

LINKS

Strengthening links between technologies and society
for European disaster resilience

D6.5 SECOND LINKS CASE AND BROADER CONTEXT REPORT

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 deliverable (6.5) focuses on the evaluation of the LINKS Framework in the case assessments. There are five cases in LINKS, in the frame of the following hazard scenarios:

- Earthquakes in Italy
- Industrial hazards in the Netherlands
- Drought in Germany
- Flooding in Denmark

- Terrorism in Germany

This deliverable provides a detailed overview and timeline of the activities carried out by each case in the second round of case assessments between November 2022 and March 2023. It highlights the products in the Framework on which each activity focused and the stakeholders involved. It reports on the activities, their outcomes, and their contributions to the overall development of the products (and Framework).

During this period, the cases identified the themes and sub-themes to connect their needs with user guidance in the Framework and the products that would assist them in addressing their needs.

- For the theme **engaging citizens**, the main sub-themes of interest were **mobilising citizens** and **collecting and analysing information**.
- While for the theme of **improving communication**, the sub-theme **targeting communication** was of most relevance.

As per the specific activities to implement the LINKS Framework and products, each case assessment team (CAT) developed activities engaging its stakeholder network. Additionally, CATs and product owners developed specific processes to discuss progress, issues, and preliminary results concerning the products and their applicability at the case level (in particular) and practitioner level (in general). They coordinated these processes through meetings with respective product task forces within the project.

All in all, the cases engaged in various activities, which led to valuable inputs for the products and for the cases. Below is an overview of key activities and thematic focuses per product, and highlights of the outcomes at case level.

- The **Feel Safe** product was part of workshops engaging children, teachers, and LINKS partners. They also included site visits. The overall inputs that the product received were connected to improvements in terms of content and layout. They received advice to improve the activities (aiming at their target group) already in the product, which led to improving its overall applicability. The activities for **Feel Safe** were aimed at **engaging citizens** (sub-theme collecting and organising information) and **improving communication** (sub-theme making information accessible) to school children in the Italian case. The outputs led to better ways for teachers and students to access information on SMCS communication via exercises and games embedded in the platform. The contributions to the product have the potential to increase disaster resilience by improving children's digital skills, community engagement and participation in disaster prevention, also at the scenario level of enhancing the understanding of Earthquakes.

- Regarding the **Including Citizens Handbook**, the cases and product owners organised workshops and activities to explore the product and its applicability, and to decide how to organize its content into a user-friendly format. The most relevant inputs for the product involved further interconnecting the four topics in which the handbook is divided (accessibility, mobility, awareness and volunteering), adjustments to its format, general aesthetics, and engagement of the different type of citizens potentially using the product. Overall, the activities for **Citizens Handbook** aimed at **engaging citizens** (sub-theme mobilising citizens) and **improving communication** (sub-theme targeting communication). The outputs of the activities could assist DMOs and citizen groups/organisations to access information on SMCS communication. They give the opportunity to improve the mobility and accessibility of vulnerable groups in their immediate surroundings (e.g., street, neighbourhood, area). The outputs and ongoing activities assist stakeholders (e.g. in the Dutch, Danish, and German (terror) cases) to better organise and optimize resources at the moment of mobilising citizens and targeting their communication.
- Concerning the **Technologies, Use Cases and Guidelines Libraries** (they are different products but with similarities and under the responsibility of the same product owner), the most salient activities were expert interviews, site visits, reviewing media coverage related to droughts, participating in conferences, testing and applying their content, feedback and testing in the LCC and meetings between the CATs and the product owners. The main outputs from the activities had to do with recommendations for some (minor) improvement in the usability and understandability of the products, adjusting the filters' wording, and general feedback to expand the content. Overall, the activities for the three **Libraries** focused on **engaging citizens** (sub-theme collecting and analysing information) and **improving communication** (sub-theme targeting communication). The outputs generated during the activities could assist DMOs in all cases to update, find, select and/or access information regarding SMCS communication. The ongoing activities provide opportunities for users to update the relevant Libraries and explore ways to make the products more sustainable.
- Regarding the **Resilience Wheel**, the main activities concerning this product were expert interviews, workshops with practitioners, and meetings between the CATs and the product owners. The main inputs concerned the adjustment of the vocabulary to the organisational jargon, explaining some key terms, feedback on usability, and simplifying the elements used to navigate the product. The activities for the **Resilience Wheel** mainly focused on **engaging with citizens** (sub-theme collecting and organising information). The recommendations generated during the activities provide opportunities to make the product more user-friendly. Using the **Resilience Wheel** in the ongoing case activities can assist the relevant stakeholders (e.g. Dutch and Danish

cases) in understanding their organizational practices by making them aware of their challenges and opportunities regarding SMCS technologies.

The above list provides a snapshot of the activities and outcomes in this period. More specific details on products and themes covered, activities, and outcomes related to the cases are found in Sections 2 and 3 of this deliverable.

This document is a public document and of relevance to external stakeholders (e.g., researchers, practitioners) who are engaged in research activities similar to those carried out in LINKS and are looking for guidance on subjects like planning and/or for practical information (such as guidelines) that can support their research.

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LIST OF ACRONYMS

Abbreviation/Acronym	Description
CATs	Case Assessment Teams
DCT	Disaster Community Technologies
DMP	Disaster Management Processes
DRPV	Disaster Risk Perception and Vulnerability
DMO	Disaster Management Organisation(s)
LCC	LINKS Community Center
LCW	LINKS Community Workshop
PO	Product Owner
SMCS	Social Media and Crowdsourcing
VOST	Virtual Operations Support Teams
WP	Work Package

DEFINITION OF KEY¹

Terms	Definition
Best Practices	This encompasses the preferred actions in a specific type of situation to efficiently and effectively achieve a certain objective. Best Practices may be formalised in internal policy documents such as handbooks and standard operation procedures and could be based on one or several lessons learned approved by decision-makers (definition builds on DRIVER+ terminology, LINKS Glossary).
Case	Context-based study, realised through fieldwork, to assess the LINKS Framework. A case implies an empirical inquiry that investigates a real-life hazard scenario (LINKS Glossary).
Case Assessments	The assessment of the LINKS Framework in local cases (LINKS Glossary).
Crowdsourcing	Describes a distributed problem-solving model where the task of solving a challenge or developing an idea gets 'outsourced' to a crowd. It implies tapping into 'the wisdom of the crowd' (definition builds on Howe, 2006; see also LINKS Glossary).
LINKS Framework	The LINKS Framework consolidates knowledge and experiences on the uses of social media and crowdsourcing in disasters, into products for relevant stakeholders. The Framework is accessible online through the LCC, and can be used by stakeholders to openly explore knowledge, or as a strategic planning tool for guiding disaster management organisations in their planning for using social media and crowdsourcing in disasters.
LINKS Knowledge Base	The outputs and knowledge obtained from the assessment of three knowledge domains. This knowledge is used to develop the LINKS Framework (LINKS Glossary).
Resilience	The ability of individuals, institutions, and systems to recover from disturbance and to develop and adopt alternative strategies in response to changing conditions (definition builds on Tyler & Moench, 2012; see also LINKS Glossary)
Scenarios	In LINKS, the scenarios are the hazards, contextualised in each case (case 1, earthquake, Italy; case 2, industrial, the Netherlands; case 3, drought, Germany; case 4, flooding, Denmark; case 5, terrorism, Germany). They are informed by methodological choices and are instrumental for the case-based assessments of the Framework as they are the real-life scenarios through which the LINKS Framework is assessed (LINKS Glossary)

¹ Definitions are retrieved from [LINKS Glossary - Links Project \(links-project.eu\)](https://links-project.eu).

Social Media

A group of internet-based applications that build on the ideological and technological foundations of the Web 2.0 and that allow for the creation and exchange of user-generated content (UGC). Forms of media that allow people to communicate and share information using the internet or mobile phones (definition builds on Kaplan & Haenlein, 2010; see also LINKS Glossary).

1. INTRODUCTION

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 social media and crowdsourcing (SMCS) in disasters. This is achieved through the creation of the LINKS Framework. The Framework can be accessed online via the LINKS Community Center (LCC) in includes the following products (D5.4 Fonio & Tzavella, 2022; D2.7 Luke et al., 2022):

- Three libraries revolving respectively around a) **Technologies**, b) **Guidelines**, and c) **Use Cases** related to SMCS in disasters;
- An **Including Citizens Handbook** focused on involving citizens and promoting more inclusive approaches in disaster risk management (DRM);
- The **Feel Safe** platform used to provide educational material to engage children in disaster preparedness activities, and to promote knowledge and good practices in Europe around children's rights during emergencies and participation in DRM.
- The **Resilience Wheel** facilitating initial discussions and assessments on how SMCS may support disaster management processes within and across organisations.

The Framework also provides user guidance² to the products for stakeholders, and supports strategic planning, by pulling out knowledge across the products in relation to two main themes and six sub-themes (D5.4).

1. **Engaging with citizens:** collecting and analysing information, mobilising citizens, mobilising volunteers;
2. **Improving communication:** targeting communication, ensuring the quality of information, making information accessible.

During the lifetime of the project the Framework is developed and evaluated in case assessments, through which it investigates different hazard scenarios: earthquakes, industrial hazard, drought, flooding and terrorist attacks. The second LINKS case and broader context report, D6.5, builds upon the results from the activities planned in the third and final work plan (D6.3 Larruina et al., 2022) which provided a breakdown of the steps and activities to take place across the second round of case assessments from November 2022 to March 2023. The case reports in this document provide the results from those case assessments.

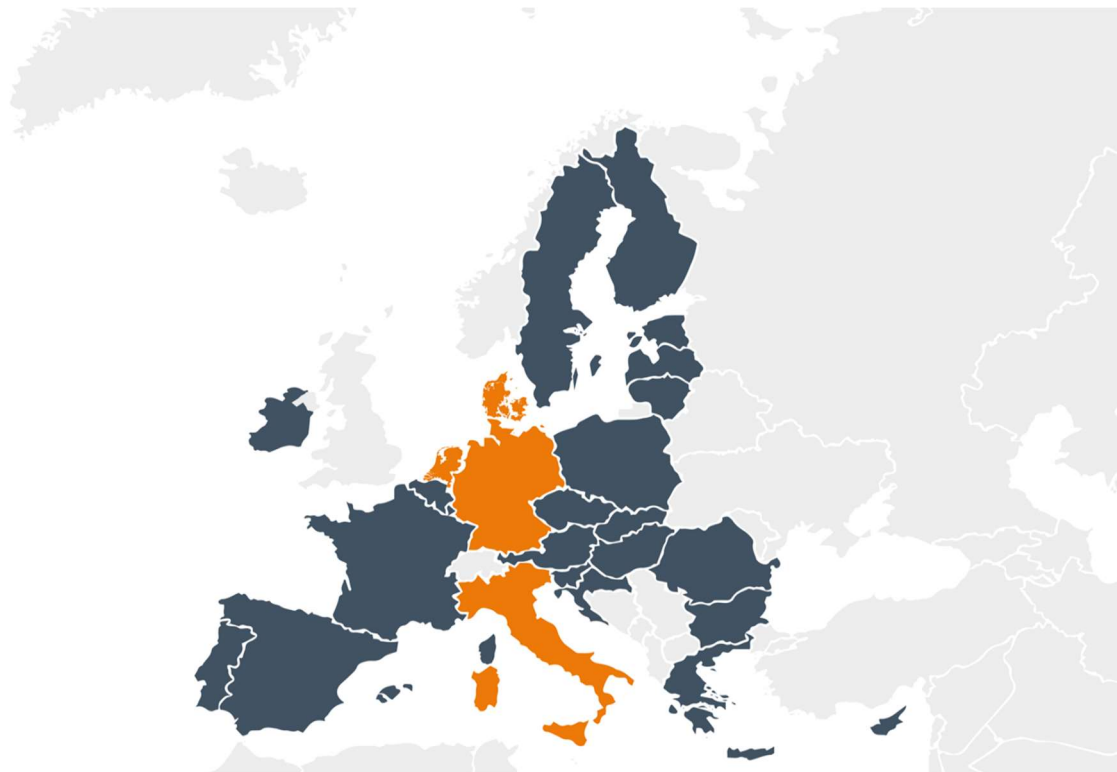
Building on the previous work of the cross-case and deep dive assessments in each case (D6.4 Clark et al., 2022), deliverable D6.5 is based on the second round of assessments, in which the

