract existing accounts of strong civil society engagement during the floods (Bier et al., 2023; Fekete & Rhein, 2024), showing that these interactions are not always experienced as so positive.

Taken together, these findings contribute to the broader literature on social cohesion in DRM, which emphasizes that the relationship between disasters and social cohesion is complex and

not unidirectional (Meyer, 2018). While disasters can foster solidarity and a shared sense of identity, these effects are often temporary (Kuper & Kröpelin, 2006; Ntontis et al., 2020). The emergence of conflicts during the recovery phase, combined with increasing distrust towards authorities and feelings of injustice and resentment, supports this perspective. Rather than replacing social cohesion, conflict appears to coexist with it, and may over time, contribute to its gradual deterioration.

6.1.4 Synthesis: Social Cohesion Beyond Positive Outcomes

This research question explores the different stakeholders' experiences of social cohesion, further revealing key aspects of social cohesion that are not only experienced in positive dimensions but also in negative ones. The literature of the 2021 flood disaster in Germany shaped the picture of the devastation. Moreover, in the social cohesion literature, Meyer (2018) understands social cohesion as a property that can lead to mixed outcomes of DRM: positive, negative, and no lasting effects. However, despite this more nuanced conceptualization, much of the literature still tends to frame social cohesion primarily in terms of positive outcomes in DRM. It was, therefore, expected that the people's experience of social cohesion during and after the disasters would also be predominantly positive, with people expressing only positive feelings about the experience, e.g., gratitude and trust. However, findings show that people experienced negative social interactions alongside positive ones, rather than isolation or separation from them. For example, distrust in authorities was expressed because of the unmet expectations of the outcome of the authorities' disaster response effort. During the recovery process, feelings of frustration and resentment emerged among people due to uneven resource distribution and varying reconstruction progress. This highlights that the relationship between social cohesion and disasters is not unidirectional, but rather entails a feedback loop that creates both positive and negative social experiences, which will be further touched upon in Section 6.2.4.

6.2 The Construction of Social Cohesion during and after a Flood Disaster

This section addresses the following research question: *How do different stakeholder groups in Germany construct the meaning of social cohesion during and after a flood disaster?* It examines this by analyzing social cohesion in terms of its definition, levels, roles, and transitions.

6.2.1 Definition of Social Cohesion

What becomes clear from a first examination of how interviewees define social cohesion, compared to but similar to the literature, is that the concept remains highly variable and multidimensional. Although similar themes and concepts recur throughout the interviews, each participant defined social cohesion slightly differently.

Several interviewees used wording such as “important”, “beautiful”, “solidarity”, “basic needs”, “things you cannot live without”, and “the glue that ties people together”. These descriptions partially align with the literature. Some expressions, particularly “important” and “beautiful”, reflect more subjective and emotional experiences of social cohesion. Other concepts, such as solidarity, strongly correspond with existing literature (Beauvais & Jenson, 2002; Chan et al., 2006; Dragolov et al., 2013; Fonseca et al., 2018). In the DRM literature specifically, disasters are described as capable of fostering solidarity through social cohesion (Bonfanti et al., 2024; Monteil et al., 2020).

Although “basic needs” and “things you cannot live without” are not explicitly included in most definitions of social cohesion, the literature frequently refers to common goals and mutual help (Broadhead, 2022; Fonseca et al., 2018; Moustakas, 2023). In a disaster context, these dimensions can be experienced through the fulfillment of basic needs for oneself and others. Furthermore, defining social cohesion as “the glue that ties people together” directly reflects Broadhead’s (2022) metaphor of social cohesion as glue, referring to the invisible bonds based on shared values and collective goals that hold societies together.

A second way in which interviewees defined social cohesion concerned the willingness to help others and receive support from neighborhoods or communities. The willingness to help is a recurring concept throughout the literature and is central to definitions provided by Chan et al. (2006), Dragolov et al. (2013), Moustakas (2023), and Zahnow (2024). Within this understanding, several interviewees emphasized the importance of “leaving no one behind”, referring to an inclusive society in which vulnerable or marginalized groups, such as elderly people or people with disabilities, are not excluded. This aligns with Moustakas’s (2023) dimension of acceptance of diversity. Interestingly, Green and Janmaat (2011) describe exclusionary behavior as a possible downside of social cohesion, whereas interviewees instead emphasized inclusivity as an essential component of cohesion.

Interviewees also mentioned the importance of equal access to resources, such as education, energy, and water supply, regardless of nationality, religion, or social status. Although these

specific needs are not explicitly mentioned in most definitions, the literature emphasizes equality and quality of life as important dimensions of social cohesion (Moustakas, 2023; Schiefer & an der Noll, 2016; Schiefer et al., 2012). Equality is understood as the fair distribution of resources and opportunities, while quality of life includes both objective and subjective dimensions of well-being.

Moreover, interviewees frequently associated social cohesion with strong social networks and shared community values and goals. This is one of the most consistently recurring elements in the literature. Broadhead's (2022) glue metaphor similarly emphasizes social networks as the structures holding societies together through shared values and collective goals. Dragolov et al. (2013) additionally highlight a common sense of purpose, while Beauvais and Jenson (2002) refer to shared values, group structures, and inclusion. Zahnow (2024) emphasizes social ties and their contribution to collective well-being. Similarly, social networks are central within the definitions by Aldrich and Meyer (2015), Dynes (2006), Moustakas (2023), and UNDP (2020). Overall, the interviewees' emphasis on willingness to help, inclusion, and equal access aligns closely with the definitions of social cohesion by the Council of Europe (2008) and the OECD (2011), which conceptualize social cohesion as promoting societal well-being while reducing inequalities and marginalization.

