

LINKS

Strengthening links between technologies and society
for European disaster resilience

D5.1 WORK PLAN FOR THE LINKS FRAMEWORK

Research Report

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EXECUTIVE SUMMARY

About the project

LINKS “Strengthening links between technologies and society for European disaster resilience” is a comprehensive study on disaster governance in Europe. In recent years, social media and crowdsourcing (SMCS) have been integrated into crisis management for improved information gathering and collaboration across European communities. The effectiveness of SMCS on European disaster resilience, however, remains unclear, the use of SMCS in disasters in different ways and under diverse conditions. In this context, the overall objective of LINKS is to strengthen links between technologies and society for improved European disaster resilience, by producing sustainable advanced learning on the use of SMCS in disasters. This is done across three complementary knowledge domains:

- Disaster Risk Perception and Vulnerability (DRPV)
- Disaster Management Processes (DMP)
- Disaster Community Technologies (DCT)

Bringing together 15 partners and 2 associated partners across Europe (Belgium, Denmark, Germany, Italy, Luxembourg, the Netherlands) and beyond (Bosnia & Herzegovina, Japan), the project will develop a framework to understand, measure and govern SMCS for disasters. The LINKS Framework consists of learning materials, such as scientific methods, practical tools, and guidelines, addressing different groups of stakeholders (e.g. researchers, practitioners, and policy makers). It will be developed and evaluated through five practitioner-driven European cases, representing different disaster scenarios (earthquakes, flooding, industrial hazards, terrorism, drought), cutting across disaster management phases and diverse socioeconomic and cultural settings in four countries (Denmark, Germany, Italy, the Netherlands). Furthermore, LINKS sets out to create the LINKS Community, which brings together a wide variety of stakeholders, including first-responders, public authorities, civil society organisations, business communities, citizens, and researchers across Europe, dedicated to improving European disaster resilience through the use of SMCS.

About this deliverable

This document focuses on the work plan for the development of the LINKS Framework. The ambition of the Framework is to provide a set of learning materials (such as methods, tools and guidelines) for enhancing the governance of diversity among the understanding of SMCS in disaster for relevant stakeholders (for instance: practitioners, researchers and policy makers). Learning is an important aspect of resilience, and ultimately the learning processes enabled by the Framework will contribute to strengthening societal resilience. Using a step-by-step approach, this deliverable describes what is needed to develop the Framework. Specifically, three phases are necessary to achieve this ambitious goal:

- A **co-design phase**, involving all relevant partners in the project to conceptualise the Framework and capitalise on the knowledge of the consortium;
- A **development and consolidation phase** in which the first version of the Framework, consisting of the research design (i.e. assumptions, research questions and gaps) is consolidated based on the outcomes from the co-design phase and on the state of the art, the methods (identified in WP2-4), and the “hands-on” knowledge of one important stakeholder group: the practitioners involved in the project;
- The **development of the second version of the Framework**, based on the findings from the first round of the case-based assessment of the Framework in five cases across four European countries (Italy, Germany, Denmark and the Netherlands).

This document provides the initial work plan for the phases above, identifying the steps and mini-milestones in each of the phases.

This document is public, but is meant for internal (LINKS consortium) use and it should be considered as a strategic planning document to ensure that the Framework is developed in a timely manner and in a comprehensive way. It is a living document that will be updated regularly. A revised public version of the document will be submitted in November 2022 in deliverable 5.2 (D5.2).

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LIST OF ACRONYMS

Abbreviation / Acronym	Description
CM	Crisis Management
DCT	Disaster Community Technologies
DMP	Disaster Management Processes
DRPV	Disaster Risk Perception and Vulnerability
DRR	Disaster Risk Reduction
EMS	Emergency Management System
KB	Knowledge Base
KPIs	Key Performance Indicators
LAC	LINKS Advisory Committee
LC	LINKS Community
LCC	LINKS Community Center
PFW	Practitioner Framework Workshop
PTF	Practitioner Task Force
SMCS	Social Media and Crowdsourcing
STF	Sustainability Task Force
VOST	Virtual Operation Support Team
WP	Work Package

DEFINITION OF KEY TERMS¹

Term	Definition
Case assessments	The assessment of the LINKS Framework in local cases
Crowd sourcing	Describes a distributed problem-solving model where the task of solving a challenge or developing an idea get “outsourced” to a cloud. It implies tapping into “the wisdom of the crowd”.
Diversity by design	Entails making diversity ideas, ideals and considerations both integrally and structurally imbedded into the design and functioning of projects, work environments, decision making, professional choices, and interpersonal relationships. In LINKS, it is encapsulated in the methods and tools needed to endow stakeholders with the capability to reason about the diversity aspects of their actions, and the methods, tools and formalisms to guarantee that diversity is considered in all the phases of the design, implementation and use of the LINKS work and outputs.
LINKS Framework	A set of learning materials, such as methods, tools and guidelines for enhancing the governance of diversity among the understanding of SMCS in disasters for relevant stakeholders. Methods in LINKS refer to approaches that will enable researchers and practitioners to assess the effects of SMCS for disaster resilience under diverse conditions. Tools are practical instruments supporting first-responders, public authorities and citizens with the implementation of SMCS in disaster and security contexts. Guidelines are recommendations for improving national and regional governance strategies on SMCS as well as introductions and explanations of how to apply the methods and tools under diverse conditions.
LINKS Knowledge Bases	The outputs and knowledge obtained from the assessment of three knowledge domains. This knowledge is used to develop the LINKS Framework.
LINKS Knowledge Domains	<p>The three crucial domains of analysis for studying European disaster resilience and SMCS. These include:</p> <p>Disaster Risk Perception and Vulnerability (DRPV), for assessing changes in the citizens’ perception of disaster risks induced by SMCS, as well as assessing the changes in the vulnerability of practitioners and citizens.</p> <p>Disaster Management Processes (DMP) for analysis of how SMCS changes the procedures and processes within the crisis and disaster management.</p> <p>Disaster Community Technologies (DCT), for assessing SMCS related technologies used by practitioners (and citizens) in disasters.</p>
Social Media	A group of Internet-based applications that build on the ideological and technological foundations of the Web 2.0 and that allow the creation and exchange of user-generated content (UGC). Forms of media that allow

¹Definitions are retrieved from the LINKS Glossary (forthcoming).

	<p>people to communicate and share information using the internet or mobile phones.</p>
<p>Sustainable Advanced Learning</p>	<p>A maintainable and evolving collection of knowledge and best practices produced for and by relevant stakeholders. Sustainable advanced learning entails a cognitive dimension (the capability to gain in-depth knowledge of crises and crisis response) and a social dimension (the ability to implement the knowledge into new practices).</p>

1. INTRODUCTION

The LINKS Framework lies at the core of the LINKS project. With the ambition of governing diversity around the uses of social media and crowdsourcing in disasters through sustainable advanced learning, this output, in the long term, will play an important role in strengthening community resilience. Within LINKS, the Framework is conceived in the frame of WP5, but, as outlined in this document, there are strong interdependencies with the other WPs in the project:

- In WP2-4 the foundations of the Framework are set in the knowledge bases (KB) and the methods to carry out the case-based assessment of the Framework are defined;
- In WP6 the evaluation is carried out in local cases and the results are instrumental to refine the Framework throughout the project;
- WP7 provides the LINKS Community Center (LCC) through which the content of the Framework will be accessed and the LINKS Community can share experiences and lessons learned in applying it;
- WP8 is concerned with the LINKS Community and with LINKS Community Workshops (LCW) which are key to identify relevant stakeholders who will be involved in case-based assessments;
- WP9 critically deals with the dissemination of the results and with the sustainability strategy of the Framework.

This document sets the stage for the development of the Framework: it should be considered as a strategic planning deliverable to ensure that the development of the Framework follows a systematic approach through the identification of phases, mini-milestones, risks and mitigation strategies. It is structured in 3 Sections:

- Section 2 focuses on the rationale of the Framework in relation to the project objectives, and provides an overview of the Framework workflow within the project;
- Section 3 is the core part of the work plan. It provides the timeline and the objectives of the development of the Framework both at project level and at WP5 level with an emphasis on three main phases for development: the **co-design phase**, the **development and consolidation phase** and the **development of the second version** of the Framework. The steps included in each phase, the main elements, how to best monitor the development of the Framework (mini-milestones, risk and mitigation strategies) are captured in this section.
- Section 4 deals with conclusive remarks.

In addition to these sections, the preliminary results from key project meetings and workshops feeding into the development of the Framework are included in two Annexes.

This work plan covers the timeframe from September 2020 to November 2022 when a revised version of the work plan (D5.2) will be submitted together with the second version of the Framework (D5.4). It goes hand-in-hand with the first work plan for the five cases in deliverable 6.1 (D6.1). The development of the LINKS Framework and the assessment in the five cases are strongly interrelated and it is not always feasible, nor recommended, to distinguish between WP5 and WP6-related activities. To ensure consistency, the work plans in D5.1 and D6.1 cover the same timeframes and have similar structures.

This work plan will be regularly updated. It is of interest to the entire LINKS consortium as it revolves around key internal processes and activities which are critical to deliver a successful output.

2. CONCEPT AND OBJECTIVES OF THE LINKS FRAMEWORK

This section introduces the rationale behind the LINKS Framework and describes how the Framework relates to the main objectives of the project. It further provides orientation for the Framework within the project workflow, and serves as an introduction to better understand the work plan outlined in Section 3.

