



Report on Research Line 1

Valorising local knowledge on natural hazards

Insights from ACCTING's Experimental Research

Research Cycle 2

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The ACCTING project

It is acknowledged by now that the global climate crisis is not only an ecological crisis but also an economic, social and political crisis, with devastating effects on individuals and societies. These negative effects are not evenly distributed within societies. It is the poorer, marginalised and vulnerable groups who are the most acutely affected, exacerbating existing socio-economic inequalities. The European Green Deal foresees efficient use of resources for a circular and clean economy. However, inequalities emerge in the context of its policy and interventions.

The EU-funded ACCTING project takes these considerations as a starting point for a complex series of research and experimental activities aimed at identifying, analysing and testing policies and initiatives capable of responding to this crisis, mitigating its effects on the most vulnerable and helping them play a significant role in the pursuit of greater environmental sustainability.

The project mobilises research experimentation and innovation to promote an inclusive and socially just European Green Deal focusing on the inequalities produced by its policies and supporting behavioural change at individual and collective levels.

ACCTING explores the impact of Green Deal policy initiatives on individual and collective behaviours, provides evidence, and empowers policymakers and stakeholders to anticipate policy responses and potential negative influences, and mitigate such impacts in decision-making. The project collects new data on Green Deal policy interventions and co-designs and implements pilot actions to reduce or prevent policy-related inequalities and advance behavioural change for an inclusive and equal European Green Deal.

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Table of Contents

List of Tables	3
1. Introduction.....	4
1.1 Overview of the research	4
1.2 Climate change and disaster risk reduction	5
2. Methods and materials.....	7
2.1 Case study selection and context.....	7
2.2 Sample groups and recruitment	10
2.3 Data generation and reporting.....	11
3. Data analysis	13
3.1 Engaging social difference	13
3.2 Gendering disaster management	17
3.3 The valorisation and undervaluation of local knowledge.....	19
3.4 Learning from the insights and experiences of others	24
3.5 Enablers and hinders of change.....	28
4. Discussion and conclusions	32
4.1 Better stories and links to transformation	32
4.2 Policy recommendations	34
4.3 Policy crossovers	38
4.4 Research gaps.....	38
References	41

List of Tables

Table 1. Overview of important characteristics of the ten case studies.	7
Table 2. Summary of the interview research and reporting conducted in case studies.....	12
Table 3. Key enablers and hindrances of authority engagement with local knowledge holders.	29
Table 4. Key enablers and hindrances of greater gender+ inclusiveness amongst authorities.	30

1. Introduction

This report presents a summary of findings from ACCTING's second cycle of experimental studies, which entailed 87 quasi-experimental case studies conducted across thirteen countries between December 2023 and August 2024. Each of the eight research lines explores sustainability and behavioural change within the framework of a specific European Green Deal policy area — including climate change, biodiversity, energy, food, and transport. The Research Line 1 report focuses on how local communities play an active role in preventing, preparing for and managing disasters brought about by climate-change-related natural hazards.

All reports are available at <https://accting.eu/project-deliverables/>.

1.1 Overview of the research

Research Line 1 (RL1) of the ACCTING project focuses on how local communities play an active role in preventing, preparing for and managing disasters brought about by climate-change-related natural hazards. The research seeks to learn from the experiences and insights of communities, while exploring ways to further empower them. The aim is to enhance their resilience and capacity, and to help drive the gender+ intersectional transformations required to address climate change effectively. By focusing on diverse policy sites and multiple vulnerabilities, ACCTING aims to empower policymakers and stakeholders to anticipate and mitigate potential negative effects of the European Green Deal (GD) to ensure social equality. RL1 contributes to this goal by fostering community-driven solutions to disaster risk and integrating knowledge from individuals and groups vulnerable to disaster into policy and decision-making.

The research presented in this second research cycle (RC2) report builds upon the findings from the first research cycle, which identified significant untapped potential within local communities. However, the first RL1 report also stressed that expecting individual action to prevent disasters, especially undertaken by those least responsible for disaster vulnerability, can foster uncertainty and anxiety, and impede effective coordination at the collective level. Not only is this ineffective, but it is also unfair. In RC2, the focus shifts from placing responsibility on vulnerable communities to emphasising the need for adaptation by authorities. Rather than focus on change in individual behaviour, emphasis is here placed on a higher level of social organisation, including values, practices and institutions (Boström & Klintman 2019; Chater & Loewenstein 2023).

This report was written by the RL1 lead, James White, drawing on the considerable research and reporting activities of nine researchers (in alphabetical order, Ayşe Gül Altınay, Catarina Conceição, Esin Düzel, Marcelo Fragoso, Francesca Pugliese, Gabriele Quinti, Lina Sandström, Burcu Borhan Türel, and João Vasconcelos) working in four countries (i.e., Italy, Portugal, Sweden and Turkey). Much of the inter-case study analysis was conducted by the research lead, with correspondence and confirmation from the researchers to ensure accuracy and consistency with the national and case-study contexts. The scientific commitments of the report have a foundation in feminist epistemology (Alcoff & Potter 1993), which asserts that knowledge is situated within social and value-based practices (Haraway 1988; Stoetzler & Yuval-Davis 2002). In keeping with this, the report treats objectivity not as an achievement of a unified, comprehensive ontology, but an outcome of the pluralisation of voices and perspectives (Harding 1995, 2015). The author's identity and positionality, his disciplinary background in sociology and human geography, and how this has informed his reading of the disaster studies literature, shape the report.

In keeping with the overall ACCTING methodology, examples of good practice are identified. Several of the case studies exhibited both meaningful and effective engagement with local knowledge holders and a gender+ inclusive approach. Others surfaced local ‘better stories’ (Georgis 2013): individuals exercising high levels of agency; recognition of effective applications of local knowledge; and demonstrations of the power of community organising. However, many of these positive examples are taken to be isolated occurrences and not an indication of proper structural support. This raises concerns about the reproducibility and scalability of these examples, limiting their potential for broader application. Nevertheless, it is possible to learn from both their successes and failures, drawing out the overarching social conditions — both the enablers and hindrances to institutional change — and analysing the relationships between them.

The report is structured in four sections. The introduction outlines the research problem and approach, and the academic context of the research. The second section presents the case studies, research materials, methods and methodology, including the reporting practices used to elevate the research data and analysis to the level required for this research line report. Analysis of the data is then presented across five subsections, covering social differences, including their intersections and vulnerabilities, with gender given its own subsection; the valorisation and undervaluation of local knowledge; the construction of learning situations; and enablers and hindrances of change. Finally, the results are summarised using ‘better stories’, policy recommendations are provided, overlaps with other ACCTING research lines are identified, and the findings are situated in the academic literature to highlight gaps for future research.

1.2 Climate change and disaster risk reduction

Climate change is altering the conditions under which disasters emerge by intensifying natural hazards and exacerbating the social vulnerabilities that increase disaster risk (UNDRR 2019; Calvin et al. 2023). As global temperatures rise, climate change drives more extreme weather events, such as storms, floods, heatwaves and wildfires (Stott 2016). But this does not mean that an increase in disasters is inevitable. Also important are the social conditions that determine disaster vulnerabilities (Kelman, Gaillard, and Mercer 2015; Mercer 2010). Social vulnerability refers to the ways in which certain people and groups are more exposed to risk due their socio-economic, cultural, and political identities and opportunities (Cutter et al. 2003; Methmann & Oels 2014). The extent to which a state chooses to support its most vulnerable populations, is also the extent to which it chooses to prevent disaster (Kelman 2020).

The call for long-term strategies and policies to prevent and prepare for disasters by addressing their social causes is most clearly articulated in the Sendai Framework for Disaster Risk Reduction 2015–2030 (SFDRR), which was agreed upon by UN member states in 2015 (UNDRR 2015) and thereafter integrated into the European policy landscape through the EU Action Plan on SFDRR 2015–2030 (European Commission 2016). This framework provides a critical foundation for policy alignment and coordination, and adopts a proactive, long-term approach to disaster prevention and preparedness. Crucially, it encourages a shift from responding to disasters after they emerge, to reducing disaster risks by addressing underlying social and infrastructural vulnerabilities.

In this report, disaster preparedness is used to refer to policies and practices that foreground the importance of social and technological systems to anticipate and mitigate disaster risks (Anderson 2010). Preparedness encompasses early warning systems, efficient and timely response mechanisms, coordinated resource allocation (including the organisation and distribution of spontaneous volunteers and donations), and the direction of aid towards the most vulnerable (Gillespie & Streeter 1987). Beyond immediate readiness, this approach also encompasses

awareness raising and education of at-risk groups (Benadusi 2014). These efforts aim to encourage individual and household preparedness, ensuring that people do not only understand how to respond in the event of a disaster but also have the ability and resources to act effectively. Ultimately, disaster preparedness aims to enhance the resilience and capacity of both communities, and state and non-state organisations, to effectively respond to hazardous events.

Prevention refers to a more holistic approach to disaster risk reduction, which acknowledges the need to address the underlying social drivers of disasters through structural interventions and long-term development strategies (Wisner et al. 2012; Schipper 2020; Centemeri & Tomassi 2022). It involves the implementation of policies for the built environment, including appropriate land use practices and building and planning standards, and the development and maintenance of critical infrastructure. Additionally, it supports the strengthening of essential social supports, such as accessible and high-quality education and healthcare services, and policies that reduce poverty and social inequalities. As used here, the preventative approach to disaster targets the systemic issues that create and intensify vulnerability, with the goal of mitigating the social consequences of natural hazards and preventing their effects from being disastrous.

Effective disaster risk reduction requires strategies of both preparedness and prevention. Progress across European political scales is varied.

While disaster management was not part of the EU's early mandate, various legislative measures, policy instruments and mechanisms have been developed to govern crises and disasters (European Environment Agency 2017; Group of Chief Scientific Advisors 2022). The need for European-level organisation was prompted by recognition that the impacts of many disasters are transboundary in nature. Significantly, the 2001 EU Civil Protection Mechanism established an Emergency Response Coordination Centre to centralise assistance and expertise, and mobilise resources during emergencies in Europe but also worldwide. More recent policy has shown a marked turn towards preparedness and prevention. In 2013, the EU adopted a Climate Change Adaptation Strategy (European Commission 2013), which — among other things — aims to build capacity and resilience to climate-change-related natural hazards. This was updated and integrated into the GD in early 2021. Climate-ADAPT, a data and information platform maintained by the European Environment Agency, provides disaster risk reduction resources in support of this policy area (Climate-ADAPT 2024). Furthermore, a key piece of GD legislation, the 2024 Nature Restoration Law, underscores the importance of disaster prevention to the EU's broader crisis management strategy (European Parliament 2024). Despite these advances, the EU's approach to disaster management is diverse, complex and unevenly implemented, posing challenges to its analysis as a cohesive policy framework.

Similarly, much remains to be done by member states if the EU's ambition for disaster prevention is to be realised. Historically and institutionally, national civil protection organisations have tended to focus on emergency preparedness and response — perhaps, as Revet (2020) has argued, owing to their military origins and often continued associations. Prevention, however, is a broader concept that is easily conflated with social development policy, such that its responsibility escapes the structures of existing government departments. Even in countries where preparedness and response receive explicit attention, prevention may be treated as an incidental outcome of broader political and policy goals.

Following agreement of the Hyogo Framework for Action 2005–2015, the predecessor to the SFDRR, many countries established platforms for disaster risk reduction, including Italy, Portugal, Sweden and Turkey (UNDRR 2020). Nevertheless, uptake of SFDRR policy recommendations by national, regional, and local governments has been fragmented (Wamsler et al. 2019; Mizutori 2020;

International Science Council 2023), which has been attributed to issues of political sovereignty (Revet 2020).

One way to improve the legitimacy of high-level policy recommendations is by involving in their development and implementation the at-risk communities that they affect. Active incorporation of local knowledge and experience fosters participation, support, and a sense of co-ownership (Berkes 2012; Tengö et al. 2014). To this end, the SFDRR stresses the role of local knowledge in improving the effectiveness of disaster response. Local populations, such as those that have lived in hazard-prone areas for extended periods, often possess valuable, context-specific insights into mitigating and managing disaster risks. Complimenting local knowledge with scientific and technical expertise can lead to more objective, robust, and adaptive approaches to disaster (Gaillard & Mercer 2013). By being grounded in both empirical data and local realities, policies are better able to address needs of the community, and their social and environmental circumstances, underscoring their legitimacy.

SFDRR also marks meaningful progress towards the integration of gender considerations into disaster risk reduction (Fothergill 1996; Fordham 1999; Andharia 2020). It acknowledges that disasters affect women differently than men, recognises the importance of women in leadership positions, encourages greater participation of women in disaster management, and promotes the use of sex-disaggregated data for policy development and impact assessment. But in certain respects, the framework does not go far enough (Zaidi & Fordham 2021). It does not fully engage with issues of gender diversity or complex, intersectional vulnerabilities, the importance of which has long been recognised in the literature. SFDRR does not have a clear and comprehensive definition of gender, lacks actionable strategies to ensure the inclusion of women and other marginalised groups, and does not include measurable indicators on gender participation.

The natural hazards and social vulnerabilities that together constitute disaster risk are varied and dynamic, and have broad political and policy implications. While this means that there can be no silver bullet to the disaster threat posed by climate change, by studying how authorities that have and have not adapted to engage with local knowledge, an explanation for how high-level intervening factors can shape and ultimately improve community-led disaster risk reduction can be developed.