A third recurring aspect in the interviews was the capacity to cooperate with others, also referred to as coordination capacity. Although this interpretation may be particularly relevant in a disaster context, it is also reflected in broader definitions within the literature. The Council of Europe (2008) and the OECD (2011), for example, define social cohesion as the capacity of society to promote well-being, which requires cooperation. Similarly, Beauvais and Jenson (2002) conceptualize social cohesion as an ongoing process involving participation and conflict resolution. Dragolov et al. (2013) and Dragolov et al. (2016) further define social cohesion as the quality of social cooperation, similar to Aldrich and Meyer (2015), while DRM literature highlights how social cohesion fosters cooperation during disasters (Bonfanti et al., 2024; Monteil et al., 2020).

Social cohesion was also defined through local traditions, shared identities, and place attachment. Within the Ahr Valley, wine production was frequently mentioned as a local tradition that fostered community cooperation and shaped regional identity. Others referred to place attachment and the willingness to help one another based on the connection to place. These findings correspond with Beauvais and Jenson's (2002) dimensions of group structures and participation, Zahnow's (2024) concept of belonging, and Berger-Schmitt's (2002)

emphasis on common identity and shared community belonging. Similarly, Larsen (2014) highlights national identification as an important basis for community formation.

Finally, interviewees strongly defined social cohesion within the context of disasters. Participants described social cohesion as trust and cooperation that emerge during disasters, even among people who had never previously interacted. The interviewees' emphasis on trust, therefore, corresponds with broader literature conceptualizing trust as one of the central dimensions of social cohesion across interpersonal and community levels (Berger-Schmitt, 2002; Chan et al., 2006; UNDP, 2020), which facilitates cooperation and collective action during disasters (Chan et al., 2006; Fonseca et al., 2018; Lo et al., 2015). At the same time, interviewees noted that great disasters are not always necessary for people to help one another, suggesting that social cohesion may not always be visible but can become activated during moments of need, regardless of the size or severity. This again reflects Broadhead's (2022) metaphor of social cohesion as invisible glue. Moustakas (2023) similarly conceptualizes social cohesion as a set of dimensions shaping how societies respond to shared challenges. The idea of responding collectively to challenges was particularly central in the interviews. Beauvais and Jenson (2002) likewise define social cohesion as including mechanisms for conflict resolution, which can also be understood as collective responses to societal challenges.

Despite the strong overlap between interview findings and the literature, several dimensions emphasized in the literature were largely absent from the interviewees' definitions. One notable exclusion is vertical social cohesion (UNDP, 2020). Although institutions and governments were occasionally mentioned as support actors, interviewees primarily focused on horizontal cohesion between neighbors, communities, and citizens when defining social cohesion. This is particularly interesting because DRM literature strongly emphasizes institutional trust during disaster response and recovery (Antronico et al., 2020; Joerin et al., 2018; Lo et al., 2016). This suggests that interviewees mainly experienced social cohesion through interpersonal and community-based relations rather than through institutional dimensions.

This distinction also relates to the different levels at which social cohesion is conceptualized. The literature distinguishes between micro, meso, and macro levels (Fonseca et al., 2018), whereas interviewees mainly focused on the micro and meso levels. The different levels of social cohesion will be discussed in greater detail in Section 6.2.2. Similarly, this relates to distinctions between bonding, bridging, and linking social capital (Aldrich & Meyer, 2015). Interviewees referred strongly to bonding social capital within close communities and

partially to bridging ties across social groups, but there were no references to linking ties between citizens and institutions or authorities.

Another absent dimension concerns civic participation and political engagement. The literature repeatedly defines social cohesion in terms of civic participation, democratic engagement, participation in governance, and legitimacy (Beauvais & Jenson, 2002; Fonseca et al., 2018; Moustakas, 2023). Although interviewees occasionally mentioned inclusive decision-making, they did not explicitly conceptualize this as part of social cohesion. This can indicate that their understanding of social cohesion is primarily informal and community-oriented rather than institutional or political.

In addition, while interviewees strongly resonated with the metaphor of social cohesion as glue, the metaphor of social cohesion as sugar was much less visible within the interviews. Broadhead's (2022) sugar metaphor conceptualizes social cohesion through everyday interactions, routine social practices, and small acts of connection that continuously reproduce cohesion. In contrast, interviewees mainly described social cohesion through solidarity during crises, visible support mechanisms, and small- and large-scale acts of help and cooperation. However, given that this thesis focuses on social cohesion in a disaster context, it is understandable that interviewees emphasized visible forms of cohesion rather than everyday interactions.

Based on these findings, it can be concluded that social cohesion is difficult to define in a unidimensional manner. Nevertheless, by combining the perspectives of interviewees with the relevant literature, the following definition can be formulated:

> Social cohesion is formed by social bonds, shared values, networks, and practices that enable individuals and communities to cooperate, support one another, and work toward collective well-being, particularly in times of shared challenges. It is characterized by solidarity, mutual trust, inclusion, equal access to opportunities and resources, a sense of belonging, and the willingness and capacity to help others, thereby strengthening society's resilience and functioning.

This definition reflects the experiences and perspectives identified in the context of the 2021 German floods and should therefore not be assumed to be universally applicable.

6.2.2 Levels of Social Cohesion

In terms of the levels at which social cohesion exists, the findings showed similarities with the literature. Existing literature conceptualizes social cohesion across multiple, interconnected levels, including micro, meso, and macro levels (Fonseca et al., 2018). It aligns with the finding that social cohesion exists at multiple levels: individual, community, and institutional levels.