2.1 The LINKS Framework and the main objectives of the project

The definition of the LINKS Framework is evolving alongside its development, taking into account the main objectives of the project. Through ongoing discussions and activities (e.g. workshops) within the LINKS consortium, the definition has been revised from “a set of best practices” to:

“a set of learning materials, such as methods, tools and guidelines for enhancing the governance of diversity among the understanding of SMCS in disasters for relevant stakeholders”.

This is an important shift, as the revised definition does not limit the Framework to “best practices” but instead opens it up to a broader domain of knowledge and learning material, including good and bad practices, which may be context specific. Furthermore, the definition points towards the overarching objective of LINKS: to produce sustainable advanced learning on SMCS in disasters, in order to strengthen societal resilience. In LINKS, sustainable advanced learning is defined as maintainable and evolving collection of knowledge and best practices produced for and by relevant stakeholders. This entails a cognitive dimension (the capability to gain in-depth knowledge of crises and crisis management) and a social dimension (the ability to implement that knowledge into new practices). As will be explained in this document, the LINKS Framework contributes to learning at different levels and in different phases of the project, in other words, learning by doing. At its core, the Framework is envisaged to embody different learning materials (e.g. methods, tools and guidelines), and will provide access to a structured and varied amounts of knowledge on SMCS in disasters in different ways. What needs to be learned, by whom, as well as how to enable dynamic learning processes and feedback loops, will become clearer in the course of the project through the assessment and application of the Framework in local cases (also specified in the cases work plan in D6.1).

Of course, the preconditions for learning around the role of SMCS in disaster and in different socio-cultural contexts, is to translate and transfer the knowledge coming from different knowledge domains into learnable and actionable information. In this way, the Framework also contributes to the second LINKS objective: to achieve a consolidated understanding of SMCS in disasters. This is done through ongoing dialog and interactions with stakeholders in the LINKS Community and with

WP2-4, which have established the knowledge bases on disaster risk perception and vulnerability (DRPV), disaster management processes (DMP), and disaster community technologies (DCT). From the knowledge bases and dialogue with stakeholders, LINKS translates diverse knowledge concerning gaps, needs, and best practices into methodological components and learning materials, for evaluating the Framework at different phases in the project.

The ultimate goal of the Framework is to govern the diversity around SMCS in disasters. In this regard, diversity is also embedded into the design and assessment of the Framework learning materials, through the 'diversity by design' principle. Diversity by design involves inputs from all partners; the utilization of a wide variety of scientific methods, tools and guidelines addressing different groups of stakeholders (e.g., researchers, first-responders, practitioner, policy makers, industries, and citizens); and the incorporation of five different disaster cases across Europe including different disaster management phases against a variety of socioeconomic and cultural backgrounds. Diversity is further imbedded in the design and potential uses for the Framework from the perspective of intersectionality in the LINKS research. This entails an approach which recognizes and accounts for the ways in which the identities and experiences of individuals and groups influence their advantages and disadvantages in coping with disasters (and thereby impacting resilience). Here we recognize both individual and system related dimensions of diversity. On the one hand, diversity is considered as an individual aspect, characterized by personal markers, diversity awareness and different cultural belonging. On the other hand, diversity is a range of capabilities, information and data resources, skills and knowledge (scientific and experiential) to which systems can draw upon. Importantly, diversity is not considered simply as a vulnerability factor in disasters, but also as one of resilience. In this regard, the Framework will account for the resilience capacity of diversity in addition to vulnerability aspects (see: Bonati, 2020, D2.1).

Through the diversity by design principle, the development of the Framework is intended to be done in a dynamic way together with the stakeholders of the Framework. The stakeholders' increased awareness of the effectiveness of SMCS in disasters should not be considered as an automatic process. Instead, the Framework will evolve first, through the involvement of the LINKS Community, in its development and as it is assessed in five different cases to understand whether learning materials (e.g. methods, tools and guidelines) can be helpful to strengthen resilience capacities with a specific focus on the use of SMCS in all phases of disasters. And ultimately over time, as stakeholders continue to engage with and contribute to the Framework. Here, the Framework both emerges from and contributes to the last LINKS objective and its own longevity, helping to establish and sustain the LINKS Community of stakeholders.

The LINKS Framework directly contributes to the LINKS project objectives in the following ways:

- **Sustainable advanced learning on SMCS in disasters (O1):** By enabling sustainable learning on SMCS on disasters for different stakeholders through different learning processes and materials, even after the project has finished;

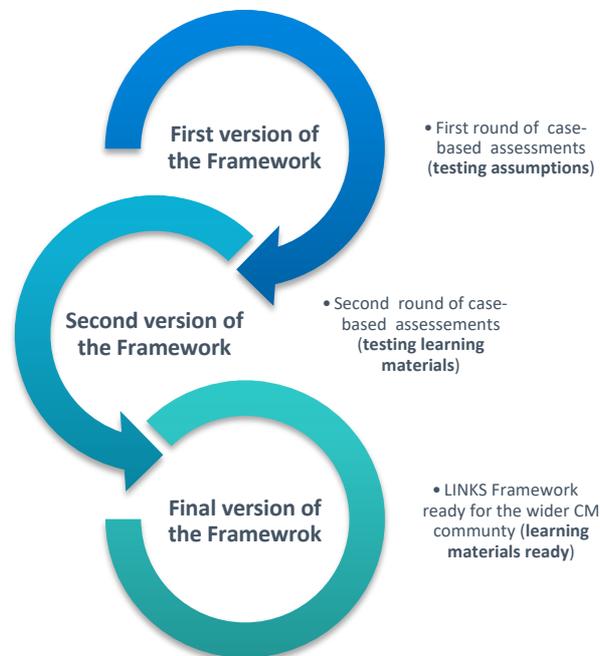
- **Achieve a consolidated understanding of SMCS in disasters (O2):** By acting as the conceptual umbrella for testing and translating assumptions from the KB in the case-based assessments of the Framework;
- **Govern the diversity of SMCS in disasters (O3):** By translating the diverse knowledge derived from the cases assessments and ultimately the LINKS Community, into learnable and actionable information, sorted through different thematic areas and learning materials;
- **Bring multidisciplinary SMCS stakeholders together (O4):** Through a design which relies on the continuous exchange of ideas, experiences and knowledge from diverse stakeholders.

2.2 Overview of the LINKS Framework Workflow

The development of the Framework follows an iterative cycle which runs from September 2020 to July 2023 (see Figure 1). This can be outlined generally by the key deliverables establishing the different versions of the Framework:

- V1 (D5.3; November 2021): The foundations of the first version of the Framework are established from the knowledge bases (KB) deliverables (D2.1; Pazzi, et. al., 2020: D2.2; Nielsen & Raju, 2020: D3.1; Habig et.al. 2020: D4.1) and from the “practical” knowledge of the practitioners involved in LINKS. The first version of the Framework will mainly consist of the conceptual/research design: meaning the research questions and the gaps identified in the KB deliverables (i.e. the assumptions) and confirmed by relevant stakeholders as well as the methods to address those gaps;
- V2 (D5.4; November 2022): The second version of the Framework is developed based on the results from the application and assessment in local cases and from a broader evaluation among EU and international crisis management (CM) networks. This version will consist of learning materials developed drawing on specific learning needs, objectives and themes for the Framework;
- V3 (D5.5; July 2023): For the final version of the Framework is ready for a final round of the evaluation by the LAC and broader LINKS network will be necessary. After 2023 the Framework will be ready for the wider CM community.

Figure 1: The development of the LINKS Framework



Source: Authors contribution

Participatory approaches and co-design strategies across WPs are key to ensuring that the Framework is well integrated with other project results, and are defined in Section 3 of this work plan². The Framework cannot be considered as a stand-alone output. It builds on top of the work conducted in WP2-3-4 and is strongly interrelated with the case-based assessments (WP6), the LINKS Community Center (LCC) (WP7), and the LINKS Community (LC) (WP8). To evaluate whether the Framework is effective at enabling sustainable advance learning; achieving a consolidated understanding; governing the diversity; and bringing multidisciplinary stakeholders together around the uses of SMCS in disasters, it will be assessed through the iterative steps above, in five hazard case scenarios (flooding, drought, terrorism, earthquakes, industrial hazards) across four countries (Denmark, Germany, Italy and The Netherlands), as well as through broader networks in the CM community (see: Fonio & Clark, 2021, D6.1).

The LCC will enable the application and the evaluation of the second version of the Framework online and will facilitate sharing of experiences and lessons learned from the cases. The LC, through

² Methodological considerations are not discussed in detail in this deliverable. The DRPV, DMP and DCT – methodologies for the case-based assessment of the Framework will be described respectively in the upcoming D2.3, D3.2 and D4.2 (May 2021).

the organization of LINKS Community Workshop and other activities, will be actively involved in evaluating the Framework in the case assessments. Indeed, the Framework serves different yet complementary users within the LINKS Community, who will be involved in evaluating its effectiveness. For example:

- *Researchers* will be interested in learning and contributing to helpful and new approaches (methods) to studying the benefits and drawbacks of SMCS in disasters, across different knowledge domains;
- *Practitioners* will have a more hands-on approach to the Framework and will look for practical instruments (tools) on how to best implement SMCS into their operating procedures, in different phases of disaster management cycle³;
- *Policy makers* will look for recommendations (guidelines) for improving national and regional governance strategies on SMCS in disasters.

It can be foreseen that the Frameworks learning materials will be beneficial for all the above-mentioned potential stakeholders in different socio-cultural contexts. Therefore, the Framework should address different needs while embedding the principle of “diversity by design” into its development, as introduced above in Section 2.1. Ultimately this will inform the flexibility of Framework, in its ability to both govern diversity while enabling learning which can be adjusted to local (socio-cultural) and case-specific contexts.