² In the course of developing and evaluating the LINKS Framework, the term user guidance has replaced the previous terminology “learning paths”.

collaboration between Case Assessment Teams (CATs) and relevant stakeholders in the cases (e.g., schools, police, fire brigades, municipalities, civil protection authorities) worked towards the ongoing development and use of the Framework and its related products through different case activities. In this regard, this document is also written together with the CATs. This collaboration is central to understanding the contexts of the different cases and for the organisation and execution of the activities across and within the different case communities. The second round of case assessments took place in the frame of the following hazard scenarios:

- Case 1: Earthquakes in Italy
- Case 2: Industrial hazards in the Netherlands
- Case 3: Drought in Germany
- Case 4: Flooding in Denmark
- Case 5: Terrorism in Germany

Figure 1: The LINKS Cases



1.1 How to Read the Document

This document is structured as follows:

- Section 2 provides a short overview of the research design for the second round of case assessments, and summarises the overall results from the assessments.
- Section 3 elaborates on the results of the CATs' planned activities for the five cases. This section provides detailed reports from the CATs in the second round of case assessments.
- Section 4 outlines the preliminary outcomes from the broader evaluation of the Framework.
- Section 5 provides conclusive remarks and an overview of the next steps for the project.

In addition to these sections, Annex I shows tables with an status overview of the case activities.

2. THE OVERALL RESULTS FROM THE SECOND ROUND OF CASE ASSESSMENTS

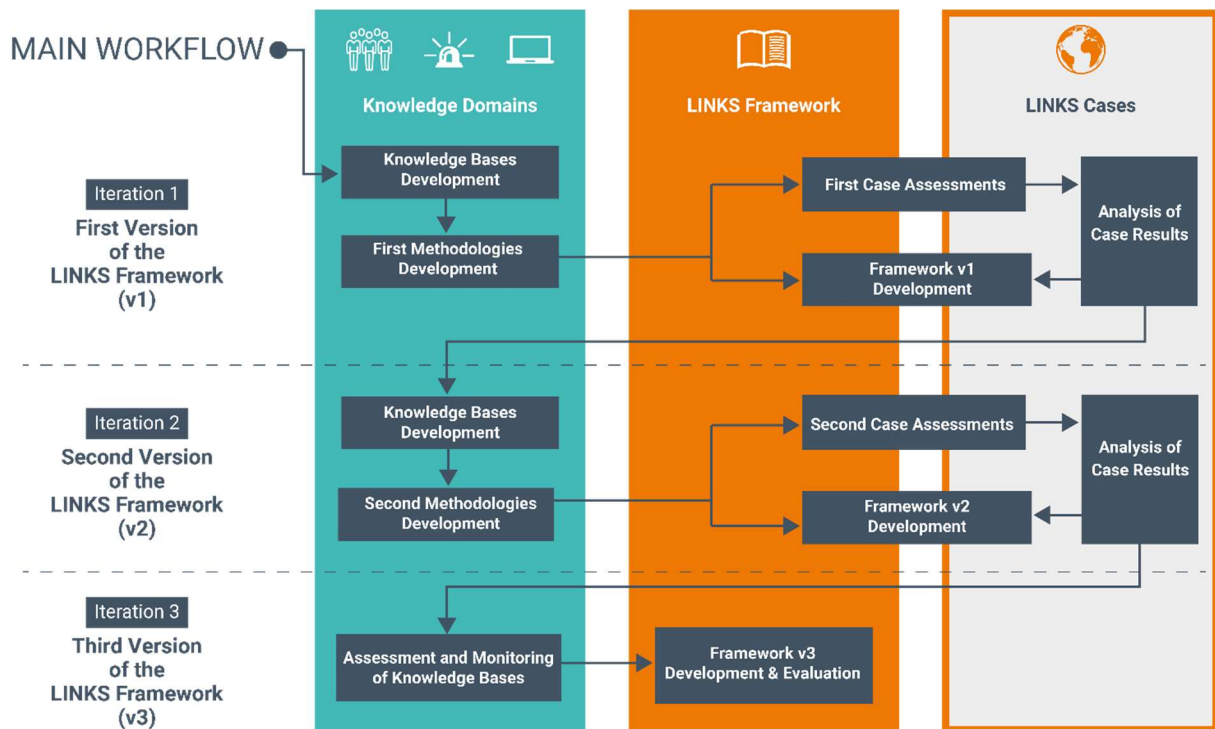
This section presents a short overview of the work processes and research design for the case assessments in the LINKS project. It also summarises the overall results from the second round of case assessments.

2.1 From the First to the Second Round of Case Assessments and the Broader Context

Following the LINKS workflow (Figure 2), the first round of case assessments and activities between November 2021 and April 2022 was based on the second work plan in D6.2 (Fonio & Clark, 2021). These rounds of assessments and consisted of both cross-case and deep dive activities applied in all cases (D6.4). The deep dives were additional assessments that allowed the CATs to focus more freely on what was relevant to their local context. Similarly, the second round of case-based assessments and activities between November 2022 to March 2023 was based on the final work plan in D6.3. This work plan built on the first round of assessments and on the existing work and outputs from the cross cases, and the ongoing deep dive activities (D6.2).

The results from the second round of case assessments contribute to further developing the three knowledge bases (Disaster Risk Perception and Vulnerability, DRPV; Disaster Management Processes, DMP; Disaster Community Technologies, DCT). The user guidance and products in the Framework were also improved and are being consolidated in a third and final version of the Framework, accessible in the LCC.

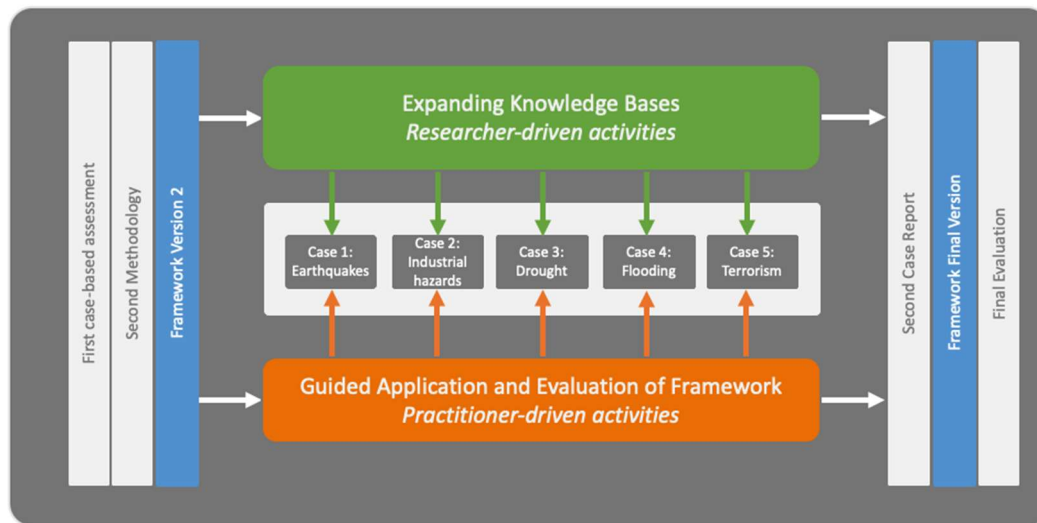
Figure 2: LINKS Workflow



D6.3 moved towards the specific case needs and challenges that were contextualised in the LINKS Framework themes and on the development of products. The second round of case assessments were conducted through the guidance of the second methodology (D2.7), which builds from the results of the first case assessments and the experiences and organisational setting of the practitioners in the LINKS consortium. The second methodology was designed considering the three knowledge base perspectives (social, institutional, and technical) and through researcher and practitioner-driven activities.

Combining research with practice in the second methodology allows the generation of new knowledge in a methodological manner (research-driven activities) at the same time that it permits further testing and co-producing results from the first phase of the project directly with practice (practitioners-driven activities) (D2.7) (see figure: 3).

Figure 3: Research design for second round of case assessments



Source: D2.7

In the second round of assessments, the collaboration between CATs and relevant stakeholders in the cases had a crucial role in developing activities, contributing to the products, and the use of actionable results from the project. The CATs validated and applied the knowledge and experiences included in the Framework within their organisations and the local communities. At the practical level, the cases assessed how the Framework could be applied in their operations. The application entailed exploring the respective user guidance and implementing and improving the products that can address the organisation's needs.

Considering the practitioners' needs and objectives alongside the user guidance in the Framework also allowed the practitioners to participate in developing and adjusting the products. This approach aimed at the local application, participation, and implementation of the LINKS results and at addressing the needs and expectations of the CATs. While the case assessments are primarily practitioner-driven, they were facilitated and implemented at the case level with support from the knowledge bases (WP2-4), and in close consultation with the product owners and product task forces set up around the development of specific products (see Annex I). The methodological task forces set up earlier in LINKS have merged into the product task forces. CATs and product owners discussed preliminary results, the development of the products, how they can be used by the CATs and their stakeholders' network, and possible issues regarding using the products in practice. These interactions directly facilitated the coordination of the co-creation process of products at the case level.

2.2 The Implementation of the LINKS Framework at Case Level

As outlined in D6.3, the implementation of the LINKS Framework and its products (**e.g., SMCS Technologies Library, Guidelines Library, Use Cases Library, the Including Citizens Handbook, Feel Safe and the Resilience Wheel**) entails three steps:

1. The **preparatory activities**, which mainly refer to the selection of the focus for the application based on the needs and aims of the CATs. More specifically, on the stakeholders (e.g., practitioner organisations) involved in the CATs.
2. The **application of the Framework**, at the case level, revolves around all the activities carried out by the CATs that led to one or more outcomes, including the improvement of the core components of the Framework (the products).
3. **The evaluation of the Framework** relates to the actual outcomes (e.g., how the products have been adopted) and the activity impact.

Step 1 took place from August to October 2022, and step 2 was from November 2022 to March 2023. Step 3 presents the outcomes of the previous steps (D6.5). The following subsections present the connection between the needs of the cases with user guidance that assists in identifying a product in the Framework. Identifying and utilising a product has implications for the outcomes and impact of the Framework application.

The main sub-themes of interest in the **engaging citizens** theme were **mobilising citizens** and **collecting and analysing information**. While **targeting communication** was the sub-theme of more interest under the theme of **improving communication**. The CATs focused on different products, and the work led to changes in terms of content, graphics, prioritization of themes, adjusting vocabulary to specific populations and general recommendations regarding improvement in usability and understandability. Table 1 provides an overview of the key focuses per case in terms of products and themes in the Framework. It should be noted that the cases also conducted activities in relation to other themes and products, those specific details can be found in the individual case reports in Section 3.