2. Methods and materials

2.1 Case study selection and context

The case studies chosen for inclusion in the research are authorities that evidence change toward engaging local knowledge and including it within disaster management strategy, policy, and practice. Assessment of the success of an authority's change processes is made along two lines: (1) the gender+ inclusiveness of the community engagement, and (2) the effectiveness of the subsequent disaster management.

Within Italy, Portugal, Sweden and Turkey, an overview of civil protection and disaster management structures, and a list of potential case studies were assembled and presented back to the RL1 group for discussion and harmonisation. Ten case studies were ultimately selected. They encompass a variety of authorities operating across different geographical areas and jurisdictional scales, and in the context of different types of natural hazards. Important differences between the case studies are shown in Table 1.

Table 1. Overview of important characteristics of the ten case studies.

Country/case	Geography	Hazard	Authority
Italy			
Campi Besenno	Urban	Floods	Multi-scalar and organisational civil protection
Imola	Urban/rural	Floods	Multi-scalar and organisational civil protection
Serra Sant'Abbondio	Rural	Landslides	Multi-scalar and organisational civil protection
Portugal			
Amadora	Urban	Heatwaves/floods	Municipal civil protection
Frielas	Urban	Floods	Municipal civil protection
Sweden			
Prepping Together	Urban/rural	Non-specific	National civil protection
Ljusdal	Rural	Forest fires	Municipal government
Turkey			
Ahmetler	Rural	Forest fires	Forestry association
Muğla	Rural	Forest fires	University + civil society project
Izmir	Semi-urban	Forest fires	Municipal firefighters

In Italy, responsibility for civil protection has shifted from the central government to regional governments and local authorities. Each region now operates its own civil protection system, and local authorities, particularly in smaller municipalities, oversee civil protection efforts, often under the direct leadership of the mayor. Voluntary work plays a significant role in Italy's civil protection system, with over 5,000 formally organised and trained volunteer organisations engaged in disaster prevention, preparedness, and response activities.

Three case studies have been undertaken in Italy:

1. Campi Bisenzio is an urban municipality located in the Florence metropolitan area. It is economically diverse, combining industry with a strong retail and service sector. In November 2023, Campi Bisenzio faced a severe flood that inundated many urban areas, disrupting daily life and infrastructure, and challenging the area's robust civil protection institutions.
2. Imola, situated in the Emilia Romagna region, is a medium-sized city known for its strong agricultural base and historic urban core. In May 2023, two flash floods caused substantial damage to local infrastructure and disrupted essential services in Imola's agricultural areas and small villages nearby. Disaster preparedness has become a political priority.
3. Serra Sant'Abbondio is a small, mountainous municipality in the Marche region, economically reliant on agriculture and forestry. In September 2022, an intense storm hit Serra Sant'Abbondio, triggering flooding and landslides, which damaged roads, buildings, and agricultural land, hampering recovery efforts and isolating parts of the community.

The Portuguese National Civil Protection System includes hierarchically organised levels of government — national, regional, district, and municipal — civil protection agents, public and private organisations, and scientific institutions. At the local level, the Municipal Civil Protection Service develops and executes emergency plans and coordinates local resources. Local civil protection depends on volunteer organisations, whose trained membership plays a critical role in prevention, preparedness, and emergency response.

Portuguese researchers carried out two case studies:

1. Amadora is a densely populated municipality on the suburban outskirts of Lisbon, characterised by its multicultural makeup and diverse communities, including various religious groups and immigrant populations. Amadora's urban landscape is prone to flash floods during periods of heightened rainfall, and heat waves amplified by the urban heat island effect.
2. Frielas is a locality within the municipality of Loures, situated on Lisbon's suburban outskirts, that frequently experiences natural hazards such as flash floods and occasional landslides. The area is marked by a history of informal and illegal housing inhabited by communities in precarious socio-economic conditions.

The Swedish Civil Contingencies Agency (MSB) holds primary responsibility for disaster preparedness and response in Sweden, encompassing public safety, and civil protection and defence. Coordination occurs at multiple levels: local (municipalities), regional (21 county boards), higher regional (six specialised regional areas), and national (government with agency support). Municipalities are responsible for managing local rescue services, assessing risk and vulnerability, preparing action plans, and training staff. They are also tasked with maintaining the operation of essential services, informing the public during crises, and coordinating with government, private, and volunteer entities involved in response efforts.

Two case studies were conducted in Sweden.

1. The Prepping Together initiative, funded by MSB and run by the Workers Educational Association (ABF), aimed to enhance crisis preparedness in a collective rather than individual manner. From 2020 to 2023, it supported local networks to foster community connections, strengthen self-reliance, and promote mutual aid in emergencies. The project was broad in focus and encompassed the COVID pandemic and Russian-Ukrainian war.
2. The 2018 forest fires in the rural, sparsely populated municipality of Ljusdal were poorly responded to by the municipal government. Nevertheless, local groups with varying organisational structures and capacities successfully co-ordinated volunteers and resources until operations were taken over by the County Administrative Board.

Turkey's primary disaster management body, the Ministry of Interior's Disaster and Emergency Management Presidency (AFAD), oversees the Turkey Disaster Response Plan, coordinating across local, national, and international levels. The General Directorate of Forestry (OGM) oversees preparedness for forest fires, including reforestation, resource protection, and legislative enforcement. The 2021 wildfires brought public scrutiny to OGM's outdated equipment and limited public engagement in fire prevention. Forest fire prevention and preparedness are politically sensitive areas with policy changes undermining efforts to utilise local knowledge, and restrictions on animal grazing straining community-state relations.

Three case studies were carried out in Turkey:

1. Ahmetler is a small forest village that engaged with an OGM representative during Turkey's 2021 wildfires. Its isolated location, reliance on remittances and animal husbandry, and elderly population underscore its vulnerability. Nevertheless, drawing on the grit, solidarity and organisation developed a decade earlier during resistance to a nearby dam development project, the villagers successfully defended their homes and nearby forest from the fire. Elderly women took leading roles in fire response efforts, defying typical gender roles in disaster situations.
2. The Muğla case study focuses on a collaborative project to improve local engagement and fire resilience in forest villages. Bozyer village, the most socio-economically vulnerable of the

project's field sites, typifies local reliance on small-scale farming and the active economic role played by women.

3. The focus of the third case study is a unit established by the Izmir Metropolitan Municipality to improve forest fire intervention in rural areas by distributing water tankers to remote villages, and supporting them with ongoing maintenance and resident training. The head of the village of Urla Birgi coordinated local fire responses and managed relations with both municipal and forest authorities.

The breadth of national and case study contexts allows us to investigate how authorities engage local knowledge holders across a variety of disaster management structures, strategies and policies. Specific attention to participatory and action-oriented research, and state-run pilot projects act as a lens onto sites of experimentation and intervention.

2.2 Sample groups and recruitment

Once case studies had been identified and mutually verified, researchers used qualitative methods (including document analysis, participant observation and group interviews) to address the research questions in a manner appropriate to the circumstances, with an expectation that between four and ten interviews be conducted for each case study.

The research targeted two subject groups:

1. Representatives of authorities that have undergone a change in how they engage with local knowledge about disaster preparedness and response
2. Local knowledge holders that can independently verify and comment upon that change, including representatives of excluded groups where relevant

Given the specificity of the topic and the potential vulnerabilities of research subjects, emphasis was placed on the quality rather than quantity of interviews, but researchers were encouraged to include different and countervailing voices. More specifically, in instances where there were noticeable absences from interactions between authorities and locals, the importance of trying to find out why those absences existed, for example, by speaking to representatives of absent groups, was stressed. This was helpful in addressing some of the recruitment limitations reported by the researchers, especially with respect to gender.

The research design assumed a neat separation between authority and local knowledge holder that was not always so clear in practice. This was due in part to openness in the definition of 'authority' and variations in national forms of political organisation. In both Swedish case studies, for example, intermediaries played a key role in bridging between the main authority and local knowledge holders. These actors, often recognised as authorities themselves due to their expertise or organisational roles, facilitated communication and understanding between the two groups. While influential, they generally maintained a subordinate position relative to public authorities. This is in keeping with trends towards more distributed forms of governance and responsibility in Scandinavian political organisation, especially at the local and municipal level (Bogason 1996; Stegmann McCallion 2007). A constrained authority definition was employed in the Swedish cases to maintain comparability. Having said this, the value of such hybridity and intermediation in engaging local communities is one of the key findings of the report.

2.3 Data generation and reporting

Interviews were semi-structured in nature (Longhurst 2010; McIntosh and Morse 2015). Researchers made use of a questionnaire template but were free to adapt it to the interviewee and use follow-up questions to encourage elaboration. The approach was expected to generate qualitative data in an applied but flexible manner, while allowing new ideas and topic areas raised by the interviewee to be properly explored.

Risks involved in interviewing experts and people in potentially vulnerable positions were anticipated and addressed in the research guidance documents. Interviewing experts and authority figures can be a challenge (Bogner et al. 2009; Harvey 2011). Gaining access can be difficult, as can ensuring that an open and honest account is given of ideas, experiences and work practices (Berry 2002). Researchers were advised to consider the power dynamics at play in this kind of interview, and ensure that the junior scholars received adequate encouragement and support (Smith 2006). Challenging moments can also arise when conducting research on vulnerable people (Montgomery 2012). Care should be taken to establish a relationship of trust, to choose a suitable time and place for the interview, and to conduct the interview in an engaging but professional manner. During the interview introduction, not only the objectives but also the limits of the research should be covered concisely. The interviewee must feel free to withdraw their consent at any time. Again, researchers were also advised to reflect on their own potential vulnerabilities in this context (Cotterill 1992).

The questionnaire template consisted of three sections. The first covered background information on the researcher and the interview (e.g., case, country, name of researcher). The second was a series of survey-like demographic questions, designed to generate data on potential individual and familial vulnerabilities (e.g., gender, age, location). These were harmonised across the eight ACCTING RLs. For many of the interviews conducted in RL1, especially those with authority representatives, these questions were felt to be not applicable. The third set of questions were RL-specific. They were formulated to address the research questions and objectives, and were shaped by discussions with the country-level researchers. The questions included were the following:

- (How) did you become involved in this organisation/project/activity?
- Who participates in the interaction between locals and authorities (at different moments)?
 - How do people become involved?
 - Who are the authorities in question (and how do they interact, etc)?
 - How are diversity and gender+ inclusion encouraged? And if not, why not?
- How do you interact with the authorities/locals?
 - How is local knowledge (experience, capacity, practice, etc) understood?
 - Why is it valuable to include local knowledge?
 - What has worked well? Why?
 - How are tensions/disagreements managed?
- How do your efforts address the challenge of people's unequal vulnerability to natural hazards?
 - How is this reflected in behavioural change?
 - How is this reflected in policy outcomes?
 - Whose voices remain unheard and why?
- What effect has this had on the local community?
 - How has it contributed to disaster preparedness and response?
- Has there been a significant or ongoing change in the way that local knowledge is regarded/handled/leveraged?

- What are the most important (broader social) factors that enable authorities to change to better include local people in the design and development of disaster preparedness and response strategies/policies? Why/how?
- What are the most important factors that hinder meaningful participation between authorities and local people in this way? Why/how?
- Are there any other issues that you would like to discuss?

Researchers were again given discretion to translate, adapt and reformulate these questions as they saw fit, and to present them in a natural order.

Researchers completed a report for each meaningful interview or interviewee. Like the questionnaire, part of the report template was in a form standardised across the eight RLs, and part was specific to RL1. The first part consisted of three sections, covering background to the interview, interviewee demographic information including potential vulnerabilities and inequality grounds, and enabling and hindering factors. This last section inherited a categorisation of micro-, meso- and macro-level change conditions from RC1, covering individual resources, social dynamics and structural conditions. The second part of the interview report was based on the structure and content of the interview questionnaire, and included sections for RL1 specific background information, a narrative retelling, assessment of the change process, identification of intervening factors, and further researcher comments and reflections. Inspired by the narrative interview reporting used in RC1, this format gave the researcher the opportunity to directly address the research questions while also retell the story of the interviewee, revealing details about relations, processes and situations not so easily captured by the more directed reporting.

The table below summarises the number of individual and group interviews that were conducted, and research reports that were submitted for each of the case studies. Where interviews were conducted but not reported on, researchers have prioritised the most significant findings, given time constraints.

Table 2. Summary of the interview research and reporting conducted in case studies.

	Individual interviews	Group interviews	Reports
Italy			
Campi Besenno	14	0	14
Imola	9	0	9
Serra Sant'Abbondio	7	0	7
Portugal			
Amadora	5	0	2
Frielas	7	0	5
Sweden			
Prepping Together	8	0	8
Ljusdal	6	0	6
Turkey			
Ahmetler	3	1	5
Muğla	9	0	8
Izmir	3	1	4
Total	71	2	68

In addition to the interview reports, each research partner also compiled a country-level report. These consisted of general country- and research-level questions, covering national, regional and local disaster management, suitability of the research design, and any difficulties encountered in meeting the gender+ and intersectional requirements of the research. They also contained sections specific to the case studies — completed as many times as there were case studies in the country. This included: background questions to the case study, type of disaster or hazardous event, authority, local groups, and research materials generated; a summary of the interaction between the authority and the local knowledge holders; an assessment of the success or failure of the case study in terms of the extent of change, the gender+ inclusiveness of the engagement and the impact on disaster preparedness and response; and a consideration of important intervening factors and the relations between them. There was some variation in the completion of the country-level reports, with Swedish and Turkish researchers electing to take a more descriptive and integrated approach to the reporting, to better represent the complexities of the fieldwork and the findings that did not fit easily into the questions asked.