At the individual level, social cohesion was often experienced through small-scale, interpersonal interactions and everyday acts of support. Participants described how even a small act of kindness, such as helping someone repair a car, contributed to feelings of mutual trust. These findings align with the individual-level conceptualization of social cohesion, which emphasizes face-to-face interactions and interpersonal trust (Bottoni, 2018; Fonseca et al., 2018). Similarly, Saggar (2019) conceptualizes micro-level social cohesion as sugar, embedded in everyday relationships and social processes.

The community level emerged as the most prominently experienced form of social cohesion among participants. Many interviewees described communities and groups as spaces where people not only shared common goals and ideas but also just being there for others, fostering a sense of togetherness and collective identity. Participants also emphasized that social cohesion should not depend on specific individuals but rather be sustained through shared missions within the community. This aligns with the meso-level conceptualization of social cohesion, in which shared values and collective goals strengthen social relationships within communities (Fonseca et al., 2018). Similarly, the findings reflect forms of horizontal cohesion described by the UNDP (2020), through which relationships between individuals and groups within society play a key role. The findings further suggest that social cohesion is actively sustained and reinforced through everyday practices rather than simply existing as a static condition.

Social cohesion at the institutional level was often expressed through trust in institutions. A participant reported that the neighborhood decided to evacuate because they trusted the THW, as evidenced by the uniform, highlighting how trust in an institution can lead to evacuation behavior. This aligns with the vertical cohesion defined by the UNDP (2020), in which trust plays a crucial role in relationships between citizens and institutions. Similarly, this finding reflects forms of macro-level social cohesion founded on trust in institutions (Fonseca et al., 2018).

Most importantly, participants also described that social cohesion should exist and emerge not only from the micro-level but also from the macro-level, emphasizing the importance of each level of social cohesion. This aligns with the literature, noting that social cohesion is a state that concerns both horizontal and vertical cohesion (Chan et al., 2006). Therefore, social cohesion should not be treated as operating at isolated levels, but rather as a multidimensional process in which each level both complements the others and remains essential to the overall functioning of social cohesion.

6.2.3 Roles of Social Cohesion

Regarding the role of social cohesion in the context of DRM, some findings align with the previous studies, while others extend existing literature. Previous studies on social cohesion in DRM primarily highlight its functional role across the disaster phases of prevention, preparedness, response, and recovery. Existing literature shows that strong social networks and institutional trust contribute to collective response efforts, resource sharing, volunteerism, and recovery processes (Aldrich & Meyer, 2015; Braun & Aßheuer, 2011; Choo & Yoon, 2022; Lo et al., 2016; Nakagawa & Shaw, 2004).

The findings support these perspectives. Participants frequently described how interactions with and support from neighborhoods, communities, volunteers, and organizations enabled the collective action during and after the flood. Social cohesion contributed to effective disaster response coordination and the sharing of resources such as food and shelter. Several participants also noted that social cohesion created a sense of agency, in which people felt that everyone could contribute in different ways according to their abilities, resulting in effective disaster response coordination without formal structures. In this way, social cohesion contributed to the individual resilience, the resilience of the affected area, but also the resilience of the community.

However, some aspects emphasized in the literature were not strongly reflected in the interviews. For example, Nakagawa and Shaw (2004) and Sadri et al. (2018) argue that communities with higher levels of social cohesion experience faster reconstruction and greater satisfaction during recovery processes. While such positive recovery experiences were partially reflected in the findings, participants who experienced social cohesion instead reported negative experiences, such as feelings of dissatisfaction with uneven reconstruction progress. Although five years may not have been sufficient to fully assess long-term recovery processes, these findings raise questions about the sustainability of social cohesion, which will be discussed in more detail in Section 6.2.4.

Furthermore, the findings extend existing literature by showcasing that the role of social cohesion was not only operational or functional, but also emotional and relational (Aldrich & Meyer, 2015; Nakagawa & Shaw, 2004). Participants described how the sense of togetherness and solidarity gave them hope and enabled them to endure the disaster collectively despite severe loss and destruction. Furthermore, the findings highlight the importance of self-organized spaces, such as community cafés, where people could talk about their experiences and feelings or simply be present for one another. While previous studies often focus on resource mobilization and coordination (Aldrich & Meyer, 2015; Nakagawa & Shaw, 2004), these findings suggest that social cohesion also operates through emotional presence and shared experiences. Therefore, social cohesion functioned not only as a mechanism for disaster response and recovery but also as a source of emotional support, collective endurance, and shared meaning.

6.2.4 Transition of Social Cohesion

The findings reveal that social cohesion in the aftermath of the floods cannot be understood as a fixed or uniformly experienced matter. The results show that social cohesion is a dynamic and uneven process that evolved over time. For many, social cohesion initially increased, mainly driven by a sense of urgency, collective action, and shared support during the immediate aftermath. This increased social cohesion diminished when everyday life returned and people yearned for a sense of normality. Furthermore, some experienced a stable level of cohesion, while others reported a persistent exclusion and noticed structural inequalities that affected mainly marginalized groups. These findings align with earlier research suggesting that strong social cohesion can also reinforce group boundaries and contribute to exclusion (Green & Janmaat, 2011).