At the time of writing (December 2020), the learning materials and content that will constitute the Framework has not been defined yet⁴. Furthermore, in-depth discussions on the “governance of diversity” and what it entails are still on-going in the project. However, key decisions and work processes have already been initiated, as will be described below in Section 3, to ensure that the Framework will be developed by taking into account the needs of relevant stakeholders within the LINKS Community.

³ It is worth noting that the practitioners are the first the stakeholder group who was addressed to develop the Framework but they are not the only relevant stakeholders. The learning needs and potentials for different stakeholders through the Framework will be addressed in different phases in the project, and through different levels of learning.

⁴ The first version of the Framework will be delivered in November 2021 and described in D5.3.

3. WORK PLAN FOR THE DEVELOPMENT OF THE LINKS FRAMEWORK

This Section outlines the work plan for the LINKS Framework by focusing on:

- The timeline and the objectives of the Framework development (Section 3.1). This part provides an overview both at project level by mentioning the key benchmarks (project deliverables) that have and will have an impact on the work plan, and at WP5 level by outlining the main phases to develop the Framework;
- More detailed explanations on each phase are included from Sections 3.1.1 to 3.1.3. Specifically, those sections focus on: steps, main elements (key features), mini-milestones (how to best monitor the development of the Framework). The narrative part is followed by a wrap-up table including only the most important steps per phase, the partners involved, inputs (e.g. deliverables, outcomes of meetings), outputs (e.g. the mini-milestones), risks and mitigation strategies. Each section ends with a phase-specific timeline.

3.1 Timeline and objectives for the development of the LINKS Framework

As mentioned in the Introduction, the work plan described in this document will be applied until November 2022.

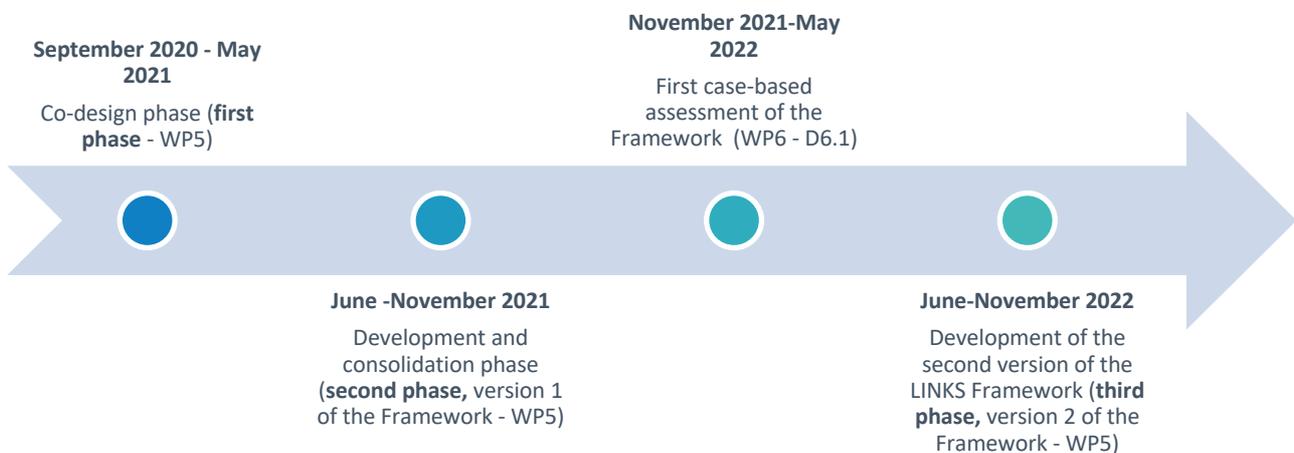
Before turning to more detailed explanations of the three phases, two timelines are provided below (Figure 2 and Figure 3). In the first timeline, key benchmarks in the overall project that have significant impacts on the work plan between November 2020 (submission of the knowledge bases deliverables) and November 2022 (two months prior to the submission of the second version of the LINKS Framework) are captured. In the second timeline, only the phases to develop the Framework are included.

Figure 2: Key benchmarks



Source: Authors contribution

Figure 3: Timeline of the phases for the development of the LINKS Framework



Source: Authors contribution

The two timelines show that there are strong interdependencies across WPs that are taken into account for the development of the Framework: for instance, the development and consolidation phase of the Framework cannot start before the submission of the methodological deliverables (D2.3, D3.2 and D4.2); and the development of the second version of the Framework can start only after the first round of assessments in local cases (D6.4).

In Figure 3 we distinguish **three interrelated phases for the development of the Framework:**

1. The **co-design phase** sets the stage for the actual development of the LINKS Framework and it deals with both the conceptualisation, the practical implications for development (coming from WP2-4), and the knowledge (e.g., needs, gaps, challenges, and expectations) of researchers and practitioners alike. In the frame of WP5 and WP6, the key process here entails both an in-depth understanding of the practical implications of the knowledge bases deliverables (D2.1, D2.2, D3.1 and D4.1), and collecting, interpreting and mapping the knowledge of practitioner stakeholders. In this phase, synergies with WP2-6 are key to ensure alignment around a common vision and to agree on the overall methodological approach. Furthermore, this is the phase in which important learning dimensions and objectives shall be decided, as detailed in Section 3.1.1 below.
2. The **development and consolidation phase (version 1 of the Framework)** is when the knowledge and requirements from the co-design phase turn into a coherent research design that will constitute the first version of the LINKS Framework. It is also the phase in which more prominence is given to the main objective of the project, sustainable advanced learning. The first research design of the Framework must begin to embed the key feature of facilitating learning into the content which will be assessed in the local cases. The delivery of D5.3 (November 2021) marks the end of the development phase: testing assumptions and addressing gaps in the case assessments can start. This will be done in frame of WP6 (see: case-based assessment of the Framework in D6.1). In this phase, synergies with WP2-6 are still crucial but the direct involvement of WP8 is also expected to identify relevant stakeholders who will be involved in the assessments and to plan LINKS Community Workshops accordingly (see: Philpot & Reuge, 2020: D8.1).

The main difference between the co-design phase and the development and consolidation phase is the approach to the Framework. While the first phase is the “embryonic period” of the Framework in which knowledge is collected, analysed and discussed, the second phase concerns the actual development in which the systematized knowledge evolves into a coherent research design that will be tested locally.

3. The **second development phase of the Framework** depends on the results from the application of the Framework in local cases (see: D6.1) and it will revolve around the learning materials which will be included in the second version. The initial considerations for this phase are described in this document (Section 3.1.3) and will be updated in detail in subsequent work plans for the Framework.

The following sections describe the activities, mini-milestones and milestones in each of the three phases as well as potential risks and strategies to address those risks.

3.1.1 Co-design phase: setting the stage for the Framework (September 2020 – May 2021)

The first important phase, defined as “co-design”, implies a participatory approach in the conceptualization of the Framework. As mentioned above, this phase started in September 2020 when important activities⁵ were organized and ends with the submission of the disaster risk perceptions and vulnerability (DRPV, WP2), disaster risk management processes (DMP, WP3), disaster community technologies (DCT, WP4) methodologies (D2.3; D3.2; D4.2).

It should be considered that the Covid-19 situation had and still has an impact on all project-related activities, including the conceptualisation of the Framework. All the activities mentioned below were carried out on-line: ensuring co-creation and fostering a participatory approach only through on-line meetings and workshops required a significant effort from all partners and the results of those activities should be interpreted within the constraints of the current situation.

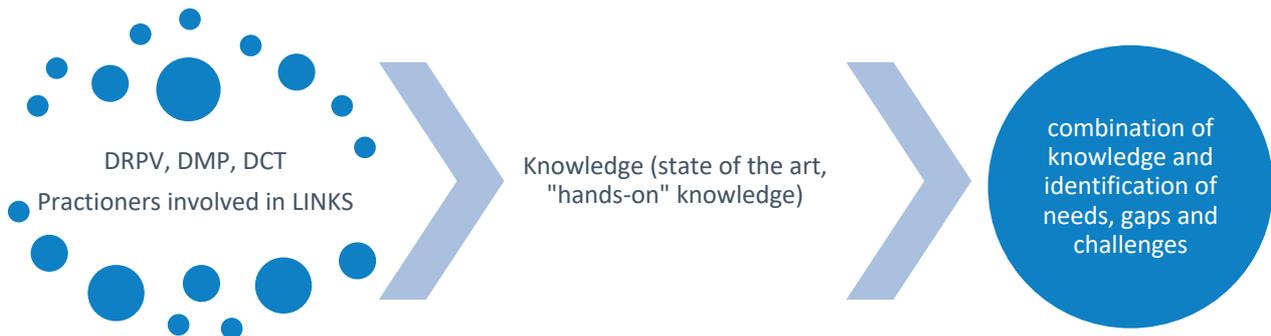
The co-design phase involves the following steps:

- Engaging in the discussions with partners revolving around the knowledge bases (WP2-4) and how the findings can be included in the Framework;
- Initiating discussions with the practitioners involved in the case assessments to understand the socio-cultural contexts, as well as needs, gaps and challenges experienced in their daily work. The discussions serve the double purpose of informing also WP6;
- Mapping and combining the findings and future directions for research identified in WP2-4 with the knowledge coming from the practitioners;
- Matching the outcomes of the “mapping and combining exercise” with general (at a project level) and specific objectives (LINKS Framework);
- Identifying the LINKS learning model at project level and at WP5 level;
- Engaging in discussions on the design and concept for the LCC with WP7;
- Engaging in discussions on the stakeholder analyses with WP8;
- Engaging in the methodological discussions (WP2-4).

