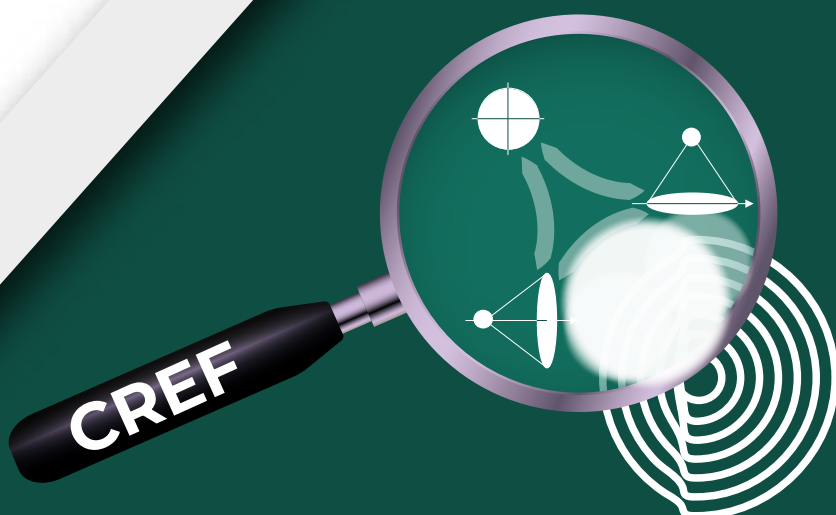TOWARDS A
COMPREHENSIVE RESILIENHANCE FRAMEWORK
CREF

from the ResiliEnhance Platform
field trip activities

2023

RESILI platform
ENHANCE

**Enhancing the resilience to disasters
for sustainable development**

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RESILI ENHANCE platform

Enhancing the resilience to disasters for sustainable development

This publication was prepared by the UNESCO Chair on Intersectoral Safety for Disaster Risk Reduction and Resilience at the University of Udine (Italy), for the "Central European Initiative", in the framework of the "Cooperation agreement for research activities" 2023. The insights expressed in this document summarize the discussions held during the field trip activities of the ResiliEnhance Platform organized in Udine (Italy), on 6-7 November 2023.

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1 BACKGROUND

The *Central Europe Initiative* (CEI) and the *UNESCO Chair on Intersectoral Safety for Disaster Risk Reduction and Resilience at the University of Udine* (hereinafter *UNESCO Chair UNIUD*) established the ResiliEnhance Program in 2022 [1,2]. This CEI area-focused initiative aims to serve as a catalyst for collaboration and knowledge-sharing among stakeholders, fostering the development and implementation of effective strategies for building resilience to disaster in support of sustainable development.

The Program, in the period 2022-2024, foresees the implementation of a series of activities aiming to link diverse viewpoints, expertise, and knowledges of experts in different disciplines contributing to resilience.

The aim of the program is to achieve the following short- and long-term results:

- elaboration of recommendations and reference guidelines to address the issue of strengthening resilience and safety, in the various phases of the disaster risk management cycle with an intersectoral approach;
- creation of an interdisciplinary network between experts from scientific institutions, United Nations agencies, EU institutions, and regional and national governmental and local institutions, to promote a holistic approach for increasing resilience to disaster risk;
- increase of the synergy between scientists and policy- and decision-makers, aiming at enhancing resilience and safety to support sustainable development.

As part of the ResiliEnhance Program, the UNESCO Chair UNIUD launched in 2022 the ResiliEnhance Platform, a space that facilitates interdisciplinary and intersectoral expert exchanges on the different aspects concerning resilience to disasters. Serving as a knowledge-sharing and bridging tool, the Platform takes advantage of the collaboration with the International Centre for Mechanical Science (CISM, Italy), and brings together different expertise representing a wide spectrum of
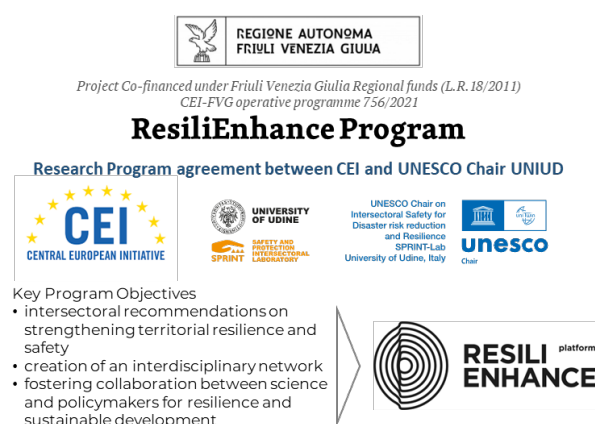
Figure 1: The ResiliEnhance Program

disciplines and experiences, from UNESCO Chairs and UNESCO Category II centres in the CEI area, to United Nations and European agencies, as well as regional and local institutions involved in disaster risk reduction activities.

By focusing mainly on the resilience to disaster risk, as central driver in managing the challenges posed by systemic risk, climate change, natural hazards, man-made threats, COVID-19 pandemic, and also by the increased complexity and uncertainty that will characterize the future, the ResiliEnhance Platform aims to explore effective ways and means for strengthening resilience to adverse events and critical situations in the context of complexity and systemic risk.

The ResiliEnhance Platform is firmly grounded in the core principles of the main UN agendas and frameworks that address disaster risk reduction and sustainable development. These include:

- The 2030 Agenda for Sustainable Development [3]: This comprehensive blueprint for achieving a better and more sustainable future for all recognizes that disaster risk reduction is essential for sustainable development.
- The Sendai Framework for Disaster Risk Reduction 2015-2030 [4]: This international agreement aims to significantly reduce global disaster risk and losses in lives, livelihoods, and health.
- The Paris Agreement [5]: This international agreement aims to limit global warming and strengthen the ability of countries to deal with the impacts of climate change.

The Platform also considers the latest insights provided by the United Nations Office for Disaster Risk Reduction (UNDRR) in its Global Assessment Reports (GARs) on Disaster Risk Reduction (DRR). The GAR 2022 [6] emphasizes the importance of transforming governance for a resilient future, to build stronger societies to withstand disasters. UN Secretary-General Guterres himself highlighted this, stating that "*nothing undermines development like disasters*". Although countries have made commitments to reduce disaster risk, address climate change, and create sustainable development, current societal, political and economic choices seem to be to be doing the reverse, hindering progress on established international goals for disaster risk reduction and sustainable development. To make progress, the GAR 2022 advocates for risk-informed, science-based strategies that consider the complexity and interconnectedness of challenges across social, environmental, and economic dimensions.

A year after, the GAR Special Report 2023 [7] maps resilience for the SDGs and points out several resilience deficits and action cases implemented to respond to highlighted needs. This report delves into the concept of risk-informed sustainable development in a world that is becoming more complex and riskier, underscoring the interconnected nature of risks, and exploring the potential to turn challenges into opportunities for fostering resilience. The report showcases some examples proving that action is possible to stop the worsening spiral of risk and disasters and to accelerate SDG target achievement, focusing on the three main dimensions of people, planet, and prosperity. The report suggests several recommendations to significantly increase investment in resilience and adaptation, urging both public and private

sectors to take unprecedented measures, especially in support of the most vulnerable countries.

Thinking and acting proactively for reducing risks and for increasing the capacity to face and cope surprises and unprecedented situations is one of the main challenges in building an effective resilience enhancement. The activities of the Platform will provide an interdisciplinary and intersectoral contribution in this direction with the overall aim of helping to achieve the objectives of the UN 2030 Global Agenda and contributing to the critical thinking that will help shape the post-2030 Agenda.

In this context, the ResiliEnhance Platform participants pursued their collaborative efforts in 2023 to engage into resilience-related discussions on enhancing resilience in the CEI area. Building on the 2022 meeting and its outcomes (described in [1], to which reference is made for further details, and summarized in section 1.1), the UNESCO Chair UNIUD started drafting the Comprehensive ResiliEnhance Framework (CREF, Section 2), a comprehensive lens for addressing the need to take action to strengthen resilience, in a world of escalating complexity. The ResiliEnhance Platform participants agreed to first test and implement the CREF through a case study concerning the reconstruction in the Friuli Venezia Giulia Region (Italy) following the devastating earthquake, which occurred in 1976. Organised in November 2023, this first field trip was an opportunity to test and refine the CREF (as described in Section 3). This report concludes with insights gained and future directions for the CREF: additional case studies are foreseen to be analysed in 2024 in order to polish the CREF and facilitate its implementation in the CEI area and potentially beyond.

1.1 The first meeting of the ResiliEnhance Platform 2022: Summary outcomes

The ResiliEnhance Platform participants met for the first time in October 2022 with the aim to engage into resilience-related discussions and convene on a common workplan for the year to come. The outcomes of this launch event meeting are summarized in the "Expert recommendations from the launching event of the ResiliEnhance

Platform, 2022" report [1]. The meeting focused on resilience as a pivotal element in addressing the challenges posed by an uncertain future, aligning with the objectives of the UN 2030 Global Agenda and fostering a proactive approach to reducing risks and managing unforeseen crises.

During the 2022 meeting, participants acknowledge the challenged posed by the increasingly complex and uncertain world, characterised by more intense and more frequent disasters, and they engaged into discussions on the characteristics of the new normality and governance actions during the Disaster Risk Management Cycle (DRMC), to issue critical recommendations for supporting governance transformation and the enhancement of resilience to disasters for sustainable development.

The meeting issued key recommendations for:

- Context-Specific Governance: Tailoring governance approaches to suit varying contexts, considering various spatial and temporal scales.

- Knowledge Management: Systematizing data collection and transforming it into actionable knowledge that supports decision-makers.

- Enhanced Communication: Moving from merely understanding issues to making informed decisions through effective communication and knowledge transfer. Recognizing the critical importance of communication in facilitating informed decision-making is essential.

- Necessity to Take Action: Emphasizing the urgent need for decisive action to address risks proactively rather than reactively, ensuring that resilience strategies are implemented effectively and timely.

- Continuous Adaptation: Recognizing the dynamism of disaster management scenarios, which necessitates ongoing adaptation and learning from new challenges that actions may introduce.

- Collaborative Initiatives: Creating a material-sharing platform and collaborating on pilot actions to ensure transparency and accessibility of results.

Further discussions on the common workplan for the years to come highlighted the CEI area as a valuable site for testing collaborative disaster risk management approaches. This would involve

partnerships between UNESCO Chairs, various UN scientific institutions, and diverse stakeholders, creating a rich environment for exchanging best practices and developing innovative solutions through pilot projects. The establishment of a stakeholder network was emphasized, aiming to unite diverse perspectives and create a robust resource to drive future initiatives.

Additionally, the "Udine Chart," proposed as a tool to consolidate and synthesize discussion outcomes, would serve as a strategic roadmap, guiding stakeholders towards effective resilience-building actions.

The ResiliEnhance Platform meeting in 2022 concluded with the identification of the following key next steps identified by participants. These include:

- Conducting retrospective analyses of real disaster governance cases, starting with a study of the 1976 Friuli earthquake in Italy. This analysis will provide valuable insights into past successes and challenges, informing future strategies.

- Participating in and providing updates at regional events. This will raise awareness of the platform's progress and developments, fostering collaboration and engagement with a wider audience.

- Developing a comprehensive framework that integrates key themes and concepts. This framework will ensure a unified understanding across all platform activities, promoting consistency and facilitating knowledge exchange.

- Creating a dedicated repository for experts to share resilience-related documents. This platform will foster collaboration and knowledge sharing among disaster risk management professionals.

This report fulfils two key objectives. Firstly, it outlines the established CREF, illustrating the basis for the platform's efforts. Secondly, it illustrates the CREF's real-world application by describing its use in the 2023 field trip activities.

2 THE COMPREHENSIVE RESILIENHANCE FRAMEWORK

Building on the agendas, frameworks, and reports that underpin the ResiliEnhance Platform, this section presents the pilot version of the Comprehensive ResiliEnhance Framework (CREF), a shared conceptual framework, initially proposed and developed by the UNESCO Chair UNIUD on the basis of the Intersectoral Safety approach, with the aim of guiding and unifying the activities of the ResiliEnhance Platform

The CREF builds upon the outcomes of the first meeting of the ResiliEnhance Platform [1], where discussions were centred on exploring the field of action, within the context of real-world challenges, i.e. the new normality, which is characterized by:

- complexity, that implies acknowledging the importance of interrelations, of the context, of the uncertainty and surprises in non-controllable contexts and systems;

- a large amount of data that not always brings to a better knowledge of the situation;

- presence of multiple points of view, under which governance actions can be identified;

- strong interconnection between dimensions, especially between human and physical spheres.

The CREF also considers the Platform discussions held during the same first meeting concerning the governance actions in the DRMC, in detail in the purpose phases of prevision-prevention, preparedness, response, and recovery.

The CREF has three main interconnected and integrated objectives:

- To serve as a global lens to address the need for action to build resilience in an increasingly complex world.

- To integrate diverse perspectives, sources of knowledge and practical experience, reflecting the holistic Intersectoral Safety approach [8] of the UNESCO UNIUD Chair.

- To establish a common language for interdisciplinary and cross-sectoral discussions and activities on the ResiliEnhance Platform.

The following sub-sections introduce the CREF. The first three sub-sections (i.e., 3.1. Building blocks, 3.2. Use of metaphors, and 3.3. CREF perspectives) break down the structural elements of CREF; the fourth sub-section (i.e., 3.4. CREF implementation) provides an understanding of how this conceptual framework can be applied in practice through a real case study.