This changing and dynamic experience of social cohesion challenges the dominant conceptualizations in the literature. Many definitions frame social cohesion as either a stable condition or an inherent feature of everyday life that is produced through social interactions continuously (Broadhead, 2022), often emphasizing, for example, strong social relationships (Berger-Schmitt, 2002) or shared values and mutual support (Moustakas, 2023). While these perspectives capture important dimensions of social cohesion, they portray it as a static and continuous concept, leaving no room for change, disruption, or transformation. Some researchers acknowledge the importance of context in defining social cohesion (Bruhn, 2009), but focus primarily on environmental differences rather than on changes over time. As a

result, much of the literature conceptualizes social cohesion as a “state of affairs” (Chan et al., 2006), overlooking the temporal dynamics.

In DRM literature, in contrast, there are some mentions of the dynamic nature of social cohesion. Disasters are typically recognized as events that can disrupt existing social networks, while also simultaneously creating new relationships (Kaniasty & Norris, 1999), which takes the possible transition in social cohesion into account. Similarly, other studies highlight both the possibility of strengthening and weakening social cohesion following a disaster (Meyer, 2018), as well as the unfolding of temporary solidarity due to a sense of shared fate (Kuper & Kröpelin, 2006; Ntontis et al., 2020). However, this is still a limited view compared to the findings presented in this thesis. First of all, the literature emphasizes the strengthening of social cohesion and its positive outcomes, such as increased solidarity and volunteering (Bonfanti et al., 2024; Monteil et al., 2020), leaving less room for negative experiences and their consequences. Second, Meyer’s (2018) research assesses the overall impact of a disaster on social cohesion as either positive, negative, or neutral. Such an approach overlooks how experiences of social cohesion may fluctuate throughout the different stages of a disaster itself. Therefore, while the findings revealed both static and dynamic understandings of social cohesion, a dynamic perspective emerged more frequently in respondents’ accounts.

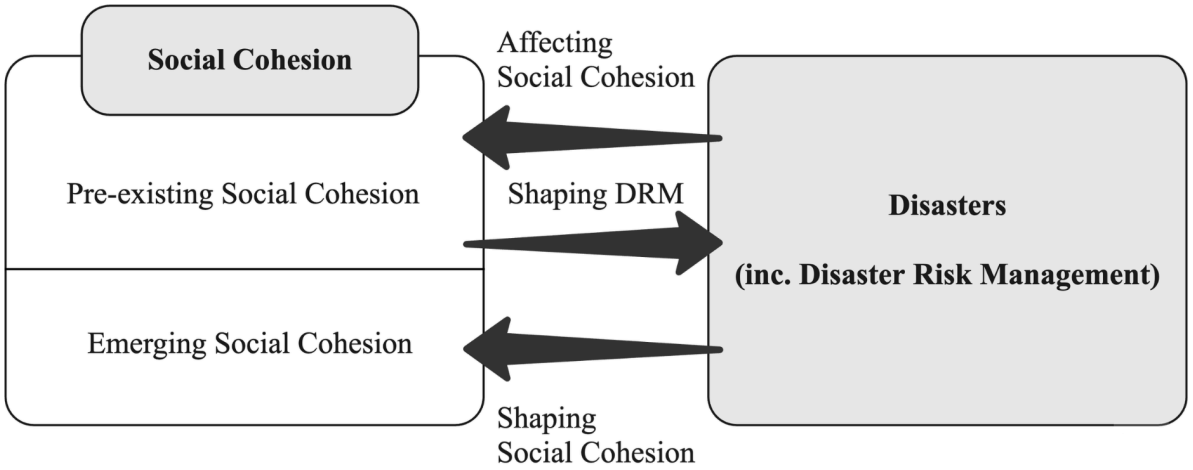
The dominance of social capital as a concept within DRM literature contributes further to this conceptual limitation. Social capital is often operationalized through stable components such as networks and trust, which are treated as resources that facilitate social cohesion (Aldrich & Meyer, 2015). While this is analytically useful, it risks reinforcing a static understanding of social cohesion itself. In contrast, the findings suggest that while social capital may be conceptualized as a set of resources, social cohesion should be understood as the dynamic process through which these resources are mobilized.

The findings of this study extend previous research by demonstrating that social cohesion is not only shaped by disasters as singular events, but is also continuously changing and transforming across the different phases of recovery after a disaster, within the lived experiences of individuals. Short-term changes in social cohesion, both positive and negative, were observed not only between phases of DRM but also within them, reflecting the differences in individuals’ personal experiences and social positions. This highlights that social cohesion should be understood as pre-existing social cohesion, but also as a dynamic process, emerging social cohesion, rather than an outcome or a contribution to DRM. Figure 3 depicts the reciprocal relationships between social cohesion and disasters, including DRM.

Pre-existing social cohesion, such as strong social networks or cultural identities, not only enables close and effective coordination but can also be reinforced, weakened, or transformed by disasters. On the other hand, disaster can create, for instance, a sense of togetherness through a shared experience, as emerging social cohesion.

Figure 3

Reciprocal relationships between social cohesion and disasters.



6.3 Additional Findings

Going beyond the research questions, the findings revealed some further relevant outcomes, namely, factors contributing to the formation of social cohesion, and social cohesion within the multilayered disaster. These additional findings will be discussed in the following headings.

6.3.1 Factors Contributing to the Formation of Social Cohesion

A finding that this thesis did not anticipate was the identification of several factors that contributed to the formation of social cohesion during the 2021 floods in Germany. While some of these factors are reflected in the existing literature, others are less prominent, suggesting either a gap in the literature or that they are specific to this disaster context.