Table 1: Overview of Key Themes, Sub-Themes, and Products Per Case

Case	Theme	Sub-theme	Product (s)
Case 1: Italy	Engaging with citizens	Mobilising citizens	Including Citizens Handbook
	Improving communication	Making information accessible	Feel Safe
Case 2: Netherlands	Engaging with citizens	Mobilise citizens	Including Citizens Handbook

		Collecting and analysing information	Feel Safe
	Improving communication	Targeting communication	Including Citizens Handbook
			Feel Safe
Case 3: Germany	Engaging with citizens	Collecting and analysing information	Technologies, Use Cases and Guidelines Libraries
	Improving communication	Targeting communication	Technologies, Use Cases and Guidelines Libraries
Case 4: Denmark	Engaging with citizens	Collecting and analysing information	Resilience Wheel
	Improving communication	Targeting communication	Technologies Library
Case 5: Germany	Engaging with citizens	Collecting and analysing information	Technologies and Guidelines Libraries
		Mobilising citizens	
	Improving communication	Targeting communication	Including Citizens Handbook

In the sub-sections below, a short overview of the main outcomes from each case in relation the Framework themes and products is provided.

2.2.1 Case 1: Italy

In the Italian case, considering the stakeholders involved, the uses and challenges in applying SMCS were identified more in relation to the local context than to one specific organisation.

The main challenge refers to digital education that must be strengthened to:

- Increase children's digital skills for disaster resilience
- Increase community engagement and participation in disaster prevention activities
- Enhance resilience through innovative products and platforms
- Improve the understanding of the uses of SMCS with a focus on mobility and accessibility.

The main themes of the LINKS Framework (**engaging with citizens and improving communication**) are of particular relevance here, emphasising (sub-themes) **mobilising citizens** and **making information accessible**. The products that can serve the purpose of overcoming the challenges mentioned above and that were co-created, assessed and used in the activities are **Feel Safe** and the **Including Citizens Handbook**. The expected outcomes were, on the one hand, a shift in children's role in disaster risk management, resilience and prevention activities thanks also to **Feel Safe**. On the other, the validation of the **Handbook** with DMOs willing to improve mobility and accessibility at the local level. Relevant stakeholders can be guided towards helpful resources by following the user guidance questions around **targeting communication** and **mobilising citizens**.

2.2.2 Case 2: The Netherlands

In the Dutch case, the uses and challenges in applying SMCS were considered concerning specific target groups: healthcare organisations, businesses, and schools (Please see D5.4 section 2.2.2; User Story 2). For healthcare organisations, SMCS has the potential to provide with the swift and direct information they desire, in the event of a chemical incident. For businesses, social media has the potential to improve the risk awareness of their staff and customers. This, in turn, will allow for easier management of staff and personnel in the event of chemical incident. For schools, if done correctly, SMCS has the potential to provide a means of improving the communication between the disaster management parties and the various schools. SMCS also has the potential of providing a network of communication between the schools themselves. Proper agreements between different schools are vital in avoiding confusion during a chemical incident. Overall, the communities living around and/or close to Chemelot may benefit from more coherent and structured uses of social media. Both themes of the Framework are deemed important, and specifically focusing on **targeting communication** and **collecting and analysing information** when it comes to, e.g., active and already existing (online) stakeholders. Learning how to **mobilise citizens** is also helpful. The products in the LINKS Framework that can be most useful, considering the context and its needs, are the **Including Citizens Handbook** and **Feel Safe**.

2.2.3 Case 3: Germany (Drought)

In the German case of drought, the potential usages and challenges of SMCS were also considered, particularly for specific target groups such as rural fire brigades and local authorities. For rural fire brigades, the potentials of SMCS were monitoring and analysing data from different platforms for all phases of a disaster: as early warning systems (before), for improved situational picture (during) and for exchange of experiences and status (after). The sharing of gained knowledge and experiences with other relevant stakeholders is also a goal of the drought case (possible via the Use Cases Library). For local authorities, the challenge was improving communication and collaboration among different stakeholders, including

local communities, emergency responder organisations, and civil society organisations, to better respond to the impacts of drought. The main challenges in the case were identified and supported by the consideration of relevant institutions like DWD, UBA and BBK, which deal, among other things, with climate change and drought:

- Strengthening the collaboration between various actors
- Development and communication of measures to improve crisis prevention and management
- Improved application of the identified SMCS potentials in operational practice.

Overall, the LINKS Framework can provide guidance through the three SMCS Libraries (**Technologies, Use Cases and Guidelines**) to better **target communication** and to **collect and analyse information** from active SMCS platforms.

2.2.4 Case 4: Denmark

The Danish case considers the potential usages and challenges of SMCS, particularly for specific target groups. The case wants to understand the communication between professional actors, NGOs, and citizens concerning crisis preparedness and response in the case of flooding (Please see D5.4 section 2.2.1; User Story 1). The case chose the Framework path of **engaging with citizens** to achieve its aims. The path was used to find technological options to implement social listening, which relates to the subtheme of **collecting, and analysing information**. The **Technologies Library** narrowed down the options, which helped the case to select and try several technologies. Currently, the municipality of Frederiksberg uses one of the technologies tested. Also, through different workshops, the case tested the **Resilience Wheel**, which relates to the path of **improving communication**. The workshops showed that the **Resilience Wheel** works well to uncover organisations' digital and inclusive maturity improving communication, but can also relate to the path of **engaging citizen**. The participants in the workshop became aware of their strong and weak points in terms of using SMCS technologies. The workshops helped them to see where they lacked methods, strategies, guidelines, and digital tools, which is e.g. related to the subtheme of **targeting communication** in flooding related situations. The experience from the workshops showed that the wheel was fully developed, yet it requires local and linguistic adaptations to be used in individual countries. The LINKS Framework can assist in the context of the Danish case and the respective user guidance **engaging with citizens** and **improving communication**. Considering the case's context and needs, the **Technology Library** and the **Resilience Wheel** are the more valuable products. From the case, HBR participated in the development of the Citizens Handbook, which relates to the learning path of **engaging citizens** (subtheme mobilising citizens) and the learning path **improving communication** (subtheme targeting communication). A work that has strengthened the production of the handbooks.

2.2.5 Case 5: Germany (Terrorism)

For this German case, the potential usage and challenges of SMCS concerned law enforcement groups (police spokespersons, police educators, officers in charge of the development of SM, and crisis communication strategies). It also tried to address the perspective of citizens potentially affected by terrorist attacks as well as volunteers willing to assist during major police operations. Of the main challenges identified by research participants, some relate more broadly to structures within the police in general, while some address the specificities of terrorist attacks:

- Unlike other hazards, a terrorist attack features a perpetrator or group of perpetrators that might be monitoring social media, too.
- Terrorist attacks are prone to foster the spread of rumours and deliberate false information. Thus, verification tools and strategies and/or external assistance to rate the credibility of information are needed.
- Yet, credible and well-intended information also posed problems during recent attacks because police units were confronted with too many of them; tools and processes to cope with information overload are needed.
- However, information within law enforcement units cannot be handled as it is in other organizations due to security protocols: much tactical information is classified. It must not be shared with, e.g., volunteers, many workstations must not have internet access etc. Thus, the development of new guidelines and workarounds is needed.

Accordingly, the terrorist attacks touch upon most themes of the LINKS Framework. For terrorism resilience, the relevant stakeholders can be guided through the user guidance focusing on **collecting and analysing information, targeting information**, and also **mobilising citizens** and helping them to engage with the **Technologies** and **Guidelines Libraries** (to identify tools and workarounds to cope with information overload and rumours) and the **Including Citizens Handbook** (to develop strategies to tailor information and/or outsource tasks to volunteer communities).

In the next section, a summary of the results from the implementation of the LINKS Framework in the five cases is presented. The section focuses on the activities carried out and the inputs that these activities generated for the development of the products with the Framework.

3. CASE ASSESSMENTS REPORT

3.1 Summary of the results from the cases

This section presents a summary of the results from the implementation of the LINKS Framework and products in the five cases. Then there is elaboration on the specific activities developed by each Case Assessment Team (CAT) within its stakeholder network.

CATs and product owners have developed specific processes to discuss progress, issues, and preliminary results, concerning the products and their applicability at case level (in particular) and at practitioner level (in general). These processes were coordinated through meetings of the respective product task forces.

3.1.1 General overview of activities and inputs for the products

The following table presents an overall overview of the activities carried by the CATs and the inputs for the products from November 2022 to March 2023. Table 2 presents the LINKS products, the activities organized by the CATs, and the overall inputs for the product that the activities have contributed to.

Table 2: Overview of Activities and Inputs for the Products

Product	Activity	Inputs for the Product
Feel Safe	Workshops with children (IT ³) Workshop with teachers (IT & NL ⁴) Workshop with LINKS partners (NL) Site visits (NL & DE ⁵)	Improvement in terms of content (activities and other resources) and graphics Feedback about the layout and improvement of the activities already existing Feedback about applicability
Including Citizens Handbook	Ambassadors program (NL) Co-creation of content to decide the overall themes (NL, DK ⁶ & IT) CAT meetings/workshop with product owners (DE ⁷ , NL, IT & DK)	General awareness and exposure to the product Selection of overall four themes in which the handbook is divided

³ Italian case

⁴ Dutch case

⁵ German case on drought

⁶ Danish case

⁷ German case on terror attacks

		<p>Selection of format, general aesthetics and accessibility</p> <p>Feedback on visuals and management of different stakeholders</p>
Technologies Libraries	<p>Expert interviews (DE1)</p> <p>Live demonstration with PublicSonar (DE1)</p> <p>Site visits (NL & DK)</p> <p>Review recent and current drought reports from different media outlets (DE1)</p> <p>Participation in conferences and congresses (DE1)</p> <p>Testing and application of technologies (DE1 & DK)</p> <p>Feedback and testing in the LCC (DE1)</p> <p>CAT meetings/workshop with project owners (NL, IT & DE2)</p>	<p>Validation of the entries of the PublicSonar technology and slight refinement of the function categories</p> <p>Recommendations regarding minor improvements in usability and understandability</p> <p>Improvement and usability (e.g., refinement of the filter logic)</p> <p>Identification of different improvements (functions, how to suggest and add new technologies)</p> <p>Adjusting the wording of the filters and discussing and planning the content to be added</p>
Use Cases	<p>Expert interviews (NL)</p> <p>Site visits (NL & DK)</p> <p>Review recent and current drought reports in different media outlets (DE1)</p> <p>Development of the example use case (DE1)</p> <p>Participation in conferences and congresses (DE1)</p> <p>Testing and application of the technologies (DE1 & DK)</p> <p>Participation in internal workshops/meetings (IT, NL, DE1 & DE2)</p> <p>Searching and selecting new cases (D1 & DE2)</p>	<p>Recommendations regarding minor improvements in usability and understandability</p> <p>Feedback on improvement and usability (e.g., refinement of the filter logic)</p> <p>Improvements to the filter system or options for automatic translation are planned</p> <p>Creation of a template to contribute new use cases to the Guidelines Library</p> <p>Adjusting the wording of the filters and discussing and planning the content to be added</p>

		Content expansion
Guidelines Library	Site visits (NL & DK) Expert interviews (DE1) Participation in conferences and congresses (DE1) Feedback and testing in the LCC (IT, NL, DK, DE1 & D2)	Recommendations regarding minor improvements in usability and understandability Improvement and usability (e.g., refinement of the filter logic) Improvements to the filter system
Resilience Wheel	Expert interviews (NL) CAT meetings/workshops with project owners (NL, DK & DE2) Workshops (NL & DK)	The language used must be adjusted to the organizational sphere/language use The terms might need some explanation Overall feedback about usability Reduction of the number of drivers Simplification of the drivers

3.2 Results from the Cases

This section offers a comprehensive status update on the activities at the case level. While the activities in this report took place from November to March, some started earlier because they were linked to the ongoing activities in the deep dives. Each case first provides a short update since the last deliverable (D6.3) and then provides a summary of the outcomes of their activities and how those feed into inputs for the products. The summaries are followed by tables detailing the activities developed by each case, their expected and actual outcomes and how these outcomes contribute to inputs for the products. The update for each case ends with an elaboration of the next steps for each of the cases.