2.1 CREF building blocks

The CREF draws upon fundamental elements from scientific literature for establishing governance actions to strengthen resilience. These are described in detail in [1], and summarized below:

- **Intersectoral Safety approach**: This approach recognizes the complexity of disaster risk reduction. It calls for collaboration across sectors (e.g., technical, social, economic) and disciplines to address interconnected risks and leverage diverse knowledge. It emphasizes continuous monitoring, adaptation, and learning to navigate effectively in a constantly changing environment, towards the continuously moving target of a safer and more resilient future. From the actor's perspective, the fundamental question is: how can one take the right action at the right time? Real-world experience has shown that navigation is not always linear and calm. Adverse events, such as earthquakes, floods, pandemics, droughts, wars, or unprecedented events can occur, potentially causing unexpected or surprising effects.
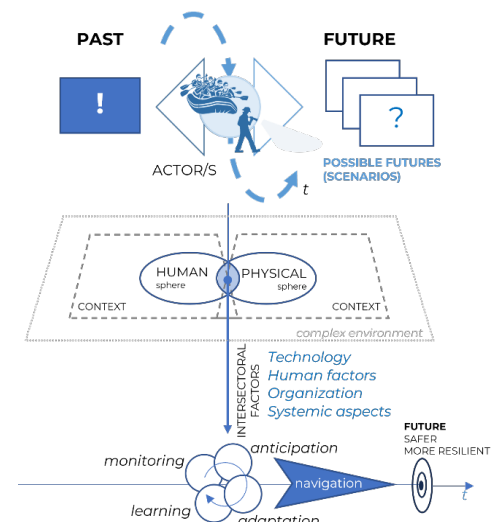

Figure 2: The intersectoral safety approach.

- **Disaster Risk Management Cycle** (DRMC): This cycle encompasses the well-established phases of response, recovery, prevision-prevention, and preparedness. These phases are crucial for managing the impacts of disasters and building resilience beforehand. Discussions during the first meeting of the ResiliEnhance Platform emphasised the importance of DRR, which should be set already during the response and recovery phases, implementing Build Back Better interventions. Similarly, while during the response and recovery phases resilience should be "used" to overcome the situation and reach a (new) normality, resilience should be built during the prevision-prevention and preparedness phases.

Figure 3: The Disaster Risk Management Cycle.

- **Resilience**: The resilience graph depicts the impact of adverse events on a system's functionality over time. It visually represents how much an event (a severe disruption) causes a decline in the system's functionality, and how subsequent actions can improve the situation, allowing the system to reach or surpass its initial level of functionality.
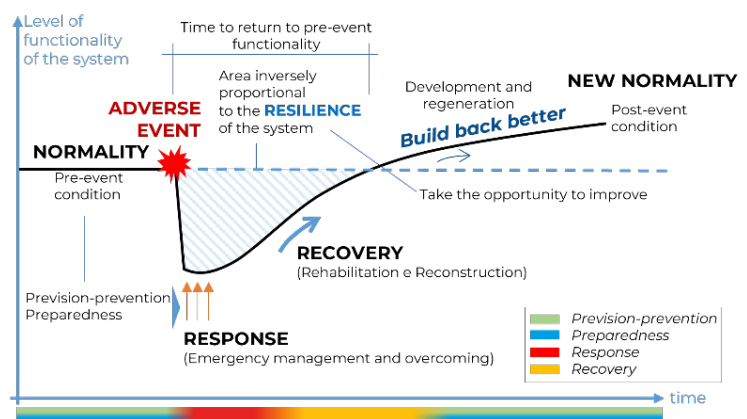
Figure 4: The Resilience graph.

- **Management Process for Disaster Risk Reduction and Resilience** (MP-DRRR): This process starts with establishing the goal to be reached through governance actions (i.e. navigate towards a more sustainable and safer future). It comprises the interacting and partially overlapping steps of understanding the problem, making decisions to plan how to proceed, and putting actions in place to reach the goal. The process must be considered within its (potentially) continuously changing context, and all steps require continuous feedback to check and continuously adjust the navigation trajectory.
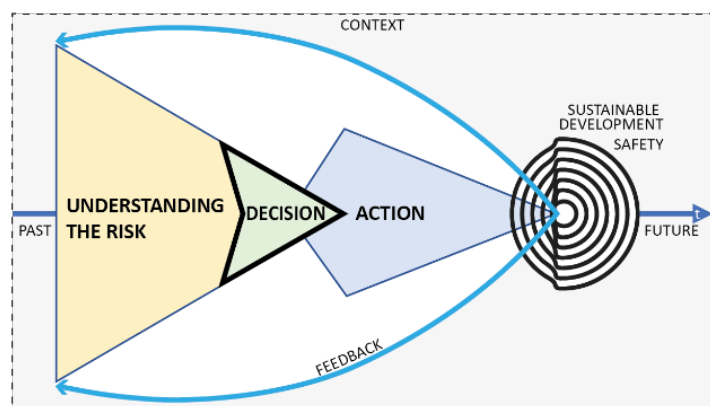
Figure 5: The Management Process for Disaster Risk Reduction and Resilience.

2.2 Use of the metaphors

The emergence of a "new normality" necessitates a fundamental shift in how governance is approached to build a resilient future. This is particularly relevant considering the ever-increasing complexity of the world, characterized by data overload, diverse viewpoints, and strong interconnectedness.

The CREF aligns with the key issue of **transforming governance** for a resilient future, as highlighted in the GAR 2022 report. The latter emphasizes this point by stating: «*governance is sometimes referred to as "play of the game" rather than merely the "rules of the game"*» underscoring the crucial role of governance in actively shaping a more resilient future, going beyond simply enforcing pre-defined rules.

From this perspective, metaphors become powerful tools to support knowledge sharing for bridging the gap between understanding the need for transformed governance and implementing it in practice. Metaphors serve as powerful tools for conceptualizing complex phenomena, making abstract concepts more tangible, and facilitating understanding among both experts and the public. Just as scientific metaphors help us grasp complex phenomena, they can be harnessed within the ResiliEnhance Platform activities to make the concept of transformative governance more tangible and relatable.

Three main metaphors have been adopted in the CREF:

- The "**play of the game**" metaphor (Section 2.2.2), to describe governance as a "game", as mentioned in GAR 2022; enhancing resilience to disasters calls to play a game considering different focuses (or phases): the prevision/prevention, the preparedness, the response and the recovery, which can also overlap partially each other;

- The **navigation metaphor** (Section 2.2.3), to describe the governance process, that focuses on the importance of the boat, on establishing the path, the crew and the characteristics of the sea as the context in which we are navigating. Considering the navigation metaphor, the functional moves and manoeuvres have been defined, which permit to define the route of the boat, with the distinction that the manoeuvres are those enacted by the players during the navigation, while the functional moves are those recognized by the observers in the analyses.

- The **common lenses metaphor** (section 2.2.4), also referred to as the "multiple lenses" approach, involves employing various perspectives, akin to different lenses, to examine a situation. It encourages the use of everyday language to extract relevant information and synthesize diverse viewpoints, all filtered through a common lens with multiple viewpoints. This approach is employed by individuals and groups from various perspectives, promoting a more comprehensive understanding.

2.2.1 Play of the game metaphor

In risk governance, the term "play of the game" encapsulates a dynamic understanding of governance beyond merely defining rules; it involves understanding and navigating the intricate interactions, strategies, and adaptations within complex systems. This concept, articulated by scholars like North [9] and Shepsle [10], suggests that governance is not static but rather a constantly evolving process influenced by various stakeholders, structures, and strategies.

Within the framework of risk governance, the "play of the game" signifies the agility and adaptability of the players necessary to address systemic risks effectively. Unlike conventional approaches that rely on linear cause-and-effect models, systemic risk governance acknowledges the interconnectedness and uncertainties inherent in complex systems. It emphasizes the need to consider causal structures, dynamic evolutions, and feedback mechanisms to mitigate risks effectively.

Moreover, systemic risk governance necessitates proactive measures to foster innovation and encourage transformative change. This involves

not only responding to crises but also proactively identifying and addressing emerging risks before they escalate. As illustrated in the GAR 2022, transformative change entails fundamental shifts in the nature, structure, or function of systems, necessitating considerations beyond technological advancements.

The concept of transformation, as outlined by the Intergovernmental Panel on Climate Change (IPCC), underscores the need for systemic changes that incorporate social, economic, and technological factors to address global challenges effectively. It emphasizes the importance of scaling up solutions and fostering systemic resilience to navigate uncertain and rapidly changing environments.

The metaphor of "playing the game" in the ResiliEnhance Platform thus aims to underscore the need for:

- **Comprehensive situation understanding** – i.e., Gathering and analysing data on vulnerabilities, risks, and capacities to inform effective decision-making.
- **Collaborative decision-making** – i.e., Involving diverse stakeholders in shaping and implementing disaster risk reduction strategies.
- **Adaptive governance** - i.e., Building flexible and responsive systems that can adjust to evolving risks and uncertainties.
- **Investing in capacity building** – i.e., Equipping communities and institutions with the knowledge, skills, and resources needed to manage disaster risks effectively.

In summary, the "play of the game" in risk governance refers to a holistic, situational and adaptive approach to governance going beyond rigid rules and structures. It acknowledges the complexities of interconnected systems, uncertainties, and the need for transformative change to address systemic risks effectively.

2.2.2 Navigation metaphor

The navigation metaphor is the second one used as it summarises the key aspects of the discussions on the ResiliEnhance platform and shaping the CREF.

Navigation requires a destination that must be reached (i.e., a goal), the sea where to navigate (i.e., the context) a boat (i.e., a system), a crew (i.e., the players) that must work together as well as a set of navigation roles. The crew implements the actions given by the coaches who are not on the boat and have a different perspective. The crew, to navigate, shall use the tools of the boat, and be respectful of the rules of navigation. The sea where navigation occurs represents the (often) complex context, which is not fully controllable and exposed to potential unforeseen events.

In addition, there are observers and analysists (out of the game) who can see and analyse the entire navigation and discuss on the positive and/or negative outcomes of specifics actions, criticizing (positively or negatively) the results. These analyses can be useful for crew training, which could take place in a similar or completely different context and/or also with a different boat and crew.

2.2.3 Common multi-lens metaphor

The metaphor of 'common multi-lens' offers an approach that allows a given situation to be examined from different perspectives, similar to the use of multiple lenses, with each lens providing a unique insight and contributing to a more nuanced and comprehensive understanding of the subject under study.

This is not limited to a single field, but is on the contrary, widely applicable to a variety of disciplines and contexts. By using different lenses, it is possible to cross-reference information, identify biases and uncover aspects that may be overlooked when using a single perspective. This global analysis is crucial in fields where complexity is important.

The metaphor of the common multi-lens is often applied in situations where there are several 'users' (e.g., researchers, policy or decision-makers, stakeholders). Each user brings their own unique point of view, which enriches the analysis.

However, the power of the metaphor extends beyond collaborative situations. A single investigator can benefit from adopting 'multiple lenses'. It allows him/her to analyse the situation from different angles, taking into account various details and points of view that might escape a single perspective. This encourages a more critical and reflective approach, leading to a more nuanced understanding of the phenomenon being studied. When the metaphor of the common multi-lens is used by several collaborative users, an additional element becomes crucial: a shared language. This shared language can take various forms, such as agreed terminology, standardised methodologies or a common set of guiding principles. Sharing a common language facilitates the exchange and synthesis of diverse perspectives, ultimately leading to a more complete and insightful understanding of the complex situation in question.

The common multi-lens approach is particularly effective in group situations, where individuals bring different experiences and expertise to the table. It encourages individuals to consider their own biases and assumptions, as well as those inherent in other perspectives. By continually moving from one lens to another, lens users can develop a more critical and reflective approach to understanding complex issues, which is essential to ensure that analyses remain dynamic and adaptable to new information and changing contexts.

By encouraging collaboration and the sharing of different points of view, the common multi-lens approach thus promotes a more inclusive and participatory form of analysis and fosters critical thinking and reflexivity.

2.3 CREF perspectives

The concept of disaster resilience is multifaceted, requiring an understanding that transcends singular viewpoints. For this reason, the CREF integrates multiple perspectives, for a holistic understanding of disaster risk governance and promoting a sustainable and safer future.

The CREF identifies three key perspectives, differentiated primarily by their point of view and temporal focus, i.e., schematizing in front of the time; looking from over the time; moving along the time. Each perspective requires identifying: 1) who are the actors involved, 2) what typologies of actions they undertake, and 3) how they read the situations through specific reference schemes.

The three CREF perspectives are:

IN FRONT OF THE TIME

Schematizing in Front of Time: This is the perspective of the **scholars**, who can see the whole process and schematize it, distinguishing various phases from a scientific point of view. The scheme at the base of the scholar's perspective is the DRMC, which identifies the main purpose phases for managing disaster risk, while time is secondary in the scheme, highlighting only the need to go through all the phases (which may overlap). By studying "in front of the time", scholars are able to identify the key **principles and strategies** that underpin the purpose phases of DRMC.

OVER THE TIME

Looking over the Time: This is the perspective of the **observers**, who have the possibility to observe the phenomenon/situation "as a whole" from the outside. Observers can visualise and analyse the situation prior to an event, the impact of that event on the system's level of functionality, and the consequences of the measures taken to restore the situation. The observers can use the resilience graph to draw and study the changes of the navigation trajectories, which have been referred to as "**functional moves**", providing ex-post comments and observations, also to support and guide, with experience, new DRR or disaster management activities.

ALONG THE TIME

Moving along the time: This perspective focuses on real-time activities and is the domain of "**players**," i.e., the individuals directly involved in taking action at specific moments. In this respect, the MP-DRRR framework introduced earlier (see section 3.1.), visualised through the navigation metaphor

considering a boat navigating towards the desired goal (safety and sustainable development), offers valuable insights. The activities of the players can be compared to the "**manoeuvres**" of the crew, which aim to lead the boat towards the desired goal, considering the context where the navigation occurs (for example with the need to manoeuvre to avoid rocks, which may symbolise unforeseen events/situations).