One of the factors contributing to social cohesion was geographical attachment to the affected areas. Interviewees repeatedly described a sense of responsibility and solidarity connected to the places affected by the flood. This attachment was not only based on residence or nationality, but also on shared history, tourism experiences, emotional connections, or social relationships with the area**.** Existing literature often conceptualizes social cohesion in terms of

societal members, citizens, and members in geopolitical terms (Berger-Schmitt, 2002; Burns et al., 2018; Dragolov et al., 2016). However, the findings of this thesis suggest that geographical attachment can transcend the traditional geographical boundaries. The fact that individuals from different countries traveled to support affected communities because they had previously visited the area shows how place attachment can foster solidarity beyond a formal attachment based on nationality or residence. This finding thus expands on the narrow understandings of social cohesion that focus only on national identity or citizenship (Larsen, 2014), and points towards a broader human connectedness based on emotional attachment.

A second factor that forms social cohesion was inclusion and diversity within the response efforts. Interviewees emphasized the importance of involving people from different age groups, cultural backgrounds, religions, and skill sets. The participants viewed the differences as strengths, enabling more efficient collective action. For example, children contributed through smaller or less risky tasks, while those with professional experience focused on coordination and technical support. Interestingly, several interviewees described shifts in their perceptions of certain social groups, particularly younger generations, who were previously stereotyped as unengaged or unwilling to contribute to society. These findings align with broader understandings of social cohesion that emphasize inclusion, participation, recognition, and acceptance of diversity (Beauvais & Jenson, 2002; Fonseca et al., 2018; Moustakas, 2023). Furthermore, these reflect institutional perspectives, such as those of the Council of Europe (2008) and the OECD (2011), which conceptualize cohesive societies as those capable of promoting well-being while reducing exclusion and marginalization. The findings, therefore, suggest that inclusion itself can become a mechanism through which cohesion is strengthened.

Leadership and coordination also emerged as contributors to social cohesion. Although leadership was closely connected to the demands of disaster response and recovery, the interviewees associated effective coordination with feelings of togetherness, stability, and collective purpose. Importantly, leadership was rarely understood as hierarchical or authoritarian. Instead, participants described it as collaborative, flexible, and relational. Even certain participants with a coordinating role described the leadership as based on consultation, mutual respect, and collective decision-making. This finding connects to the literature linking social cohesion to social capital as the norms that facilitate cooperation and promote civic participation in decision-making (Aldrich & Meyer, 2015; Dynes, 2002). Existing research within DRM highlights that strong social networks and trust facilitate coordination and collective action during crises, thereby strengthening community resilience (Aldrich, 2012).

Closely connected to leadership is the importance of social networks regarding the formation of social cohesion. Interviewees described how pre-existing and newly formed networks enabled cooperation, support, and resource sharing. These networks often went beyond direct personal relationships, creating what could be understood as overlapping networks of cohesion that connected individuals, families, neighbors, volunteers, and organizations. Support was not necessarily dependent on close personal familiarity; rather, indirect social connections were often sufficient to create trust and willingness to help. This reflects broader conceptualizations of social cohesion as active and relational (Broadhead, 2022), as well as literature emphasizing the role of social networks in social cohesion (Moustakas, 2023; UNDP, 2020; Zhao & Van de Walle, 2024).

Another unexpected finding was the existence of an individual dimension within social cohesion. Typically, social cohesion is discussed as a collective concept characterized by belonging, togetherness, and shared identity (Fonseca et al., 2018). However, the interviews showed that participation in cohesive practices also involved individual motivations. Interviewees mention that contributing to collective action yields personal meaning, emotional fulfillment, or a sense of purpose. Fonseca et al. (2018) identify individual participation as a contributing factor to social cohesion, while Dynes (2006) also emphasizes an individual dimension, arguing that social networks can motivate individuals to take action.

Religion and faith-based values also emerged as contributors to social cohesion, despite receiving limited attention in the literature reviewed for this thesis. Interviewees described religious communities as important spaces for shelter, aid distribution, emotional support, and moral guidance. At the same time, references to religion often extended beyond formal religious affiliation and instead reflected broader ethical frameworks emphasizing compassion, solidarity, and mutual responsibility. This raises conceptual questions regarding whether social cohesion is rooted primarily in institutional religion, shared moral systems, or broader human values. While the findings do not allow for definitive conclusions, they suggest that moral frameworks can provide an important foundation for collective action and social solidarity during crises.

Closely related to this was the role of altruism and collective responsibility. Many interviewees described helping behavior as a natural or instinctive human response, even when it involved personal sacrifice. Social cohesion in this sense was understood not only as a social structure, but also as an expression of solidarity, compassion, and moral obligation toward others. Existing literature similarly highlights willingness to help, mutual support, and

shared moral values as important dimensions of social cohesion (Larsen, 2014; Moustakas, 2023; Zahnow, 2024).

Shared experiences and collective practices further strengthened social cohesion throughout the disaster response and recovery process. Experiencing the floods together created emotional connections between individuals and contributed to a collective identity. At the same time, cohesion was reinforced through everyday practices such as shared laundry facilities, communal meals, and collective celebrations organized after the disaster. These findings strongly align with relational understandings of social cohesion as something continuously produced through daily social interaction and mutual support (Broadhead, 2022) and created through shared experiences and mutual help (Moustakas, 2023; Zahnow, 2024).