The RL1 report should be understood as a complement rather than a replacement or even an extension to the country reports. The analysis works across rather than within the case studies, and was conducted by a different researcher, with a different background and theoretical commitments.

Following completion of the reporting, a table of findings was compiled by the RL1 leader, and then verified and extended through discussion with the researchers. This informed the analysis, organisation and presentation of the findings. The lead then read and coded the interview and country reports, before organising the codes according to the topic headers: engagement with social difference, the valorisation of local knowledge, and learning practices. The most important of the results are presented and interpreted in the following ‘Data analysis’ section. The analysis of enablers and hindrances for change proceeded slightly differently. These were determined in a more collaboratively, bottom-up manner, before being cross-referenced with the inter-case study analysis. Throughout the final two sections of this report, abbreviated interview codes are used to reference data from the interview reports. Where relevant, the national, case study, or personal context of the interviewee is discussed in the body of the text. Direct quotes are used only when they have been indicated as such by the researcher.

3. Data analysis

3.1 Engaging social difference

Authorities interviewed from across the case studies and countries were aware of differential social needs and abilities, and how these relate to people’s knowledge and experiences. More than this, many respondents expressed opinions about the willingness of different groups of people to involve themselves in the activities of disaster management. These opinions, regardless of their basis in fact, are an important precursor to analysis of the relationships between authorities and local knowledge holders. Structurally then, this subsection begins by discussing four areas of social difference often raised by research participants: between the old and the young, urban and rural populations, and the engagement and capacities of migrant communities and disabled persons. A distinction is maintained between the perceptions and statements of participants, and the analysis of the context in which they were made, which is important in moving from a description to an explanation of the findings. The subsection then looks at both meaningful examples of change towards greater inclusiveness as well as the persistence of non-inclusive practices.

The elderly are often seen as valuable knowledge holders due to their memory of disastrous events, particularly in terms of resiliency and recovery, and their familiarity with the local environment and community (IT02). This is most clearly articulated in the context of traditional land-use practices. For example, elderly Italians are said to remember how to survey and clear obstructions from waterways to reduce flood risks, and the older generation of Turkish villagers are said to have an ancestral knowledge of the forest relevant to wildfire prevention (TR02). Despite these capacities, older people are often presented as limited and/or as underappreciated. This may be due to the physical and health-related frailties of old age, cultural shifts that devalue their knowledge, and the introduction of overly rationalised and regulated land management frameworks that render their knowledge inactionable (e.g., SE02). By contrast, young people are typically perceived as lacking relevant knowledge of their local environment and how it is looked after. This may be attributed to a general disinterest or lack of care (IT09, SE03), although it was often said that young people also face economic pressures that impel them to leave their childhood homes for education and work (e.g., TR09). Interestingly, parents aged 30 to 50 were sometimes said to have returned home or were noted to show interest in disaster preparedness for the purpose of protecting their families (SE05). Despite these perceptions, young people are valued for their physical energy and strength during disasters, such as when they mobilised to protect the village of Ahmetler during the 2021 Turkish wildfires (TR02), or for their involvement in post-disaster recovery, for example in Campi Bisenzio (IT01). Young people are also recognised for their ability to learn, adopt, and champion risk management strategies, as in the example of civil protection education programmes in Frelas, Portugal (PT05).

The second significant area of social difference raised by participants is between urban and rural populations. This often takes the form of a familiar social narrative and tension (e.g., IT02, SE07). Country people are said to be attuned to the land and community, and to the ways that they have changed and become more or less at risk of disaster. By contrast, city people are perceived to be disconnected from and largely disinterested in the people and environment around them. This may surface in important ways, for example, when urbanites move to rural areas, as in Izmir, Turkey, but are believed to be uninterested in fully engaging with local people or practices, to the detriment of long-term environmental care (TR17). Without rejecting their significance, it may be understood that more endemic social and structural inequalities underlie these tensions, especially in terms of the centralisation of economic and political power, and the perception of unfair redistributions of wealth. From an intersectional perspective, it is worth noting how the urban/rural divide also describes the economic pressures and possibilities faced by young people, especially in the Swedish and Turkish case studies.

Of relevance to the report's focus on the meso-level of institutional change are the ways in which authorities respond to spatial differences through policy and best practice. For example, following the experience of the Turkish wildfires, Izmir municipality made a distinction between the characteristics of urban and rural fires, and adjusted their disaster management strategy accordingly (TR15). This change afforded greater attention to the role of local knowledge in the prevention of rural fires. Similarly, some civil protection organisations in Italy recognise their strength in responding to urban disaster while perceiving the need to improve preparedness to rural disaster. It is in this context that local knowledge comes to be valorised, and more open and participatory practices initiated. In both examples, more important than an inherent distinction between rural and urban populations, is an appreciation for the geographical distributions and differentiations of disaster risk and resilience, both materially and socially.

Less present but no less important in the data are perceptions of the engagement of migrant populations. Two overarching observations were made. It was sometimes said that recent migrants lack the place-based knowledge that is required to make informed decisions about disaster avoidance and mitigation. For example, in the population-dense and historically informal urban regions of Lisbon, Portugal, African immigrants that live in flood-prone regions are said to be unaware of how this poses a risk. Attributing responsibility to the individual in this way, however, ignores the economic pressures faced by migrant communities, and the lack of suitable construction and housing standards that have allowed susceptible dwellings to be constructed. The second observation is that there are low levels of migrant community participation and/or integration within civil defence outreach, education and volunteer programmes (e.g., IT11, SE12). For example, the large and important Chinese diaspora in Campi Bisenzio, Italy, was felt to be insulated and separated from the wider community, an opinion that was also expressed by a young Chinese restaurateur (IT11). Similarly, the Roma population in Freilas, Portugal, was understood to be vulnerable and largely cut off from engagement with the rest of the population. This disconnect also limited the fieldwork, in that the Portuguese researchers, despite their best efforts, were unable to secure an interview with a representative of the Roma community.

These narratives of immigrant disconnect were challenged and given context by other interviewees. A representative of the Swedish Red Cross (SE10) noted that in general many volunteers have an immigrant background. The perception of low participation or integration should be understood in terms of wider issues of segregation. An interview conducted in Sweden, with a leader of an East African community group, revealed the broader social and economic conditions that also can be at play in such situations (SE08). This group had not followed up on an invitation to participate in the preparedness education programme Prepping Together. The interviewee expressed that preparedness was not an immediate concern for its members, many of whom face pressing everyday economic and care responsibilities. Such difficulties of marginalisation can be compounded by minority ethnic status and age. While the Swedish authorities, particularly The Swedish Civil Contingencies Agency, may make some information available in languages other than Swedish on their website, relying on this form of communication poses an accessibility challenge to elderly migrants. Here, it is not the fact of their being migrants that makes engagement difficult, but the way that this intersects with other inequalities under the condition of limited state support.

The fourth area of social difference covers the varied forms of vulnerability and exclusion related to disability. During a hazardous event, the environmental conditions that contribute to the physical and mobility limitations of elderly and disabled persons may become more acute. For example, one flood survivor interviewed in Portugal expressed her distress at seeing the water level reach her window while being unable to relocate to higher ground (PT07). It was only with assistance from her neighbour and landlady, who had knowledge of her condition and cared enough to intervene, that she survived. Awareness of the special needs of disabled persons in such situations exists, both formally in the vulnerability mapping of civil protection organisations and through more localised forms of recognition and aid (SE05). However, there are also real and persistent obstacles to the involvement of disabled persons in disaster management. The knowledge and experience of disabled persons, particularly those with mental disabilities, are easily discounted. This is demonstrated by the remark made by one Turkish professor of an encounter with such a person in their otherwise inclusive work with forest villagers (TR20). The respectful and dignified participation of disabled persons requires proper forethought and training, something that knowledge-based organisations, including universities, can do much to improve on. This was experienced first-hand by our Swedish researcher in her interview with a deaf person. Despite her acute awareness of the situation, it proved challenging to arrange an interpreter and the interview was long delayed. Such obstacles to inclusion are not uncommon for the

deaf community. That interviewee also stressed the limitations of material infrastructure: early warning systems that prioritise audible communication, such as alarms, and visual communication, such as phone messaging, that is susceptible to damage (SE06). Disabled persons are made more vulnerable to disaster by a lack of adequate supports, both social and material.

Several authorities were encountered that are undergoing change to improve their strategy and engagement with these four areas of social difference. This extends beyond recognition to meaningful adaptations in policy and practice. For example, the civil protection authority of Florence appears to have made a genuine shift to consider and map vulnerabilities within their jurisdiction (e.g., IT07, IT28, IT29). Difficulties do of course persist, especially when called in to support less experienced and well-equipped municipalities, such as with the Campi Bisenzio floods. Locals interviewed in that case study expressed frustration at being ignored and neglected by the authorities (e.g., IT01, IT26). Interviews with authorities in Imola (e.g., IT20) contained similar considerations of the inequalities in disaster risk, which were supported by some municipal residents. Again, however, discontent was voiced in the less well-off neighbouring municipality of Conselice. In Portugal, an interview with the leader of the civil protection activities in Amadora revealed a positive and proactive attitude towards community involvement and the inclusion of representatives from a diversity of backgrounds (PT08). Again, these progressive efforts to valorise local knowledge were confirmed by the positive sentiments of local knowledge holders. While it is difficult to imagine a scenario where everyone feels welcomed and engaged — one should be careful given that small sample sizes and snowballing may have skewed these results — these examples nonetheless will be treated as better stories and returned to in subsequent sections.

Not all authorities demonstrated such awareness of social difference, however, and for all the best intentions non-inclusive practices persist. Even where there is recognition of diverse capacities and needs, those most vulnerable are also those most difficult to reach. This is partly due to the material, economic and infrastructural limits to participation discussed above. But it also has an epistemic basis in that authorities can never be certain that they know who the most vulnerable people are and precisely in what ways they are at risk. This is also something that a short-term research project struggles to overcome, as seen above in the difficulties of access to the Roma community in Portugal and the deaf community in Sweden.

Furthermore, many limited, protectionist and even paternalistic approaches to vulnerability were also encountered. These occur when authorities are unable or unwilling to engage with citizens — or even consider them to be a ‘nuisance’ (SE03). They surface in discussions of spontaneous volunteers, who are denigrated as disorganised, an obstacle to professionals, and a group that does more harm than good (SE10). And these opinions exist amongst authorities whose job it is to respond to disasters, when at-risk groups (especially but not only the elderly and disabled) are perceived principally as bodies to be protected or saved (IT18, IT30). These views are likely to be far more common than the research data suggest, given that the case studies were selected specifically for their adoption of more inclusive practices.

Social difference is apprehended in varied and at times contradictory ways. People marked as ‘different’ may be seen as a burden, as someone in need of care, or even as a source of insight and aid. One thing that is always important to consider, especially with respect to the intersection of multiple vulnerabilities, is the wider context in which these dynamics emerge and come to be recognised. This includes social and material supports, and the economic opportunities that are available.

3.2 Gendering disaster management

Gender — and the way gender differences intersect with other inequalities — was the main conceptual frame for consideration of social vulnerability and marginalisation within the theoretical framework. While gender is certainly present in the interview data, several of the researchers reported finding the issue difficult to draw into focus. In this subsection the complicated issue of gender is made more visible, first with respect to how gendered differences are perceived and then in terms of gendered considerations of disaster. The results presented here are varied and complex, and more research will be needed to fully tease out the broad range of intersectional dynamics that are at play within disaster management in the EU.

It was not uncommon in the case studies for women to occupy positions of responsibility and influence. Several authorities, including in civil protection and municipal government, had high levels of female representation in their senior leadership. The executive team of the Amadora civil protection system was said to be 50:50 men and women, which required breaking with outdated stereotypes and prejudices (PT08). And women were recognised for their roles as mayors and councillors in rural communities, including Serra Sant'Abbondio, Italy (IT09), and Izmir, Turkey (TR17). In the case study of the Ljusdal forest fire, three women were amongst the most important leaders of the varied and successful civil and voluntary response (i.e., SE11, SE12 and SE13). There were also instances where female leadership was significant in driving progress towards more gender sensitive disaster preparedness. Researchers in Turkey identified several female experts that were able to bring a gendered perspective to their workplace. The sociologist included within the hybrid team of academics and non-governmental organisation (NGO) experts tasked with improving the fire resilience in Muğla municipality improved access to village women's knowledge and allowed it to be better incorporated into the project's research findings (TR08). In Izmir municipality's efforts to distribute equipment to villagers and support volunteer firefighters, the inclusion of a female firefighter promoted women's inclusion in the project more generally and the decentring of its focus from the predominantly male spaces of village tea houses (TR16). The mayor of one Izmir village was able to leverage these opportunities and her personal relationships to strengthen the community-led early fire response (TR17). In Italy, the authority furthest along in its thinking about gender was the Imola office of the Italian Red Cross (IT12). Here, the regional leader presented her organisation, 70% of whose volunteers are women, as placing gender differences at the forefront of their strategy. Crucially, this was said to be not only a result of her leadership, but also in consideration of how gender affects disaster vulnerabilities, and conditions for mitigation, adaptation and response.