The CREF aims to integrate the three aforementioned perspectives with a **systemic approach**, which is essential for understanding disaster resilience, as it is a complex phenomenon influenced by numerous interconnected factors.
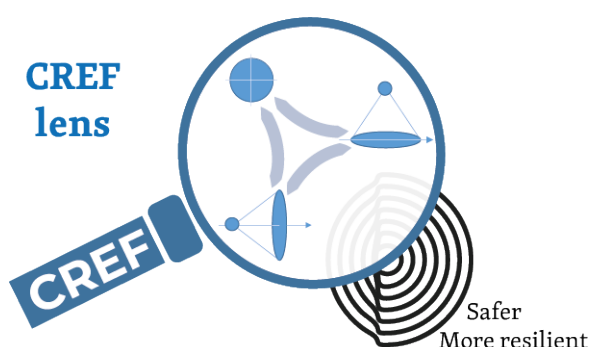
By integrating both the single perspectives and their interactions, the CREF provides a comprehensive framework for analysing and addressing disaster resilience, navigating complex challenges. Just as a captain relies on a diverse crew to navigate treacherous waters, effectively addressing intricate issues demands considering viewpoints from various vantage points within a system. This systemic approach allows for a more holistic understanding of the challenges and opportunities in disaster resilience and supports the development of effective strategies for promoting sustainable development. Players benefit from understanding systemic interactions (delineated by observers) within a broader framework for building resilience (described by scholars). This approach underscores the value of collaboration, considering diverse knowledge and experiences across stakeholders.

The value of the CREF lies in its ability to provide a comprehensive, multi-perspective approach to disaster resilience. By integrating the immediate, on-the-ground actions of players, the broad, systemic analysis of observers, and the theoretical frameworks of scholars, the CREF creates an

adaptable model for understanding and enhancing resilience. This integration of perspectives aims also to prevent any single viewpoint from dominating the understanding of disaster resilience, allowing for a more nuanced and effective approach. The collaborative nature of this framework highlights the importance of interdisciplinary and intersectoral cooperation, recognizing that complex challenges require multifaceted solutions.

By combining the three perspectives and accounting for interdisciplinary and intersectoral approaches, the CREF additionally aims to build a **common conceptual language**, to allow for different fields of application in the field of disaster risk reduction. The adoption of a common conceptual language intends to facilitate interdisciplinary collaboration, promote knowledge sharing, enhance the accessibility of disaster risk information for informed decision-making, and simplify discussions, avoiding falling into misunderstandings caused by inconsistent terminology adopted by different disciplines.

To elucidate the CREF perspectives, let's consider the different views of a vertical cylinder: when it is viewed from the top, it appears as a circle; from the side, it appears as a rectangle. Both perspectives are accurate representations of the cylinder's form, yet they only capture partial aspects of the whole object. Similarly, the perspectives of players, observers, and scholars each provide valid but incomplete views of disaster resilience. Players, focusing on immediate actions and decisions, perceive the dynamic and real-time aspects ("along the time"). Observers, analysing the situation's broader context and evolution, see the event's comprehensive impact and aftermath ("over the time"). Scholars, with their ability to abstract and schematize, offer an overarching framework that connects different phases and insights ("in front of the time"). Just as understanding the true nature of the cylinder requires integrating the circle and rectangle views, grasping the full complexity of disaster resilience necessitates the integration of these diverse perspectives. This multi-faceted approach ensures a more accurate, holistic understanding, essential for effective disaster risk reduction and the promotion of sustainable development.

Similarly, complex issues require considering all dimensions. Players offer firsthand experience, while observers analyse the broader context and historical trends. Scholars with a theoretical perspective provide frameworks and strategies. By integrating these diverse perspectives, it is possible to gain a more comprehensive understanding of the challenge. This collaborative approach, akin to a captain utilizing the crew's combined knowledge, fosters effective problem-solving and a more resilient future.

CREF lens

Safer
More resilient

Perspectives	Who	What	Reference schemes
IN FRONT OF THE TIME	**SCHOLARS**	**PRINCIPLES AND STRATEGIES**	**DISASTER RISK MANAGEMENT CYCLE**
OVER THE TIME	**OBSERVERS**	**FUNCTIONAL MOVES**	**RESILIENCE GRAPH**
ALONG THE TIME	**PLAYERS**	**MANOEUVRES**	**MANAGEMENT PROCESS FOR DRR AND RESILIENCE**

Legend
+ Favourable conditions/aspects
− Unfavourable conditions/aspects
◇ Starting point
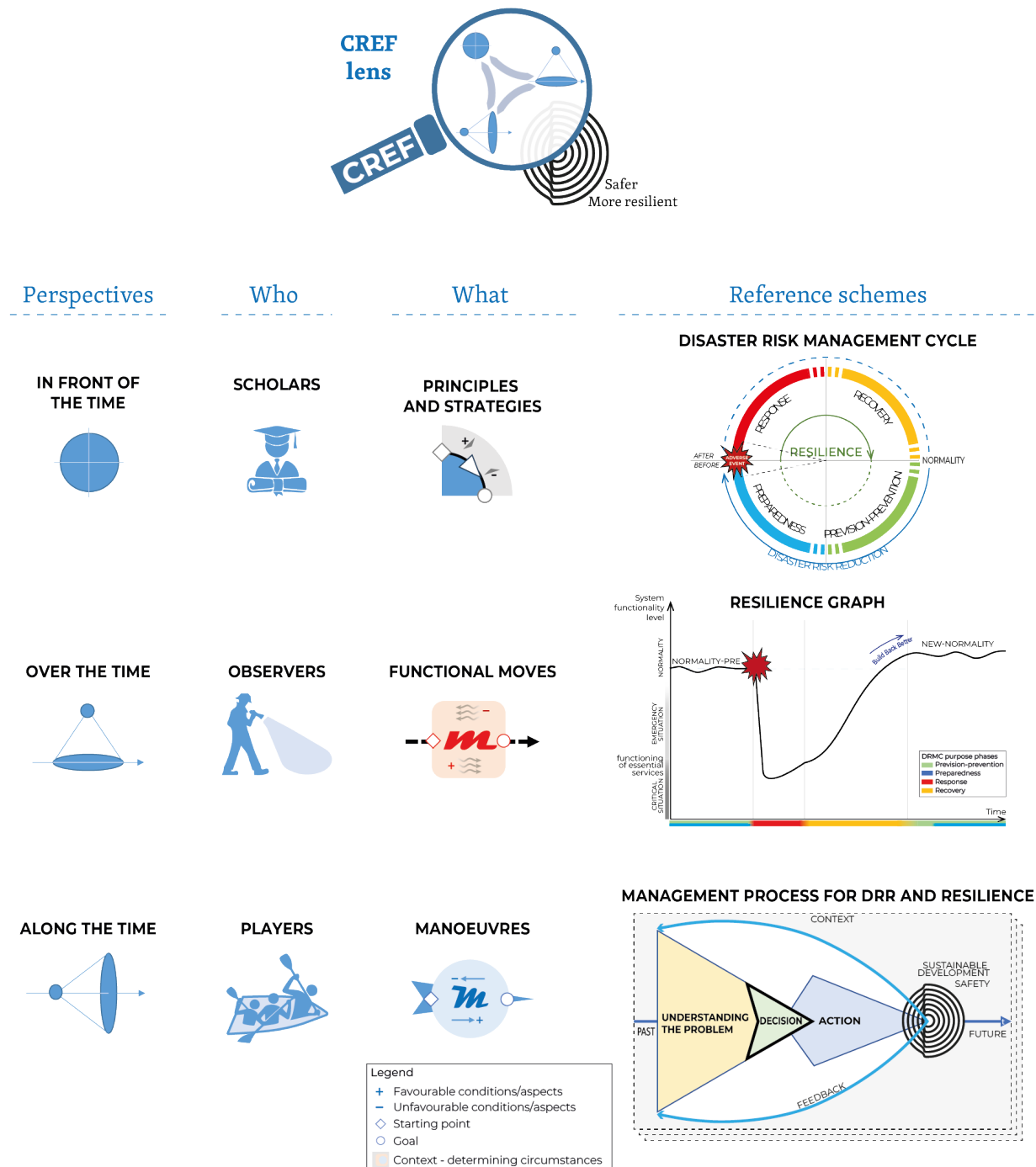○ Goal
▫ Context - determining circumstances

Figure 6: The Comprehensive ResiliEnhance Framework.

2.4 CREF implementation

As part of the activities of the ResiliEnhance Platform, the CREF was first developed as a *conceptual framework* to provide a coherent structure for examining and interpreting the different aspects of reality related to enhancing disaster resilience for sustainable development. In order to verify whether the CREF lenses were applicable to real cases, the members of the ResiliEnhance Platform decided to implement the CREF through a real case of disaster governance, using a retrospective evidence-based approach (see the following section detailing the first implementation of the CREF in the real case).

The aim of implementing the CREF is to identify, at a conceptual level, the principles and strategies, functional movements and manoeuvres available to researchers, observers and players to improve disaster resilience. However, the CREF can also be used as a tool to support the future implementation of activities, projects, programmes, etc. By providing a structured approach to building resilience, the CREF makes it possible to identify strategies, activities and measures for improving resilience and for safer and more sustainable development.
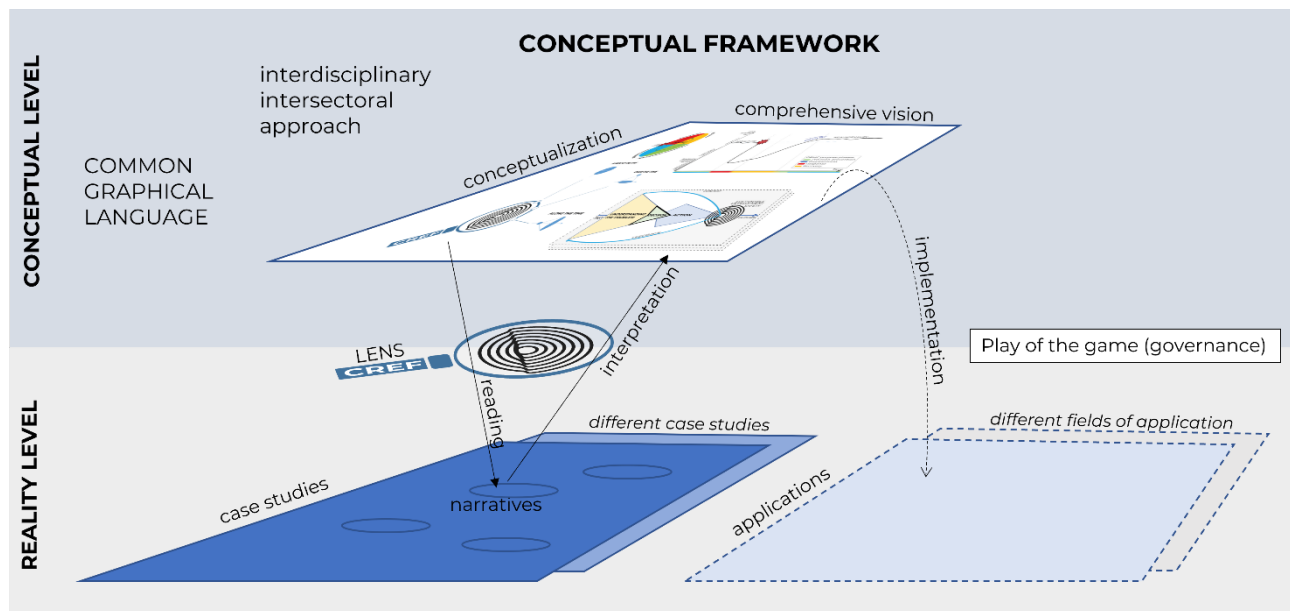

Figure 7: The conceptual framework for the CREF implementation.

3 THE RESILIENHANCE FVG 2023 FIELD TRIP

In continuation of the 2022 ResiliEnhance meeting and its recommendations, the ResiliEnhance Platform sustained its activities in 2023 with a focus on analysing real case studies of past governance actions aimed at enhancing resilience to disasters. For this purpose, the case study concerning the reconstruction in the Friuli Venezia Giulia (FVG) Region following the devastating earthquake in 1976 was identified as a key case study for the platform.

Employing an evidence-based approach, the ResiliEnhance FVG 2023 field trip engaged participants from diverse backgrounds, including scientists, policy-makers, and experts from various institutions, in a holistic examination of resilience-building strategies. By delving into specific narratives from the Friuli Region, the field trip was organized to offer valuable insights into effective governance practices and their impact on resilience outcomes.

3.1 Organization and purpose

The ResiliEnhance FVG 2023 field trip employed a participant-centred approach to immerse the participants of the ResiliEnhance Platform in the FVG Region's response to the 1976 earthquake and the long-term strategies for strengthening resilience. The experience unfolded through four distinct narratives, spanning over one and a half days:

- **The memory**: history of an earthquake and its people
- **Using the past for the preparedness**: a training and experimentation camp
- **Community-based approach**: urban choices for the reconstruction
- **Organization for response**: the Regional Civil Protection structure and functions.

These narratives were specifically crafted to offer participants a comprehensive understanding of the reconstruction efforts undertaken in the aftermath of the devastating earthquakes of 1976, exploring the adopted strategies. Each narrative represented specific facets of the post-disaster governance landscape. This provided participants with diverse perspectives and insights into the challenges and strategies employed during the reconstruction phase.

Local experts, well-versed in the region's history and reconstruction efforts, served as guides throughout the field trip. These guides actively led participants through each narrative, providing deeper context and understanding of the events, challenges, and decisions made during the reconstruction.

During the field trip, participants were actively engaged in exploring the governance strategies presented in these narratives. Drawing on their unique perspective and professional experience, participants were tasked with critically analysing the effectiveness and relevance of the strategies adopted in the aftermath of the earthquake. Central to their analysis was the Comprehensive ResiliEnhance Framework (CREF) - see section 2, which provided participants with a structured lens through which to analyse governance strategies and activities and their implications for resilience-building efforts.