Finally, trust emerged as one of the most fundamental factors contributing to social cohesion. Interviewees repeatedly emphasized the necessity of trusting others during the disaster response, particularly in situations requiring rapid cooperation, resource sharing, and delegation of responsibilities. Trust enabled individuals to work together despite limited prior relationships, creating a sense of security. This finding strongly reflects existing literature, which consistently identifies trust as a core dimension of social cohesion (Broadhead, 2022; Chan et al., 2006; Fonseca et al., 2018; UNDP, 2020; Zhao & Van de Walle, 2024). Also within DRM research, trust is frequently linked to social capital and collective resilience, as it facilitates cooperation and coordinated action (Aldrich & Meyer, 2015).

Taken together, these findings demonstrate that social cohesion during disasters is shaped through a complex interaction of geographical attachment, inclusion, trust, networks, shared experiences, leadership, religion and morals, altruism and collective responsibility, and individual agency**.** While many of these factors are reflected within existing conceptualizations of social cohesion, the findings also reveal dimensions that remain underexplored in current literature, particularly regarding religion, geographical attachment beyond borders, and the interplay between individual motivations and collective solidarity.

6.3.2 COVID-19 Pandemic

Another unanticipated finding from the research is the change in social cohesion during the COVID-19 pandemic. Several interviewees expressed that social interaction in communities had already decreased prior to the flood disaster due to the quarantine measures implemented during the COVID-19 pandemic, which aligns with the literature suggesting that such

measures placed pressure on communities (Banulescu-Bogdan & Ahad, 2021; Schröder et al., 2022).

The flood took place in July of 2021, when the pandemic was still ongoing; therefore, evacuations and care services were affected due to medical restrictions (Fekete & Sandholz, 2021). However, the interviewees, specifically those who were affected, noted that the pandemic had almost no impact after the flood. Those who worked in the field, including the military and the research group, on the other hand, reported experiencing more restrictions, such as wearing masks and getting tested, whereas they did not need to wear masks later.

Furthermore, the transition of social cohesion from the early phase of the pandemic to the later phase, including after the floods, was observed. While social cohesion first increased in terms of solidarity and institutional trust, assumed to be due to the "rally-round-the-flag" effect (Schröder et al., 2022), prolonged restrictions limited social interaction and raised questions of politicians' and the government's abilities. This distrust remained during and after the floods, while higher social cohesion, especially among citizens, was observed during the response and the recovery processes. Further research is required, but some interviewees expressed that this phenomenon was an oppressed willingness to help during the pandemic, encouraging more help regarding the flood disaster, as people could fulfill their own roles for diverse needs, whereas this was not possible during the pandemic.

7. Future Research

The research not only examined participants' experiences and definitions of social cohesion but also revealed its dynamic nature within disaster contexts. However, this study focused primarily on the response and the recovery phases of DRM to examine the mutual interactions between social cohesion and disasters, leaving the prevention and preparedness phases less explored and limiting the analysis of DRM as a continuous cycle.

Moreover, this study entailed several limitations as addressed in Section 4.7. While measurements were taken to mitigate their impact on the research, the findings remained in limited generalizability, as they were based solely on the 2021 flood disasters in Germany. Accordingly, the applicability of the findings to different cultural, social, or disaster contexts remains uncertain.

Therefore, future research should further build on these findings by examining social cohesion across every phase of DRM, including prevention, preparedness, response, and recovery. Taking a full cycle perspective would allow for a more detailed analysis of how social relations and the state of social cohesion change in a more long-term perspective, and how the experience of disasters can influence future prevention and preparedness efforts.

This thesis highlighted the dynamic nature of social cohesion as a potential area for future research. Participants' experiences suggested that perceptions of social cohesion may change over time and across different phases or contexts. Exploring how these perceptions evolve and are different from each other could provide valuable insights into the processes that shape social cohesion. However, due to the scope and objectives of this thesis, this was beyond the limits.

Furthermore, conducting research on social cohesion across contexts, such as single- or cascading-disaster settings, technological or natural hazards, and different countries or cultures, is also recommended. Comparing and contrasting findings from such research can contribute not only to developing more context-specific definitions and improving analytical clarity but also to building a broader and more comprehensive understanding of social cohesion in disaster contexts. Ultimately, such research can contribute to more effective positioning of social cohesion in DRM policies and planning frameworks.

8. Conclusion

Social cohesion is defined in various ways across the literature, depending on the disciplinary perspective and the context in which it is studied. Most definitions emphasize aspects such as trust, solidarity, shared values, social networks, and collective belonging. However, social cohesion is often treated as a relatively stable condition or characteristic of society, with limited attention given to the dynamic nature or to how it changes during and after crises. As a result, there remains only a partial understanding of how social cohesion is understood and influences DRM processes, and how disasters can shape social cohesion over time, especially during the response and recovery phases.

This thesis addressed this gap by examining the following research questions*: How do different stakeholder groups in Germany experience social cohesion during and after a flood disaster?* and *How do different stakeholder groups in Germany construct the meaning of social cohesion during and after a flood disaster?* Focusing on the 2021 floods in Germany, the study explored the experiences and understandings of social cohesion among research professionals, field professionals, and affected citizens. Through 20 qualitative semi-structured interviews and an abductive thematic analysis, the thesis contributes to a more nuanced understanding of social cohesion in disaster contexts.

The findings demonstrate that social cohesion played a significant role throughout the response and recovery phases of the flood. Participants frequently described strong feelings of togetherness, solidarity, and mutual support despite the devastation caused by the disaster. Support emerged through assistance and shared resources from family, neighbors, volunteers, local communities, organizations, and governmental institutions. In particular, spontaneous self-organization, collective practices, and the sharing of resources created important practical and emotional support systems. The findings therefore show that disasters can activate forms of cohesion, allowing individuals and groups to cooperate rapidly even when strong social ties were not necessarily previously visible.