3.2.1 Case 1: Italy

Figure 4: Case 1: Location, Stakeholders, and Focus



The Italian case study focuses on earthquakes and is geographically located in the Umbria region of central Italy, comprising some of the country's most earthquake-prone areas. The Italian CAT has conducted nine workshops with students from the secondary school Fanciulli and two LINKS Community Workshops (LCW). The first LCW was a presentation of the project to the community and served to collect data from key stakeholders around gaps and needs. A focus group was also conducted to discuss using social media and technologies in earthquake prevention and response. The main gaps identified pointed to the lack of social media communication management guidelines, especially during the first phases of a disaster. The second LCW was meant as an intergenerational activity to bring together children and practitioners to discuss disaster management, more inclusive preparedness, and the use of technologies in risk management. The workshops with the secondary school and the LCWs were used to steer the co-design of two of the LINKS products: Citizens Handbook and Feel Safe.

3.2.1.1 Overview of the outcomes of the activities in this period

During November 2022 and March 2023, the Italian CAT conducted two workshops with the secondary school Fanciulli. This activity involved the children in a participatory approach to co-design, with several rounds of feedback from the children. An exchange visit to Chemelot

Site in the Netherlands and a visit to the Risk Factory. Both visits were extremely useful in acquiring knowledge and inspiration on chemical risk prevention/response for working with children on Disaster Risk Reduction. The case carried out a workshop with the Italian Association of Geography Teachers in Florence. This event provided the opportunity to present the LINKS project and test Feel Safe with approximately 90 teachers. The CAT presented the LINKS project and Feel Safe to thematic experts as well as the general public in the RESIFEST (Resilience Festival) in Gorizia.

A workshop with the LINKS partners was conducted in November 2022 to co-design Feel Safe and test a selected number of resources. The feedback and inputs received by the partners were extremely helpful. They will be integrated in the future iteration of the platform.

All the activities mentioned above supported the development of Feel Safe. Feel Safe aims to increase boys' and girls' awareness of Culture of Safety and Resilience and their engagement in disaster prevention and preparedness. The website is organised into 5 thematic areas: reducing vulnerability, being prepared, increasing awareness, communication emergencies, and natural disasters. Each area will include individual, group activities, online tools, and multimedia support for a more immersive understanding and experiential approach.

As for the status of the Including Citizens Handbook, two out of four parts are developed by UNIFI (Accessibility⁸ and Mobility). UNIFI is also in charge of the final development of the full product. For this reason, UNIFI is collaborating with UCPH and UCC (Awareness and Volunteering) regularly through online meetings involving WP5. The integration of the LCC and the Framework is ongoing. As for the part on Mobility, UNIFI has provided a first outline, which was implemented within the first half of March 2023.

⁸ Already available

Table 3: Outcomes of the Activities from October 2022 to March 2023

Activity	Date	Expected Outcome	Outcome	Input for the Product
Workshops with children: Consultation on Feel Safe .	October	<p>The Italian case hopes that Feel Safe can officially be introduced into the school curriculum.</p> <p>The workshop will be a consultation and co-design with children and their teachers. Participants were accompanied in a guided discovery of the product Feel Safe and asked for feedback and inputs using a playful and participatory methodology.</p>	<p>The case was able to spend 9 hours over 3 workshops dedicated to exploring the product and co-creating ideas together with a group of 45 children in total. Numerous feedback was collected to improve the product layout and content.</p>	<p>The co-design session improved Feel Safe in terms of content (activities and other resources) and graphics. For instance, children suggested interesting graphic solutions related to the choice of characters, the colours of the panel, and some other features. They also gave useful tips on the activities they would like to be engaged in at their school.</p>
AIIG ⁹ Workshop: Consultation on Feel Safe with teachers	October	<p>The case would like schools to use Feel Safe and introduce it in their curriculum. They would also like to see schools adopting</p>	<p>Approximately 60 teachers participated in the workshop, providing feedback and helpful comments and testing some of the resources proposed in the</p>	<p>General feedback was provided about the layout of Feel Safe. Moreover, some of the product's activities were tested with the teachers, and they provided recommendations for quality improvements. For instance, they</p>

⁹ *Associazione italiana insegnanti di geografia* (Italian Association of Geography Teachers)

		a more innovative and child-friendly approach to risk management.	product. The teachers believed that the product could help them implement DRR activities in their schools.	suggested changing some of the activities' objectives and texts to make the activities more relevant, fun and applicable.
Resilience festival in Gorizia (RESIFEST)	October	The case would like schools to use Feel Safe and introduce it in their curriculum. They would also like to see schools adopting a more innovative and child-friendly approach to risk management.	Participants were informed about LINKS and its main products and research findings. They were invited to get in touch with the project.	Feel Safe was not presented in detail.
Feel Safe workshop with LINKS partners	November	Use the contributions from multi-sector disciplines and experiences to contribute to the development of the product	15 participants had the chance to get a deeper understanding of the Feel Safe approach to risk management and reflect on the applicability of the tool in their country.	General feedback was provided about the layout of Feel Safe . Moreover, some of the product's activities were tested with the teachers, and they provided recommendations for quality improvements. Partners discussed solutions to improve the applicability of the product in their local context. They also addressed interactive features that could be added to the product to make it more fun, appealing and easy to use.
Exchange site visit to the Netherlands	January	How can you mobilise citizens? This case wanted to get ideas from the Risk	The visit was useful to better understand the partner's expertise and to get to know	Feel Safe was not presented in detail.

Chemelot site (and Risk Factory)		Factory in terms of engaging children in experiential DRR activities.	the Risk Factory. Several ideas were collected to benefit Feel Safe development (i.e. scenario building, schools partnerships, and volunteer-engagement).	
Providing feedback on the task-based survey distributed for the Guidelines Workshop. Participation in the Guidelines Library Workshop	January & February	With the feedback from the task-based survey and participation in the discussion in the Guidelines Workshop, they expected to contribute valuable input for the further development of the Guidelines Library .	The output of this activity is feedback to the Guidelines Library based on the task-based approach.	The feedback provided has helped advance various aspects of the Guidelines Library . For example, improvements to the filter system and options for automatic translation are planned.
Workshop with children from Fanciulli secondary school	March	The case expects to test six activities from Feel Safe together with 45 children from the school.	Three workshops were held with students from three different classes. As a result of the workshop, four different activities/resources from Feel Safe were tested. The test helped to gather some practical recommendations on how to improve the quality of the resources and refine some technical aspects (i.e.,	The workshops represented a good opportunity for testing the product and refine it. More in general, the workshops were also an opportunity to present the advancement of the product to students and teachers, to brainstorm and co-design together, and to get a sense of the applicability of the product.

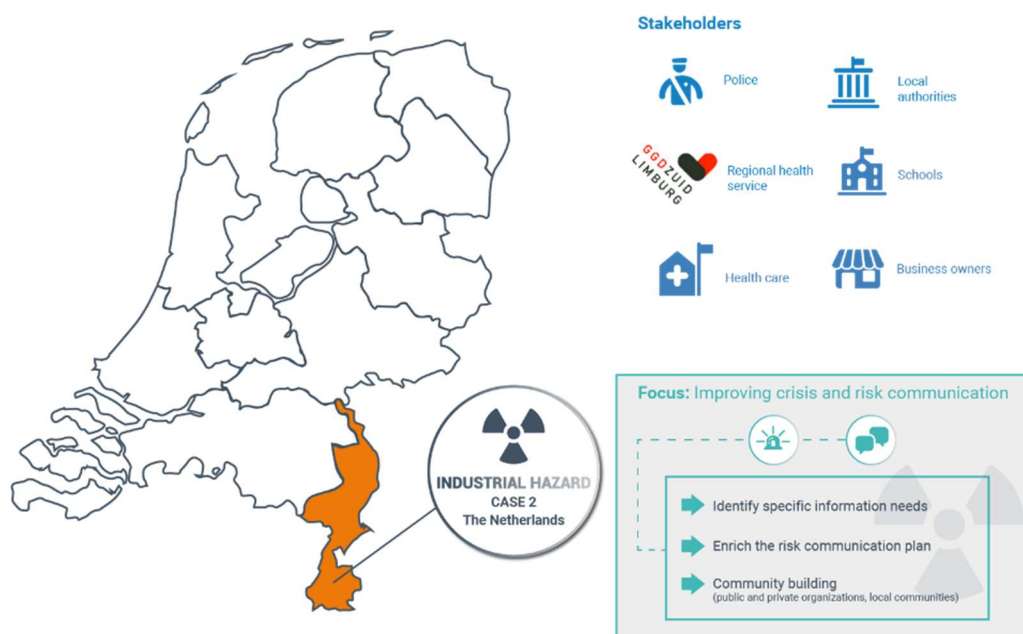
			methodology for the implementation, materials that can be used, inclusivity aspects).	
Feedback and testing of the Guidelines Library in the LCC.	Ongoing	Providing feedback and continuously testing for the Guidelines Library regarding the content, the understandability of filters, and usability aspects, as part of the Guidelines taskforce, with the expectation of improving the product.	The output of this activity is regular feedback to the Guidelines Library .	The feedback provided has helped advance various aspects of the Guidelines Library , for example, improvements to the filter system and options for automatic translation are planned.
Feedback and testing of the Use Cases Library in the LCC.	Ongoing	Through continuous feedback and testing of the Use Cases Library , regarding the content, understandability of filters and usability aspects, with the expectation to improve the product.	The output of this activity is regular feedback to the Use Cases Library .	The feedback provided has helped advance various aspects of the Use Cases Library . For example, improvements to the filter system or options for automatic translation are planned.

3.2.1.2 Next Steps

The activities related to the Citizens Handbook (March-May 2023) are two online workshops with the DMOs and local authorities and the LINKS partners. The structure of the two workshops will be similar: an online survey on two out of four parts of the handbook, with questions focused on its structure, format, design, and accessibility; a second one will follow this first phase, which is an open discussion on the outcome of the surveys. The online survey will be carried out with Protezione Civile di Terni. It will focus on the mobility section of the handbook. This will be followed by an online workshop aimed at a better understanding of the survey results. The case expects feedback especially on the format of the product as well as its user-friendliness. The expected date for the activity is the middle of April 2023. There is a LCW in May. This event will bring together relevant stakeholders to discuss risk and digital education for children. The event will take place at SCIT HQ or at the PDT (Provincia di Terni) offices. The case is planning to launch the Feel Safe product in May, which will likely take place through a webinar to which potential users will be invited, with a focus on dissemination and capacity building.

3.2.2 Case 2: The Netherlands

Figure 5: Case 2: Location, Stakeholders and Focus



The Dutch case focuses on the chemical cluster in the municipality of Sittard-Geleen in the region of South Limburg, Chemelot. Chemelot is an industrial multi-user site and research campus of 880 ha, with 64 industrial plants, 150 organisations, and more than 8000

employees. An incident on the Chemelot site can have major consequences for the surrounding area. If a factory that works with flammable, explosive, and toxic substances malfunctions, a large (chemical) fire can occur. A (chemical) fire can cause a lot of smoke. Chemical substances can be carried with the wind to nearby residential areas. More vulnerable people, such as children and the elderly, are less capable of bringing themselves to safety and are therefore at increased risk (RIVM 2019).

As a result of the research conducted by the RIVM (2019), the IFV and the Dutch case, regarding the topic of safety and communication in the surroundings of Chemelot, the Dutch case has identified three primary groups that could benefit from more targeted information. These groups include healthcare institutions, schools, and businesses/shop owners. The Dutch case aims to equip the population surrounding Chemelot with the appropriate knowledge and tools needed to prepare for a chemical-related incident. The Dutch case hopes to achieve this, in part, by providing targeted LCWs.