To ensure active engagement and maximize learning during the field trip, participants received specially designed notebooks to facilitate reflection and knowledge capture per phase. Throughout the days, participants were encouraged to take notes, sketch diagrams, or jot down questions prompted by the narratives and the local experts' explanations. These notebooks
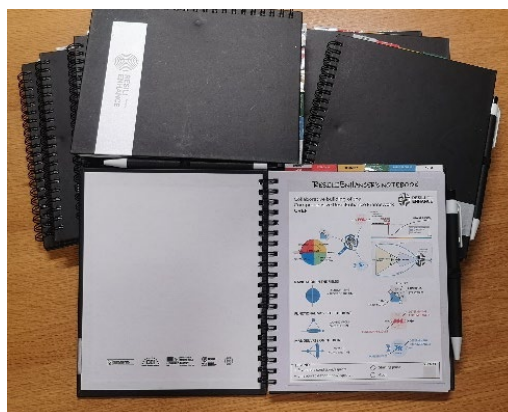

Figure 8: Notebooks for field trip activities.

served as a valuable resource for the final discussion, allowing participants to revisit key points, synthesize their learnings, and contribute meaningfully to the collaborative exploration of resilience-building strategies.

Following the on-field activities, a final debriefing session was convened to facilitate collective discussion and the collection of observations and insights derived from the retrospective analysis. This debriefing served as an opportunity for participants to reflect on their experiences, share their perspectives, and synthesize key findings from the field trip. Through open dialogue and exchange of ideas, participants were able to identify overarching themes, lessons learned, and areas for further exploration. Additionally, the debriefing session provided a platform for refining and consolidating insights gathered during the field trip, enabling participants to draw meaningful conclusions and implications for

resilience-building efforts. By fostering collaboration and knowledge-sharing, the final debriefing played a pivotal role in maximizing the impact of the field trip and informing future initiatives within the ResiliEnhance Platform.

Overall, the field trip pursued two key objectives:

- **Refine and align the CREF framework:** By exploring the presented narratives, the trip aimed to identify real-world governance practices and challenges, allowing for a better alignment of the CREF with these practicalities. Integrating these insights, the Platform aimed to establish the CREF as a relevant and effective tool for guiding resilience-building efforts.
- **Facilitate knowledge exchange:** This collaborative platform empowered stakeholders to contribute to the ongoing enhancement of resilience in their respective communities.

3.2   Description of the field trip

The four narratives of the ResiliEnhance Field-Trip FVG 2023 are presented in this section with the purpose to illustrate the various facets of the region's response to the 1976 earthquake and the long-term strategies employed for building resilience. Each narrative delves into a specific theme, utilizing a unique approach to engage participants and foster a deeper understanding of the challenges and experiences of the reconstruction process.

During the field trip, experts were asked to examine the narratives considering the three perspectives of the CREF lenses (see section 2.3) – i.e.:

- schematizing in front of the time, to consider the recursive phases of the DRMC and exploring, for each phase, which is the context, and which are the principles and strategies guiding the activities in the phase;
- looking from over the time, to identify which have been the functional moves adopted in each situation and which were the determining circumstances of the context;
- moving along the time, to recognize the so-called manoeuvres adopted by the players to navigate towards the desired destination, considering the determining circumstances of the context.

3.2.1   Narrative 1 - The memory: history of an earthquake and its people.

The purpose of the first narrative was to illustrate to participants the history of the Friuli earthquake, following the exposition path of the "Tiere Motus" museum[1], in Venzone[2] (Udine). During the visit, a specific narrative was developed to link and

describe the content of each museum room according to the four main phases of the Disaster Risk Management Cycle, and to illustrate the situation to participants in order to allow them to

[1] https://www.tieremotus.it/

[2] Venzone was one of the municipalities most affected by the 1976 earthquake.

try to empathise with the protagonists of the reconstruction.

This narrative explored the comprehensive and challenging journey of Friuli's earthquake-stricken communities, emphasizing both the immediate impacts and the long-term recovery efforts that followed the seismic events of 1976. It began by setting the context, offering insights into the area's geographical and geomorphological characteristics, and touching on its cultural history and existing regulatory frameworks. These foundational aspects helped participants understand the unique setting in which the earthquake's effects unfolded.

The initial seismic event on May 6, 1976, catalysed an impressive, multi-layered local response, involving rapid rescue operations and collaborative, community-led support. Local and regional authorities organized logistics and established a multi-level framework to provide immediate assistance to the population, focusing on both rescuing lives and preserving community values.

In the months following this first event (from June to August 1976), efforts were aimed at rapidly moving through the recovery phase to restore a sense of normalcy. During this time, the community played a significant role in determining local priorities, shaping values, and providing psychological support. Self-repair strategies emerged as a reflection of resilience, with media and communication channels reinforcing the community's commitment to recovery.

However, the seismic sequence resumed in September 1976, leading to further building collapses and highlighting the limitations of the initial repair strategies. This renewed devastation called for a revised approach, one that included a temporary exodus of the population due to worsening weather and safety conditions. In response to these renewed challenges, discussions shifted towards a science-based rehabilitation phase, emphasizing the importance of a well-informed and methodical approach to recovery.

The reconstruction phase that followed became a model of interdisciplinary collaboration, involving scientific expertise, coordinated stakeholder management, and specialized technical guidance. Transborder cooperation, particularly with Austria and Slovenia, played a significant role in supporting these efforts. The governance framework ensured effective planning, fund management, and distribution of resources, underlining the need for organized and accountable recovery practices. In reconstructing buildings and infrastructure, there was a dual commitment: to rebuild "as it was" to preserve cultural identity, while also embracing the "build back better" principle to enhance safety and foster development.

Key takeaways

- **Context matters**: Historical, geographical, and cultural understanding was essential for guiding effective disaster responses.

- **Community-driven recovery**: Local involvement and ownership were key drivers of resilient, successful recovery.

- **Adaptive learning**: The shift from self-repair to science-based reconstruction after subsequent events highlighted the importance of learning from each phase to improve strategies

- **Interdisciplinary collaboration**: Successful reconstruction requires a collaborative approach involving multiple disciplines and stakeholders to leverage diverse expertise and resources.
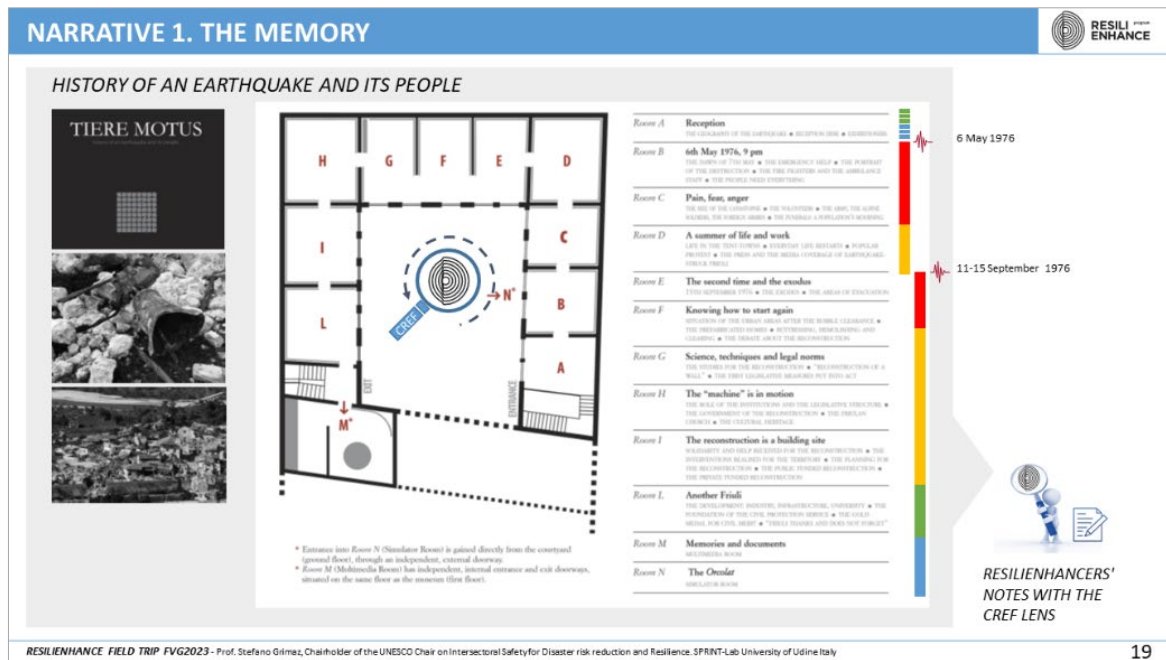
Figure 9: Narrative 1: the memory. The image shows the plant of the "Tiere Motus" museum.

Figure 10: Narrative 1: the memory. Fotos of the visit to the Tiere Motus Museum. a) Explanation of the response phase after the 6th of May 1976 earthquake. b) Community-based decisions. Many photos demonstrate the role of community in guiding decision-making. c) Illustration of technical details and technical procedures developed for the reconstruction, after the events of September 1976. d) Example of typical retrofit intervention adopted during the reconstruction. Specific capacities had to be strengthened to implement massively these interventions. e) Schematization of the organizational "machine" for the management of the reconstruction activities. f) Examples of reconstruction plannings.

3.2.2 Narrative 2 - Using the past for the preparedness: a training and experimentation camp.

The second narrative aimed at illustrating how the past experiences become a launching pad for current preparedness endeavours.

In this area of action, the Friuli Venezia Giulia Region, the Regional Civil Protection, the Italian National Fire Service, the University of Udine, the "Associazione dei Comuni Terremotati e dei Sindaci della Ricostruzione del Friuli" (Association of Earthquake Municipalities and Mayors of Friuli Reconstruction) and the Venzone municipality benefit from a strategic collaboration within the SERM Academy[3] (Safety and Emergency Response Management International Training School). The main aim of the SERM Academy is to strengthen an integrated system for the seismic emergency management as well as the cross-border interoperability among civil protection actors, to improve preparedness to future events.

For the purpose of the field trip, participants were introduced to the SERM academy through a summary video and the visit to the Portis Vecchio[4] training camp. Portis Vecchio was a small village in the municipality of Venzone and, because of an impending landslide, it was abandoned after the Friuli earthquake of 1976 (specifically, after the seismic sequence of September). The surviving buildings of the village are used as a training camp for technical and operational training for the assessment of structural criticalities and safety in seismic emergency, as well as for testing new technical solutions for shoring damaged buildings.

Key takeaways

- **Learning from experience:** effective disaster preparedness builds on lessons from past events, adapting to emerging challenges through continuous training and improvement.

- **Training environment:** practicing in realistic, controlled environments equips responders with critical skills and fosters confidence in high-stress situations.

- **Cross-disciplinary collaboration:** the collaboration between various organizations and stakeholders (e.g., civil protection, academia, local municipalities) illustrates the importance of integrated approaches to disaster preparedness.

- **Innovation:** testing new solutions in safe settings encourages innovation, empowering responders to manage foreseen and unforeseen events more effectively.

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[3] https://sprint.uniud.it/en/serm-academy/

[4] Portis Vecchio is a hamlet in the municipality of Venzone, abandoned after the 1976 earthquake because of a landslide impending on the houses.

Figure 11: Narrative 2: using the past for the preparedness: a training and experimentation camp.

Figure 12: Narrative 2. a) Observation of the 3D model representing the village of Ports Vecchio before and after the 1976 earthquakes. b) Observation of a damaged building part of the SERM Academy training camp. The buildings serve as real scale examples to train inspectors in the evaluation of the building damage. c) and d) Buildings with shoring structures created to test new solutions and procedures for manging the interventions of first responders in the first response activities.

3.2.3 Narrative 3 - Community-based approach: urban choices for the reconstruction.

The third narrative was designed to illustrate the significance of the community-based approach in the reconstruction endeavours that followed the destructive earthquakes that struck Friuli in 1976. Three towns were presented as exemplifications of the three main reconstruction choices adopted during the reconstruction:

- **Venzone**: the reconstruction was guided by the "*as it was*" principle, prioritizing the community's desire to restore the original city layout (including the principle of "building back better", with upgraded structures and modern utilities). Venzone reconstruction of the city centre included also a stone-by-stone reconstruction of cultural heritage buildings.

- **Osoppo**: while maintaining the urban layout, the reconstruction choices embraced new construction typologies and architectural characteristics, potentially reflecting evolving community needs.

- **Gemona del Friuli**: used a blended approach, with a small part of the city centre following the "as it was" principle, while outlying areas prioritized functionality while maintaining the overall urban layout.

These diverse approaches highlight the importance of tailoring reconstruction efforts to the specific needs and preferences of each community.

Through the third narrative focusing on the importance of a community-based approach, the participants were invited to reflect on these examples. Participants were asked to use the CREF lens to identify the principles and strategies of the purpose phase, identifying which were the functional moves adopted, as well as the manoeuvres that the players developed at the time. In this context, one example highlighted the importance of having specific construction skills to rebuild the heritage structures "stone by stone", while reinforcing them to withstand future events. The community-based choice to reconstruct "as it was" required the organization and implementation of many factors, including the development of new capacities, securing funds, sourcing materials, establishing organizational structures, implementing control measures, and applying scientific management principles.

Key takeaways

- **Diverse reconstruction models:** different towns like Venzone, Osoppo, and Gemona showcase varied reconstruction approaches ("as it was" vs. modernization), reflecting community-specific needs and choices.

- **Cultural heritage:** rebuilding with the "as it was" approach, especially in Venzone, preserves cultural identity and memory, which can support social cohesion.

- **Technical capacity building:** Community-driven decisions often require specialized skills, empowering both community members and workers to preserve local architecture in resilient ways.