The main elements of this phase are depicted in the figure below:

⁵ The activities mentioned in this Section were organised in the frame of T5.2 and started earlier than M6 which is the official starting date of the task.

Figure 4: Main elements of the co-design phase



Source: Authors contribution

The Framework cannot be conceived without an in-depth understanding of the three knowledge domains: DRPV, DMP and DCT. WP2-6 weekly meetings are being held, as a comprehensive overview of the rationale behind methodological decisions will play an important role in the development phase of the Framework. The mini-milestone, or the output of this activity, was a brainstorming meeting around the practical potentials of the Framework involving WP2-5 in February 2021. The aim of the brainstorming was to identify potential practical implications of D2.1, D2.2, D3.1 and D4.1 for the LINKS Framework through users' or stakeholders stories⁶ that can shed light on the helpfulness of the knowledge bases for a specific stakeholder. All stories were told from a practitioner point of view. From a WP2 perspective, the DRPV knowledge base can feed into the Framework by providing, for instance, learning materials and information on how risk perception varies in relation to disaster risk reduction (DRR) as well as education tools on DDR focused on the use of social media. Moreover, the DRPV knowledge can be useful to understand how to better engage with marginalised groups and how to promote mutual learning for minors and the elderly. From a WP3 perspective, the DMP knowledge base can offer best practices on, for instance, establishing a virtual operation support team (VOST) and guidelines for using VOST in disaster management processes. From a WP4 perspective, the DCT knowledge base can provide good

⁶ User stories are narrative told from the perspective of a potential future user.

practices on the application of technologies for reducing information overload, for assessing public sentiment through a list of tools for sentiment analysis.

The LINKS Framework is envisaged as a toolkit with ad-hoc learning materials structured by themes (such as the ones mentioned above). It is not a one-size-fits-all toolkit but rather it can be a dynamic tool that facilitates learning and can be accessed through the LINKS Community Center (LCC) in which the needs and experiences of potential users are shared. While the brainstorming meeting was an initial exercise, and more work is needed to refine the concept of the Framework and how the knowledge bases will feed into it, the meeting was important to start thinking in more practical terms about the outputs of the project.

A practitioner task force (PTF) was established in September 2020 with the aim of exploring needs, gaps and challenges of the practitioners. Seven PTF were organized between September and December 2020. The meetings provided a good overview of similarities and differences across countries as well as an overview of the “hands-on” knowledge of the practitioners. How this knowledge will feed into the Framework, will be described in detail D5.3 (November 2021). However, an example of preliminary results is provided in Annex I. Moreover, a Practitioner Workshop Framework (PWF) was carried out in October 2020, with the aim of thinking about the Framework in operational terms and of sharing thoughts and ideas on the effective use of SMCS in all phases of disasters. The participants were split in groups and were engaged in discussions around two scenarios: a wildfire in a camping area and how SMCS could be helpful in that context, the potential use of SMCS in preparing for a hurricane season on an island which has never been vulnerable to hurricanes. The main difference between the two contexts, beside the phases addressed in the scenarios (response in the first, preparedness and to some extent recovery in the second), was the socio-cultural factors. While in the wildfire scenario, digital volunteers were already active in the area, in the hurricane scenario the population was not familiar with the use of social media. The main outcomes are included in Annex II and provide an interesting overview on the potential role of social media for the workshop participants.

Understanding the expectations of the stakeholders is also essential and needs to be done at an early stage. In light of these considerations a Design Thinking Workshop was carried out in December 2020, in collaboration with WP7 and WP8. The goal of the workshop was to get a better understanding of users’ needs and expectations with a focus on the main components of the Framework, the LCC and the LINKS Community. The results – currently being analysed and for the LCC are already embedded in Kiehl et.al., 2021, D7.1⁷– are considered as the third mini-milestone in the co-design phase. A few takeaways to consider refer, *inter alia*, to the learning dimension of the Framework. The participants were asked to share their ideas with regards to “what they want to learn” from the Framework. The answers vary from strategies on how actively involve different

⁷ The structure of the workshop is described in D7.1

types of groups (citizens) to use more effectively social media, to get an understanding of the strengths and challenges of the use of social media in disasters.

The knowledge collected in these meeting may translate into the Framework by including learning materials which refer directly or indirectly to needs, gaps and expectations. If, for instance, the need for making sense of the sheer amount of data shared in social media during a crisis emerges, it will be properly addressed in the Framework through guidelines and tools that can help dealing with this challenge.

The next important step is the combination of two different and yet complementary domains: the “theoretical knowledge” emerging from the literature and captured in WP2-4 deliverables on the knowledge bases, with the “practical knowledge” of the practitioners. In this context, “combining” is not equal to “merging”. Instead, it is more of a “reality check” guided by one main question: how do the main outcomes from the knowledge bases resonate with the practical knowledge of the practitioners? To address this question, a workshop (cross WP5-6) will be organized in March 2021 (mini-milestone) involving WP2-4 leaders. The findings will contribute to identify similarities, differences between the gaps emerging from the literature and the gaps perceived by the practitioners in different socio-cultural contexts. In addition, those outcomes will be matched with the general and specific objectives at project and at WP level to address potential challenges and ensure alignment with a common vision. The expected outcome of this workshop is to agree on a comprehensive list of needs and gaps structured along thematic areas that will inform:

- The general methodological approach, meaning what will be achieved at project level and how (this would entail, for instance, taking key methodological decisions such as to what extent a comparative analysis across the cases can be done);
- The case-specific methodological approach. A variety of participatory approaches can be used in the cases based on case-specific objectives and on the expectations of the practitioners involved in the case assessments;
- Similarities and differences across the cases, namely common themes and differences in the thematic areas (especially in relation to the KBs).

After the workshop, the identification of the learning objectives shall start. There at least four different levels of learning that must be addressed:

1. The LINKS learning model (project level);
2. The LINKS Framework learning model (WP5);
3. The case-specific learning objectives (WP6);
4. The learning objectives from a technical point of view concerning the use of the LCC (WP7).⁸

⁸ Some learning needs and potentials have already been defined for the users of the LCC in D7.1.

While specific learning needs and objectives in each case will be discussed in the frame of WP6 (see D6.1), one of the tasks of WP5 is to set more general learning objectives for the LINKS Framework. To do this, it is essential to:

- Agree on the LINKS learning model, namely how sustainable advanced learning is framed in the project and how this relates to resilience. It can be foreseen that the WP2-6 workshop will also inform the overall learning objectives of the project through the thematic areas mentioned above. Activities (e.g. follow-up meetings) will be decided, as needed;
- Deciding how the LINKS Framework will feed into the learning model, specifically deciding the specific learning objectives of the Framework. These may include considerations for the learning objectives coming from the KB and for the learning materials in the Framework. This activity shall start in this phase and *ad-hoc* initiatives will be organised in the development and consolidation phase (see: Section 3.1.2);

Cross-WP meetings with WP7 and WP8 started in November-December 2020 and are on-going. From February 2021 on, the discussions will primarily revolve around ensuring synergies between the LCC, the LC and the Framework. This will entail taking decisions on the concepts of the LCC that will impact on the Framework (and the other way round), based also on the needs and potentials outlined in D7.1: for instance, “who” shall access “what”, “when” and “how” the LCC will enable the application and the evaluation of the Framework in local cases. Another important point is how the stakeholders involved in the case assessments will exchange their experiences in applying the Framework through the LCC. Here the involvement of WP8 is crucial for identifying and engaging with the relevant members of the LINKS Community. Not all these decisions should be made by May 2021, when the Design of the Concepts of the LINKS Community Center (D7.2) will be delivered. However, the design and conceptual foundations for the LCC will be established, and a structured decision process for the integration with the Framework must be followed moving forward. The mini-milestone to be achieved by May is to agree on key conceptual aspects regarding which processes the LCC will facilitate. This will require in-depth discussions on the type of learning experience that the LCC will support and requirements to facilitate sustainable advanced learning (for different stakeholders and purposes) should be agreed upon with WP7 until April 2021 to be included in the concept of the LCC (due in May 2021).

The involvement of WP8 is also key in this phase. While initial indications of the LINKS Community stakeholders have been provided in the frame of WP5 in relation to the objectives of the WP (Philpot & Reuge, 2020: D8.1), those indications may need revisions and bi-lateral discussions on the stakeholder analysis will be needed. For this purpose, monthly meetings with WP8 will be organised.

The engagement in methodological discussions that will lead to D2.3, D3.2 and D4.2 is also important. As explained above, these discussions are ongoing in weekly WP2-6 meetings. In particular focus is the levels at which the Framework should be evaluated in the cases, and how those levels feed into the methodologies.