3.2.2.1 Overview of the Outcomes of the Activities in this Period

The Dutch case has organised several LCWs in the municipalities of Beek, Stein, and Sittard-Geleen. The LCWs in the Dutch setting are designed to improve the risk awareness of civilians and to equip them with the knowledge and procedures needed to effectively react during a chemical-related incident, as well as to network and share the LINKS products. On May 2022, the Dutch case organised its first LCW for healthcare institutions. This workshop revealed that more needs to be done to increase the self-reliance of care organisations and their staff. The Dutch case gathered valuable information from this workshop for the knowledge bases of LINKS, the VRZL and Chemelot. On November 2022, the Dutch case organised its second LCW for schools from the three municipalities. While most schools have a safety plan in place, these plans do not always include what to do during a chemical-related incident. The Dutch case also organized its third targeted LINKS community workshop for businesses, in the municipality Beek, in March, 2023. Similar to the feedback provided during the workshops for hospitals and schools, the participants of the workshop for businesses admitted that their organizations did not (all) have plans in place in the event of a chemical incident. Additionally, the participants were unable to recall all of the necessary safety procedures required of them.

As part of the core tenets of LINKS, "strengthening the links between technologies and society," the Dutch case is also establishing on-the-ground relations with locals living in the surroundings of Chemelot, as part of a local "ambassadors program¹⁰". The Dutch case is currently active in two pilot locations, Lindenheuvel and Limbricht. It has identified key players from the two pilot locations to assist them in their efforts with the expectation that these

¹⁰ The Ambassadors Program consists of representatives from community groups who help to improve citizen engagement and reduce the spread of misinformation during crises. The ultimate goal of the ambassadors' network is to ensure that citizens are well-informed and prepared to respond appropriately in an emergency.

actors will be able to help them in expanding their current communication channels, to better connect and to stay connected with the surroundings, to stay relevant and to assist in the needs of both sides. The Dutch case organized two LCWs for their stakeholders (ambassadors). The LCWs were held in the pilot locations, for the relevant stakeholders. The case continues to stay in contact with ambassadors and partners, through meetings, newsletters and posts.

The Dutch team continues to contribute to the development of the Citizens Handbook by providing feedback, case examples, and relevant/case-specific documents (e.g., communication plans, crisis communication evaluation reports, etc.). The Dutch case sees the potential for a trial application of the Citizens Handbook in the field of the Dutch case, as it is primarily interested in the risk awareness theme of the Citizens Handbook. The Dutch case will be communicating with the product owners of the Citizens Handbook in the coming months to work out the direction/approach for the Citizens Handbook within the Dutch case. The primary method of the Dutch case currently involves information sharing through LCW's and information sharing through the expanding ambassador network. The Dutch case is also involved in the online discussions of the LCC, provides the owners of the LCC with feedback, and provides the LCC with use case examples. The Dutch case is also exploring which stakeholders to approach for the testing of the Feel Safe product. The case has already been approached by schools in the region in their search for resilient learning tools for children about risks.

3.2.2.2 Outcomes of the activities from October 2022 to March 2023.

Table 4: Case 2: Overview of Activities

Activity	Date	Expected Outcome	Outcome	Input for the Product
Site visit - SIC Convention	October	<p>During this activity the case learned about the LCC and further potentials of SMCS usage in disasters. Among other things the German application INSPIRE was discussed, which can be interpreted as a platform that integrates data from different sources in order to improve data collection during incidents.</p> <p>Opportunities:</p> <p>1) The discussions and the INSPIRE application inspired the organizations to think about what direction this case can take with their current SMCS technologies.</p> <p>2) The LCC and the INSPIRE application helped the team to think about the current</p>	<p>Learning about the LCC and the INSPIRE application has helped the Dutch case as a team to think about technological solutions for problems that people in the surroundings face. Discussions have been started with project members of projects like Smart City¹¹ in the Zeeheldenbuurt¹² (municipality Sittard-Geleen, South-Limburg). Projects that investigate the uses of technologies to improve the livelihood of the residents. Discussing the solutions has gotten the ball rolling within the</p>	<p>With partners from SIC, the VRZL, and SiTech, more was learned about the LCC and the potentials of SMCS usage in disasters that could be useful for the respective organizations. During the activity the case also learned more about the uses of the LCC and how it can be used to find relevant technologies, guidelines, and use cases. Further a technology was added to the Technologies Library (Obi4Wan) and</p>

¹¹ https://commission.europa.eu/eu-regional-and-urban-development/topics/cities-and-urban-development/city-initiatives/smart-cities_en

¹² <https://metsittardgeleen.nl/projecten/zeeheldenbuurt/default.aspx>

		<p>monitoring processes and where there is still room for improvement.</p> <p>3) Citizen participation is gradually moving up the agenda within the organisations. The case could use new SMCS technologies to help involve citizens in the event of a crisis (volunteerism).</p> <p>Possible complications:</p> <p>1) The control room has its regulations. The case members are not allowed to provide new software.</p>	<p>organisations to think more about where the case can still improve the current communication mediums and where the case could still use new technologies, plus where there are need gaps.</p>	<p>later followed a use case about experiences using Obi4Wan.</p>
(LCW) - Schools (Upper-Management)	November	<p>They expected that the school directors and upper management would have prepared some action plan and communication strategy in the event of a chemical incident.</p> <p>It was expected that the workshop would clarify the schools' current communication strategies and action plans. The aim is to immediately address any shortcoming by discussing them and clarifying the expectations and where improvements are needed.</p>	<p>School directors and upper management clearly defined who they wished to target with their communication plan. However, during a chemical incident, children, teachers & parents were often unaware of what was expected of them. The workshop clarified the role division and responsibilities of the schools. Through discussion, the different schools learned where their shortcomings were and what they needed to</p>	<p>The findings from this LCW align with the previous one (healthcare professionals). More was learned about how the groups would like to receive information. For example, this workshop revealed how e-learning activities would be highly appreciated, along with other visual learning tools.</p> <p>There is potential to share the Feel Safe product. However, the Feel Safe</p>

			(re)consider in their current action plans.	<p>website will need to be translated into Dutch. The case would also need more feedback from the schools to determine if the Feel Safe activities will accurately capture the children's attention and needs.</p> <p>This case is interested in using the Feel Safe website. They will be working together with the product owners of Feel Safe to create an activity for the schools they are partnered with.</p>
Expanding Partner Network.	Ongoing activity December till March	For this exercise, the case reviewed the data gathered during past interviews (from the early phases of the project). The case sees the value in maintaining tight relations with partners. A lot can be learned from those already active in the field. Further, they would want to keep the partners updated on progress so they could aid each other. This case wishes to learn from partners and also	The partners are helping to expand social reach. A great deal can be learned from partners. There are ongoing projects in the field with similar goals. The case is currently working on combining forces with as many projects as possible, e.g., with	The partners are already becoming more aware of the LINKS project, and several parties are willing to explore the products. However, the case might need to adjust the products to a certain extent to make them more

		<p>hopes to assist where possible. They hope to use these connections to introduce LINKS products in the field and to get a feel for the needs.</p> <p>This period the case not only reached out to old contacts but also met with representatives of the Smart City Project, Proefuin Zeeheldenbuurt, PIW (Limbricht and Lindenheuveld area) and Retailpark manager (Sittard-Geleen).</p>	<p>Zeeheldenbuurt and Together Safe. They are already learning a great deal from the partners regarding approaching the field and identifying any (social and technological) needs.</p>	<p>relevant/useful for the surroundings. For example, Smart City is interested in discussing the products and the product owners of the Citizens Handbook are working together with the Dutch case to create a handbook catered towards the needs of those within this case.</p> <p>Expanding the network has not only been useful for spreading risk awareness, but has been incredibly useful in locating organizations/ institutions that are willing to test out LINKS products. In short, expanding the network provides channels needed to communicate about risks, as well as for communicating about LINKS. For example, there is more awareness about</p>
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				the Technologies Library through the growing network.
Expert interview: Environmental Analyst (VRZL)	December	As part of maturing, the use cases of the LCC the case reached out to an environmental analyst at the VRZL. The case hoped to learn more about the current analysis program the VRZL uses (Obi4Wan) and what areas LINKS products might be useful/ relevant for the VRZL.	Not only did the case discuss the Obi4Wan system (which can be viewed in the technologies section of the LCC), they have also created a Use Case in the LCC based on an environmental analysis conducted during Covid. Further, the Resilience Wheel was briefly discussed.	<p>Aside from providing a Use Case to the LCC, the Resilience wheel was reviewed.</p> <p>The following is feedback shared by a colleague on the Resilience Wheel:</p> <p>The language use will need to be adjusted to the organizational sphere/language use. The terms might need some explanations.</p> <p>In the future the case will be conducting an LCW to discuss the Resilience Wheel both at the VRZL and at SiTech. They have already discussed the possibility of organising a workshop with the product owners, have made some</p>

				preliminary translations of the Wheel to Dutch, and will discuss the translations and workshop plans on March 28.
Brainstorm Session Dutch case team & Interview with Smart City representatives	January	<p>During the brainstorming sessions plans continuing until the end of the project were discussed. This included the ambassador program and partner plan, which LINKS products they planned to pursue, and how they imagined the products could best serve the case.</p> <p>The case also spoke with the project coordinator of Smart City (active in the Zeehelden neighborhood of Lindenheuvel and are in cooperation with the Zeeheldenbuurt Project) and spoke to a city manager of Sittard-Geleen.</p>	<p>The case members followed the advice of the city manager and the project coordinator of the smart city and decided on two pilot locations for the ambassador program. They also learned which organisations to contact and coordinate with (for example, the PIW and Project Zeeheldenbuurt).</p> <p>While not a direct technical outcome, the connections and knowledge gathered during this meeting will ultimately feed into the ambassador and partner network being built, which will ultimately serve as the foundation for the sharing and application of LINKS products in the future.</p>	The ambassador and partner network is still growing. However, LINKS and its products are a growing presence in the surroundings. As the LINKS products develop further, the case can pitch some ideas to partners (e.g., combining technological forces with the members of Smart City as mentioned earlier).

<p>Risk Factory Venlo, visiting the site and meeting the project leader</p>	<p>January</p>	<p>The case is always open to exploring new methods of communicating risks. Especially for groups that prove more difficult to communicate with, in this case, an extremely young demographic.</p> <p>There is potential for the Risk Factory in Venlo to be a useful learning site. It could have the potential to engage children and help them learn about risks.</p>	<p>During the site visit to the Risk Factory in Venlo the team learned how risk could be communicated/made accessible for children. The case sees the possibilities for teachers to use this kind of communication approach when teaching their children about risks. The Risk Factory is a great educational resource and a potential fieldtrip location for schools.</p> <p>Information about the Risk Factory is now on the Dutch case's webpage. The product owners of Feel Safe have done the same.</p>	<p>The product owners of Feel Safe learned about the Risk Factory during their visit to the Netherlands. The case hopes this visit provided useful experiences for developing their product.</p> <p>They now use the Risk Factory as an example of how one can communicate difficult topics with children. When Feel Safe is tested with the schools, more about activities in the Netherlands can be shared that are great for learning about risks.</p>
<p>Providing feedback on the task-based survey distributed for the Guidelines Workshop. Participation in the Guidelines Library Workshop</p>	<p>January & February</p>	<p>With feedback from the task-based survey and participation in the discussion in the Guidelines Workshop, the case expected to contribute valuable input for the further development of the Guidelines Library.</p>	<p>The output of this activity is feedback to the Guidelines Library based on the task-based approach.</p>	<p>The feedback provided has helped advance various aspects of the Guidelines Library. For example, improvements to the filter system or options for automatic translation are planned.</p>