Figure 13: Narrative 3: community-based approach. The three main reconstruction approaches adopted in three towns in Friuli

Figure 14: Narrative 3. a) and b) Visit to the Dome of Venzone, rebuilt with the anastylosis approach. c) Visit to the Venzone historical walls surrounding the city centre. d) Illustration of the activities necessary to rebuild the city centre of Gemona del Friuli. The columns under observation are the historical ones, reinforced through specific and highly technical interventions and reassembled "where they were, as they were".

3.2.4 Narrative 4 - Organization for response: the Regional Civil Protection structure and functions.

The fourth narrative delved into the current organization for response in Friuli Venezia Giulia, and specifically, with the illustration of the activities of the regional Civil Protection and its functions, in the various phases of the Disaster Risk Management Cycle. The narrative included a comprehensive visit to the headquarters of the Civil Protection of the Friuli Venezia Giulia Region (PCR-FVG). The visit began with a detailed presentation outlining the organizational structure of the PCR-FVG, highlighting their approach to multi-risk management based on the DRMC. Examples of their work were provided across various scenarios, including earthquakes, floods, heavy rainfall events, weather alerts, and the operation of their marine, river, and seismic monitoring networks. The presentation also covered emergency procedures and the use of a dedicated portal for managing emergencies and planning responses.

Furthermore, the visit showcased specific activities undertaken by the PCR-FVG in the phases of prevention (such as the case of the Pordenone embankment strengthening after the break in 2002) and preparedness, emphasizing their supportive role in various regional efforts. The significant contribution of volunteers, a vital force in the region, was also highlighted, particularly in their active participation during response phases for specific types of events.

The visit concluded in the operations room, the central hub where all the monitoring networks converge and various requests for assistance are meticulously analysed to coordinate effective responses. This visit provided a comprehensive overview of the PCR-FVG's multifaceted role in ensuring the safety and resilience of the region.

Key takeaways

- **Comprehensive risk management:** a structured, multi-risk approach allows regional civil protection organizations and stakeholders to effectively address diverse hazards and improve overall safety.

- **Role of volunteers:** the significant contribution of volunteers in disaster response emphasizes the value of community involvement and grassroots support in emergencies.

- **Effective communication systems:** implementing robust emergency management communication tools enhances coordination and response effectiveness during disasters.

- **Integration of technology:** utilizing monitoring networks and dedicated platforms for emergency management demonstrates the importance of technology in modern disaster response strategies.
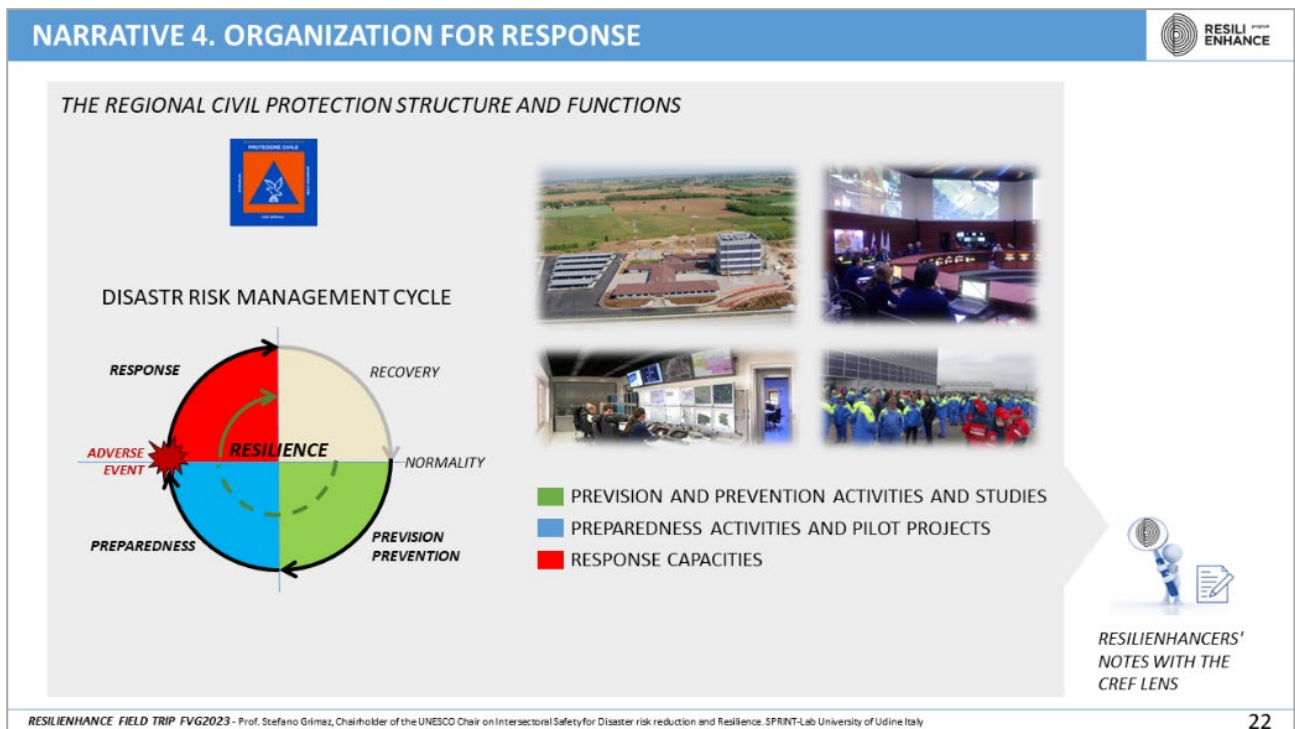
Figure 15: Narrative 4: organization for response. The narrative delved with the activities of the regional Civil Protection on Friuli Venezia Giulia and its activities according to the Disaster Risk Management Cycle.
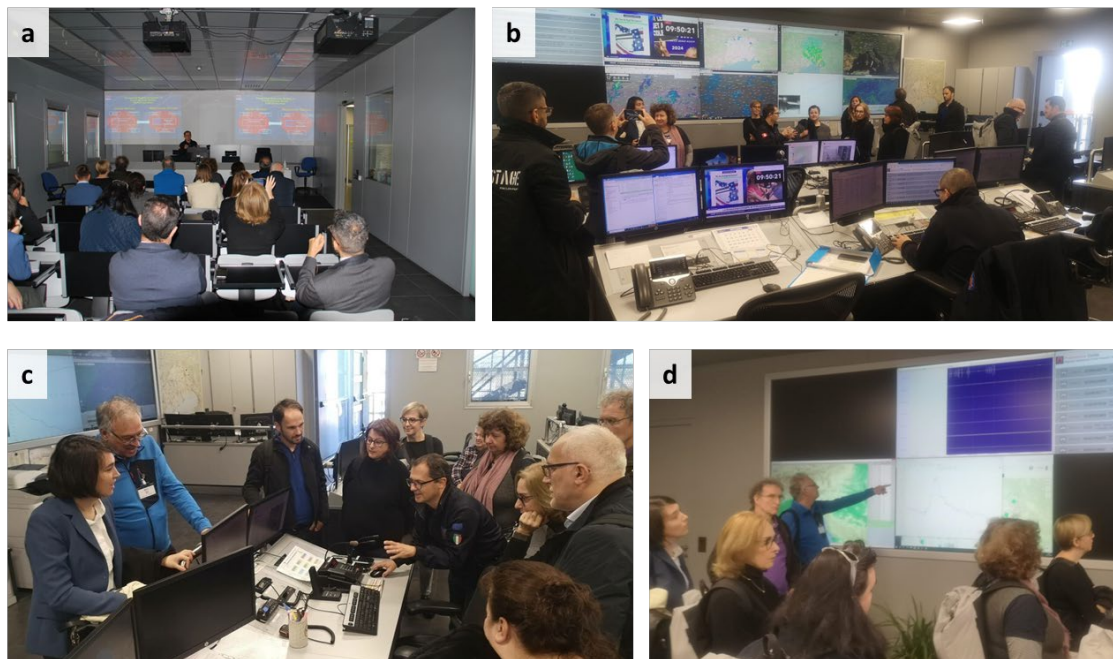

Figure 16: Narrative 4. a) Presentation of the main PCR-FVG activities. b), c) and d) Visit to the operations room where emergencies are managed.

3.2.5 Final debriefing

A debriefing was organized to facilitate collaborative reflection and foster a meaningful exchange of observations and lessons learned from the field trip analysis activities. With a focus on strengthening territorial resilience in the face of complexity and systemic risk, discussions centred on practical applications from real cases. Experts pooled their insights and perspectives, delving deeper into the four narratives encountered during the field trip. Utilizing the CREF and DRMC frameworks, participants were divided into three groups and engaged in extensive dialogue, dissecting each phase (response, recovery, mitigation, and preparedness) and synthesizing collective wisdom. These deliberations aimed to go beyond

academic discourse, seeking to distil actionable strategies and good practices for effectively addressing crises and adverse events.

At the conclusion of the discussions, each group synthesized their outcomes and shared them with the others, not only illuminating challenges but also highlighting innovative solutions and contextually relevant approaches.

These outcomes, detailed in section 3.3, served as calibration points for refining the Comprehensive ResiliEnhance Framework (CREF), integrating the collective insights garnered from the discussions, offering a structured approach to bolstering resilience against disasters.

Figure 17: Final debriefing. a-d) Photos of the group's discussions. e) Posters filled with summary notes and outcomes. f) Sharing of final results with UNESCO and UNDRR representatives.

3.3 Insights from the field trip experience

The collaborative work and discussions developed during the field-trip debriefing session led the participants to outline the following outcomes, which reflect key aspects for governance actions that are relevant to all phases of the DRMC (i.e., response, recovery, prevision-prevention, and preparedness).

Additionally, participants agreed on the importance of properly and promptly characterizing the adverse event that generates the disruption leading to emergency or crisis situations.

This analysis described in the following sections, highlights overall valuable insights for improving governance actions across the entire DRMC.

The key aspects in the DRMC are categorized as either generic or phase-related:

- **Generic aspects** are fundamental principles that apply consistently throughout the entire DRMC, regardless of the specific phase. They serve as the foundation for all decision-making and actions.

- **Phase-related aspects** are tailored to the requirements and challenges of each specific phase within the DRMC. While we've attempted to list them in sequential order, it's important to note that many phase-related aspects can be implemented at any point within a given phase, depending on the specific circumstances.

It is however worth noting that DRMC phases are not strictly sequential, as some aspects can be implemented throughout a particular phase.

This distinction helps to clarify the different roles and functions of each key aspect within the DRMC and provides a framework for understanding how they contribute to the overall success of the process.

In the following, the outcomes of the field-trip debriefing are presented showing first the key aspects discussed on the characterization of the adverse event, and subsequently the response, recovery, prevision-prevention, and preparedness phases.

3.3.1 Adverse event
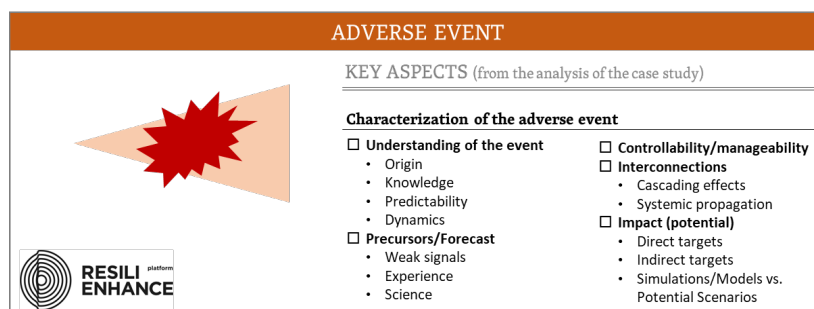
The analysis of the ResiliEnhance Field-Trip FVG 2023 case studies evidenced the importance of understanding and characterizing the **key aspects** that permit to understand and characterize the adverse event that generates the disruption. In detail, discussions highlighted the relevance of the following key aspects:

Understanding of the event:
- Origin: Disasters can arise from various origins (adverse events), including geological phenomena like earthquakes and volcanic eruptions, hydro-meteorological events such

as hurricanes and floods, technological mishaps like industrial accidents and nuclear meltdowns, biological outbreaks like pandemics and epidemics, or man-made incidents like terrorist attacks and wars. Some disasters may even result from combinations of these factors, demonstrating the complex interplay of natural and human-induced risks.

- Knowledge: Knowledge of events can stem from scientific research, empirical observations, or indigenous wisdom.

Accounting for and integrating these diverse sources enhances resilience and fosters sustainable development.

- **Predictability:** The predictability of events varies widely. While some events, like seasonal storms, can be anticipated with reasonable accuracy, others, like earthquakes, may strike unexpectedly, despite advancements in seismic monitoring and early-warning systems. Additionally, there are instances of surprise or unprecedented events (e.g., COVID-19) that challenge existing knowledge and response capabilities, highlighting the need for continuous adaptation and preparedness efforts.

- **Dynamics:** Events exhibit diverse dynamics, varying in their speed, onset, and complexity. Some events unfold rapidly, such as earthquakes or flash floods, with sudden and immediate impacts. Others, like droughts and economic recessions, progress slowly over time, gradually intensifying and affecting larger areas. Additionally, events can manifest as single/isolated, such as a hurricane striking a coastal region, or as multiple events, such as a seismic sequence. Understanding the dynamics of events is crucial for effective mitigation, preparedness, response, and recovery efforts, as strategies must adapt to the unique characteristics and challenges posed by each event.

Precursors/Forecast:

- **Weak signals:** The ability to identify and interpret weak signals, or subtle indicators of potential adverse events, can significantly enhance preparedness and response efforts. These signals may include unusual environmental patterns, social unrest, or economic fluctuations that, when analysed collectively, can provide early warnings of impending crises. Recognizing and acting upon these weak signals requires a combination of vigilance, data analysis capabilities, and interdisciplinary collaboration.