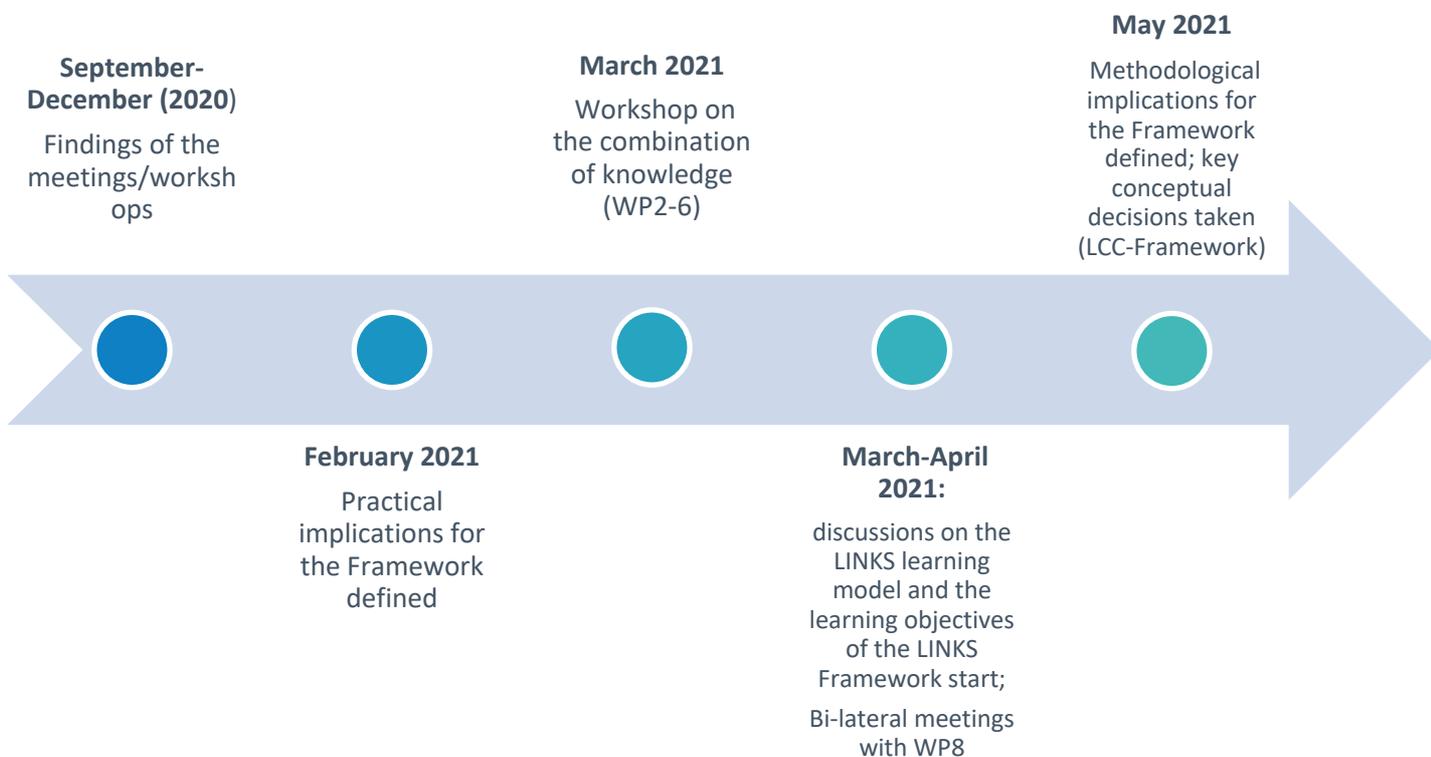
Table 1: The co-design phase

Steps of the co-design phase	Partners	Inputs	Output/Mini-milestones	Risks	Mitigation strategies
Implications of the knowledge base deliverables for the Framework	VU with WP2-4 leaders	D2.1; D2.2; D3.1; D4.1 -WP2-4 meetings	Brainstorming (WP2-6) and findings (February 2021); Minutes of the meeting, users/stakeholder's stories	The key takeaways of the brainstorming are too general with no direct implications for the Framework; The stakeholder stories are not helpful	This risk, identified before the brainstorming, was mitigated through stakeholder stories
Practitioner Task Force (PTF) meetings and workshops	VU with WP2-6 partners	Minutes, notes	Initial identification of gaps, challenges and needs (PTF meetings from September to December 2020); Findings of the workshop (December 2020)	The outcomes are not taken into account for the development of the Framework	WP2-6 workshop (see below)
Understanding stakeholders' expectations	VU with WP 7-8 leaders	Design Thinking Workshop (December 2020)	Findings of the Design Thinking Workshop (December 2020)	Stakeholders' expectations not aligned with the specific objectives of the Framework	Re-discuss expectations with users ensuring a common vision in the design phase
Combination of knowledge (theoretical and practical)	VU	Mapping exercise: knowledge bases knowledge of the practitioners (notes of	WP2-6 Workshop (March 2021); Expected outcome: comprehensive list of needs and gaps structured along thematic areas	Mismatch between the theoretical and the practical knowledge	Include in D6.1 intermediate steps in the preparatory phase of the case – based assessments to ensure that

		the PTF meetings)			researchers and practitioners do not work in silos (test assumptions before is too late). Organize a follow-up workshop with researchers and practitioners to address potential challenges
Implications of methodological decisions for the LINKS Framework	VU with WP2-4 leaders	D2.3 D3.2 D4.2 -WP 2-6 meetings	Internal document on the methodological implications for the LINKS Framework (May 2021), as needed	Delays in delivering the internal document on the methodological implications	Compile a lighter document with the main implications and/or topics which should be considered in the development of the first version of the Framework
The Framework and the LCC-LC	VU with WP7 and WP8	WP5-8 meetings	Outcomes of the meetings; Internal document on key conceptual decisions for the LCC (May 2021)	Poor synergies between WP5-WP8; Tech designs too complex to meet objectives of Framework	Re-discuss the overall rationale both behind the Framework and the LCC to ensure a common understanding; Set clear and realistic expectations early on of functionality and usability,

					usefulness of both components; Syncing the stakeholder analysis (WP8) with the needs of the LCC and the Framework
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Figure 5: Timeline of the co-design phase



Source: Authors contribution

3.1.2 Development and consolidation phase: the LINKS Framework (June 2021 – November 2021)

The second phase focuses on the actual development of the first version of the LINKS Framework, based on the outcomes of the co-design phase. As mentioned in Section 2.1, the first version of the Framework will mainly consist of the research design of the Framework, meaning that it will be focused on the research questions, the gaps and the methods to test the assumptions identified in the KB deliverables, as well as on the learning dimensions to be addressed in the Framework.

The most important steps in this phase are the following:

- Structuring the assumptions and the methods in a research design;
- Deciding the learning objectives of the Framework and the cases;
- Ensuring a common understanding of the research design before the case assessments;
- Delivering the first version of the Framework (D5.3) and ensuring alignment with the second iteration of the work plan for the five cases (D6.2) in November 2021.

The main elements of the development and consolidation phase are visualised in the figure below:

Figure 6: Main elements of the development and consolidation phase



Source: Authors contribution

The methodological deliverables (D2.3, D3.2, D4.2) pave the ground to this phase as they provide orientation for the overall research design of Framework. The methodological implications agreed upon in the co-design phase must translate into a systematic and coherent research design focused on:

- Assumptions (translated into research questions, gaps and themes to be assessed in the assessments);
- Methods for the case-based assessment of the Framework provided by WP2-4.

The definition of the research design (the first step of this phase), should follow the submission of the methodological deliverables. It can be foreseen that meetings and/or workshops with WP2-4 leaders will be required to develop a robust first version of the Framework. At least two mini-milestones are envisaged in this phase (cross WP5-6 activity): one workshop in June and one in

September. The aim of the first workshop will be to discuss the research design in each case related to the knowledge bases, while the second workshop in September will revolve around the presentation of a consolidated research design of the Framework from a WP5 and WP6 perspective. This will ensure, on the one hand, a shared understanding of the Framework, on the other it will offer the opportunity to discuss before the actual submission of the first version and to adjust it or improve it, as needed.

This activity will be coupled with a specific step which started in the co-design phase focused on the learning dimensions of the project. Based on the discussions on the learning models at project level and at WP5 level, and on the main takeaways of workshops and meetings carried out in the previous phase, the following activities will be carried out:

- Exploring already existing initiatives such platforms, networks, and toolkits on sustainable advanced learning with a specific focus on the project objectives;
- Matching the general learning objectives of the LINKS Framework with the learning needs and objectives of the stakeholders involved in the assessments (cross WP5-6: see D6.1).

To achieve these objectives, three mini-milestones are set:

- Deciding the LINKS learning model (level 1, see Section 3.1.1) and carrying out an explorative study on already existing initiatives focused on sustainable advanced learning with an emphasis on SMCS. The overall conceptual model should be ready by June 2021 at the latest and shared with LINKS partners. For the explorative study, support from WP7 will be needed, given the analysis on platforms included in D7.1. Even if the analysis in D7.1 has different objectives, the same approach (extended and targeted on the Framework) can be used also in the frame of WP5.
- Deciding the learning objectives of the Framework (level 2, see Section 3.1.1) in relation to the LINKS learning model and based on the outcomes of the explorative study. The added value of the Framework with regards to learning and how it will facilitate sustainable advanced learning shall be agreed upon by June 2021;
- In both cases key decisions must be taken before June 2021, to ensure capturing relevant aspects in the first version of the LINKS Framework in which the learning assumptions and needs will be included;
- Match those two levels of learning (at project level and at WP level), with case-specific learning objectives (cross WP5-6 activity, level 3, see Section 3.1.1). The outcomes of the matching exercise should be ready by July 2021.

The learning assumptions for the materials that will constitute the backbone for the second version of the Framework should also be decided by July 2021.

The outputs of these activities will be presented and discussed with all partners in a “Framework for Learning Workshop” that will be held in July 2021.

An important parallel process will take place with the active involvement of WP7 in the development and consolidation phase: deciding on how the LCC can facilitate both the access to the LINKS Framework and how it can ensure sustainable advanced learning. Notwithstanding that the learning materials will be included in the LINKS Framework only at a later stage, the learning objectives of the Framework must be supported by the LCC. This will require ongoing discussions on the type of learning experience that the Framework will support through the LCC to facilitate sustainable advanced learning (for different stakeholders and purposes).