Ambassadors program	Ongoing	<p>Dissemination event - PILOT - Citizens (Lindenheuvel & Limbricht). Ambassador networks in Limbricht, Lindenheuvel, and in the business parks surrounding Chemelot have been established to strengthen bonds, improve communication, and find interested parties to test out the LINKS products.</p> <p>They hope that by identifying key nodes (community ambassadors) within a community and by instructing/ passing along information to these key nodes (ambassadors), information can then be passed on to the other members of the key node's social network</p>	<p>As part of the core tenets of LINKS "strengthening the links between technologies and society" on-the-ground relations with locals living in the surroundings of Chemelot are being established. There are now two active pilot locations: Lindenheuvel and Limbricht. In order to get people involved in the efforts and to keep people involved, key players in the two pilot locations have been identified to help expand communication channels and to stay in touch with the surroundings, to keep things relevant and directed at the needs that are present. There is already a large network of ambassadors (approximately 35 different organisations, clubs, institutions, etc).</p>	<p>The case has been contacted by colleagues from the Citizens Handbook to see how they can utilise the ambassador network for this product, e.g., in spontaneous volunteerism. They are also able to use the contacts from the ambassador network to find potentially interested parties to try out Feel Safe (schools in the pilot areas of Lindenheuvel and Limbricht). They have also used new connections from the ambassador network to plan the third LCW (for shopkeepers).</p>
2 PILOT LCWs- Citizens (Lindenheuvel & Limbricht); coordinating	March	<p>They expect these LCWs to be similar in nature to previous LCWs. However, these LCWs will also be useful for learning directly</p>	<p>While citizens are generally aware of the proper safety protocols, it can prove rather</p>	<p>After the workshops, ambassadors have expressed interest in the</p>

<p>the ambassador network; LCWs for the established ambassadors to test out the LINKS products and to discuss the communication strategy going forward</p>		<p>from the locals what the frequently used communication channels are in their neighbourhoods and where there are possible (communication) gaps.</p>	<p>difficult for those in managerial or leading roles to manage other citizens during an incident (without prior preparation). While a shop owner might know that it is not yet safe to leave the building, they ultimately do not have the power or the right to lock people inside. The same goes for schools and organisations. However, making agreements before an incident takes place can help to avoid discussions taking place during an incident.</p> <p>LCWs demonstrate what problems the participants face and provide an opportunity to immediately address these problems and to search for solutions. Risk communication plays a central role in the LCWs and involves information exchange, correction (of mistakes), and suggestions. The stakeholders are optimistic and</p>	<p>LINKS products and developing ideas together.</p> <p>The schools are interested in sustainable learning tools for the children, and the Dutch case will be working with schools to test out Feel Safe.</p>
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			<p>positive about working together to improve the risk communication in the region. After the workshops, several parties have stepped forward to specifically introduce LINKS products in the field. For example, schools and the product Feel Safe, the Smarty City project and the LINKS technologies & finally a retail park manager were interested in organizing a risk awareness program. The case has been approached by many ambassadors asking if the case can meet with them and help improve their risk communication strategies. There is also a possibility of sharing the Technologies Library with the organizations that have signed up as ambassadors.</p>	
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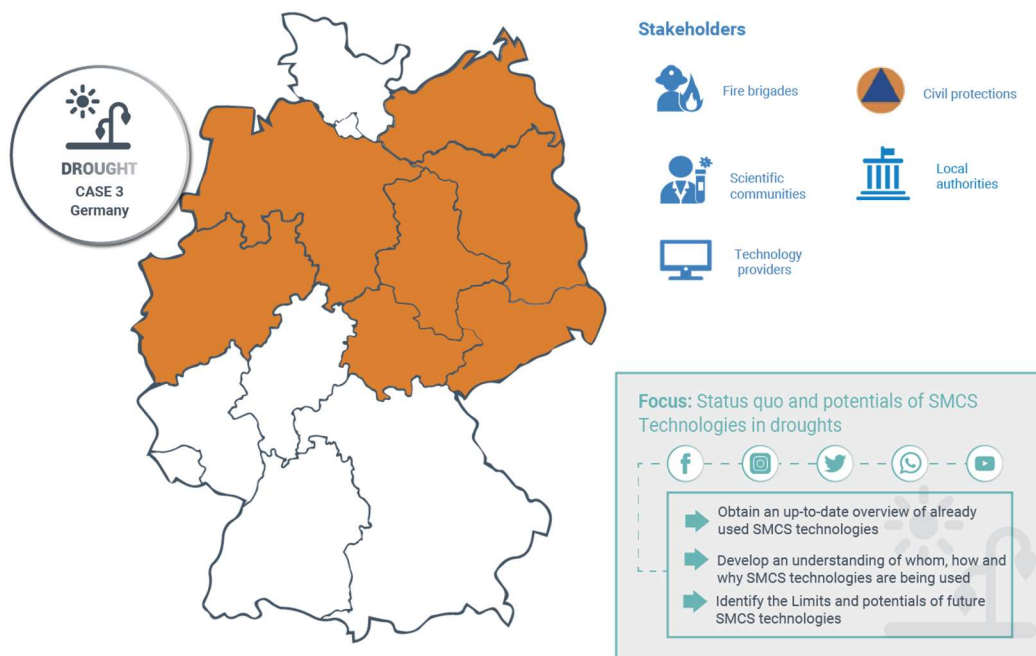
<p>Feedback and testing of the Guidelines Library in the LCC</p>	<p>Ongoing</p>	<p>Within the Guidelines taskforce, giving feedback and continuously testing the Guidelines Library regarding the content, the understandability of filters and usability aspects, with the expectation to improve the product.</p>	<p>The output of this activity is regular feedback to the Guidelines Library.</p>	<p>The feedback provided has helped advance various aspects of the Guidelines Library. For example, improvements to the filter system or options for automatic translation are planned.</p>
<p>Feedback and testing of the Use Cases Library in the LCC</p>	<p>Ongoing</p>	<p>Improve the product by giving feedback and testing the Use Cases Library continuously regarding the content, the understandability of filters and usability aspects.</p>	<p>The output of this activity is regular feedback to the Use Cases Library.</p>	<p>The feedback provided has helped advance various aspects of the Use Cases Library. For example, improvements to the filter system or options for automatic translation are planned.</p>

3.2.2.3 Next steps

The case is currently exploring different avenues for the discussion/application of the Resilience Wheel within their organizations. They will be looking into the possibility of either testing it out with the communication colleagues of the VRZL or with members of the communications group at Chemelot (possibly even colleagues from SiTech). At the end of April or beginning of May they will be organizing an LCW with Maastricht Airport, at their location. They are also currently planning workshops for some of the larger shopping centers in the area (Makado & Urmond). The Dutch case is currently planning a large-scale LCW for all the businesses in the surroundings of Chemelot. This is being planned with some of the local business owners/organizations in the surroundings and should take place in the months of June or July. They will be planning a Feel Safe workshop together with the product owners of Feel Safe and the interested schools. The case hopes to organize this workshop before the summer break in August. They will be following up on all the ambassadors throughout the year with tips, tools, and regular updates. Additionally, they will be coordinating with the product owners of the Citizens Handbook to see how the ambassador network can be used for the testing/application of the Citizens Handbook. Finally, they will continue to discuss and add content to the LCC.

3.2.3 Case 3: Germany (Drought)

Figure 6: Case 3: Location, Stakeholders, and Focus



In recent years, Germany has been experiencing more frequent and intense heat waves and droughts. These climate-related events have led to significant challenges for disaster

management organisations. As a result, there is a growing interest in exploring the potential of SMCS technologies to support these efforts. Accordingly, the overall focus of the German case (drought) is to analyse the status quo and the possibility of applying SMCS technologies in the drought scenario. This includes understanding who, how, and why social media technologies are being used. Interviews and workshops, including with different representatives from fire brigades, local authorities, and civil protection organisations have been conducted in the first case assessment phase to deepen this understanding. This provided valuable insights into the motivations and needs of different stakeholders and helped identify gaps or limitations in the current use of these technologies (cf. D6.4 and D2.7). Additionally, a collaboration with technology providers to explore the potentials of SMCS technologies in droughts is ongoing. The second case assessment focuses on the three LINKS Libraries (Technologies, Use Cases and Guidelines).

3.2.3.1 Overview of the Outcomes of the Activities

The activities in the drought case have both explored the status quo and the potential of SMCS applications in drought situations (and in general) and provided significant contributions to the further development of the SMCS Technologies, Use Cases and Guidelines Library. In summary, the following activities with respective outcomes were carried out:

- By working with PublicSonar, case members were able to increase their technical expertise and validate, discuss, and improve the function categories of the SMCS Technologies Library.
- To demonstrate the benefits of the libraries, the case co-developed user stories in workshops and interviews, which were used, among other things, for the review meeting in December 2022. The stories were based on the findings identified during the case activities.
- The case developed the use case "Tornado in Paderborn" as an example to demonstrate the added value and potential of the SMCS Use Cases Library. The feedback on this use case helped to refine the categories of the Use Cases Library. In a further step, the case was able to design a user-friendly contribution form and distribute it in the consortium to collect further use cases.
- Throughout the testing of the Technologies Library and the application of the technologies itself (e.g., Ubermetrics), the case regularly identified improvement measures, such as improving tooltips of function descriptions, complementing the profile page of a technology by researching information, checking information or even suggesting and adding new technologies.
- The participation in the KI-COP workshop from the sister project ENGAGE helped to differentiate the LINKS Libraries from the knowledge platform of ENGAGE and opened discussions for further cooperation.

- The German case on drought continuously collects and analyses drought reports, specifically looking for innovative uses of SMCS in drought situations (for the communication from authorities to citizens (A2C), but also vice versa (C2A). The goal is to identify helpful examples and technologies.
- The cases presented the SMCS Technologies Library and the LCC at the national security research congress "Research for Civil Protection" (organised by the Federal Office of Civil Protection and Disaster Assistance (BBK) and received valuable feedback on its development and promotion. The strategic input identified new opportunities for promoting the libraries and suggested expanding the focus beyond SMCS use in crisis situations to include disaster management organizations in non-crisis situations.
- Also, other activities (e.g., site visits by project partners, organisation of and participation in workshops and task forces on the Use Cases and Guidelines Library, expert interviews) have led to valuable improvements of the LINKS Libraries.