- **Experience:** The occurrence of certain adverse events may be informed by weak signals or past experiences, where historical events serve as valuable lessons. For instance, regions prone to flooding may draw upon past flood records to anticipate future events and implement preventative measures. However, the emergence of new threats, such as new infectious diseases or cyber threats, underscores the importance of continuously monitor and being adaptable in the face of evolving risks.

- **Science:** Adverse events may be well-understood by scientific research and observations, enabling the development of predictive models and early-warning systems. For example, hurricanes are extensively studied, allowing meteorologists to forecast their paths and intensities with increasing accuracy. However, there are also instances where emerging threats challenge scientific understanding, requiring ongoing research and collaboration to enhance forecasting capabilities and response strategies. Simulation models and possible scenarios must therefore be developed.

Controllability/manageability:

- The degree to which adverse events can be controlled or managed varies depending on the nature of the event. While some events, like earthquakes and volcanic eruptions, are inherently uncontrollable forces of nature, others, such as floods and wildfires, offer opportunities for mitigation and risk reduction through proactive measures like land-use planning, infrastructure development, and early warning systems. Understanding the controllability of different hazards is essential for developing effective disaster preparedness and response strategies.

Interconnections:

- **Cascading effects:** Adverse events can trigger cascading effects, where the initial event sets off a chain reaction of secondary hazards and consequences. For instance, an earthquake may lead to landslides, tsunamis, and infrastructure damage, exacerbating the overall impact on affected communities. Recognizing these interconnected risks is crucial for comprehensive disaster risk management and response planning.

- **Systemic propagation:** Certain adverse events can propagate systemically, affecting interconnected systems and infrastructures beyond their initial impact zone. For

example, a large earthquake may affect critical infrastructure, disrupting essential services, causing widespread societal disruption and amplifying the overall impact on communities and ecosystems. Understanding the potential systemic nature of adverse events and of their impacts is essential for building resilience and enhancing preparedness across various sectors and stakeholders.

Impact (potential)

- **Direct targets:** Adverse events often have direct targets, including infrastructure, human populations, and natural ecosystems. For instance, earthquakes can cause widespread destruction to buildings and infrastructure, posing immediate threats to public safety and well-being. Similarly, pandemics can directly impact human health and healthcare systems, leading to illness, death, and strain on medical resources.

- **Indirect targets:** In addition to direct impacts, adverse events can also have potential impact on indirect targets, affecting broader systems and networks. For example, supply chains may be disrupted by natural related disasters or industrial accidents, leading to shortages of essential goods and services. Economic sectors, such as tourism and agriculture, may also suffer from the ripple effects of disasters, impacting livelihoods and

socio-economic stability. Recognizing and addressing these indirect impacts is essential for holistic disaster risk management and resilience-building efforts.

- **Simulations/models vs. potential scenarios:** The use of simulations and models can offer valuable insights into the potential impacts of adverse events, aiding in preparedness and response planning. These tools can help to identify vulnerabilities, assess potential consequences, and test the effectiveness of different mitigation strategies. However, it is important to recognize that models are based on assumptions and simplifications, and their accuracy may be limited by the availability and quality of data. The potential scenarios approach, on the other hand, involves developing a range of plausible future scenarios based on expert judgment and available information. This approach can help to identify potential risks and opportunities, and to develop flexible and adaptive strategies that can be adjusted as the situation evolves. Scenario checks are an essential feedback mechanism within this framework, allowing for continuous refinement and adaptation as new information emerges. The choice between simulations/models and potential scenarios approaches will depend on the specific context and the nature of the adverse event being considered.

3.3.2 Response
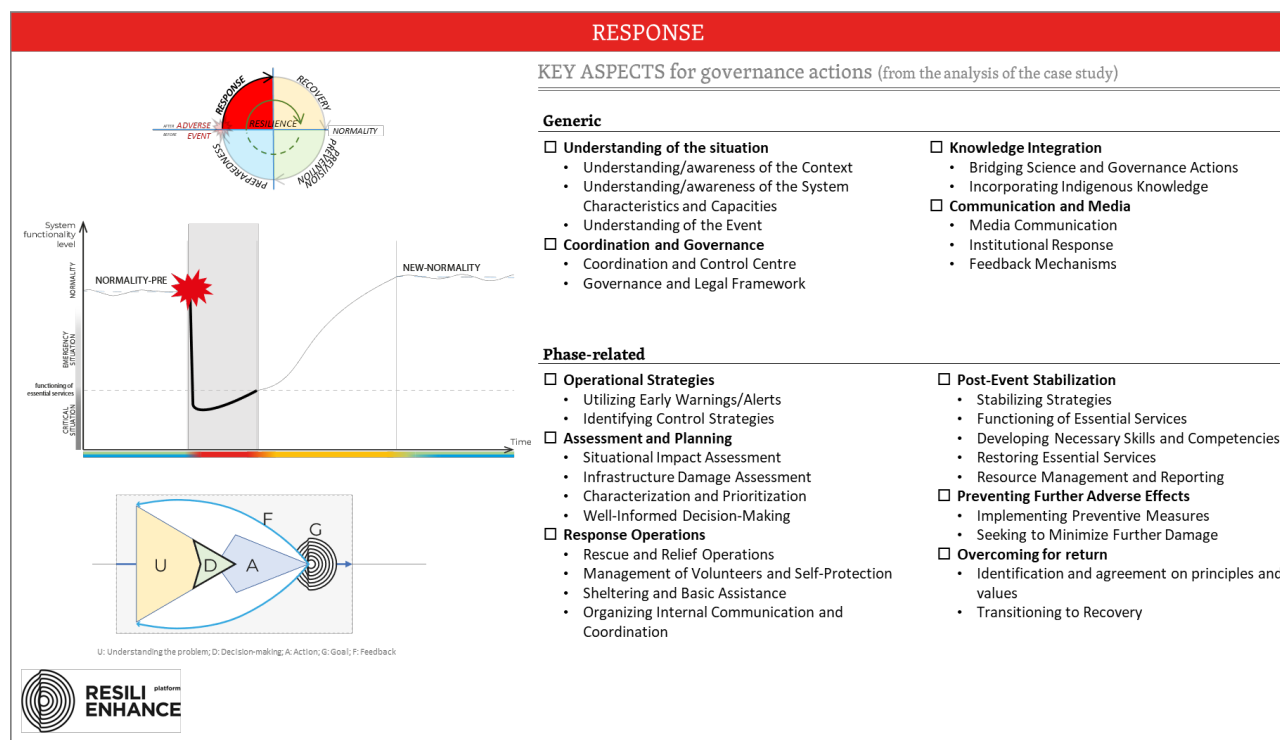
Generic key aspects for governance actions, highlighted after the analysis of the ResiliEnhance Field-Trip FVG 2023 case studies.

Understanding of the situation

- **Understanding/awareness of the context:** Thoroughly understanding the local context, including socio-economic factors, cultural dynamics, and geographical features, to tailor response strategies accordingly.

- **Understanding/awareness of the system capacities:** Assessing the capacities and resources within the response system to effectively navigate and deploy resources during the response phase.

- **Understanding of the event:** Analysing the substantial characteristics of the event, with its potential evolution; forecasting the potential evolution of the disaster to anticipate impacts and plan response actions accordingly.

Coordination and Governance

- **Coordination and control centre:** Establishing a coordination and control centre to coordinate and manage disaster response activities and streamline communication between various agencies and stakeholders.

- **Governance and legal framework:** Implementing robust governance structures and legal frameworks to guide and regulate disaster response efforts, ensuring accountability, effectiveness and adaptability to the changing context.

Knowledge Integration

- **Bridging science and governance actions:** Establishing mechanisms to bridge the gap between scientific knowledge and governance actions, ensuring evidence-based decision-making and effective implementation of response measures.

- **Incorporating indigenous knowledge:** Recognizing and integrating local indigenous knowledge and practices into disaster response strategies to leverage community resilience and enhance the relevance of interventions.

Communication and Media

- **Media communication:** Engaging with the media to disseminate accurate information, provide updates on response

efforts, and address public concerns, fostering transparency and building trust.

- **Institutional response:** Ensuring prompt and coordinated responses from relevant institutions and agencies, including government bodies, non-governmental organizations, scientific institutions, academy, and international partners, to address emerging challenges and meet evolving needs.

- **Feedback mechanisms:** Establishing feedback mechanisms to gather input and concerns from affected populations, enabling two-way communication and ensuring response efforts are responsive to community needs and preferences.

Phase-related key aspects for governance actions, highlighted after the analysis of the ResiliEnhance Field-Trip FVG 2023 case studies.

Operational Strategies

- **Utilizing early warnings/alerts:** Utilizing early warning systems and alerts when feasible to provide timely information to communities and authorities, enabling proactive response actions and evacuation measures.

- **Identifying control strategies:** Identifying and prioritizing strategies and actions to control the effects of the disaster during and immediately after the event, focusing on life-saving measures and minimizing further damage.

Understanding and deciding

- **Situational impact assessment:** Conducting rapid assessments to evaluate the extent of damage and the impact on population and on critical infrastructure and services, prioritizing areas for intervention and resource allocation.

- **Infrastructure damage assessment:** Assessing the damage to critical infrastructure such as hospitals, schools, and transportation networks to prioritize repair and reconstruction efforts and ensure the resumption of essential services.

- **Characterization and prioritization:** Characterizing the needs and

vulnerabilities of affected populations and prioritizing response actions accordingly to address the most urgent requirements.

- **Well-informed decision-making:** Ensuring decision-makers have a timely and effective access to accurate situational awareness, including information on assets, capacities, and damages, to make informed decisions that prioritize resources and interventions effectively.

Response Operations

- **Rescue and relief operations:** Prioritizing life-saving measures, ensuring the safety and security of responders, and providing immediate assistance to affected populations in the form of medical aid, food, shelter, and other essential services.

- **Management of volunteers and self-protection:** Coordinating the deployment and management of volunteers while ensuring their safety and providing necessary training and equipment for self-protection.

- **Sheltering and basic assistance:** Establishing temporary shelters and providing basic assistance such as food, water, and medical care to displaced populations to meet their immediate needs.

- **Organizing internal communication and coordination:** Establishing effective internal communication channels and coordination mechanisms within response agencies and stakeholders to ensure seamless collaboration and information sharing.

Post-Event Stabilization

- **Stabilizing strategies:** Implementing strategies to stabilize the situation post-event, including restoring essential services, securing basic functional levels, and limiting further damage to infrastructure and resources.

- **Functioning of essential services:** Ensuring the functioning of essential emergency services such as healthcare, utilities, and transportation to support recovery efforts and meet the needs of affected populations.

- **Developing necessary skills and competencies:** Enhancing the skills and

competencies of response personnel through training and capacity-building initiatives to improve the effectiveness of response efforts.

- **Restoring essential services:** Restoring essential services such as water, electricity, and communication networks to restore a minimal level of autonomy and support community recovery and rehabilitation efforts.

- **Resource management and reporting:** Effectively managing economic, material, and human resources during the response phase and providing accurate reporting on resource allocation and utilization to facilitate accountability and transparency.

Preventing Further Adverse Effects

- **Implementing preventive measures:** Implementing measures to prevent further adverse effects of the disaster, such as secondary hazards or environmental degradation, to minimize harm to affected populations and facilitate a smoother process.

- **Seeking to minimize further damage:** Taking proactive steps to limit further damage to properties, goods, and infrastructure, including securing vulnerable assets and implementing risk reduction measures, to mitigate the impact of the disaster and expedite recovery efforts.

Overcoming for return

- **Identification and agreement on principles and values:** Identifying and agreeing upon principles and values to guide the transition to the recovery phase and to the path towards a new normality.

- **Transitioning to recovery:** Organizing the transition from the response phase to the recovery phase and facilitating the return to (new) normality. Starting to foresight the desired new normality.

3.3.3 Recovery
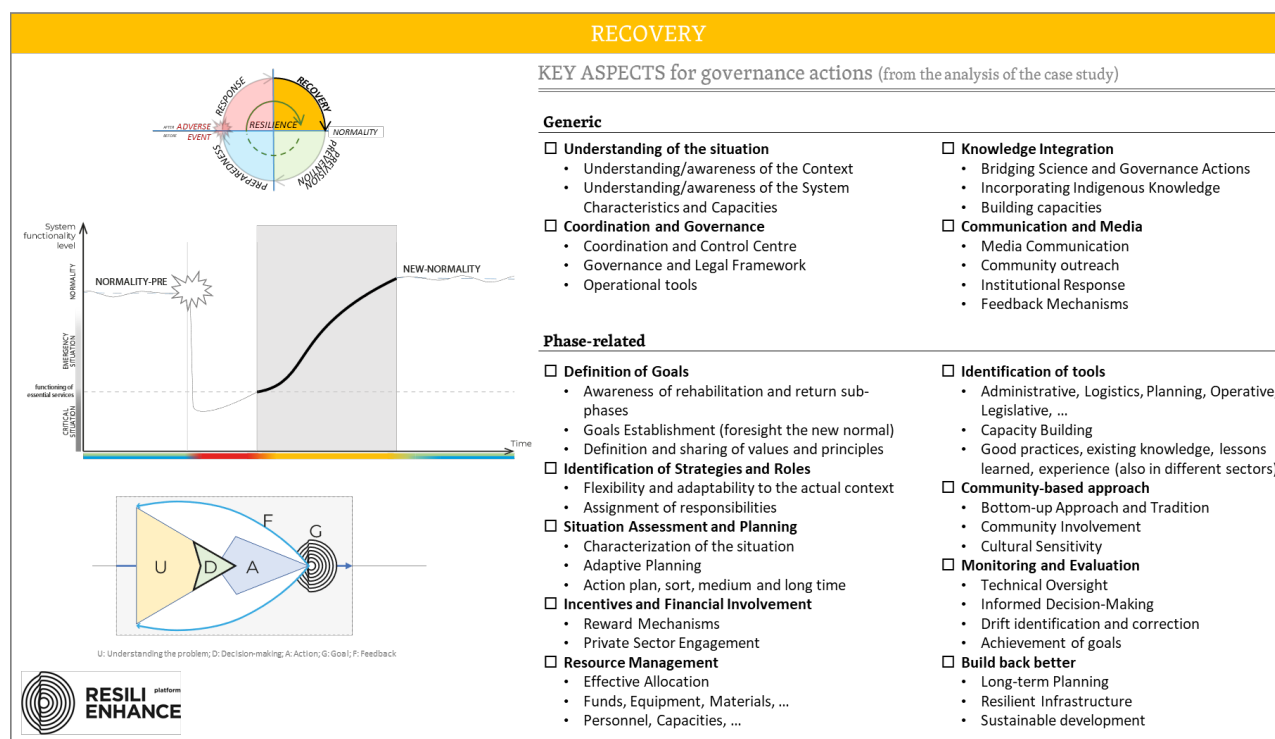
Generic key aspects for governance actions, highlighted after the analysis of the ResiliEnhance Field-Trip FVG 2023 case studies.