There were, however, also examples from the research that moved in different directions. Some professions and organisations were predominantly male and masculine, and largely resistant to considerations of gender. The two interviewed Italian firefighters (IT18 and IT22), both men, were dismissive of the potential for more open-ended and community-driven disaster management, and expressed a far more paternalistic vision for the division of roles and responsibilities. The main organisation responsible for wildfire preparedness and response in Turkey, the General Directory of Forestry was known by the researchers to be reflecting the broader forestry field in Turkey: man-dominant and lacking inclusion and interactive engagement with the locals. However, the researchers also identified the presence of a culture among foresters that deeply care for the wellbeing and preservation of the forests despite degrading forestry policies and are open to engage with the locals even if that remains at the individual level. Care was taken to interview the participants who challenge the dominant organisational culture by taking more inclusive and transformative steps.

There were also stories that complicate any simple narrative that women in power invariably leads to greater inclusion for women in society. An anecdote about the former mayor of Serra Sant'Abbondio

presented her as more forceful, and less diplomatic and tolerant in the face of adversary than the current mayor (IT09). In Sweden, two community leaders of the Prepping Together project, both white, middle-class men, were nevertheless understood to be working towards more inclusive change processes. These examples point to the social and spatial variation in gender dynamics within the research results, and support the argument that while gender representation is important, more fundamental social change is necessary to improve gender equality.

Where a gendered approach to disaster was not explicitly discussed during the interviews, researchers were encouraged to raise the topic. This led to some surprised interviewees downplaying its significance, especially in formal civil protection organisations, which were the focus of the research in Italy and Portugal. In some instances, the relevance of gender to disaster management was simply rejected. For example, a representative of the civil protection authority of Imola (IT20), despite discussing the importance of working closely with citizens and incorporating their differential vulnerabilities into disaster planning, was unable to offer any gender considerations at all, even with respect to spontaneous volunteers or other forms of participation. Other respondents stressed that it was an individual's ability to perform a specific task, not that person's gender, that was important. A coordinator of the Swedish Civil Defence League (SE09) put it this way: "The only thing that matters is competence. If a woman shows up with a chainsaw and knows how to use it, that is great. Of course she can contribute. Everybody takes part according to their own ability and their own knowledge. It's not up to me to decide. In a crisis situation, I can't really think about gender and fairness".

Such statements are undermined by clear and persistent gendered divisions of labour. This occurred in disaster response, for example, during the Ljusdal municipality wildfires (SE12), where frontline rescue operations were predominantly undertaken by men leaving women in support positions, and also in disaster preparedness, for example, when the men in rural Sweden take the lead on discussing and organising action leaving the women to make the coffee (SE02). The problem here is less that people perform tasks according to physical ability and experience, than that these divisions are produced by social norms and expectations more than material differences, and are accepted as natural, self-evident, and unworthy of reflection or comment. This occurs in Turkey, where women are sometimes assumed to have no interest in the physically demanding work of fire preparedness. In truth, opportunity is shaped by gendered norms of differential access to spaces and services. When an authority chooses to engage a community by visiting its teahouse, an establishment that women are often excluded from, it reinforces the prejudice that this is men's work (TR07). But such norms can also be reproduced in less direct ways, as when preventative action to clear the home of surrounding flammable materials is taken to be the sole responsibility of women (TR08).

Again, there were counterexamples to these trends. In terms of the work undertaken by women in disaster response, the case study of the village of Ahmetler was significant precisely because many of the people on the frontlines of the firefighting were women and/or elderly. This was discussed by the participants themselves not in terms of heroic individualism, but co-operation and stoic solidarity, for example, when a large group of villagers and other volunteers carried a firefighter's hose 500 meters through the forest and back again, or when, as an unbroken line, they together extinguished low-level fires with rakes and hoes, preventing them from spreading further (TR08). Similarly, one Swedish organiser spoke of rolling-up her sleeves to perform difficult and physically demanding work with other volunteers — including driving a forklift — and how important this was in building camaraderie and respect (SE13).

Other respondents focused on the kinds of work involved in preparedness. The leader of a Swedish all-women preppers Facebook group discussed the community's efforts to oppose the image of the individual survivalist and promote more everyday forms of familial and communal preparedness

(SE07). This entailed a thinking backwards from expected roles of mothers and women to re-conceptualise how domestic life is managed through the anticipation and counteraction of small-scale disasters. Such an inversion, where the contribution is valued in terms of the work rather than the person that performs it, offers a way to broaden categorisations of disaster prevention and preparedness in an inclusive way. Indeed, when Muğla village women were approached in more interpersonal, egalitarian and preventative terms, they showed far more interest in participating in the work of disaster risk reduction (TR08).

These examples reveal some of the many ways that gender and gender relations relate to disaster management. They show how gender roles are constructed and reinforced through assumed preferences, but also how those roles and preferences are fluid and can be reinterpreted and remade. This subsection has continued the discussion of social differences by drawing the presences and absences of gender into focus. It has explored how gender is regarded by the authorities, and how gendered issues come to bear upon different facets of disaster management. By juxtaposing examples, tensions and conflicts have been disclosed, and an analytic that contextualises and explains the viewpoints of the research participants has been extended.

Ultimately, across both this and the preceding subsection, while there are good examples of awareness and recognition of vulnerability, a full appreciation of these dynamics demands further work and continuous appraisal.

3.3 The valorisation and undervaluation of local knowledge

As with local knowledge holders and communities, authorities cannot be treated as singular and undifferentiated. Government agencies, civil protection services, and structured volunteer organisations each operate with distinct mandates and have separate but overlapping approaches to disaster. Their roles, relationships and responsibilities as authorities differ. The same applies at a more granular level amongst the professions. First responders, firefighters, community police officers and healthcare workers observe requirements and expectations that have been shaped by workplace training, their peers and experiences, and ongoing interactions with local and vulnerable populations. These differences are important to consider when analysing how authorities perceive local communities through the frame of disaster. The extent to which their domains of responsibility align with established phases of disaster management circumscribes their engagement with local knowledge and recognition of its value. Put differently, what is understood as a “good” citizen and “proper” knowledge is dependent upon the authority making the evaluation and how their activities entail disaster prevention, preparedness, response and recovery.

Bearing this in mind, practices of recognition, engagement and learning from across the ten case studies can be brought to the fore. The focus here is the evaluation of local knowledge, both in terms of appreciation and two patterns of undervaluation.

Some representatives of the civil protection authorities noted in the previous subsection for their recognition and engagement with vulnerability, also stressed their efforts to appreciate the knowledge of vulnerable groups. Moving from recognition to valorisation, however, requires a qualitative shift that authorities are not always able to make. In Florence, Italy, communication with citizens was said to have improved not only with digital technologies, but also thanks to community representatives and mediators that facilitate these relationships (IT07). The effectiveness of these initiatives was supported by an interview with a health services worker (IT16) but countervailed by the account of a firefighter (IT22). In the interview with the co-ordinator of the Civil Protection Service of Amadora, Portugal, it was claimed that a clear strategy of engagement with local groups of different backgrounds

and vulnerabilities has been established, which invites leaders and representatives to participate in the organisation's mission (PT08). The Portuguese researchers note in their country-level report that while the value of these engagements was appreciated by the local Muslim community, they were aware of vulnerable situations, such as people living in precarious and unsanitary housing, had been reported to the authorities without any action being taken. While both examples are genuine and meaningful they are also limited in extent, pointing to the challenges entailed in overcoming established hierarchies and practices.

More resolute but perhaps less sustainable and reproducible efforts to valorise local knowledge were made by two hybrid authorities included in the study. The Prepping Together initiative was established to improve community-based preparedness practices. Its funding was awarded by the Swedish Civil Contingencies Agency (MSB) to the Workers Educational Association (ABF), which in turn supported local leaders to set up study circles on the topic of disaster preparedness. It proved difficult to identify exactly who the authority was in this case study. While for practical purposes MSB have been treated as the ultimate authority, the data is far more ambiguous. For instance, in one of her interview reports (SE04), the Swedish researcher muses over whether the leader of one study circle is better thought of as a local knowledge holder or an authority. In so far as he originates from and works with a local community, he is the former. But in certain situations, including in interviews with the media, he has also been called upon to speak as an expert. Does this make him an authority? Arguably, it is precisely this dualism that allows such actors to work within and between both domains, building capacity at the local level while also intervening upon higher level strategy (SE01).

In Turkey, a team of academic and NGO experts was assembled to help improve fire preparedness in Muğla. In their interviews (e.g., TR08, TR19, TR20), they expressed respect for local people and described how they sought to bridge between different domains of knowledge and action, for example, by complimenting traditional forest land use with technical information and equipment (TR20), by impressing on local people the power that they have to speak up and demand change from political authorities (TR20), and by reflexively drawing attention to how gender preconceptions within the research group hindered more inclusive forms of engagement (TR08). In both cases, a collection of actors came together for the purpose of undertaking a temporary project. This allowed them to explore new and innovative ideas about disaster risk reduction, largely free from the obligation of being a permanent authority, while also enabling them to report their opinions and findings back to those authorities. However, the fact that these hybrid authorities were comfortable admitting to uncertainties and even subverting their own privilege cannot be relied upon.

The long-term viability of these two case studies remains unknown. For one thing, it is not clear if and how they were able to measure and report on their own success. The valorisation of local knowledge is an intangible thing. It is not easy to quantify, and the impacts of its valorisation are indirect and unfold over many years. One-off projects are of limited length, and have pre-defined mandates, expectations and budgets. To become sustainable, they would likely need to achieve a higher level of political support. 'Prepping Together' operated in a political grey area that allowed MSB to promote change at the local level, usually the sole responsibility of the municipal government. But when ABF failed to re-apply for funding the person responsible at MSB could not even be sure why (SE01). In Turkey, there was an ideological dissonance between two forestry organisations, the General Directorate of Forestry (OGM) working under the centre-right Ministry of Agriculture and Forestry, and centre-left Republican Foresters' Association of Turkey (TOD), that hampered outreach and longevity (TR07).

Similarly, it is far from certain to what extent these efforts present solutions that could be replicated elsewhere. In Sweden, there was already significant public interest in 'prepping', which likely related

to the youth climate movement and MSB's 2018 distribution of the pamphlet 'In case of crisis or war' to every household. The initiative furthermore built upon the well-established and respected institution of study circles. The prompt for the project in Muğla municipality was the 2021 Turkish wildfires, and in turn relied upon national research problems and funding cycles. Nevertheless, the strengths and weaknesses of these hybrid authorities and the contexts in which they operated have been incorporated into the analysis of enablers and hindrances in the sections below.

In most of the case studies, including in several of the four better stories presented above, complicated undervaluations were made of local knowledge. These were expressed by both experts and laypeople, including as caveats or limitations to tokenistic and instrumental valuations. Two underlying forms of undervaluation are diagnosed. The first is related less to knowledge itself than to the perception of ignorance — where ignorance is understood as an individual or collective deficiency. The second encompasses assessments in which local knowledge is found to be insufficient for the purpose of disaster risk reduction.

It was sometimes felt that citizens and communities lack the knowledge necessary to prevent and prepare for disaster. Some interviewees expressed the belief that people simply do not think or care about the risk of disaster. People are said to be self-interested, disinterested in environmental issues and disengaged from the community and the authority's emergency management plans. One example of such behaviour was of people choosing to build their homes alongside watercourses without thinking of the wider consequences (IT09). Another positioned newcomers to the village as lacking an understanding of the consequences of established practices, such as how grazing cows clear vegetation that would otherwise act as tinder for forest fires, and acting in selfish ways to the long-term detriment of the community, such as laying concrete that decreases water absorption and increases flood risk (TR17). For one respondent, citizens are held to be, above all else, consumers (IT10), hinting at a more structural explanation for the apparent absence of locally and environmentally grounded knowledge.

Other interviewees spoke of the selectivity of the public's approach to disaster risk and the inability to think more cohesively and systematically. One found that people tend to think 'spotwise', that is, only in relation to immediate threats and in a partial manner. While individuals may be interested and engaged in the immediate aftermath of a disastrous event, this is soon forgotten. The consequence, they claimed, was that societal preparedness in general is in decline (IT22). Such distrust in the capacities of memory was given a more scientific articulation by a psychologist who argued that because people tend to forget and repress the experience of traumatic events, there is a collective desire to move on from calamity and return to normalcy. For them, this meant that we cannot be prepared for disaster; there can be no local knowledge and no effective local knowledge holder (IT14).

More interesting for the purposes of this research is how this perceived loss of local knowledge is connected to long-term processes of social change. It was sometimes said that people no longer have complete autonomy or a sense of ownership over their land. This was not because of land price rises or the demographic makeup, but rather because they had been removed from responsibility either through regulatory change (IT30) or the influence of leaders (IT21). Where in the past, some citizens in Italy may have intervened directly in their environment, for example, by extracting rubbish or logs from watercourses to decrease the risk of flooding (IT09), regulation had been introduced to deter such action being taken without proper authorisation (IT03). In Turkey, the state instigated a movement from an obligation-based to volunteer-based fire response system. Previously villagers had been obligated to assist in the event of a forest fire, for which they had received a small economic recompense, but under the new programme the only way that they could be of assistance was as a trained volunteer. While this change was undertaken in the interest of public safety and

professionalisation, it also had negative consequences: it devalued the contribution of forest villagers, ended a source of income in economically marginalised regions, and was felt to involve the state releasing itself of responsibility for its citizens (TR07). This ultimately undermined trust and had an alienating effect on people (TR06).