3.2.3.2 Outcomes of the Activities from October 2022 to March 2023.

Table 5: Case 3: Overview of Activities

Activity	Date	Expected Outcome	Outcome	Input for the Product
Live-Demonstration of different functionalities of the DCT PublicSonar with the possibility to ask questions.	September	<p>The case expected to increase technical competence in the field of SMCS technologies. The extent to which the technology provider can contribute helpful use cases was also discussed.</p> <p>They are already monitoring and analysing SMCS information in crisis situations (e.g., droughts) and big events. However, there are still many functionalities that they do not use yet or do not know the potential of. Accordingly, the need is there to expand technical competence. Demonstration of different functionalities of a DCT, discussion, and validation of the current categories of the Technologies Library.</p>	PublicSonar demonstrated a variety of technical features that can identify, filter, and analyse publicly available data on social media. The target group of PublicSonar are disaster management organisations, which is why functionalities that are primarily intended for marketing in the corporate sector could be excluded. In this meeting, they were able to discuss in detail the categorisation of functions they had developed so far and evaluate them directly with the help of the software of PublicSonar.	Validation of the entries of the technology PublicSonar and slight refinement of the function categories.
Site-Visit from the case teams from Denmark and the	October	The site visit by the case teams from Denmark and the Netherlands had several expectations based on different sets of activities and objectives:	The expected outcomes were achieved: according to the feedback from the case teams, they were able to provide valuable inspiration for their future work with SMCS.	With this workshop, this case contributed recommendations regarding slight improvements of the usability and

<p>Netherlands to Paderborn</p>		<p>The case demonstrated the social media monitoring and analysis component of the application INSPIRE. INSPIRE is a national project dealing with the integration of different data sources into one platform for improved information collection in disaster management organisations. With this presentation they aimed to provide the participants with inspiration and ideas for their own possible work with SMCS and at the same time to provide a profound basis for discussion about the Technologies Library and Use Cases Library.</p> <p>They discussed the existing LINKS Libraries products (Technologies, Guidelines, Use Cases) and expected to get insights about different requirements and objectives of the participating practitioner organisations. They also expected to evaluate to which degree the products potentially meet these.</p>	<p>Subsequently, the LINKS products (Technologies, Use Cases and Guidelines Library) could be discussed with regard to the interests and potential implementation of the participating practitioners.</p>	<p>understandability of the libraries.</p>
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<p>Collect and observe recent and current drought reports (news articles, scientific papers, social media posts etc.).</p> <p>Filtering and investigation of SMCS activities in droughts</p>	<p>Ongoing</p>	<p>They expected to identify and work out ways to innovatively apply SMCS by organisations in droughts.</p>	<p>Helpful examples of innovative SMCS applications in drought situations could be identified. At the same time, however, it has proved challenging to find differences in the use of SMCS in the context of drought compared to other crisis scenarios. For a more in-depth elaboration of the applications of SMCS in drought situations that have already been found, as well as those that are potentially still to be identified, relevant stakeholders in Germany are to be contacted (cf. Table 9 in the annex).</p>	<p>Contribution to the Technologies Library and Use Cases Library.</p>
<p>Participation in a drought workshop from the European Union as a side event of the Climate Change Conference 2022 (COP27)</p>	<p>November</p>	<p>By participating in the drought workshop, the case expected to keep on track with the current research results, opinions and forecasts of reputable researchers regarding the future developments of the hazard of drought. Besides the application of SMCS, they see the need to be aware of recent developments and predictions from research regarding drought.</p>	<p>Considering the worsening drought situation in 2023 in Central Europe (cf. dry winter, especially in neighbouring France), they see the need for exploring the support possibilities of SMCS as a future research field.</p>	<p>No direct input for the products, but the understanding of the potentials of SMCS usage in droughts.</p>

<p>The case conducted expert interviews and user testing to prepare user stories for the review meeting in December 2022.</p>	<p>November & December</p>	<p>With the preparation of the user stories and conduction of the interviews and user testing they expected to show the possible application of the Libraries within practitioner organisations. While elaborating on that, they also expected to get valuable feedback of the usability, comprehension, and content of the respective user story.</p>	<p>While developing the user stories for the review meeting, the case also got valuable feedback on the usability and filters of all three Libraries.</p>	<p>With the help of the experience from the user testing and associated hands-on sessions they were able to provide significant input for improvements to the Libraries and the usability in general (e.g., a refinement of the filter logic).</p>
<p>Development of the example use case “Tornado in Paderborn”</p>	<p>December</p>	<p>With the development of the example use case “Tornado in Paderborn” as a prototype, together with local practitioners they expected to show the types of valuable information a use case could include.</p>	<p>The contributed use case meets the expectations as a prototype and has already demonstrated the added value and potential of the Use Cases Library in numerous situations.</p>	<p>With the help of the example use case “Tornado in Paderborn”, comprehensive feedback on the refinement of the categories of the Use Cases Library could be provided.</p>
<p>Participation in the second Knowledge & Innovation – Community of Practice (KI-CoP¹³) Workshop of the sister project ENGAGE</p>	<p>December</p>	<p>They already participated in the first KI-COP workshop from the sister project ENGAGE at the EENA-conference 2021 and started there a collaboration. Consequentially, they also participated in the second KI-COP workshop. ENGAGE is also building a knowledge platform and collecting and analysing information</p>	<p>The workshop made a major contribution to understanding the knowledge platform of the ENGAGE project and, on the one hand, to differentiate the LINKS Libraries from it as well as to discuss options</p>	<p>The workshop was helpful to analyse which categories are used to describe the solutions in ENGAGE. After comparison with the library model, some ideas were discussed internally in the conceptual planning and demarcation. For example, the</p>

¹³ The Knowledge and Innovation Community of Practice (KI-CoP) is the advisory board of ENGAGE and is regularly activated to ensure the validation and transferability of the solutions developed in the project across different risk and disaster scenarios.

		about broader solutions in disaster risk management. With the participation they expected to strengthen the collaboration.	in which areas further cooperation could make sense.	idea to link similar solutions at a profile page was taken up into future planning.
Workshop about the current and upcoming collaboration with PublicSonar	December	In a workshop with PublicSonar the case discussed upcoming ways of collaboration and contributions to the LINKS Libraries . With the direct collaboration of a technology provider, the case expected to increase technical competence in the field of SMCS technologies.	They got the commitment of PublicSonar to contribute use cases, for the conducting of further expert interviews and testing their software.	No direct input for the product was generated, rather the strategic course was set for several activities, which will provide valuable input for the products.
Presentation and discussion of the Technologies Library at the BBK expert congress "Research for Civil Protection".	January	This case presented the Technologies Library and the current implementation into the LCC at the congress. They expected to gather input to further develop the Technologies Library. [The Federal Office of Civil Protection and Disaster Assistance (BBK) organised the three-day congress to bring together scientists from all disciplines working in civil protection.]	As part of the discussion, the case was able to collect valuable feedback on the Technologies Library , as well as on the LCC and possible contacts for promoting the results further. They also contacted another national project which had developed some criteria for selecting social media monitoring software.	The input for the Technologies Library and the implementation in the LCC was of a strategic nature. For example, the case was able to identify new opportunities for the promotion of the LCC and to discuss comments on the that direction. For example, it was noted that the case should not only focus on social media use in crisis situations, but also on social media use in disaster

				management organizations in non-crisis situations.
Testing and application of the Technology Ubermetrics	Ongoing	The case continuously works with the DCT Ubermetrics. While doing so, they expect to deepen their understanding of DCT and refine categories where needed.	They can continuously deepen the understanding of DCTs and their functionalities.	Due to the testing of the application, the case continuously discusses and adjusts categories from the Use Cases Library as well as from the Technologies Library where needed. They also contributed the use case “Tornado in Paderborn” due to this activity.
Feedback and testing of the Technologies Library in the LCC	Ongoing	By giving feedback and continuously testing the Technologies Library regarding the content, the understandability of filters and usability aspects, they expect to improve the product.	The output of this activity is regular feedback to the Technologies Library .	During the testing of the Technologies Library , they regularly identify improvement measures. These can include improving a tooltip or a function description, complementing the profile page of a technology by researching information, checking information or even suggesting and adding new technologies.

Feedback and testing of the Guidelines Library in the LCC.	Ongoing	Within the Guidelines taskforce, giving feedback and continuously testing the Guidelines Library regarding the content, the understandability of filters and usability aspects, they expect to improve the product.	The output of this activity is regular feedback to the Guidelines Library .	The feedback provided has helped advance various aspects of the Guidelines Library . For example, improvements to the filter system or options for automatic translation are planned.
Providing feedback on the task-based survey distributed for the Guidelines Workshop. Participation in the Guidelines Library Workshop	January & February	With feedback from the task-based survey and participation in the discussion in the Guidelines Workshop, they expected to contribute valuable input for the further development of the Guidelines Library .	The output of this activity is feedback to the Guidelines Library based on the task-based approach.	The feedback provided has helped advance various aspects of the Guidelines Library . For example, improvements to the filter system or options for automatic translation are planned.
Feedback and testing of the Use Cases Library in the LCC.	Ongoing	By giving feedback and continuously testing the Use Cases Library regarding the content, the understandability of filters and usability aspects, they expect to improve the product.	The output of this activity is regular feedback to the Use Cases Library .	The feedback provided has helped advance various aspects of the Use Cases Library . For example, improvements to the filter system or options for automatic translation are planned.
Participation in internal workshops and discussions	January & February	They participated in several workshops and discussions about the Use Cases Library . They expected to contribute to	The expected outcome was achieved and a contribution form for the Use Cases Library was developed.	The feedback provided has helped advance various aspects of the Use Cases Library .

<p>about the Use Cases Library.</p>		<p>the development of the contribution form implemented in the LCC.</p>		<p>However, it must be taken into account that the Use Cases Library is not as advanced as the Technologies or Guidelines Library. Accordingly, the input for the product is more influential. As part of the discussions and the internal workshop, a template for contributing use cases was developed. This is fundamental in order to start collecting use cases in the consortium and to collect a data base that can be used for further work.</p>
<p>Expert interview.</p>	<p>February</p>	<p>The case team conducted an expert interview with the leader of VOST Europe and VOST Portugal. The expectation was to get comprehensive insights into the work of VOST regarding the use of technologies.</p>	<p>In the interview, they discovered new technologies from the VOST, especially how to engage with a crowd-based technology and platform.</p>	<p>They achieved the contribution of a VOST Portugal use case. They are also considering adding some technologies the VOST is working with.</p>

3.2.3.3 Next Steps

With the activities in the drought case, the German case will continue to explore the status quo and the potentials of SMCS applications in drought situations and in general. Furthermore, the refinement and validation and the promotion of the LINKS Libraries and the LCC is an essential part of the drought case. The following activities will thus be taken up in the next steps:

- The case will continue to cooperate with the technology provider PublicSonar. Here for example, further expert interviews, contribution of use cases and testing of PublicSonar's software are planned. In this context, the case will also test the software from Ubermetrics as well as other free technologies. The drought case expects this to further improve the Technologies Library and create more links with the Use Cases Library.
- The case will continue to work on the user stories to demonstrate the benefits of the libraries. For example, another user story is planned in the context of drought in close collaboration with local practitioners.
- The case will continue to participate in the KI-COP of ENGAGE, e.g., a common workshop with LINKS is planned in June 2023.
- The case will intensively involve relevant actors¹⁴ in the scenario of a drought from Germany based on the recommendations of the review report from March 2023. Good examples of relevant institutions are the German Weather Service (DWD¹⁵) and the Federal Environment Agency (UBA¹⁶), which deal with climate change and drought. In Germany, the DWD is the national authority for meteorology and climatology and plays an important role in observing and forecasting weather and climate phenomena, including droughts. The UBA is a higher federal authority that deals with environmental and climate policy and plays an important role in developing strategies and measures to combat droughts. Both institutes deal with climate change, which according to the consensus of the scientific community will increase the intensity of droughts in many regions of Europe in the future. There are also other interesting institutions in Germany, including the Federal Office of Civil Protection and Disaster Assistance (BBK¹⁷): a central federal agency that is responsible for disaster prevention and management, including droughts. The BBK coordinates collaboration between various actors at the federal and state level and develops measures to improve crisis prevention and management. The aim is to identify

¹⁵ <https://www.deutscher-wetterdienst.de/>

¹⁶ <https://www.umweltbundesamt.de/>

¹⁷ <https://www.bbk.bund.de/>

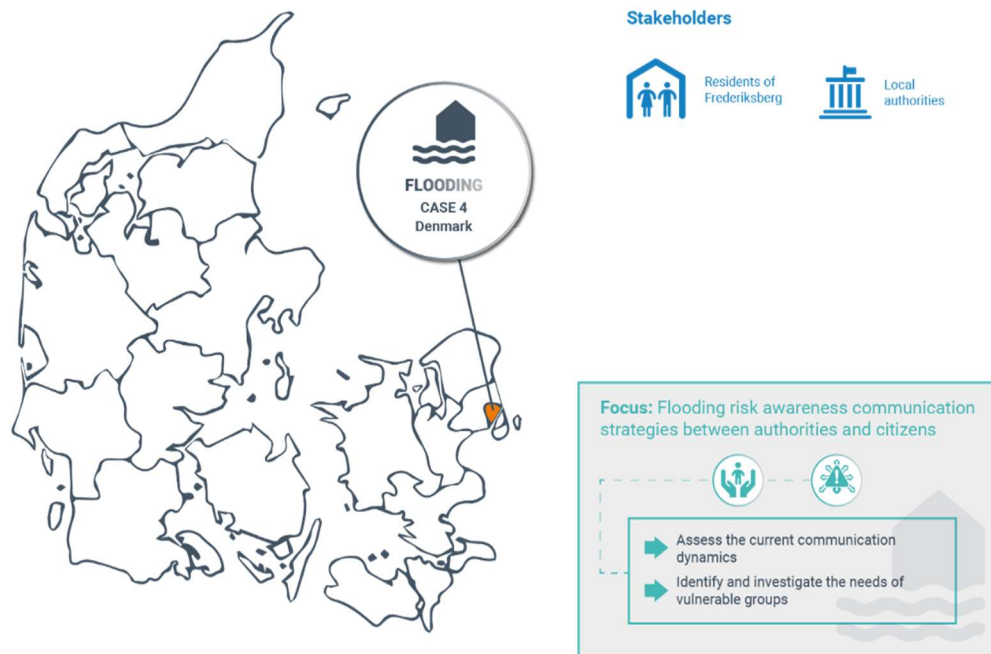
and analyse innovative applications of SMCS usage in drought and exploit future potentials.