Understanding of the situation:

- **Understanding/awareness of the context:** It is crucial to gain a comprehensive

understanding of the local context, including socio-economic factors, cultural dynamics, and geographical features. This understanding helps tailor recovery strategies effectively to meet the specific needs of the affected area for the recovery phase.

- **Understanding/awareness of the system characteristics and capacities:** Assessing the capacities and resources within the recovery system to effectively navigate, manage and deploy resources during the recovery phase.

Coordination and Governance:

- **Coordination and Control Centre:** Establishing a coordination and control centre facilitates the management of recovery activities, ensuring collaboration among stakeholders and efficient resource utilization.

- **Governance and legal framework:** Implementing governance structures and legal frameworks specific to the recovery phase helps regulate and guide recovery efforts, ensuring accountability and adherence to established protocols.

- **Operational tools:** Deploying operational tools and systems supports recovery operations, including data management systems, decision-making frameworks, and monitoring mechanisms.

Knowledge Integration:

- **Bridging science and governance actions:** Strengthening the integration of scientific knowledge into recovery decision-making processes ensures evidence-based interventions and sustainable outcomes.

- **Incorporating indigenous knowledge:** Recognizing and incorporating indigenous knowledge and practices into recovery strategies harnesses community resilience and promotes culturally sensitive approaches.

- **Building capacities:** Investing in capacity-building initiatives enhances local capabilities and skills necessary for effective recovery planning and implementation.

Communication and Media:

- **Media communication:** Engaging with the media to disseminate accurate information

regarding the recovery process fosters transparency, addresses public concerns, and builds trust.

- **Community outreach:** Conducting targeted outreach activities engages affected communities, solicits feedback, and ensures their participation in the recovery process.

- **Institutional response:** Coordinating institutional responses from government bodies, NGOs, academia, and international partners addresses emerging challenges and meets evolving needs during the recovery phase.

- **Feedback mechanisms:** Establishing feedback mechanisms solicits input from affected populations, facilitating two-way communication and ensuring responsiveness to community needs.

Phase-related key aspects for governance actions, highlighted after the analysis of the ResiliEnhance Field-Trip FVG 2023 case studies.

Definition of Goals:

- **Awareness of rehabilitation and reconstruction sub-phases:** Recognizing and understanding the various stages within the recovery process, including rehabilitation and reconstruction phases, to guide planning and resource allocation effectively.

- **Goals establishment (foresight of the new normal):** Setting clear and achievable goals that anticipate the desired outcomes of the recovery process, focusing on building resilience and fostering sustainable development for the future.

- **Definition and sharing of values and principles:** Defining and disseminating values and principles that underpin recovery efforts, ensuring inclusivity, equity, and community empowerment throughout the process.

Identification of Strategies and Roles:

- **Flexibility and adaptability to the actual context:** Maintaining flexibility and adaptability in recovery strategies to respond effectively to the evolving post-disaster context and emerging challenges.

- **Assignment of responsibilities:** Clearly defining roles and responsibilities among stakeholders involved in the recovery process to ensure accountability and efficient resource utilization.

Situation Assessment and Planning:

- **Characterization of the situation:** Conducting continuous and comprehensive assessments to characterize the post-disaster situation, including damage assessment, resource availability, and community needs, to inform recovery planning and prioritize interventions.

- **Adaptive planning:** Developing recovery plans that can adapt to changing circumstances and uncertainties, incorporating feedback loops and contingency measures to ensure resilience.

- **Action plan, short, medium, and long-term:** Developing action plans that outline short-term, medium-term, and long-term recovery priorities and interventions, ensuring a phased approach to recovery implementation.

Incentives and Financial Involvement:

- **Reward mechanisms:** Implementing reward mechanisms to incentivize participation and innovation in the recovery process, fostering community engagement and ownership.

- **Private sector engagement:** Engaging the private sector to mobilize resources and expertise for recovery efforts, fostering public-private partnerships and collaboration.

Resource Management:

- **Effective allocation:** Ensuring the effective allocation of funds, equipment, materials, and personnel to support recovery activities based on identified needs and priorities.

- **Funds, equipment, materials, personnel, capacities, etc.:** Managing and mobilizing diverse resources necessary for recovery operations, including financial resources, equipment, materials, skilled personnel, and technical capacities.

Identification/development of Tools:

- **Administrative, logistics, planning, operative, legislative, etc.:** Identifying or develop, and deploying various tools necessary to support recovery operations across administrative, logistical, planning, operative, legislative, and other domains.

- **Capacity building:** Investing in capacity-building initiatives to strengthen local institutions and communities' ability to manage and recover from disasters, promoting resilience.

- **Good practices, existing knowledge, lessons learned, experience:** Leveraging existing knowledge, best practices, lessons learned, and experiences from previous disasters and various sectors to inform recovery strategies and improve effectiveness.

Community-based Approach:

- **Bottom-up approach and tradition:** Empowering communities to actively participate in the recovery process, respecting local traditions, knowledge, and decision-making structures.

- **Community involvement:** Fostering community involvement and ownership in recovery efforts through participatory decision-making and engagement.

- **Cultural sensitivity:** Ensuring cultural sensitivity in recovery interventions by respecting diverse cultural norms, values, and practices.

Monitoring and Evaluation:

- **Technical oversight:** Establishing technical oversight mechanisms to monitor the progress and effectiveness of recovery activities, ensuring adherence to established standards and good practices.

- **Informed decision-making:** Providing decision-makers with timely and accurate information on recovery progress, challenges, and outcomes to support informed decision-making.

- **Drift identification and correction:** Identifying deviations from planned recovery trajectories and implementing corrective actions to realign efforts with established goals.

- **Achievement of goals check:** Evaluating the achievement of recovery goals and objectives, measuring the impact of interventions, and identifying areas for improvement.

Build Back Better:

- **Long-term planning:** Incorporating long-term planning considerations into recovery efforts to promote sustainable development, resilience, and disaster risk reduction.

- **Resilient infrastructure:** Investing in resilient infrastructure and systems that can withstand future hazards and mitigate disaster risks, enhancing community safety and well-being.

- **Sustainable development:** Integrating principles of sustainability into recovery strategies and interventions, ensuring that post-disaster reconstruction contributes to long-term environmental, social, and economic sustainability.

3.3.4 Prevision and prevention, and preparedness
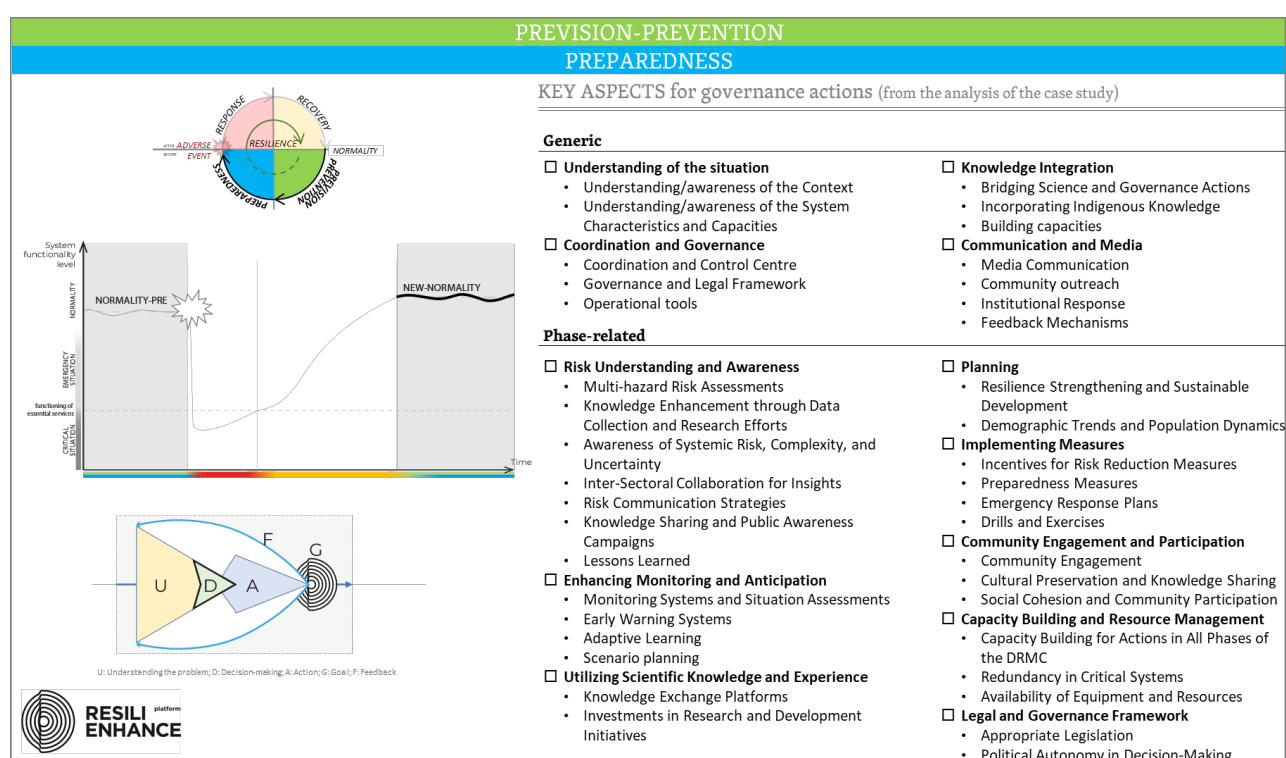
Generic key aspects for governance actions, highlighted after the analysis of the ResiliEnhance Field-Trip FVG 2023 case studies.

Understanding of the Situation:

- **Understanding/awareness of the context:** Gaining a comprehensive understanding of all relevant local contextual factors (e.g.: socio-economic, cultural, geographical, technical, political, legislative factors,) is vital for crafting tailored mitigation strategies that address community vulnerabilities and needs. This understanding also informs preparedness efforts, ensuring they are contextually relevant and effective.

- **Understanding/awareness of the system characteristics and capacities:** Evaluating the capacities and resources within the disaster risk management system to efficiently plan and implement mitigation and preparedness strategies. This assessment enables effective governance actions, strengthening overall readiness to mitigate and prepare for potential disasters.

Coordination and Governance:

- **Coordination and control centre:** Setting up hubs for stakeholders to coordinate communication, decision-making, and resource deployment, ensuring a coordinated and efficient response to disasters; such centres facilitate the management of risk reduction and preparedness activities, and should be prepared to support also the activities of the response and recovery phases.

- **Governance and legal framework:** Implementing specific governance structures and legal frameworks directly linked with disaster risk reduction coordination and control centres aids in regulating and guiding preparedness efforts, fostering a streamline and seamless preparation to governance actions for managing response to and recovery from disasters.

- **Operational tools:** Identifying, defining, testing, and fostering the utilization of operational tools and systems to support risk reduction strategies and activities as well as preparedness operations. Response tools should also be identified, prepared, continuously tested and used for training to improve preparedness. Operational tools should include data management systems, decision-making frameworks, and monitoring mechanisms.

Knowledge Integration:

- **Bridging science and governance actions:** Integrating scientific knowledge into governance processes ensures science-based decision-making for effective risk reduction and preparedness. This integration fosters synergy between scientific expertise and governance structures, leading to more robust and sustainable disaster management strategies.

- **Incorporating indigenous knowledge:** Recognizing and incorporating indigenous knowledge enhances disaster management by tapping into traditional practices that promote resilience and cultural sensitivity. This integration not only strengthens community engagement but also enriches mitigation and preparedness efforts with valuable local insights.

- **Building capacities:** Investing in capacity-building initiatives enhances local capabilities necessary for effective disaster management. This includes providing training, resources, and support to communities, organizations, and governments to strengthen their ability to mitigate risks, prepare for emergencies, and respond effectively when disasters occur.

Communication and Media:

- **Media communication:** Transparent and timely communication through various media channels is essential for building public trust and ensuring accurate information dissemination during all phases of disaster management. This includes providing updates, warnings, and instructions to the public to promote awareness and encourage preparedness.

- **Community outreach:** Engaging with communities through targeted outreach activities fosters trust, encourages participation, and ensures inclusivity in disaster management efforts. This engagement allows for the exchange of information, the solicitation of feedback, and the identification of community needs and priorities.

- **Institutional response:** Coordinating institutional responses across government agencies, NGOs, academia, and international partners is crucial for effective disaster management. This involves aligning resources, coordinating efforts, and addressing emerging challenges to ensure a cohesive and comprehensive response to disasters.

- **Feedback mechanisms:** Establishing channels for two-way communication with affected populations enables authorities to gather input, address concerns, and improve responsiveness during all phases of disaster management. This feedback loop promotes transparency, accountability, and community engagement, enhancing overall disaster preparedness and response efforts.

Phase-related key aspects for governance actions, highlighted after the analysis of the ResiliEnhance Field-Trip FVG 2023 case studies.