Such outcomes need not be brought about in so direct ways. Turkish foresters spoke of how the banning of goat grazing led to the build-up of grasses, sticks and other flammable material in the undergrowth, increasing the risk of wildfires (TR06). Many traditional land use practices, including amongst Turkish nomadic herders (as was revealed in the first RL1 report), have actively sought to decrease the risk of wildfire, not only through animal grazing but also controlled burning. This is only starting to be properly recognised by the state. While these examples vary, in each it was a process of increased rationalisation and bureaucratisation that led to the loss of local knowledge and engagement.

There are also examples from the research where it is state abandonment and *de*-regulation that have produced a lack in knowledge. Abandonment occurs when there is a discontinuation in governmental support and engagement (Povinelli, 2011). It may result from the withdrawal of welfare services, or through structural changes that decrease economic opportunities. Abandonment heightens disaster vulnerabilities, as was evident in rural areas of Turkey and northern Sweden. But the phenomenon also plays a role in disaster response and recovery, where affected communities feel that the state has reduced its presence and failed to contribute sufficiently to the cost of rebuilding homes and replacing destroyed belongings. In the Italian case studies in particular, people spoke of inconsistencies in state aid and the difficulties that many members of the community faced in securing adequate compensation for their losses (IT13, IT17, IT24).

In Sweden these dynamics play out in a slightly different way. Historically, the Swedish population has had high levels of trust in the state, and municipal governments have been able to invest in public infrastructure, and welfare and community support programmes. Over the last thirty years, economic austerity and broader political trends have driven the decline of many municipalities, particularly in rural areas of the country's north, as people and businesses have moved away, and social and material infrastructures have deteriorated. With this change, authorities have come to recognise that they must do more to utilise the knowledge and resources of volunteer organisations and civil society, not for reasons of legitimacy or objectivity, but because they no longer have the budgets to do otherwise (SE02, SE09). Abandonment has here not directly led to the loss of knowledge. Rather, it has produced the social conditions whereby disaster management has come to have greater dependence upon the public. Where communities could previously rely upon the support of the authorities, that relationship has been reversed, and they have been called upon to know and act in new ways.

The second form of undervaluation accepts that local knowledge exists but finds it to be in an improper form. To better articulate what is meant by proper and improper here, it is necessary to first introduce the sociological concept of 'usable knowledge'. This term names scientific and expert advice that is delivered in a manner that is credible, relevant and timely (Haas & Stevens 2011). Not only is the accuracy of the knowledge at stake, but also the extent to which politicians and policymakers find it actionable. Usable knowledge is thus a relational concept, where the authority in question, and their sphere and context of action, are just as important as the content of the knowledge and the identity and legitimacy of the persons from which it originates. The term is here used to pull apart the relationship between authorities and local knowledge holders, to show how evaluations of knowledge cannot be separated from the needs and obligations of the evaluator. Knowledge itself cannot be improper, but if found to be unusable it may be considered as such.

The usability of local knowledge may be rejected by its association to over-informed or over-confident citizens. Here, authorities perceive it as problematic that people believe that they can act on their own. This is connected to concerns with spontaneous volunteers, as noted in the previous subsection, but also a little different in the focus on misplaced knowledge, rather than misplaced bodies or actions. Indeed, structured volunteers themselves speak of these as different phenomena, where spontaneous volunteers must be organised to be effective, and over-confident citizens discouraged or even prohibited from acting independently (SE09, SE10). Municipal and civil protection authorities sometimes draw attention to people that know too much and act recklessly (e.g., IT10), getting themselves into dangerous situations, and obstructing or creating more work for professionals. For one civil protection official in Toscana region (IT29), there have been a lot of advancements in disaster management in recent years. Civil protection has become a global phenomenon, volunteers are more professional and better organised, and citizen awareness has improved considerably. While local people are said to have information about their territory that is helpful to emergency operators, there are also people that are too informed and choose to act separately from the professionals. Social media is identified as the main source of their information.

This phenomenon is interpreted as specific type of gendered technical knowledge, more interested in survivalism than self-sufficiency, which was discussed at length in the first research cycle report. In contrast to this, a different approach to disaster, based on humility and communal practice, was proposed. This is a distinction that was also expressed by the leader of the all-women Facebook group that explicitly rejected what she called “the Rambo ideal of the lone wolf surviving with his machine gun” (SE07).

The usability of local knowledge can also be rejected by way of the epistemic claim that it is unscientific. This may be presented in response to the self-education that leads to the problem of the over-informed citizen. Rather than local knowledge, it is asserted that action should be based upon scientifically grounded information as mediated by experts (IT29). But it is also a viewpoint that applies to a more generalised approach to knowledge. In this case, what is stressed is that local beliefs and experiences do not, on their own, adhere to scientific standards of objectivity and verifiability. For local knowledge to be usable, it must first be validated by the scientific method. The clearest expression of this form of undervaluation was made by the leader of a voluntary group of Italian academics working with disaster risk awareness raising (IT31). For this person, there is unrecognised and underutilised value to be found in local knowledge, especially in terms of disaster prevention. People’s experiences and memories of disaster are identified as one example, but only insofar as they can be integrated with the knowledge and research methods of trained historians. It is by subjecting local knowledge to scientific epistemology that it may contribute to the knowledge base on which disaster management and policy are based. Such categorical evaluations of local knowledge, however, tend to rest upon a restricted understanding of scientific practice that implicitly denies its plurality and foundation in social values. A more coherent approach to the usability of local knowledge would prioritise an understanding of its contextuality over its verification according to external epistemic norms.

While certain authorities are making meaningful efforts to valorise local knowledge, undervaluations persist. This subsection has identified better stories from the research data, where hybrid authorities bridge between expert and lay knowledge, but only within contextually specific organisational, social and political limits. More than this, it has unpacked two over-arching undervaluations: where local knowledge is said to be lacking, and where it is found to be improper. In both, a strong demarcation is maintained between lay and expert knowledge, which serves to mark and preserve the privileged status of the authority. This difference assumes a linear relationship between scientific empiricism and policymaking (i.e., that the facts, once established, will drive positive change), and discounts the

multiple and potentially intersecting ways that science and politics are practised. Such limits play an important role in how situations of learning from others come to be constructed.

3.4 Learning from the insights and experiences of others

Undervaluation furnishes practices through which “proper” knowledge is instrumented and turned into opportunities for learning. By instrumentation here is meant a practical disposition to the movement from empirical observation to generalised principle that leaves unchallenged the premises on which it is based; a reaching for solutions without interrogating the composition of problems. This occurs both through the top-down informing of citizens, and through the bureaucratic extraction and organisation of information from them. In this section, these two forms of instrumentation are diagnosed, using examples from the research data to identify their organising logics, methods of learning, and ways of bringing people and practices into alignment. While there are significant differences between these forms, they are not entirely incompatible and can coexist. Following this analysis, counterexamples are identified of community-based education and learning that are worthy of greater recognition and support. From the better stories, more horizontal and diagonal practices of intermediation, wherein problematisation itself becomes a site for pluralised learning, are then teased out. Taken together, these alternatives indicate how the valorisation and empowerment of local knowledge holders might be better realised.

As discussed in the previous subsection, many respondents, including authorities, experts, laypersons and their intermediaries, expressed a belief that local knowledge has been lost or simply does not exist. On such a basis it follows that knowledge can only move in a downwards direction. There are those that have the right kind of knowledge (i.e., experts and authorities) and those that do not (i.e., local people and citizens), and it is up to the former to educate the latter. Inherent to this construction is a preference for scientific knowledge as a universalised body of facts or established best practices. These are taken to be objective and applicable at any time or place. The contingencies and specificities of actually existing research, especially that of a human or social character, are absent. Learning thus becomes foremost a problem of communication. Change, it is taken as given, will only occur when the right information is presented to the right people in the right way.

This approach is most evident in the Italian ‘I don’t take risks’ (*‘lo non rischio’*) campaign, which was discussed in relation to all three of the country’s case studies (IT02, IT08, IT31). In this campaign, citizens are made aware of disaster risks, taught how to minimise those risks through appropriate behaviour, and advised how to best respond when a hazardous event occurs. This is valuable information — and to be fair, while the programme itself is Italian-wide, the best practices do encourage a familiarity with local territory — but it is delivered in a top-down manner and presented as if it were the only way that community learning is able to contribute to disaster prevention. Amongst those people that were interviewed, the possession of scientific knowledge serves to distinguish citizens that are part of organised civil protection from those that are not, that is, between “good” and “bad” forms of non-professional participation (e.g., IT31). This is an important point to stress, because to valorise local knowledge or to question the top-down flow of knowledge may also be to challenge that which is understood to separate structured volunteers from the wider public.

This structure of learning calls for certain roles to be filled. The downward flow of information positions citizens not as knowledge holders but receivers (SE01), that is, as individuals in need of training and education (SE03, IT18). While this frequently precludes or removes from them the opportunity to be involved in active or strategic decision making (IT09), the role of knowledge receiver is not entirely passive. Citizens are still held to be individually responsible for their own learning, in that they are

expected to inform themselves (IT31), or in the case of volunteers, undergo training to professionalise (IT22).

At the same time, the civil protection services, including both professionals and suitably qualified volunteers, are required to perform a knowledge delivery service (PT05, SE03). For awareness to be raised, someone must be tasked to do the work of *explaining* how to adopt (IT02), *training* adequately (IT10), and *providing* with knowledge (IT28). These acts of education take time and energy but are also rewarding in that they bolster the authority of the expert and their knowledge. This bittersweet burden is evident in the case of Frielas, where the municipal civil protection co-ordinator was emphatic in declaring, “We will only win through education!” (PT05). A heroic effort is made to visit all 83 of the municipality’s schools, not simply to inform but to stem the loss of knowledge and stimulate a generational shift. Other risks are also entailed in this work. These include the risk of uneven distribution of information, especially amongst vulnerable groups such as migrants, the elderly, and disabled persons, and the intersections between them (SE06, SE08). But there is also a risk of spreading unnecessary fear, as with a recent push to prepare the Swedish population for war with Russia (SE08). Part of the challenge of unidirectional education then, is that it reinforces the notion that disaster management is a professional duty to be borne by a privileged few.

Instrumental appraisal of the importance of local knowledge may also lead to prioritisation of the extraction of valuable information. This is a response with various starting points. It may follow on from a desire to identify useful information for the implementation of more specific and responsive practices. It may be more open and exploratory but emphasise a need to verify local beliefs and integrate them with a larger body of scientific knowledge. Or it may emerge where the intrinsic value of local knowledge is recognised but an authority is unable or uncertain how to best act on their intentions. Regardless of its origins, the motivating logic remains the same: value is present but needs to be uncovered. The authority may not always have a fixed understanding of what it is they are looking for, but their goal nevertheless is to transform knowledge into actionable data. This is achieved by gathering, sorting and analysing information from the public, often in well-directed and managed ways.

For the civil protection authorities in Florence, a core aspect of their public engagement entails the organisation of flows of communication to identify what can and should be acted upon (IT07). Citizens are impelled to monitor their local environment, and to identify and report risks so that timely intervention by trained and qualified — and properly insured — experts can be made. Given the need for fast and well-ordered data, interviewees in this case stressed the promise of digital tools to help facilitate this communication (IT07, IT30).

Local knowledge can also be directed towards the production of assets for the co-ordination of disaster response. This may include something as simple as a contact list of vulnerable persons and their carers, which in the event of a natural hazard may be used to check-in on people and identify those in need of assistance (IT10). More advanced is the practice of vulnerability mapping (e.g., IT07, IT16, IT18), wherein valuable spatial information is organised and visualised in a standardised way to allow for the co-ordination of disaster response. In Italy, such maps are so well established that their absence is notable and may inhibit the ability of responders called into a disaster situation to act (IT08, IT21). Digital communication and vulnerability mapping are crucial tools for disaster prevention and preparedness that when used properly allow authorities to leverage local knowledge to anticipate and mitigate disaster risks.

Emphasis on the identification and realisation of information from the public implies a greater respect for the value of local knowledge, but it does have practical, relational and epistemic limits. At a practical level, it may give preference to the most vocal and engaged, to the detriment of socially

marginalised and vulnerable groups. This is an acute risk when digitally based reporting comes to dominate over other forms of communication. As has already been observed, not everyone has access to or is able to use these technologies (SE06, SE08). Relationally, while the directionality of learning may be inverted, the extraction of information nevertheless maintains established relations between the lay and the expert. For knowledge to be useful, an evaluation must be made and an action taken, the responsibility for which remains with the authorities. As such, an instrumental approach to the valorisation of local knowledge does not lend itself to more personalised interaction and one-on-one trust building, which several of the most inspiring stories of authority–local interaction entailed (e.g., SE13, TR01, TR08). Finally, this approach is also epistemically constrained by its perpetuation of established assumptions of what the problems associated with disaster vulnerability are, and of where the value in local knowledge is to be found. These framing issues remain the sole domain of authoritative knowledge. As such, instrumental engagement with local knowledge may become fixed by practices of disaster preparedness that do little more than maintain the *status quo*, leaving the more fundamental causes of social vulnerability unattended.