Once a coherent research design and the learning objectives will be decided and discussed internally, external validation (via the LINKS Advisory Committee - LAC) will also be needed. At least one LAC meeting will be organised by WP8 at the end of September to get external feedback before finalising D5.3: a draft version will be made available one month before submission in October 2021.

D5.3 should go hand-in-hand with D6.2: the evaluation guidelines and the template for carrying out the assessments and the templates for reporting on the data collected in D6.2 will be based on the research design included in the methodological deliverables. Moreover, a set of both quantitative and qualitative KPIs should be identified together with WP2-4 and included in D5.3 to evaluate the effectiveness of the research design. In contrast with case-specific and more content-oriented KPIs decided by the case assessment teams in WP6, the KPIs that will be identified in WP5, will deal with more general and yet important aspects. For instance, the number of stakeholders involved in testing the assumptions, the number of gaps and of learning needs validated.

Table 2: Development and Consolidation phase

Steps: development and consolidation phase	Partners	Inputs	Outputs / mini-milestones	Risks	Mitigation strategies
Develop a coherent research design	VU WP2-4	WP2-4 methodology deliverables	Outcomes of the Research Design workshops (June 2021 and September 2021)	Lack of coherence: assumptions and methods are too diverse to be included in one Framework	To be dealt with in the co-design phase (workshops and meetings).
Decide the LINKS learning model (level 1) and the model for the LINKS	VU	Outcomes of the WP2-6 Workshops;	Overall learning objectives at project level and for the Framework	Challenges in identifying the LINKS learning models (level 1 and 2) and	To be dealt with in the co-design phase: engage partners in discussions on

<p>Framework (level 2).</p> <p>Match level 1 and level 2 of learning with level 3 (case-specific learning objectives)</p>		<p>Outcomes of the discussions carried out in the co-design phase;</p> <p>Exploratory study, learning needs and objectives in each case (WP6)</p>	<p>decided (outcomes of the exploratory study);</p> <p>Matching exercise with case-specific objectives (cross WP5-6) ready by July 2021 and shared with all partners at the “Framework for learning workshop” (July 2021). Outcomes of the workshop</p>	<p>potential mismatches with the learning objectives and needs in each case</p>	<p>the learning models;</p> <p>Ensure strong cooperation with the case assessment teams for the case-specific learning objectives (WP6)</p>
<p>The Framework and the LCC</p>	<p>WP5-WP7</p>	<p>D7.1; Outcomes of the workshop “Framework for learning workshop” (July 2021)</p>	<p>Refining requirements to enable and facilitate sustainable advanced learning</p>	<p>Lack of agreement on what the LCC can support and facilitate</p>	<p>To be dealt with in the co-design phase (see WP5-7 meetings).</p>
<p>Validate internally and externally</p>	<p>VU</p>	<p>Internal feedback from LINKS partners;</p> <p>Feedback from the LAC members</p>	<p>Outcomes of the LAC meeting (September 2021);</p> <p>Draft version of D5.3 shared internally in October 2021 (KPIs decided)</p>	<p>Feedback from the LAC meeting cannot be included/taken into account in the first version of the LINKS Framework due to lack of time;</p> <p>D5.3 not ready to shared internally in October.</p>	<p>Structure the LAC meeting along specific guiding questions to collect only relevant feedback that can be included;</p> <p>Share presentations instead of a draft version of a document-</p>

Figure 7: Timeline of the Development and Consolidation phase



Source: Authors contribution

3.1.3 Development of the second version of the Framework: including learning materials in the LINKS Framework (June- November 2022)

The case-based assessment of the Framework will take place in different socio-cultural contexts and in the frame of the following scenarios:

- Flooding in Denmark;
- Drought and terrorism in Germany;
- Earthquake in Italy;
- Industrial hazards in The Netherlands.

The assessments from November 2021 to May 2022 and will be done in WP6 (more information on what will be assessed is included in D6.1). As described in Section 2, the application of the Framework in local contexts is crucial to develop and to refine it according to the needs and the experiences with the Framework of several groups of stakeholders in four different European countries. More details are provided in D6.1 in which the work plan for the five cases is outlined.

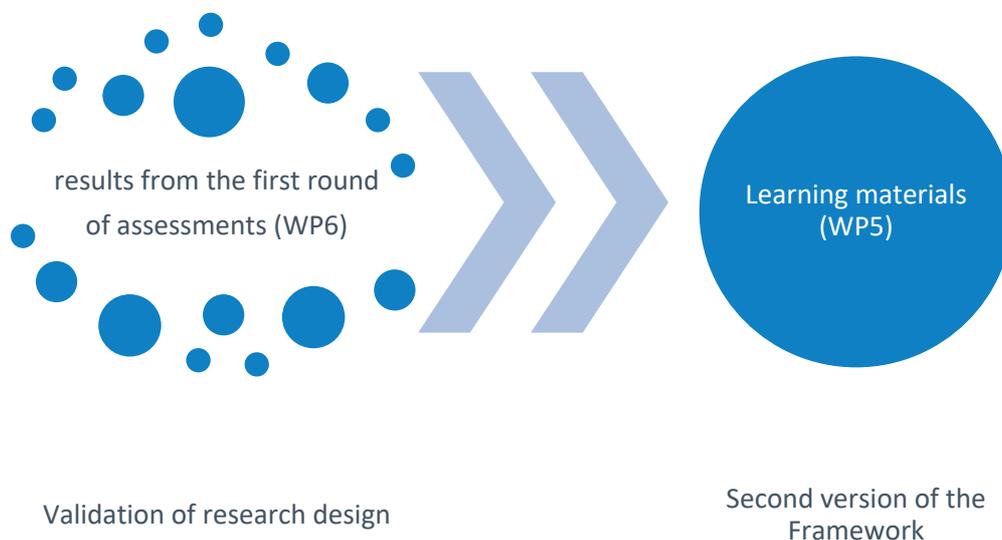
All the work and the activities carried out in the previous two phases (see: 3.1.1 and 3.1.2) and the results from the case-based assessment of the Framework (WP6) will pave the way to:

- the development of the second version of the Framework (D5.4);
- a revised version of the work plan (D5.2);
- the third work plan for the five case assessments (D6.3)

All due in November 2022 (the draft versions will be shared internally one month prior to submission).

The second version of the methodological deliverables (D2.4, D3.3, D4.3 due in September) is key in this context, since the LINKS Framework version two will be mainly focused on a set of learning materials that will be used in the second round of assessments based on the results from assessing the research and the learning assumptions in local cases. The key element in this phase will be the selection of the learning materials that will feed into the Framework, as visualised in the figure below:

Figure 8: Towards the second version of the LINKS Framework



Source: Authors contribution

This phase will consist of the following steps:

- Engaging in WP2-4 discussions on the implications of the results and providing inputs to the second version of the methodological deliverables based on D6.4 (First LINKS Case report);
- Identifying the learning materials that will feed into the second version of the Framework;
- Developing/providing the materials;
- Refining the sustainable advanced learning strategies for the LINKS Framework;
- Engaging in WP5-9 discussions on the overall sustainability strategy for the LINKS Framework;

- Revising KPIs so that those are more focused on measuring whether the Framework enhances the governance of diversity among the understanding of SMCS in disasters for relevant stakeholders;
- Deciding with WP7 when and how the learning materials will be integrated in the LCC; deciding also with WP2-8 who will get access to which materials in the second round of the assessments;
- Revising D5.1 based on the lessons learned on the application of D5.1 from February 2021 until November 2022;
- Delivering D5.2; D5.4 and D6.3 in November 2022

As in the previous phases, engaging with WP2-4 is crucial to get in-depth understanding on the implications of the results for the development of the second version. A workshop (LINKS Framework: The Way Forward) to discuss the future direction for the LINKS Framework will be carried out in July 2022. The aims of the workshop will be two-fold:

- Discuss the validation of the research design;
- Discuss the way forward for the LINKS Framework based on the results and lessons learned from the application in local cases. Given the different features of the second version of the Framework (learning materials *versus* research design), the methods should revolve around how to measure the learning experience of different types of stakeholders.

The discussions and the outcomes from the workshop will inform both the development of the second version of the Framework and the revised version of the work plan. Furthermore, a brainstorming after delivering D2.4, D3.3 and D4.3 will be needed.

The identification of the learning materials should start immediately after delivering D6.4 (May 2022). The selection of the main themes to be covered by the materials, as well as their development, depend on:

- The results from the first evaluation of the Framework, namely the case-based assessment of the Framework (e.g. methods and guidelines that can address the gaps validated in the first round of assessments);
- The decisions taken in the first two phases (level 1 and level 2 of the LINKS learning approach) in WP5;
- How to address case-specific learning objectives (level 3, WP6);
- How to meet learning objectives and needs through the LCC (level 4, WP7).

All WPs will be involved in the identification and in the development of the materials to ensure that both content (WP2-6), format and integration in the LCC (WP7-9) and the stakeholders needs (WP8) are properly addressed. It can be foreseen that relevant learning materials will be identified before June 2022, hence this activity may entail more refinement of the materials than a proper selection at this stage. This joint effort should go hand-in-hand with the definition of sustainable advanced

learning strategies and with the development of the overall sustainability approach for the Framework. While the final sustainability strategy will be delivered at the end of the project (included in D9.6 due in November 2023), it is key to initiate discussions and assess whether it is necessary to set-up a sustainability task force (STF) in the frame of T9.3. Collaboration with T7.5 is also key in this regard to identify networks, platforms and projects who will play a role in contributing to the success of the LINKS Framework. Additionally, the sustainability of the Framework critically depends on the sustainability of the LCC, hence a comprehensive approach to sustainability will be needed. At the time of writing, it is not feasible to include mini-milestones. Only a tentative timeline can be provided for both the learning and the sustainability dimensions: these steps must be carried out between May and September 2022.