Risk understanding and awareness:

- **Multi-hazard risk assessments:** Conduct comprehensive and contextualized assessments to identify potential hazards, vulnerabilities, and exposure within the community or region, enabling proactive risk mitigation strategies and measures, and preparedness actions. Include natural and human-induced factors, to inform land-use planning and risk reduction measures. Assess the vulnerability of communities and critical infrastructure to various hazards, identifying areas of weakness and informing targeted prevention and preparedness measures.

- **Knowledge enhancement through data collection and research efforts:** Allocate resources for comprehensive data collection and research initiatives, facilitating a deeper understanding of local hazards, vulnerabilities, and exposure, to enable informed decision-making and targeted interventions.

- **Awareness of systemic risk, complexity, and uncertainty:** Increase awareness of systemic risk, complexity, and uncertainty inherent in disaster scenarios. Educate stakeholders on the interconnected nature of risks to promote comprehensive and adaptive risk management strategies.

- **Inter-sectoral collaboration for insights:** Facilitate collaboration among different sectors and stakeholders to gain diverse perspectives and insights into disaster risks, fostering holistic approaches to risk reduction and preparedness. Identify and raise awareness about interconnected vulnerabilities across different sectors and systems, highlighting the need for integrated and coordinated risk management approaches.

- **Risk communication strategies:** Develop and implement communication strategies to effectively communicate risk information to communities, promoting awareness, understanding, and proactive risk reduction behaviours. Leverage on community values (e.g.: house ownership, local attachment, social cohesion).

- **Knowledge sharing and public awareness campaigns:** Establish platforms and mechanisms for sharing knowledge and good practices in disaster risk management, fostering mutual learning and collaboration among stakeholders. Launch public awareness campaigns to educate and inform the public about potential risks, preparedness measures, and actions to take during emergencies, empowering communities to respond effectively.

- **Lessons learned:** Create repositories to document and disseminate lessons learned from past disasters and response efforts, facilitating continuous learning and improvement in disaster risk management practices.

Enhancing monitoring and anticipation:

- **Monitoring systems and situation assessments:** Implement systems for continuous and real-time monitoring of key indicators, enabling timely detection of potential hazards and early warning dissemination. Conduct regular situation assessments within communities and systems, providing up-to-date information to inform decision-making and prioritize interventions. Continuously monitor and assess seasonal variations and environmental changes that may influence disaster risks, informing adaptive risk management strategies

- **Early warning systems:** Establish early warning systems that utilize technology and community networks to disseminate timely alerts and advisories, enabling people to take pre-emptive actions and evacuate to safety.

- **Adaptive learning:** Develop frameworks for adaptive learning and decision-making, integrating real-time data and feedback to adjust strategies and interventions dynamically in response to changing risk scenarios.

- **Scenario planning:** Conduct scenario planning exercises to simulate various disaster scenarios and their potential impacts, also considering different context situations (such as time-period, season, weather etc.), allowing stakeholders to anticipate risks, test response plans, and identify areas for improvement.

Utilizing scientific knowledge and experience:

- **Knowledge exchange platforms:** Create platforms for exchanging scientific knowledge and practical experience in risk management, facilitating collaboration and mutual learning among researchers, practitioners, and communities.

- **Investments in research and development initiatives:** Allocate resources to support research and development initiatives in risk management, fostering innovation and the generation of new knowledge to address emerging challenges.

Planning:

- **Resilience strengthening and sustainable development:** Integrate disaster risk reduction and resilience-building considerations into urban and regional planning processes to promote sustainable development practices and enhance long-term resilience.

- **Demographic trends and population dynamics:** Take into account demographic trends, population growth, and migration patterns when planning and implementing disaster risk management measures to ensure they are tailored to the specific needs and vulnerabilities of different demographic groups.

Implementing measures:

- **Incentives for risk reduction measures:** Foster and implement a combination of structural (physical) and non-structural (policy, regulatory, and community-based) measures to reduce risks and enhance resilience to disasters. Offer incentives to encourage individuals and businesses to implement measures aimed at reducing risks and enhancing resilience in communities and critical infrastructure.

- **Preparedness measures:** Support preparedness initiatives, including training programs, public awareness campaigns, and infrastructure improvements. Put in place measures such as emergency plans, early warning systems, and training programs to ensure readiness to respond effectively to potential disasters.

- **Emergency response plans:** Develop comprehensive emergency response plans outlining roles, responsibilities, and procedures for coordinated and effective response actions during emergencies.

- **Drills and exercises:** Regularly conduct drills and exercises to test emergency response plans, evaluate readiness, and identify areas for improvement in preparedness efforts.

Community engagement and participation:

- **Community engagement:** Engage communities in decision-making processes, empowering them to actively participate in identifying risks, developing mitigation strategies, and building resilience, ensuring ownership and sustainability of interventions.

- **Cultural preservation and knowledge sharing:** Promote cultural preservation and knowledge sharing within communities to leverage traditional practices and local wisdom in disaster risk reduction and resilience-building efforts.

- **Social Cohesion and Community Participation:** Strengthen social cohesion and community participation in disaster risk management activities, fostering a sense of ownership and collective responsibility for risk reduction and resilience-building.

Capacity building and resource management:

- **Capacity building for actions in all phases of the DRMC:** Strengthen capacities at all levels to effectively implement disaster risk management activities across the entire disaster management cycle, from prevention and preparedness to response and recovery.

- **Redundancy in critical systems:** Ensure redundancy in critical systems and infrastructure to enhance resilience and minimize the potential impacts of disruptions during disasters.

- **Availability of equipment and resources:** Ensure the procurement and availability of necessary equipment, supplies, and resources required for emergency response and recovery operations.

Legal and governance framework:

- **Appropriate legislation:** Establish and enforce legal frameworks, regulations, and policies that support effective disaster risk management, including measures for land-

use planning, building codes, and environmental protection.

- **Political autonomy in decision-making:** Advocate for or leverage on political autonomy at the local level to empower communities in decision-making processes related to disaster risk reduction, ensuring that responses are contextually relevant and responsive to local needs and priorities.

4 CONCLUSIONS

In an increasingly unpredictable world, the importance of effective governance in enhancing resilience to disasters cannot be overstated. As communities grapple with the growing frequency and intensity of natural and man-made hazards, it becomes imperative to transform governance structures to better prepare, respond, and recover from these events.

The ResiliEnhance Platform participants' comprehensive discussions during the field trip yielded several key points:

- The information collected and discussed during the field-trip activities confirmed the foundations of the CREF and led to convergence toward a preliminary version of the CREF as a support tool for building resilience for sustainable development.

- The participants agreed on the organizational structure at the base of the ResiliEnhance Platform and started organizing the Technical Secretariat and the Scientific Committee. Members provided their availability to support the activities related to the revision of scientific products, support for building the ResiliEnhance repository on the ResiliEnhance website and provide new ideas for the development of the platform, including working groups.

- As a next step, a report on the first version of the CREF, taking into account the outcomes of the field-trip activities, will be prepared and shared with the participants, UNESCO and UNDRR, who demonstrated strong interest in the initiative, as well as publicly disseminated through the ResiliEnhance Platform's website.

The discussions have further highlighted critical factors needed to build and strengthen resilience across all levels of society. Their insights ranged from contextualising strategies to achieving a smooth transition from risk understanding to decision-making and action. These findings, which offer recommendations for transforming governance to enhance disaster resilience, can be summarised as follows:

- **Importance of contextualization**: Tailoring governance strategies to the specific context is crucial for effective disaster resilience planning and response.

- **Importance of communication**: Robust communication networks and strategies are vital for disseminating information, coordinating efforts, and fostering community engagement in disaster preparedness and response.

- **Legislation**: Implementing and enforcing comprehensive legislation that addresses disaster risk reduction, response, and recovery is fundamental for effective governance in enhancing resilience to disasters. In doing this, the legislators must also take into account the specific characteristics of the various phases of the Disaster Risk Management Cycle.

- **Technical capacity**: Building technical capacity within governmental agencies and relevant stakeholders is essential to ensure the implementation of sound disaster risk management practices and technologies.

- **Monitoring**: Establishing robust monitoring and evaluation mechanisms enables continuous assessment of disaster risks, vulnerabilities, and the effectiveness of governance strategies, facilitating adaptive responses.

- **From decision to action**: Efficient decision-making processes that swiftly translate into action are imperative to minimize the impact of disasters and enhance community resilience.

- **Awareness**: Promoting public awareness and education campaigns regarding disaster risks, preparedness measures, and response protocols is crucial for fostering a culture of resilience within communities.

- **Knowledge bridge**: Bridging the gap between scientific knowledge, traditional knowledge, and local practices facilitates informed decision-making and enhances the effectiveness of disaster resilience initiatives.

- **Evolving nature of disasters**: Implementing dynamic response strategies that adapt to the evolving nature of the disaster event,

whether it unfolds gradually or abruptly, is essential to mitigate its impact and ensure effective recovery.

- **Multiple or cascading events**: Developing governance frameworks that can effectively manage the complexities arising from simultaneous or sequential occurrence of multiple/cascading disaster events is paramount for maintaining resilience.

- **Overlap of phases**: Recognizing and addressing the overlapping nature of disaster management phases, such as mitigation, preparedness, response, and

recovery, ensures seamless coordination and continuity of efforts throughout the disaster cycle.

As the next step of CREF development, participants of the ResiliEnhance Platform also underlined the importance of facilitating active dialogue among scientists, decision- and policy-makers and other stakeholders, also sharing outcomes in international conferences and initiatives.

4.1   Next steps

The next challenge of the ResiliEnhance platform members is to identify good practices of effective disaster governance cases from which to extract insights for targeting resilience enhancements for a safer and sustainable future.

The upcoming meeting of the ResiliEnhance Platform would serve as a valuable forum for collecting additional narratives and experiences from participants. The aim is to further test and refine the Comprehensive ResiliEnhance Framework (CREF) through the application of

diverse perspectives and real-world case studies. The collective insights gained from these shared experiences will contribute to the ongoing development and enhancement of the CREF, ensuring its relevance and effectiveness as a tool for building resilience in the face of complex challenges. The platform remains committed to fostering collaboration and knowledge exchange among its members, recognizing the importance of continuous learning and adaptation in the pursuit of a safer and more sustainable future.

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ANNEX I
PARTICIPANTS OF THE RESILIENHANCE PLATFORM 2023

The two-day event brought together 23 participants from the following UNESCO Chairs, Category II centers, UN and other organizations and institutions.
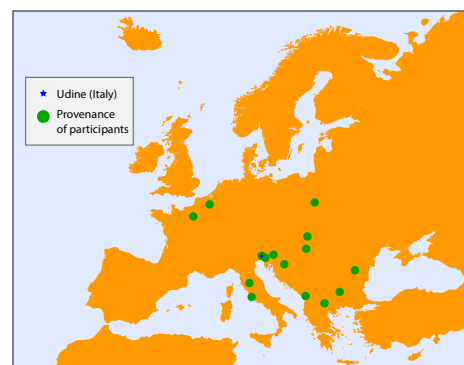
- **Francesca Bampa** – Project officer Science Unit, UNESCO Regional Bureau for Science and Culture in Europe, Venice, Italy

- **Ingrid Belčáková** – Chairholder of the UNESCO Chair on Sustainable Development and Ecological Awareness, Technical University of Zvolen, Slovakia

- **Maria De America Bendito Torija**– Consultant on Disaster Risk Reduction, SC/DRR, UNESCO HQ, Paris

- **Andrea Caffarelli** – Member of the UNESCO Chair on Intersectoral Safety for Disaster Risk Reduction and Resilience, SPRINT-Lab, University of Udine ,and Vice-rector of the University of Udine, Italy

- **Carlo Fortuna** – Program Manager of the Central European Initiative, Trieste, Italy

- **Stefano Grimaz** – Chairholder of the UNESCO Chair on Intersectoral Safety for Disaster Risk Reduction and Resilience, SPRINT-Lab, University of Udine, Italy

- **Ákos Jakobi** – Scientific secretary, UNESCO Chair in Cultural Heritage Management and Sustainability, University of Pannonia in Kőszeg, Hungary

- **Mateja Klun** – Member of the UNESCO Chair on Water-related Disaster Risk Reduction, University of Ljubljana, Slovenia

- **Klaudija Lebar** – Member of the UNESCO Chair on Water-related Disaster Risk Reduction, University of Ljubljana, Slovenia

- **Petra Malisan** – Program Coordinator of the UNESCO Chair on Intersectoral Safety for Disaster Risk Reduction and Resilience, SPRINT-Lab, University of Udine, Italy

- **Jadranka Mihaljević** – Head of the Department of Engineering Seismology, Institute of Hydrometeorology and Seismology of Montenegro

- **Matjaž Mikoš** – Chairholder of the UNESCO Chair on Water-related Disaster Risk Reduction, University of Ljubljana, Slovenia

- **Aldo Primiero** – Civil Protection of Friuli Venezia Giulia Region, Italy

- **Radmila Salic Makreska** – Head of Department for Risk, Disaster Management and Strategic Planning at Institute of Earthquake Engineering and Engineering Seismology, Ss. Cyril and Methodius University in Skopje, North Macedonia

- **Chiara Scaini** – Researcher at the National Institute of Oceanography and Applied Geophysiscs, Italy

- **Zvonko Sigmund**– Member of European Science & Technology Advisory Group (E-STAG), UNDRR, Faculty of Civil Engineering, University of Zagreb, Croazia

- **Janusz Szpytko** – Chairholder of the UNESCO Chair on Science, Technology and Engineering Education, Krakow, Poland

- **Dimiter Velev** – Director of the Science Research Center for Disaster Risk Reduction, University of National and World Economy (UNWE), Sofia, Bulgaria

- **Plamena Zlateva** – Leading Researcher of the Science Research Center for Disaster Risk Reduction, University of National and World Economy (UNWE), Sofia, Bulgaria