Having explored these two dominant constructions of learning, some of the alternatives encountered in the research, beginning with community groups that organise and learn independently of the authorities, can now be explored in greater details. These have different goals, take different forms, and contribute to different phases of disaster management.

In terms of response and recovery, three examples are indicative of this phenomenon. In the case of the Ljusdal municipality forest fire, Färilafolkan grew out of a local Facebook group and was successfully able to direct much of the labour and provisions supplied by spontaneous volunteers into a support network for emergency responders and people displaced by the fires (SE12). They received no direct aid from the municipal government, the chief authority responsible for co-ordinating the disaster response. Some support was given by the Swedish Red Cross, who ensured that personnel were always onsite so that Färilafolkan volunteers would be covered by Red Cross insurance, but the two groups also disagreed over the distinction between structured and spontaneous volunteers, and competed for recognition. Also active in Ljusdal was the Hovra volunteer fire brigade. Composed of around twenty locals with good knowledge of the area, and mixed in terms of age and gender, the group assembled their own equipment (including rakes, hoes, and tractors with water tanks and pumps) and worked in shifts with tacit recognition from official fire responders. Following the disaster, the group has persisted and established a fire station that co-operates with the municipal rescue services — with the heightened risk of climate-change-related forest fires offered as a reason for continued operations (SE14). Despite efforts to reach out to a regional politician, the Hovra volunteer fire brigade remains largely unsupported and independent of authorities at this level. In Italy, citizens committees have been set up in both Campi Bisenzio and Imola in response to the floods (e.g., IT17, IT23, IT24). These groups have responded to a perceived deficit of state support to self-educate about disaster risk, monitor threats, collaborate to maintain waterways, ditches and gardens, and organise politically to demand improved maintenance, restoration and compensation from the authorities (IT23). Participants speak of the sense of self-empowerment entailed in their preventative action and capacity building (IT17).

Grassroots disaster preparedness and prevention do not require a significant disaster experience to be brought into being. The women only Facebook group is a wonderful example of how people are self-organising to learn about and anticipate disaster risk. While misinformation exists in any such environment, leaders of this group are aware of this risk. The interviewee described how, as an administrator, she works to uphold community standards for inclusion, tolerance and quality, ensuring that the space is safe for all women, including non-Swedish and trans women (SE07). This entailed

moderating discussions, ensuring respectful and non-judgemental interactions, and removing dangerous and unscientific content (e.g., about colloidal silver, or dubious methods of food conservation), and conspiracy theories. But learning need not be so explicitly geared towards disaster to nevertheless be of value in its prevention. The East African community group shows how people with a common geography and social experience can come together in solidarity and support to resist their conditions of heightened disaster vulnerability. As a leader of the group put it in their interview, “while individual preparedness is quite low, we will find a way to manage” (SE08). Despite the everyday difficulties of poverty and social difference, the interviewee expressed that the strength of their community, and the hardship that many of its members had experienced, would nevertheless enable them to respond together in the event of disaster.

Many communities of mutual aid and learning exist without recognition and assistance from the authorities. Nevertheless, these groups demonstrate significant knowledge of situated social and material infrastructures relevant to disaster management, and in some cases also draw upon scientific literature and research. Such groups could be far better supported and drawn upon as a resource in the anticipation and mitigation of disaster risk. An example of how this can be done successfully exists in the case of Imola, where a community-established WhatsApp group was used to co-ordinate the disaster response, which in turn became the basis for a supportive relationship between the local civil protection authority and a citizen’s committee (IT13). Such relationships require active engagement on the part of the authorities, and the institutional capacity to identify and valorise community resources.

The epistemic potential of community knowledge practices exceeds the bounce-back logics of resiliency to attend to the very problems that produce social vulnerability in the first place. At the very least, these groups should be allowed to learn, organise and act independently (within the constraints of suitable safety standards and regulations), without being left to fend for themselves. More progressively, in any engagements or collaborations that they have with authorities, it is crucial that their knowledge be recognised and not replaced but complemented by scientific and technical expertise. This may entail a relaxing of the requirements for “proper” knowledge imposed by some authorities. The better story of the Muğla research project indicates how this could be accomplished (TR20). Here, the researchers speak of the introduction of equipment and technical know-how as a supplement to existing practices and capacities. The objective is not to impose but to enrich. This need not necessitate agreeing with everything done at the local level. Tension, and even contradiction and conflict can be important modalities of communication. But it does demand a respect for the lived experiences of local people and a willingness to engage with their problems on terms that they stipulate.

There are also examples from the data where authorities have effectively engaged and valorised local knowledge holders in the construction of moments of co-learning. A striking feature shared by many is the significance of actors that interface and mediate between institutions and individuals. These exist in at least three forms.

Notable, but difficult to replicate and rely upon, are authority representatives that can step outside the position of their authority to engage people in a more personal manner. One example of such a figure is the Swedish organiser noted above for her willingness to work alongside spontaneous volunteers (SE13). At the time of the Ljusdal fires, she was nearing the end of a one-year position as a crisis preparedness officer for the municipality. While she had some authority from that position, she also described having to barge into the office of the municipal chief officer to demand the mandate to be able to properly request and organise resources. Another example is the forester who worked with the village of Ahmetler during the 2021 wildfires (TR01). He was able to form bonds of mutual trust

with the locals, listen to and learn from them, and together work towards the successful defence of the village and the valley. This was achieved independently of the forestry organisation that he works for, and neither he nor the Turkish researchers expect that his approach will be adopted by them any time soon.

Lessons can better be drawn from the second form of mediator identified in the analysis. These are mid-level authorities that exist alongside (or even outside) the formal establishment of civil defence. This may include professions, for example, health and social service workers, and community police officers (e.g., IT16, IT19), for which disaster preparedness and response is not a core responsibility. One such interviewee, a healthcare worker, collaborates with civil protection authorities in Imola to facilitate engagement with vulnerable persons and the people around them. The embeddedness that comes with professionalised care seems to allow these mediators to move beyond the preparedness–response cycle, and get at the social determinants of vulnerability.

The third type of interfacing actors are not formal authorities at all but community representatives. These are the important leaders and go-betweens that can convey valuable local knowledge to authorities and *vice versa*. Such figures are referred to in some of the most successful case studies as cultural mediators (IT07), sentinels (IT16) and spokespersons (SE03). As was pointed out by the leader of the civil protection activities in Amadora (PT08), it is important to be careful who is called upon to speak for a community of people. Not only do local politics and power dynamics need to be navigated sensitively, but there is also a need to get beyond the usual voices and hear those most under-represented. Indeed, local knowledge holders may themselves become experts in their own domain, such that their success also entails a risk of institutionalisation and the calcification of learning (SE04, SE05) — something that was discussed in the Italian country-level report with respect to the decades-long involvement of volunteer organisations within the civil protection system.

This report identifies a lot of promise in the elevation of mid-level mediators and hybrid authorities, but this mode of organisation is not without its shortcomings. Distributed governance mechanisms have long been part of the political establishment, especially in the UK, Canada, Australia and, as indicated previously, Scandinavia (Rhodes 1997; Dunleavy et al. 2006). Critics of this turn caution against its tendency to complicate decision-making and accountability, such that in the event of failure it becomes difficult to identify the cause and hold parties responsible (Bevir 2010).

This subsection began by identifying and examining methods of learning based upon an instrumental disposition to what is deemed to be proper knowledge. To be clear, these methods of learning are not “bad”. Each has its strengths and a place within a varied and dynamic educational environment. What the analysis has sought to diagnose is their unsuitability for the purpose of activating the latent knowledge of local communities for disaster risk reduction. These approaches cannot be the only ones available for authorities to call upon. This research highlights both examples of community-driven education and engagement that hold significant promise for disaster management, and practices by which authorities can work with such groups. Not all learning needs to be conducted through top-down relationships. Horizontal and diagonal learning, wherein the separation of authorities and locals is challenged by various mid-level actors, also shows considerable promise.

3.5 Enablers and hindrances of change

This subsection presents enablers and hindrances of institutional change towards more gender+ inclusive engagement with local knowledge in disaster management. These are drawn from discussions between the country-based researchers and the above trans-case-study analysis. Given the great variation in the case studies, they are understood to reflect general patterns rather than

necessary conditions. Nevertheless, the hope is that they may act as levers for socially and politically progressive policy interventions. In so far as this report promotes a theory of change it is an open-ended one, whereupon these so-called enablers and hindrances may be understood as contextually meaningful entry points into longer duration change processes.

The summary of enablers and hindrances are presented in two overlapping clusters, one for engagement of authorities with local knowledge holders and the other for gender+ inclusiveness. While these were not treated any differently in the research, the results emphasise distinct modalities of social organisation, the first at the level of practice and the second in terms of institutional context. This may owe to engagement and inclusivity being different kinds of things, or to how they are situated within broader fields of social action, opportunity and constraint. In reality, they overlap and are likely to be mutually reinforcing.

The key hindrances and enablers of authority engagement with local knowledge holders are arranged into four practice pairs (see Table 3). These are presented and described below.

Table 3. Key enablers and hindrances of authority engagement with local knowledge holders.

Type of practice	Hindrances	Enablers
View of local knowledge	Perception of local incompetence	Recognition of value by leaders and institutions
Approach to individual volunteers	Denigration of 'spontaneous' volunteers	Clear plans and responsibilities for organisation of volunteers
Interface with grassroots organising	Poor engagement with capable actors/groups	Structural supports for community-led initiatives
Awareness raising and education efforts	Top-down, paternalistic interventions	Programmes of mutual education and learning

View of local knowledge:

- **Hindrance:** Authorities often perceive local populations as lacking the necessary knowledge for disaster management, viewing them as disengaged, disinterested or incapable of action. This perception, shaped by bureaucratisation and historical social changes, leads to a dismissal of local insights and reinforces a hierarchical relationship between expert-driven and community-based approaches.
- **Enabler:** When leaders and institutions recognise local knowledge as valuable, they are more likely to draw upon it as a basis for decision-making and policy implementation. Current practice tends, however, to be limited by instrumental rather than intrinsic valuations

Approach to individual volunteers:

- **Hindrance:** While this differs in degree from country to country, many authorities perceive volunteers as untrained and disruptive. This reinforces a narrow view of disaster management as the domain of professionals, sidelining motivated people who, under a holistic conceptualisation of disaster risk reduction and with proper engagement, might contribute in meaningful ways.
- **Enabler:** Clear plans and responsibilities enable the effective organisation of all volunteers, structured and spontaneous, ensuring they complement official disaster management during a moment of crisis. When volunteers are integrated into preparedness strategies, properly

trained, and given defined roles, their participation strengthens local resilience and enhances the capacity for rapid and adaptive response.

Interface with grassroots organising:

- **Hindrance:** Poor engagement with capable local actors and groups limits authorities' ability to leverage existing capacity. When authorities fail to recognise and respond to the successes of those already active in their jurisdiction, they miss opportunities for easy wins, and the potentially larger gains to be had by building up a local network or culture of active citizens.
- **Enabler:** Structural support for community-led initiatives fosters stronger disaster prevention, preparedness and response. When authorities actively engage with grassroots organisations, provide funding, and create platforms for collaboration, they empower communities to take ownership of disaster management. This participatory approach leads to more resilient, sustainable and context-specific responses.

Awareness raising and education efforts:

- **Hindrance:** Top-down, paternalistic interventions frame citizens as passive recipients of expert knowledge and action, rather than as active contributors to disaster management. This one-way approach reinforces predefined risks and responses, overlooking local problematisations of vulnerability and failing to address the social and structural drivers of disaster.
- **Enabler:** Mutual education and learning programmes foster a more participatory understanding of disaster risk, leading to policies and strategies that reflect local concerns. When scientific expertise and local experience are integrated, trust grows, and collaboratively developed solutions become more legitimate and better suited to addressing location-specific challenges.

These enablers and hindrances of change summarise how authorities can more effectively integrate local knowledge into disaster management. An authority that insulates itself from the public limits the scope and effectiveness of its policy, but when volunteers are well-organised, grassroots efforts are supported, and learning is collaborative, more diverse and fundamental disaster anticipations can be made. Certainly, structural conditions shape the possibility for action, but the emphasis on practice in our results may be an indication of a high opportunity for action in this area.

As for the engagement cluster, our enablers and hindrances for change related to the gender+ inclusiveness of interaction (summarised in Table 4) have also been grouped into four pairs. These attend less to practice than to the institutional context in which inclusiveness emerges.

Table 4. Key enablers and hindrances of greater gender+ inclusiveness amongst authorities.

Institutional context	Hindrances	Enablers
Informational	Poor communication and co-ordination, and bureaucratic inflexibility	Capacity for reflexivity, learning and knowledge transfer
Economic	Economic constraints (and a lack of resources)	Good access to resources and infrastructure
Political	A polarised political climate	An active and diverse leadership team
Social/cultural	Embedded social norms and prejudices	Strong social fabric

Informational context:

- **Hindrance:** Poor communication, lack of co-ordination, and bureaucratic rigidity obstruct efforts to integrate gender+ perspectives into disaster management. Authorities often fail to share effectively information and best practice, both internally and with local communities, reinforcing exclusionary assumptions and preventing the recognition and use of diverse knowledge sources, particularly from marginalised groups.
- **Enabler:** Authorities that prioritise reflexivity, learning, and knowledge transfer, whether directly or through intermediaries, create space for more inclusive engagement. Open communication channels, cross-sector collaboration, and bi-directional learning empower authorities to recognise and integrate gender+ perspectives. By valuing diverse knowledge systems, institutions become more responsive to the needs of different groups, which ultimately strengthens disaster risk reduction.