Revising the KPIs decided in the development and consolidation phase is crucial. For the second version of the Framework, KPIs should be focused on several aspects, *inter alia*:

- Stakeholder (Users') endorsements (e.g. the effectiveness of the Framework in relation to the main objective);
- The applicability of the Framework in different contexts;
- The user-friendliness of the format and accessibility through the LCC, etc.

A list of KPIs should also be ready by September 2022.

The development of the second version of the Framework will also entail the integration of the learning materials in the LCC. This will be discussed before and after the submission of D7.4 in May 2022. Mini-milestones cannot be decided at this stage as the full implementation and all necessary steps will be discussed in due time. As soon as the learning materials will be ready, a structured decision-making process will be put in place, as a follow-up of the process which started in the co-design phase.

This phase ends with the delivery of D5.2, D5.4 and D6.3 in November 2022.

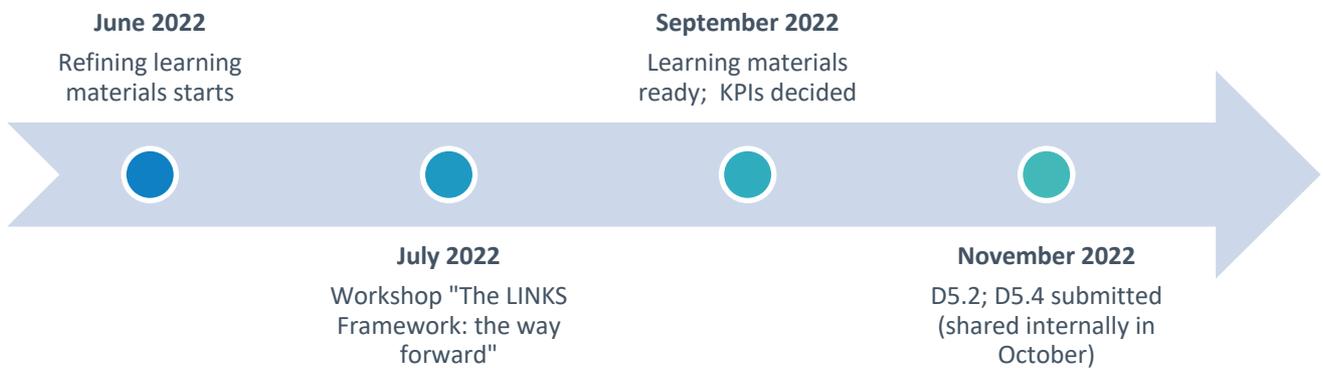
Table 3: Development of the second version of the LINKS Framework

Steps: development the second version of the Framework	Responsible partners	Inputs	Outputs / mini-milestones	Risks	Mitigation strategies
Engaging in WP2-4 discussions	VU with WP2-4 partners	D6.4	Minutes from the meetings, workshop and minutes of the	Challenges in identifying the way forward for the Framework;	Avoid the workshop and engage in focused discussions with

			LINKS Framework, the way forward (July 2022); Brainstorming after the submission of the second version of the methodological deliverables and minutes in September 2022	work overload due to too many activities to be carried out in parallel	WP2-4 partners; draft a light document to agree with them on the way forward
Refining and final developing of learning materials	WP2-9	D6.4; Main outcomes of the “Framework for learning workshop” (July 2022)	Learning materials ready by September 2022	Challenges in developing a set of learning materials that serve the learning needs of different types of stakeholders	Ensure strong collaboration with WP8
Sustainability strategy of the Framework	WP2-9	Draft version of D5.4	Outcomes of discussions with WP9	Sustainability not embedded in the second version of the Framework	Setting up a sustainability taskforce
Revising KPIs	WP2-6	D6.4, learning objectives, learning materials	List of KPIs ready in September 2022	Lack on agreement on what can/should be measured	Start discussing KPIs well in advance with relevant partners and agree on a realistic and short list of only the most relevant aspects that will be measured.

Second version of the LINKS Framework and the revised work plan	VU	D6.4 Minutes of the discussions, brainstorming sessions and workshops	D5.4 D5.2	Delays in delivery in the draft version of the Framework	Share presentations instead of a document if the draft version is not ready
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Figure 9: Timeline for the development of the second version of the LINKS Framework



Source: Authors contribution

4. CONCLUSIONS

In this deliverable, a step-by-step approach to develop the LINKS Framework is described. The work plan includes three phases, as well as inputs, outputs, risks and mitigation strategies from September 2020 until November 2022 when both a revised version of the work plan and the second version of the Framework will be submitted. D5.1 should be considered as a living document that will be adjusted, as needed, before submitting D5.2.

It goes hand-in-hand with D6.2 and it is worth noticing that there are many overlapping activities between WP5 and WP6. Redundancies in both documents are unavoidable.

If the step-by-step approach and the monitoring strategies will prove to be effective, D5.2 will rely on the same structure to develop a detailed work plan for the development and monitoring of the final version of the LINKS Framework. D5.2 will also include an assessment of the first version of the work plan: was D5.1 helpful? Was it realistic? Were the milestones achieved? What needed adjustment (e.g. phases, timeline)? Which activities were delayed and/or postponed? This exercise is needed to provide a useful and realistic work plan that will be applied until the end of the project.

D5.1 is in LINKS Share Point for all partners to consult and for the WP leader to update, as necessary.

5. BIBLIOGRAPHY

- Bonati, S. (2020). Vulnerability Knowledge Base. Deliverable 2.1 of *LINKS: Strengthening links between technologies and society for European Disaster Resilience*, funded by the European Union's Horizon 2020 Research and Innovation Programme (No. 883490). <http://links-project.eu/deliverables>
- Fonio, C., & Clark, N. (2021). First Work Plan for the five cases. Deliverable 6.1 of *LINKS: Strengthening links between technologies and society for European Disaster Resilience*, funded by the European Union's Horizon 2020 Research and Innovation Programme (No. 883490). <http://links-project.eu/deliverables>
- Habig, T., Lüke, R., Sauerland, T. & Tappe, D. (2020). DCT Knowledge Base – A consolidated understanding of Disaster Community Technologies for social media and crowdsourcing. Deliverable 4.1 of *LINKS: Strengthening links between technologies and society for European Disaster Resilience*, funded by the European Union's Horizon 2020 Research and Innovation Programme (No. 883490). <http://links-project.eu/deliverables>
- Kiehl, M., Lüke, R., Tappe, D., Gelhar, S., Habig, T. & Marterer, R. (2021). Report about the Needs and Potentials of LINKS Community Center. Deliverable 7.1 of *LINKS: Strengthening links between technologies and society for European Disaster Resilience*, funded by the European Union's Horizon 2020 Research and Innovation Programme (No. 883490). <http://links-project.eu/deliverables>
- Nielsen, A., & Raju, E. (2020). DMP Knowledge Base - A consolidated understanding of social media and crowd sourcing. Deliverable 3.1 of *LINKS: Strengthening links between technologies and society for European Disaster Resilience*, funded by the European Union's Horizon 2020 Research and Innovation Programme (No. 883490). <http://links-project.eu/deliverables>
- Pazzi, V., Morelli, S., & Bonati, S. (2020). Risk Perception Knowledge Base. Deliverable 2.2. of *LINKS: Strengthening links between technologies and society for European Disaster Resilience*, funded by the European Union's Horizon 2020 Research and Innovation Programme (No. 883490). <http://links-project.eu/deliverables>
- Philpot, J., & Reuge, E., (2020). LINKS Community Strategy. Deliverable 8.1 of *LINKS: Strengthening links between technologies and society for European Disaster Resilience*, funded by the European Union's Horizon 2020 Research and Innovation Programme (No. 883490). <http://links-project.eu/deliverables>

6. ANNEXES

6.1 Annex I – Preliminary results of the PTF meetings

The PTF meetings were conceived as a forum for discussion mainly concerned with one stakeholder group: the practitioners involved in the consortium. As outlined in 3.1.1, the task force was established in September 2020 with the aim of exploring needs, gaps and challenges of the practitioners. Each of the seven meetings held bi-monthly was chaired by a practitioner organization who delivered a presentation revolving around the socio-cultural context in which they operate, the use of SMCS and an overview of needs, gaps and challenges. The dates and the chairs of the meetings are captured in the table below:

Table 4: PTF meetings

PTF meeting – Date	Chair
17/09/2020	FRB, HRB
01/10/2020	PDT, SCIT
15/10/2020	DHPol
29/10/2020	SIC
12/11/2020	VRZL, ST
26/11/2020	CResD
10/12/2020	DPPI-SEE

While LINKS associated partners (CResD and DPPI-SEE) provided an overview of their research interests and projects (CResD) as well as of their wide range of activities (DPPI-SEE), practitioners' involved in the case assessments were asked to focus on some specific topics. The knowledge shared in those meetings will feed into the Framework as it provides relevant inputs and insights, as shown below. The notes have been restructured according to context and scenario-related aspects, direct or indirect inputs for the Framework and case-specific needs. It is worth noting that the results are **preliminary** and will be complemented by the outcomes of other meetings and workshops, especially those related to the KB outputs.