The findings, moreover, show that social cohesion cannot be understood only as a positive phenomenon. Alongside solidarity and cooperation, participants also experienced distrust, exclusion, and conflict. Dissatisfaction with institutional response, unequal recovery processes, struggles over coordination, and the influence of ideologically motivated groups contributed to social fragmentation. These findings challenge dominant narratives within DRM literature that frame social cohesion primarily through a positive lens. Instead, the

results demonstrate that social cohesion and conflict coexist and continuously influence each other.

The thesis further contributes to the conceptual understanding of social cohesion itself. Participants defined social cohesion not only through solidarity, trust, and social networks, but also through inclusion, willingness to help, shared responsibility, collective identity, place attachment, and the capacity to cooperate during times of crisis. Moreover, the findings show that social cohesion operates across multiple levels. At the individual level, social cohesion was experienced through trust, emotional support, and everyday acts of help. At the community level, participants mentioned the collective identity, shared goals, and mutual support within neighborhoods and the local community. Institutional dimensions of social cohesion were mainly experienced through trust in authorities and organizations. However, when defining social cohesion, the participants primarily understood social cohesion through horizontal relationships between citizens, volunteers, and communities rather than through vertical, more institutional relationships.

Additionally, the findings demonstrate that social cohesion played various roles within the DRM processes. It enabled practical coordination and resource sharing during the response phase, functioned as a source of emotional support, and created a sense of shared experience. Besides, the strong social ties enabled rapid and collective action as well as formed informal support systems that greatly contributed to the disaster response. At the same time, the findings also show that social cohesion shaped DRM through tensions and inequalities. Distrust towards authorities, conflicts over coordination, and unequal recovery processes influenced disaster response processes. This shows that social cohesion is not just an outcome of disasters, but actively shapes how disasters are managed and experienced.

The thesis, moreover, explored the conceptualization of social cohesion as a dynamic and evolving process rather than a fixed social condition. The findings show that social cohesion shifted across different stages. In the immediate aftermath of the flood, many participants described a strong increase in solidarity and collective identity. Over time, however, these feelings often weakened as everyday concerns re-emerged. Nevertheless, some participants also reported that the disaster resulted in stronger long-term relationships and the creation of new networks. With this, a model was created that shows the reciprocal relationship, shaping how disasters can continuously change and transform social cohesion across the recovery and response phases. Short-term changes, both positive and negative, were observed between and within the phases of DRM. These resulted in the weakening or reinforcing of effective coordination, but can also create a sense of togetherness and increase social cohesion. These

findings suggest that disasters do not simply strengthen or weaken social cohesion in a linear way, but rather transform through social interaction and shared experiences.

The thesis also identifies several factors that contributed to the formation and strengthening of social cohesion during and after the floods. These included trust, geographical attachment, inclusive participation, social networks, leadership and coordination, altruism, religion, shared experiences, and individual motivations. With this, trust and inclusion were significant, as these enabled cooperation, resource sharing, and collective action even among strangers, with individuals from different social, cultural, generational, and professional backgrounds contributing according to their abilities.

The study additionally highlights the interaction between disasters and broader societal crises. Since the flood occurred during the COVID-19 pandemic, participants reflected on how pandemic-related restrictions had already affected social interaction and institutional trust. Many interviewees described the flood response as creating opportunities for direct action and social interaction. The disaster temporarily reactivated forms of participation, solidarity, and collective engagement during a pandemic.

Future research should therefore focus on examining social cohesion across all phases of DRM and how it can influence future prevention and preparedness efforts, together with conducting research across different contexts, such as single- or cascading-disaster settings, and across different countries.

This thesis argues that disasters are not only a physical crisis, but that they are also social processes that continuously reshape relationships, trust, belonging, and collective action. Therefore, social cohesion is not to be understood as a fixed condition that exists independently from disasters, but as something that is actively produced, strengthened, and challenged throughout the response and recovery phases of disasters. This dynamic relationship is important to recognize, as it can contribute to the development of more inclusive and socially informed approaches to DRM that acknowledge capacities and vulnerabilities intrinsic to communities.

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Appendix

Appendix 1

Interview Questions Guideline

Participant group	English	German
Research Professionals	**Questions regarding their experience of the flood** Can you tell me about your experience during and after the flood? Do you have any specific moments that stand out to you? Follow-up question ● Who was involved? ● How did people interact? **Questions regarding their experience of social cohesion** Are there any factors that created togetherness or fragmentation? Were there moments when you felt a sense of togetherness? Did you observe any tensions or conflicts? And if so, in what situations? Did you feel supported? By who? - What about authorities/NGOs/…? Do you think that the COVID pandemic impacted how people interacted during and after the floods? Why?	**Erfahrungen mit der Flut** Können Sie Ihre Erfahrungen während und nach der Flut schildern? Welche Momente sind Ihnen besonders in Erinnerung geblieben? Nachfragen: Wer war beteiligt? Wie verliefen die Interaktionen? Unterschiede zwischen beruflicher und privater Erfahrung? **Sozialer Zusammenhalt** Welche Faktoren haben Zusammenhalt oder Fragmentierung beeinflusst? Gab es Momente des Zusammenhalts? Gab es Spannungen oder Konflikte? Haben Sie Unterstützung erfahren? Von wem? (Behörden/NGOs?) Hat die COVID-Pandemie das soziale Miteinander beeinflusst? Warum?