Economic context:

- **Hindrance:** Economic constraints limit investment in gender+ inclusive disaster management. A lack of dedicated resources for programmes, training, and outreach limits how authorities engage marginalised groups. Economic precarity among local communities also restricts their ability to participate, reinforcing structural inequalities.
- **Enabler:** Conversely, good access to resources and infrastructure facilitates gender+ inclusiveness. When authorities allocate funding for participatory processes, capacity-building, and equitable access to decision-making spaces, they enable diverse knowledge holders to contribute. Financial stability also allows for long-term investments in community-led initiatives that support inclusivity in disaster prevention and management.

Political context:

- **Hindrance:** A polarised political climate can stall progress toward gender+ inclusiveness by making it difficult to involve multiple stakeholders and spread good practices. Political tensions may delegitimise efforts to incorporate diverse voices, reinforce established hierarchies, and create resistance to change. In politicised environments, there is a risk that inclusive initiatives are deprioritised, leading to inconsistent policies and a lack of sustained commitment from authorities.
- **Enabler:** An active and diverse leadership team can drive gender+ inclusiveness by championing collaboration, representation, and accountability. When decision-makers foster inclusivity, they create political momentum for change, encourage broad participation, and ensure that disaster management strategies consider the perspectives of all affected populations.

Social/cultural context:

Hindrance: Embedded social norms and prejudices create barriers to gender+ inclusive engagement by prefiguring expected behaviours and interactions. Hegemonic assumptions about who is suitable to be an authority/expert may marginalise women and other underrepresented groups, preventing their knowledge from being properly considered. These biases may be intrinsic not only to established roles but also practices and places.

Enabler: A strong social fabric promotes gender+ inclusiveness by fostering trust, solidarity, and recognition of diverse knowledge systems. When social networks support equitable participation, they empower marginalised voices to be heard, encourage collaborative learning, and strengthen relationships between authorities and local communities.

These enablers and hindrances of change operate at a higher and more abstract level than the practice-oriented ones presented above. They describe the systemic or structural conditions that allow both authorities and marginalised groups to engage with one another. As such, while there are some aspects here that can directly inform policy (e.g., more proactive diversity and inclusion inside leadership teams would be expected to have a run-on effect), many of these institutionalised contexts affect far more than disaster management.

This presentation of the major enablers and hindrances for institutional change ties the analysis together in a theoretically coherent way but comes at the cost of much of the nuance and context. Given the range of material from which they have been derived, it is important to stress that these intervening factors are not as well directed as the research findings, nor as explicit as the policy recommendations.

4. Discussion and conclusions

4.1 Better stories and links to transformation

Stories of perseverance and transformation in the face of adversity have a certain kind of social and political power. According to Georgis (2013), 'better stories' are narratives of affective and pedagogical value that not only offer inspiration but also allow us to think differently. In this sense, the better stories identified in this research report serve to underscore the very possibility that things might be otherwise. The ACCTING project seeks to engage with better stories in a way that is both practical and analytical. Practically, they serve as a basis for identifying good practices that may be abstracted from a specific and situated narrative into more general policies that can then be adapted and applied elsewhere. Analytically, they act as a lens onto broader processes of social change, and the relations and processes that intervene to promote and constrain them. The idea is that this allows for interventions to be made at a higher level of governance, with the potential for broader systemic impact through downstream and ripple effects.

Better stories can be identified at multiple organisational scales in the research data. Given the complexity of the data, these stories are not necessarily cohesive, but they do not need to be to carry affective weight or inform aspirational policy prescriptions. However, it remains uncertain whether these amount to more than the sum of their parts. The research is selective, partial and fragmented, making definitive conclusions difficult. Nevertheless, in the identification of enablers and hindrances of change (above) and policy recommendations (below) there is an implicit assumption that these better stories may indicate the direction of positive change. They are presented here at individual, group and systemic levels to tie together the more positive findings of the research, and connect the report to discussions of the need for transformative social change.

At the most granular level of social action, better stories can be identified in the agency of individuals that are able to act in atypical or unexpected ways to bring local knowledge into disaster management. This includes leaders, such as mayors and village heads, and managers and administrators (e.g., IT16, TR17), that are credited as having the ability to drive change in their jurisdiction or organisation. From a sociological perspective, the capacity to act must also be institutionally sanctioned, suggesting that leaders are a product of their surroundings rather than an exception to them. It would be a mistake, however, not to recognise that some people do seem to have the personal motivation and charisma to stimulate change. Other examples that may qualify as better stories are those authority figures that act irrespective of and perhaps even in defiance to their conditions (e.g., SE13, TR01). These people, such as the Turkish forester who worked with the village of Ahmetler, promote change

not from within, but from without. While their immediate impacts are bounded but direct, as better stories, and as contributors to broader processes of social change, their agency may also have longer lasting impacts. Finally, there is also an example from the research of an individual citizen with a high capacity to impose their knowledge on the authority (i.e., PT01). This person, a local entrepreneur, recognised that a physical intervention could be made on their property to decrease the risk of flood damage to the neighbourhood, and was able to successfully lobby the municipality for the resources to carry this out. Such people appear to be quite rare (citizen action is much more common at the group level) and may require significant social or economic capital to be effective.

Meso-level group organisation is the most evident site for the emergence of better stories within the research. These encompass a broad range of relationships between local communities and the authorities. At one end of the scale, are citizen groups that self-organise without government support, to respond to disaster, and to learn about and prepare for disaster in communal ways. Färilafolkan (SE13) and the all-women preppers Facebook group (SE07) are the most evident better stories of this type. Importantly, the resiliency of these groups is no justification for the withdrawal of state support. While they are successful examples of local knowledge in disaster risk reduction, there are significant weaknesses to policies that overemphasise local responsabilisation and the power of autonomous action. More aligned with the objectives of the research are instances where such groups are recognised, supported and have meaningful and enduring relationships with the authorities (e.g., IT13, SE14). This is not about co-opting or incorporating community initiatives, but rather refusing to interpret their capacity to self-organise as a sign that they do not need the help of others.

Moving towards the other end of the scale are projects and initiatives that have been initiated by the authorities to engage local people in meaningful ways. These may entail a rather top-down and technically oriented approach to learning, as with the example of the Izmir project to promote local fire responders, that nevertheless come to depend heavily upon local knowledge and relationships (e.g., TR17). But there are also better stories, as with the Muğla research project (e.g., TR19, TR20) and Prepping Together (e.g., SE04, SE05), that have a much more explicit goal to promote mutual learning. While these initiatives demonstrate how authorities can cultivate localised disaster management, their exploratory and time-bounded nature raises questions about their longevity.

This brings us to better stories where civil protection organisations have taken concrete steps to improve the gender composition of their staff and leadership, prioritise and valorise citizens, including in terms of their diverse and even intersecting vulnerabilities, and establish meaningful practices that elevate, communicate and organise their knowledge. Interviews in Florence (e.g., IT07) and Imola (IT07) in Italy, and in Amadora (PT08), Portugal, all offer these kinds of better stories. These are meaningful change processes, which despite their current limits and constraints, all have the potential to proceed towards the policy objectives promoted by this report and by international disaster experts (as in the SFDRR).

While there is less direct evidence of systemic change, commonalities across the case studies give an indication of its existence. There is good overall recognition of the needs of the vulnerable in professional disaster management, and the establishment of effective technical practices to prioritise the most at-risk persons during disaster situations (e.g., vulnerability mapping). If the practices observed in Florence, Imola and Amadora are being widely replicated, for example, through the strong civil protection systems that exist in Italy and Portugal, then that is indeed a better story. This trend is not universal across Europe, however. In Sweden, MSB requires municipalities to develop their own disaster plans, but local actors have few opportunities to report back their experiences and shape the way that the system as a whole operates (Wamsler et al. 2019). There is also evidence that women's involvement in disaster management, at both local and higher levels, appears to be moving in the

right direction. There is a general agreement from across the case studies that equality of gender representation in both volunteer and civil protection organisations is important. Of course, addressing participation while ignoring other issues, such as the unequal gender norms and practices that ensure disasters are experienced differently by men, women, and queer and transgender people, shows that there is still much to be done in this area. Nevertheless, the progress that has been made should be considered a better story. Finally, there are also indications that cultures of disaster communication and campaigning might be undergoing a shift to recognise the importance of communal preparedness (e.g., the relationship between Prepping Together and MSB) and preventative action (e.g., ‘I don’t take risks’ bridging all three of the Italian case studies). While there are shortcomings to both examples, they offer good working examples of practices promoted by this report.

In general, however, there is little indication of the potential for transformative social change, where transformation is understood as a wide-reaching and qualitative shift in social relations (Utting et al. 2012). The better stories of individual agency, while important, remain too specific or exceptional to serve as a reliable foundation for broader transformation. At the group level, significant political and economic barriers constrain the potential for scaling up local initiatives into systemic reforms. More fundamental change among authorities — such as full recognition of the differential gendered experience of disaster, the intrinsic rather than instrumental valuation of local knowledge, and the need for a high-level disaster prevention strategy — will require sustained policy pressure, and even then, are likely only to occur incrementally. If transformative social change to address the climate crisis does transpire, it will certainly have an impact on disaster risk reduction. But the current path dependencies of disaster management and civil protection make it highly unlikely that such a form of change will originate from within. Truly transformative change must rely on a strong civil society and active political movements to alter from without the conditions under which disasters are anticipated and apprehended.

4.2 Policy recommendations

The policy recommendations made in this subsection synthesise and build upon theoretical and empirical arguments made throughout the report. They start with the enablers and hindrances of change, before covering more substantive and cross-cutting interventions. The practices identified in Table 3 lead to clear policy goals to improve authority engagement with local communities. These are fleshed out with reference, where appropriate, to the better stories and other parts of the analysis.

The first policy goal is the recognition, by both leaders and organisations, of the intrinsic value of local knowledge in disaster risk reduction. At present, assessments are too often constrained by a narrow appreciation of what people have experienced, what they know, and what they can contribute. Similarly, authorities tend to define the value and utility of knowledge in restrictive terms, privileging certain forms of expertise while overlooking lay and tacit knowledge. A more humble and inclusive approach to the varieties of relevant knowledge is needed — one that acknowledges the diverse ways in which people understand and respond to disaster risk. This would entail an expansion of the fronts of legitimate anticipatory action (as indicated by a proper appreciation of the social determinants of disaster), and an acceptance that technical disaster knowledge, both in terms of preparation and response, while crucial, is often constrained by a desire to preserve of state of normalcy. For many, what is considered “normal” is the very thing that produces their condition of vulnerability. Strong leadership can play an important role here by recognising that all sorts of people have valuable contributions to make and by having the courage to invite diverse individuals and groups to join consultation and policy development processes.

The second goal is to establish clear plans and responsibilities for the organisation of volunteers. There is a perception amongst some authorities that spontaneous volunteers (either as individual or a mass of actors) are a significant danger to themselves and an obstacle to serious and well-organised response efforts. While this report rejects the ideal of the self-sufficient hero acting on their own, it is also sceptical of the assumption that spontaneous volunteers inevitably cause disruption. Existing policy responses do well to organise and professionalise some volunteers, but this then becomes the basis for the systematic exclusion of others. The figure of the spontaneous volunteer emerges from discursive and organisational conditions; on the one hand, through narratives that valorise individual heroism and downplay the significance of government regulation and institutions, and on the other, through a paucity of mechanisms to recognise and channel collective volunteer efforts in an effective manner. While discursive conditions lie beyond the control of most authorities, there are things that can be done to improve the handling of volunteers. This includes moving beyond the distinction between structured and spontaneous volunteers, and instead fostering a dynamic and cooperative relationship between them. More than this, the development of clear agreements, roles, responsibilities and protocols well in advance of a crisis can help ensure that all volunteer efforts are channelled in ways that support, rather than hinder, disaster response.

Structural supports for community-led initiatives should also be developed. In some jurisdictions, there exists a disconnect between grassroots organisations and disaster management authorities. While authorities are not always to blame for this and not always able to overcome it, there are examples in the research data where more active engagement would clearly be of benefit to both parties. This should not be done in an *ad hoc* manner, but addressed more actively through outreach and capacity building, and through the sharing of information and best practice. At a higher level, it is important that regulatory frameworks encourage citizen safety without sanctioning or imposing harsh penalties upon people that take pre-emptive action to reduce disaster risks. Furthermore, it is crucial that community initiatives have access to funding and resources sufficient to their proper organisation and operation, particularly among social groups that are otherwise not well represented. The goal here is to foster long-term relationships and promote a diverse, self-sustaining network of community-run initiatives. This approach should avoid excessive formalisation, which risks imposing narrow, inflexible roles, and instead prioritise light-touch interventions that uphold necessary safety standards without stifling grassroots energy and autonomy.