The preliminary results are captured in the table below:

Table 5: Preliminary results of the PTF Meetings

Chair	Context-related aspects	Scenario-related aspects	Inputs for the Framework	Case specific needs
FRB – HRB	<p>New comers (10.000/year)</p> <p>Vulnerable groups</p> <p>Tourists</p> <p>Significant amount of NGOs</p>	<p>Prevent damage originated from urban floods</p>	<p>Deal with vulnerable groups in effective ways (different information needs- more targeted communication);</p> <p>Sense making of the sheer amount of data shared via social media (how to combine with other sources, who should do it – AI or people);</p> <p>Legal framework (GDPR) and how to use the data;</p> <p>Improve public awareness, engagement and preparedness;</p> <p>Sharing data among several stakeholders in a more structured way;</p> <p>Leverage the intelligence of the crowd;</p> <p>Automating systems and processes</p> <p>Integration of local knowledge in practices. Activate and coordinate already existing</p>	<p>Gatekeepers (Local trained informants/influencers) to address misinformation;</p> <p>Community-based awareness. Organise minimum trainings (use SMCS as an entry point);</p> <p>Simulation tools;</p> <p>Improve public engagement and preparedness;</p> <p>Collaboration with associations and NGOs;</p> <p>Create more ownership;</p> <p>Coordination between authorities – on all organisational levels</p>

			initiatives (potential solution: Develop an ad-hoc platform / hub for reporting needs and coordinating efforts)	
PDT-SCIT	<p>Vulnerable group: the aged people represent between 30% and 40% of the entire population</p> <p>Social context: small villages in the mountains</p>	<p>The case assessment will focus on the risk of earthquake and potential disasters related to it (cascade effects and multi-hazards). The identified area is among the most prone and susceptible to the risk of earthquakes in Italy;</p> <p>the villages involved in the project, were affected by the 2016 earthquake which caused severe human and material losses and a large number of displaced people</p>	<p>Deal with vulnerable groups in effective ways;</p> <p>Address the generation gap on the use of SM: organize opportunities of mutual learning between young people and elderly people to sensitize them on DRR and the use of social media;</p> <p>Identification of official sources of information;</p> <p>How to deal with fake news;</p> <p>Overall improvement of risk and crisis communication management at different levels;</p> <p>Promote strategies to enhance young people participation in the decision making of DRR and</p>	<p>Promote knowledge of disaster risk reduction and sensitize communities on the use of technology for better DRR processes;</p> <p>Encourage the participation of children and young people in DRR processes;</p> <p>Promote an EMS which deals with the needs of different stakeholders (citizens, first responders etc.);</p> <p>Build the foundations for a “culture of safety” adopting a multi-age perspective and promoting inter-generational dialogue.</p>

			on the development of local emergency plans.	
DhPol	No standards on how communication flows among the police leader and the executive staff as well as media relations to the community	The focus will be on areas and stakeholders who have already been affected by or were in charge during past terrorist incidents: police, municipal, press, and public representatives in the German cities of Hanau, Halle, Munich and/or Berlin	<p>Communication gap: the social media team is not part of the press staff, this can lead to confusion (the same information is communicated differently to the public;</p> <p>public relations and crisis communication are not coordinated across the same districts);</p> <p>Develop an approach on how to use SMCS with a specific focus on how to prevent panic.</p>	Communicate with “one” voice
SIC	<p>No standards or guidelines available for the disaster management organisations to manage data from SMCS;</p> <p>Fire Brigade consists of a high number of volunteer firefighters who cannot</p>	Paderborn’s neighbour’s district suffered from this problem (drought) already. The potential of using social media to deal with drought may refer both to the preparation phase (raise awareness) and during the actual emergency (e.g. information	<p>Help overcoming information overload;</p> <p>How to filter relevant information;</p> <p>How to deal with ambiguities (language-wise)</p>	<p>Involve citizens in the communication processes (by defining “how”);</p> <p>Accessing local relevant information when disasters strike</p>



	<p>continuously monitor SMCS;</p> <p>Heterogeneous aspects in Paderborn: categorized as “big city”. Rural areas located around the city, airport, hilly areas, river through the city, railway tunnel, close to autobahn, railway station, high amount of industry, university city (high number of students)</p>	<p>about reducing water consumption during the summer)</p>		
<p>VRZL-ST</p>	<p>Chemelot communicates about unusual events on-site but transparency seems to have a negative impact on the perception of safety of the people off-site.</p>	<p>Industrial hazards</p>	<p>Deal with vulnerable groups in effective ways;</p> <p>Risk Communication vs crisis communication;</p> <p>Inform people on forehand so that they already know what to do in case of emergency and act upon the information (namely, performing the necessary /correct behaviour during an emergency);</p> <p>Find a balance between speed and</p>	<p>Building and maintaining a trustworthy and long-lasting connection between Chemelot, governmental organizations and residents so people in the region know on forehand how to act in case an incident occurs.</p>



			<p>quality of information and the role of social media;</p> <p>Using adequate communication channels to reach the most vulnerable</p>	
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6.2 Annex II – Main outcomes of the Practitioner Workshop Framework (21.10.2020)

The objectives of the Practitioner Workshop Framework (PWF) were two-fold:

- Sharing thoughts and ideas on the effective use of SMCS in all phases of disasters;
- Start thinking about the LINKS Framework in more operational terms.

To achieve the objectives, the workshops had the following structure:

- Practitioners worked in two separate groups on two different scenarios not directly related to LINKS cases to foster thinking “outside the box”. The participants were not asked to solve the crisis, but rather to think critically and discuss the key issues within the questions provided by the organizers;
- Each group had a facilitator, a spokesperson and two observers. The facilitators guided the participants and facilitated the discussions. The spokesperson(s) was decided by the groups before engaging in discussions. His/her role was to capture relevant aspects emerging during the scenario sessions and to speak on behalf of the his/her group during the last session. The observers were appointed to identify benefits and drawbacks of the overall organisation.

Participant organisations are listed below:

- DPPI SEE
- FEU
- FRB
- HRB
- LCU
- PDT
- SCIT
- SIC
- UCC
- UCPH
- UNIFI
- VU
- VZRL

In the key outcomes provided below, there are clear indications of expectations that will be taken into account when developing the Framework:

- **The role of social media (SM) in all phases of disasters.** Overall, there are both expectations and concerns about the use and the role of social media. Expectations include the possibility of getting real-time information about any kind of event while concerns

refer to “sense making”. The point is how to sort and rely on the information shared via SM. A social media manager can be of help as well as the use of artificial intelligence (technical tools are needed). A social media manager could wear the double-hat of working with the crisis team (e.g. forwarding relevant information) and effectively communicating with the public.

Setting up a crisis team without overlooking crisis communication management (first responders to citizens; citizens to first responders) has been deemed as crucial.

The role of SM should be addressed in a comprehensive manner: a) as a source of potentially relevant/useful information (from the citizens to the crisis team and also the other way round); b) to stop rumours or fake news through the help of *ad-hoc* volunteers; to create awareness (e.g. situational awareness). In the preparedness phase, a **Pan-European approach can also be helpful**: e.g. an app to inform either locals or tourists about potential risks in specific areas. **A centralized data hub** to collect information and coordinate actions can also be useful.

Trust is key, meaning that the early identification of trustable platforms/channels in which those affected by disasters can find information, but also having trusted **digital volunteers** to rely on is very important. Volunteers can support first responders in locating people in danger through e.g. photos but they can also provide operational information on priority needs as well as on the development of the situation (they can act as “operational teams”).

- **Researchers, policy makers and local associations:** how to work together in the preparation phase and in the recovery phase. The expectations towards key groups of stakeholders have been identified as follows a) researchers: they should collect and share important data (e.g. scientific evidence and best practices, analyses of the socio-cultural context); b) policy-makers: they should provide strategies on how to behave when a disaster strikes (e.g. emergency plans) and specific guidelines; c) local associations: they are familiar with the context, information on the area is expected from them. Involving technicians, or experts, may be needed as they could gather information from other important sources.

A participatory approach involving locals is key and collaboration with policy makers is unavoidable.

Tool and Toolkit. The word tool is associated with both technical and non-technical concepts. A tool is something to understand a given situation and potential risks. A tool can also help in overcoming a situation (for instance, providing assistance and support). It

should be ready and easy to use for citizens and organizations alike. “One” item cannot be useful on its own: one tool as such is not helpful.

A toolkit is a set a tools that can be used in all phases of disasters. The components differ from the preparation to the recovery phase, but it would be interesting to explore if there are tools that can be useful in both phases. **In the preparation phase**, technical tools, like early warning apps are an important element of the toolkit, together with videos, flyers, trainings (the meaning of siren signals), maps of the area and evacuation plans. Both traditional paper leaflets and SM channels are part of the toolkit as they speak to different social groups. In the **recovery phase**, the toolkit can be a way to connect people with the local municipality and/or a way to find official information from the authorities. There is a need to use/rely on different information sources to be as much inclusive as possible: involving locals to distribute leaflets as well as using SM to reach the youngest. Another component of the toolkit in the recovery phase can be crowdfunding: the toolkit can be used to help raise money. Additionally, it should be used by locals to report on the current situation so that the crisis team can act upon it.

Drawing on the outcomes, some relevant questions that can be addressed in the development phase of the Framework are:

- How do we ensure a participatory approach so that we can leverage on the existing local knowledge? How do we fit into existing networks?
- How do we ensure advanced-learning?
- How do we enhance knowledge sharing among the users of the platform?
- How do we address sense making when using SM? How do we stop rumours?
- Which guidelines and best practices are considered useful?
- If /How do we deal with crisis communication management?