	Questions regarding the conceptualization of their experience of social cohesion What does a strong community mean to you? What does a weak community mean to you? Did you feel connected to a particular group, or none at all? Why? **Questions regarding the conceptualization of social cohesion** How do you understand the term social cohesion? Based on your experience, what role did social cohesion play? Five years after the flood, what changes do you see in social cohesion you felt/experienced/observed in your community?	**Konzeptualisierung** Was bedeutet für Sie eine starke Gemeinschaft? Was bedeutet für Sie eine schwache Gemeinschaft? Haben Sie sich einer bestimmten Gruppe zugehörig gefühlt? Oder gar keine? Warum? **Begriff Sozialer Zusammenhalt** Wie verstehen Sie sozialen Zusammenhalt? Welche Rolle spielte er Ihrer Erfahrung nach? Welche Veränderungen im sozialen Zusammenhalt haben Sie in Ihrer Gemeinschaft gespürt fünf Jahre nach der flut?
Field professionals	**Questions regarding their experience of the flood** Can you tell me about your experience during and after the flood? Do you have any specific moments that stand out to you? Follow-up question ● Who was involved? ● How did people interact?	**Erfahrungen mit der Flut** Können Sie Ihre Erfahrungen während und nach der Flut schildern? Welche Momente sind Ihnen besonders in Erinnerung geblieben? Nachfragen: Wer war beteiligt? Wie verliefen die Interaktionen?

	Questions regarding their experience of social cohesion How did interactions, for example, with residents or colleagues shape your view of the community? Were there moments when you felt a sense of togetherness? - Within the unit? - Between colleagues and residents? - Between residents? Did you observe any tensions or conflicts? And if so, in what situations? Did you feel supported? By who? - What about authorities/NGOs/…? Do you think that the COVID pandemic impacted how people interacted during and after the floods? Why? **Questions regarding the conceptualization of their experience of social cohesion** What does a strong community mean to you? What does a weak community mean to you? Did you feel connected to a particular group, or none at all? Why? Did the neighborhood community affect operations? In what way?	**Sozialer Zusammenhalt** Wie haben Interaktionen mit Anwohnerinnen oder Kolleginnen Ihre Wahrnehmung der Gemeinschaft beeinflusst? Gab es Momente des Zusammenhalts – innerhalb der Einheit? Zwischen Kolleginnen und Anwohnerinnen? Zwischen Anwohner*innen? Gab es Spannungen oder Konflikte? Haben Sie Unterstützung erfahren? Von wem? (Behörden/NGOs?) Hat die COVID-Pandemie das soziale Miteinander beeinflusst? Warum? **Konzeptualisierung** Was bedeutet für Sie eine starke Gemeinschaft? Was bedeutet für Sie eine schwache Gemeinschaft? Haben Sie sich einer bestimmten Gruppe zugehörig gefühlt? Oder gar keine? Warum? Hat die Nachbarschaftsgemeinschaft die Einsätze beeinflusst? In welcher Weise?

	Questions regarding the conceptualization of social cohesion How do you understand the term social cohesion? Based on your experience, what role did social cohesion play? Five years after the flood, what changes do you see in social cohesion you felt/experienced/observed in your community?	**Begriff Sozialer Zusammenhalt** Wie verstehen Sie sozialen Zusammenhalt? Welche Rolle spielte er Ihrer Erfahrung nach? Welche Veränderungen im sozialen Zusammenhalt haben Sie in Ihrer Gemeinschaft gespürt fünf Jahre nach der flut?
Affected citizens	**Questions regarding their experience of the flood** Can you tell me about your experience during and after the flood? Do you have any specific moments that stand out to you? Follow-up question ● Who was involved? ● How did people interact? **Questions regarding their experience of social cohesion** Did you notice anything special about the way people interacted? Were there moments when you felt a sense of togetherness? Did you observe any tensions or conflicts? And if so, in what situations? Did you feel supported? By who?	**Erfahrungen mit der Flut** Können Sie Ihre Erfahrungen während und nach der Flut schildern? Welche Momente sind Ihnen besonders in Erinnerung geblieben? Nachfragen: Wer war beteiligt? Wie verliefen die Interaktionen? Unterschiede zwischen beruflicher und privater Erfahrung? **Sozialer Zusammenhalt** Ist Ihnen etwas Besonderes am Umgang der Menschen miteinander aufgefallen? Gab es Momente des Zusammenhalts? Gab es Spannungen oder Konflikte? Haben Sie Unterstützung erfahren? Von wem? (Behörden/NGOs?)

	- What about authorities/NGOs/…? Do you think that the COVID pandemic impacted how people interacted during and after the floods? Why? **Questions regarding the conceptualization of their experience of social cohesion** What does a strong community mean to you? What does a weak community mean to you? Did you feel connected to a particular group, or none at all? Why? **Questions regarding the conceptualization of social cohesion** How do you understand the term social cohesion? Based on your experience, what role did social cohesion play? Five years after the flood, what changes do you see in social cohesion you felt/experienced/observed in your community?	Hat die COVID-Pandemie das soziale Miteinander beeinflusst? Warum? **Konzeptualisierung** Was bedeutet für Sie eine starke Gemeinschaft? Was bedeutet für Sie eine schwache Gemeinschaft? Haben Sie sich einer bestimmten Gruppe zugehörig gefühlt? Oder gar keine? Warum? **Begriff Sozialer Zusammenhalt** Wie verstehen Sie sozialen Zusammenhalt? Welche Rolle spielte er Ihrer Erfahrung nach? Welche Veränderungen im sozialen Zusammenhalt haben Sie in Ihrer Gemeinschaft gespürt fünf Jahre nach der flut?