The fourth policy goal is to promote authority engagement with local knowledge holders to develop programmes of mutual education and learning. Many current learning situations are limited conceptually and in practice. Narrow ontological and epistemic requirements for useable knowledge reinforce the demarcation between the roles of the expert and the public. This leads to the prioritisation of top-down awareness-raising and the delivery of technical information, or the instrumental extraction of local knowledge for predetermined purposes. A more open programme of mutual education and learning requires recognising disaster knowledge as co-created, always evolving, and embedded in local social conditions. This process must begin well before a disaster occurs, with assumptions about what constitutes usable knowledge and who holds it suspended at the outset. Local knowledge holders should not only contribute to the development of solutions but also play a role in defining the problems — to ensure genuine engagement with the social basis of disaster vulnerability. The purpose is not to identify a set of demands. Rather, it is to work collaboratively, to compliment local knowledge with scientific research and technical know-how, and thereby define areas most in need of action, and identify effective and legitimate measures to address them. This is an approach that demands ongoing, iterative engagement, and the continual verification and refinement of knowledge. This work is difficult, potentially uncomfortable and may entail a significant break in how authorities interact with local people and communities. As such, the

achievement of this policy goal is likely to require strong collaboration with community organisers and representatives, and even investment in new personnel and professional training.

The enablers and hindrances of change for gender+ inclusiveness are a different modality of social organisation than those for engagement with local communities. Rather than practice, they target the institutional context within which authorities operate. For this reason, they do not translate so easily into discrete policy recommendations. Despite this, it is worth trying to unpack what they might mean across the four sites of information, economics, politics and culture, especially as these are likely to have wide-reaching impacts.

At an informational level, it appears that inclusiveness is encouraged by authorities that can examine and learn from their own mistakes, and have the capacity for learning and knowledge transfer. This implies policies that encourage a culture of modesty, openness and flexibility, as well as good communication and bureaucratic flexibility. It is clear from the data that availability of money, resources and infrastructure is also necessary to support inclusiveness measures. Fiscal responsibility and long-term planning are obviously central to good governance. But policies of economic austerity and the withdrawal of welfare and service provision invariably increase social vulnerabilities and heighten the risk for disaster. Political divisiveness and polarisation are inhibitors of inclusiveness, engagement with difference and the spread of good practices. Respect for others and the proper control of hate speech help promote a culture of tolerance. Authorities should also endeavour to lead by example and encourage an active and diverse leadership team. Finally, in terms of the broader social and culture milieu, a strong social fabric is an enabler of gender+ inclusiveness. Authorities should do what they can to fight internal biases and prejudices in their composition, policies and practices.

While the enablers and hindrances offer a good starting point for the specification of policy recommendations, they are blind to certain theoretical and political arguments made in this report. Thus, it is necessary to make three further policy interventions.

The first is to motivate a *focus on good practices not good people*. There are many examples of individuals working effectively within and outside official structures to champion good values, relationships and initiatives. While these represent better stories, it would be a mistake to seek to create the conditions to encourage the emergence of such actors or to invest in them greater power to shape organisational directions. This would leave authorities too exposed to the will and whim of a small number of people, potentially undermining more collective and democratic decision-making. Even if these people continue to act in ways favourable to the organisation as a whole and to the agenda of disaster risk reduction, they will eventually move on, leaving an absence that will be difficult to fill. Policymakers should ask themselves: what is it that the leader does that is so important? and, how might this be specified and incorporated into the culture of the organisation?

The four policy goals identified above all emphasise the development of good practices. Other practices from the research that are worth replicating include the identification of cultural mediators (IT07) and spokespersons for vulnerable groups (SE03), and working with carers and sentinels (IT16) to monitor and report on situations in anticipation of their deterioration. Each of these increases the number of individuals involved in disaster risk reduction networks, and strengthens the connections between the authority and vulnerable community members. Another positive practice is the use of hybrid authorities, and experimental pilot and research projects (e.g., SE01, TR20), and the inclusion of care workers and organisations in civil protection effort (e.g., IT16, IT19). These create opportunities for more diagonal forms of collaboration and trust-building, resisting a top-down versus bottom-up dynamic and the overinvestment of power in individual actors. While there are a lot of strengths to this kind of political organising, it is important to be wary of its weaknesses and limits.

These include making bureaucratic relationships more complex, potentially obfuscating accountability and compounding opportunities for unintended consequences. Furthermore, these policies do little on their own to ensure gender+ inclusiveness, and will need to be complimented by a concerted effort to ensure diversity and inclusiveness in all forms of public engagement.

The second intervention is to *elevate the political qualities of plurality*. The representation of all groups, including the most vulnerable, is an important overarching policy goal with wide ranging social benefits. Ideally, this should strive to achieve equity by correcting for historical injustices that have systematically excluded minority social identities and positions (including it terms of age, gender, ethnicity and disability) from policy-formation and decision-making. This is something that must occur high-up in organisations — gender integration will not succeed if it does not entail more women on boards of directors and in leadership roles. But representation on its own is not enough. Social change makers should strive to do more than ensure the participation of diverse groups of people. Gender+ inclusiveness is not about numbers, but values, beliefs and practices. To promote a politics of plurality is to recognise that strength lies in multiplicity and difference, rather than in unity. Perhaps not everyone will agree on the single, best way forward, but to fully open-up to others is also to recognise that there is seldom just one way to ensure positive outcomes for everyone. For example, and with respect to gender, it is insufficient to ensure equality of representation if an authority continues to fail to recognise the differential gendered impacts of disaster.

Finally, more must be done to *foreground the significance of relationships of care in disaster management*. It is extremely common for civil defence and other disaster-related organisations to stress the importance of a culture of risk (e.g., PT05). This way of thinking about disaster has become so normalised that it often goes unnoticed and unremarked upon. The Italian-wide campaign to promote good practice and preparedness among the public is called ‘I don’t take risks’. The foremost international organisation for disaster co-ordination and relief is the United Nations Office for Disaster Risk Reduction. Risk, however, is a slippery concept that means different things to different people (Lupton 2013). This includes technical definitions, methods, measures and processes that allow risk to be managed with a semblance of control, and to align with and be incorporated into systems of management and auditing (Power 2004). Both everyday and sociological understandings of risk do not easily comport with these more technical approaches. At the same time, the social perspective on disaster vulnerability elaborated in this report cannot be fully captured by the prevailing risk management paradigm. Too great an emphasis is placed on the complexity of social organisation, the significance of economic, political and cultural forces, and the run-on effects of high-level development policy, for related risks to be easily defined, measured and brought into closed process loops. The risk management approach disaster prevention focuses too much on technical fixes to the environment intended to minimise the physical consequences of hazardous events. This is not to say that these are unimportant, nor that the concept of risk should be abandoned. Rather, the point is that efforts to foster a culture of risk should be complimented by attention to a culture of care. This would emphasise interpersonal relationships, dedicate time to learn about people, animals and things, and perform the work of looking after them and their well-being. Care is a difficult thing to quantify and optimise, but this is also what makes it well suited to the complexities and intangibilities of the social context of vulnerability, and ultimately, the prevention of disaster.

Disaster risk reduction requires policies that are not only well-intentioned but also carefully tailored to local concerns. By aligning these high-level policy recommendations and goals with the knowledge, needs, capacities and conditions of communities, authorities can create more inclusive, adaptable, and sustainable disaster management systems that genuinely support those most at risk.

4.3 Policy crossovers

Some overlaps and synergies with European Green Deal policy areas and other research lines can be emphasised.

Just like in RL1, also RL2, RL5, RL6, and RL7 showcase instances where people have formed groups and grassroots initiatives to respond to a perceived deficit of state action and/or support to advance change. These groups play a key role in a variety of aspects, such as generally mobilising individuals; connecting people to collaborate on maintaining, for example, gardens, seasonal/ecological food supply, and bicycles; and empowering people to organise politically. Crucially, they also provide their target groups relevant education, knowledge, as well as tools to self-educate themselves and develop self-efficacy.

Furthermore, RL5 emphasises the role of local and traditional knowledge that is being used/applied and shared/transmitted among individuals in urban gardens. This knowledge is key in enabling individuals to produce seasonal, healthy, and ecological food on their own. This helps them become more self-sufficient, which is not only relevant from a socio-economic perspective, but also from an emergency and disaster preparedness perspective. Similarly, RL2 emphasises local knowledge in developing and maintaining biodiversity enhancing and nature protecting actions.

Akin to RL1, RL8 found a similarly problematic relationship between public actors and individuals and affected communities. In RL8, policymakers were found to be worried about involving citizens in processes that would lead to and define car-free policies. This mirrors the reluctance of the public officials in some RL1 cases to engage local knowledge-holders and trust in their knowledge and understanding. Likewise, it overlaps with the undervaluing of local cycling knowledge found in RL7.

4.4 Research gaps

This research highlights several areas of disaster risk reduction that need greater attention if inclusiveness, adaption, and resiliency are to be assured. The eight gaps identified in this subsection attend to disconnects between formal disaster authorities and local experiences, and the social barriers to their effective collaboration.

Empowering local knowledge — Local communities possess knowledge about disaster prevention, preparedness and response, shaped by their lived experiences and embedded within their social and material environments. However, this knowledge is frequently undervalued or dismissed as anecdotal, unscientific, or impractical. Making the most of local resources requires rethinking what counts as “useful” disaster knowledge, fostering mutual recognition between authorities and communities, and ensuring that local insights are meaningfully valorised. How can local knowledge be effectively incorporated into disaster risk reduction policies and frameworks? What epistemic practices and institutional mechanisms are needed to bridge the gap between expert-driven approaches and community?

Gender+ intersectionality — Disaster risks and vulnerabilities are unevenly distributed across social groups, with women, the elderly, disabled individuals, and marginalised communities often experiencing disproportionate impacts. However, gender and intersectionality remain underexplored in disaster management practice and research. Research on this topic may also include attention to the often invisible but gendered labour that sustains social and material infrastructures essential to disaster preparedness and prevention efforts. Understanding how disaster policies interact with existing social inequalities is key to fostering more inclusive and effective strategies. How do

intersecting social vulnerabilities influence disaster risk and response capabilities? What policies and practices can ensure the meaningful inclusion of marginalised groups in disaster preparedness?

Institutional adaptation — While authorities may acknowledge the value of local knowledge, formal disaster management systems are at times constrained by bureaucratic rigidity and top-down decision-making. Such organisational practices appear more likely to resist the kinds of flexible, community-led approaches that are necessary for effective disaster risk reduction. Institutional adaptation is needed to support participatory policies that enable communities to actively shape disaster strategies. This research identifies significant promise in the identification of mid-level mediators and the formation of hybrid authority structures. What cultural and structural changes are required to facilitate institutional adaptation in disaster risk reduction? How can participatory models be scaled to enhance inclusiveness in disaster management?

Community-driven initiatives — Community initiatives sometimes step in to fill gaps left by formal authorities, particularly in rural and under-resourced areas. These efforts — such as citizen committees monitoring flood risk and organising fire response — demonstrate the capacity of local actors to prepare and mobilise quickly and effectively. However, their long-term sustainability may be undermined by a lack of official support and funding. Strengthening these initiatives requires formal mechanisms that facilitate collaboration, rather than simply regulating or co-opting them. What funding and support programmes can sustain community-driven disaster preparedness efforts? How can authorities create the regulatory conditions that encourage and not foreclose community organising?

Systemic inequalities — Disaster risks are shaped by socio-economic disparities, exclusion from decision-making and precarious living conditions. Migrant and marginalised communities, for example, may reside in high-risk areas with limited support and access to resources. Disaster risk reduction efforts must go beyond technical preparedness and response, and engage with the root causes of vulnerability if they are to ensure that policies do not reinforce existing inequalities. What role can disaster risk reduction policies and practices play in addressing intersecting social inequalities? How can policies for the broad social transformation that is needed to address social vulnerabilities and prevent disaster be properly integrated into existing state and regulatory responsibilities?

Behavioural and social change — Existing policy and practice tends to focus on personal and familial preparedness, and pay less attention to the interplay between individual action, collective behaviour and broader social transformation. Understanding how risk awareness translates into action and how local communities collectively shape disaster responses is essential for designing more effective and contextually relevant policies. How can individual and collective behavioural change complement each other in enhancing disaster prevention, preparedness and response? What are the most effective ways to engage individuals and communities in long-term disaster mitigation and adaptation strategies?

Youth engagement and intergenerational knowledge — Intergenerational knowledge transfer, especially in terms of traditional and place-based resilience — is absent in many communities. The youth are often positioned as receptive, but may feel forced to leave their communities due to economic pressures. Older generations have considerable personal experience to draw on but feel ignored. Research is needed to explore how different generations can be brought into meaningful dialogue, ensuring that past experiences inform future preparedness efforts in locally-grounded ways. How can youth be more effectively involved in community-based disaster management strategies? What role does intergenerational learning play in building resilience in vulnerable communities?

Polarisation in disaster management — Political polarisation, institutional distrust, and state dysfunction pose significant challenges to disaster governance in many contexts. Disagreements over climate change policy, resource allocation and risk management strategies can undermine coordinated action and the spread of good practice. More research into how ideology, politics and disaster policy are mutually shaping is necessary to ensure effective responses to climate-change-related disasters. What are the most effective strategies for overcoming polarisation in disaster management and collaborating across different groups? How do political conflict and consensus shape community participation in disaster risk reduction?

Addressing these research gaps is essential for developing disaster risk reduction strategies that are not only technically effective but also socially just and inclusive. By integrating diverse forms of knowledge, adapting institutional structures, and fostering collaborative approaches, authorities can become more responsive to the lived realities of the most vulnerable and make the choices that are needed to prevent disasters.



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