- The drought case will continue to collect and analyse drought reports, specifically looking for innovative uses of SMCS in drought situations. The goal is to identify helpful examples and technologies relevant for the LINKS products.
- The case will continue to present, promote and validate the LINKS Libraries and thus the LCC at conferences, events and wherever possible. In this way they contribute as a case to the building of the LINKS community. Upcoming events include the EENA conference in April 2023 and annual conference of the Association for the Promotion of German Fire Protection (vfdb¹⁸) in May 2023.
- The case will continue to work on the libraries within the internal taskforces and workshops and provide continuous feedback from different perspectives.
- The case plans to conduct another LCW with members of Virtual Operation Support Teams (VOST). The focus will be on the application scenarios and potentials of the Technologies and Use Cases Libraries as well as the dissemination possibilities of the LCC.

¹⁸ <https://www.vfdb.de/events/jahresfachtagung>

3.2.4 Case 4: Denmark

Figure 7: Case 4: Location, Stakeholders and Focus



The overall focus of the Danish case is to investigate the potential for strengthening the communication between professional actors, NGOs and citizens concerning preparedness before crises occur and in the response phase during actual incidents. There is a distinct focus on the citizens' risk awareness of flooding as well as on other incidents, the practice for communicating among the actors involved, and the underlying conditions for taking better care of vulnerable groups (e.g., older adults). The scenario of cloudburst is a point of departure in the Danish case, but other incidents (either experienced or objects of concern) are brought into the assessment of the case both by practitioners interviewed in the cross-case interviews and by citizens who have participated in the focus groups related to the deep dive analysis.

The Danish partners have decided to work closely with the following LINKS products: The Technologies Library (technologies to support social sentiment analyses), the Resilience Wheel (to help the integration of new technological methods that involve intra- and inter-organisational coordination, to be applied on workshops with practitioners), to develop the Including Citizens Handbook (to target communication to citizens with diverse needs of information), and the Use Cases Library (to get inspiration). To support upcoming local workshops with citizens a quantitative survey is carried out. This survey will add to the qualitative findings from the focus groups held in the summer of 2022 and test the hypotheses regarding citizens' expectations of preparedness and response, differentiation of tasks of

responsibility, and practice of use of news media, social media and non-mediated communication.

3.2.4.1 Overview of the Outcomes of the Activities

The activities presented below have provided outcomes on three levels: They have firstly provided insights into processes, sensemaking, and communication among citizens regarding hazards, crises and concerns about cloud burst and other incidents. This includes results of the survey that was distributed to 1000 citizens and the use of the social listening analytical tool to catch the dialogue on social media gives answers to the concerns among the citizens. It also shows that citizens don't have many concerns on a daily basis, and that flooding from cloud bursts is not a question that occupies them too much. Further and more thorough analyses are needed to understand the details. The LCWs planned with citizens are expected to nuance these insights.

The activities have secondly impacted Frederiksberg municipalities' understanding of the potentials and constraints of applying some of the many technological solutions presented in the LINKS Technologies Library. This activity aims at establishing social listening, which describes the practice of monitoring social media channels to gather information about public opinion, sentiment, and trends that may impact the work and decision-making processes. It is a way for governments to understand how citizens feel about certain issues and topics and can also help governments identify opportunities for engagement with citizens. In the Danish context, Facebook is a very dominant social medium. Social listening does not work in relation to the comprehensive number of Danish Facebook groups. Due to the privacy policy of Facebook and applicable laws and regulations¹⁹, this insight cannot be selected in the Technologies Library.

The third overall take away from the activities is that the Resilience Wheel is well adopted by a group of operational officers in Hovedstadens Beredskab (HBR), and that the tool gained insights and intentions to incorporate some of the LINKS findings into the development of own practices regarding communication. There is a similar interest in testing the Including Citizens Handbook.

¹⁹ Collecting personal data or publishing information without the consent of the individuals concerned can lead to legal consequences. In addition, the legal and ethical aspects of monitoring must be carefully weighed, as privacy violations or ethically questionable behaviour can easily occur. Facebook group monitoring can lead to negative reactions from group members if they feel monitored or controlled. It is therefore important to ensure a transparent approach and open communication in order to gain the trust of group members and avoid misunderstandings.

3.2.4.2 Outcomes of the Activities from October 2022 to March 2023.

Table 6: Case 4: Overview of Activities

Activity	Date	Expected Outcome	Outcome	Input for the Product
Visit to Paderborn – LINKS partners (NL and DK CATs)	October	To learn more about the work of the drought case, the LCC and the German INSPIRE application. INSPIRE can be interpreted as a platform that sources data from different disaster management organizations to improve data collection during incidents.	Learning about the LCC and the INSPIRE application has helped the team to think about technological solutions for problems that people in the surroundings face. Discussing the solutions has led to the team to consider in more detail how the case can still improve current communication strategies, where they could still use new technologies/where there are need gaps.	Detailed insight into the Use Cases Library Technologies Library and Guidelines Library in order to apply (consider their application) the product and the technologies presented, e.g., products to be applied for social listening and VOST.
Workshop in HBR: Resilience Wheel	February	To initiate a focus on community and citizen resilience and the use SMCS among practitioners in HBR/in the fire brigade	A better focus on community and citizen resilience and the use of SMCS in HBR/in the fire brigade	The Resilience Wheel has been tested for workshop purposes and is being adjusted. It has been important to figure out how to change the Wheel to be applied as a tool by practitioners. Firstly, this

				regards a complete translation not only into Danish but also concerning the choice of notions that is well suited for practitioners and that can be recognised. Secondly, it has been necessary to simplify the drivers and decrease the number of drivers to create a better overview for practitioners to apply the Wheel as a tool for dialogue.
Testing and validation of the Technologies Library	November-January	The Technologies Library were tested and validated in order to identify suitable technologies with functionalities supporting social listening.	A good overview about the market and potential technologies was given by the product.	While testing the Technologies Library , valuable feedback to the search criteria (filters) could be given. Additionally, in collaboration with the project owners the user story for the review meeting has been developed.

<p>Providing feedback on the task-based survey distributed for the Guidelines Workshop. Participation in the Guidelines Library Workshop</p>	<p>January & February</p>	<p>With feedback from the task-based survey and participation in the discussion in the Guidelines Workshop, they expected to contribute valuable input for the further development of the Guidelines Library.</p>	<p>The output of this activity is feedback to the Guidelines Library based on the task-based approach.</p>	<p>The feedback provided has helped advance various aspects of the Guidelines Library. For example, improvements to the filter system or options for automatic translation are planned.</p>
<p>Implementing test of social listening technology at FRB</p>	<p>From March to August</p>	<p>To get a nuanced insight into the use of SM among citizens and others outside DMOs, insights into their sensemaking, knowledge sharing, and need for information.</p>	<p>The outcome so far: FRB has obtained nuanced insights into the potential of technology (Retriever)</p>	<p>When the system is running, experience with the use of social listening and insights into the adaptation of technology by DMOs will be disseminated to both the Technologies Library and the Use Cases Library.</p>
<p>Co-creation of content for Citizen Handbook</p>	<p>From November to April</p>	<p>Inspiration, insights, checklists, best practices and guidelines on two out of four Handbook themes: 'risk awareness' and 'voluntarism.'</p>	<p>The outcome so far: Choice of overall themes for these two handbooks, choice of format (digital learning platform)</p>	<p>The products are under production in close collaboration with the task force (LINKS practitioner partners and DMO practitioners, who are not part of the LINKS consortium.</p>

LCW – citizens at FRB	March or April 2023	Co-learning between FRB and a group of citizens regarding cloudburst preparedness		A survey (based on insights from focus groups) will be sent out to citizens Ultimo March – the survey results will be applied and presented at the LCW(s).
Feedback and testing of the Use Cases Library in the LCC	Ongoing	With giving feedback and continuously testing the Use Cases Library regarding the content, the understandability of filters and usability aspects, they expect to improve the product.	The output of this activity is regular feedback to the Use Cases Library .	The feedback provided has helped advance various aspects of the Use Cases Library . For example, improvements to the filter system or options for automatic translation are planned.

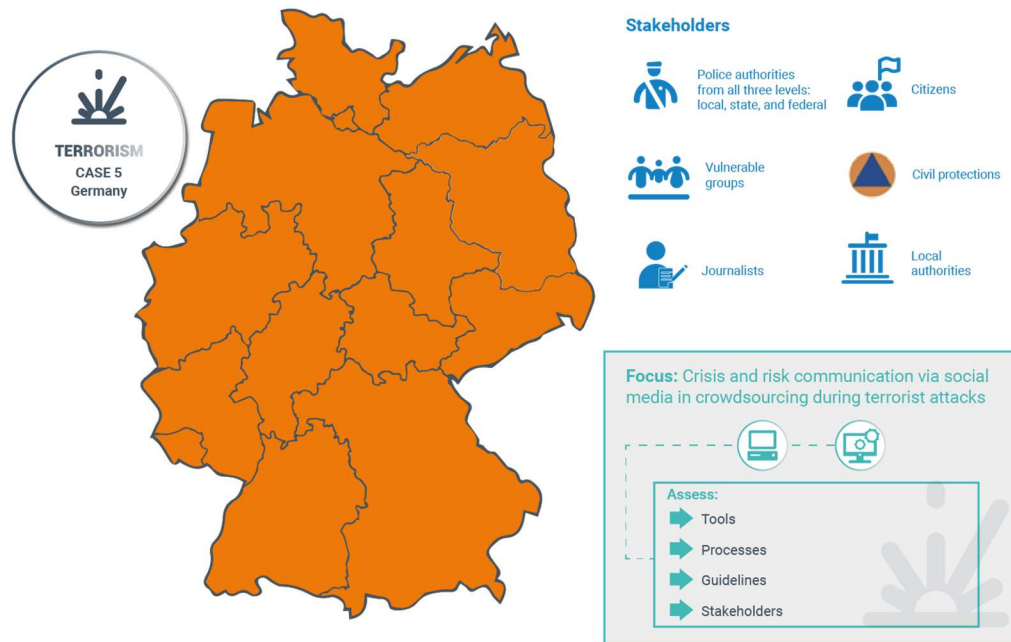
3.2.4.3 *Next Steps*

After the social listening tool has been implemented in the municipality, the upcoming period provides a possibility to carry out more thorough analyses of the communication activities to understand the processes and the potential for a more multidirectional form of communication that engages both the municipality and the citizens in questions of preparedness for a cloud burst, as well as covering incidents and crises that appear in the next months in order to understand communication in times of crisis response. Besides the feedback and application of the Technologies Library as well as the planned contribution of use case, these insights will be presented outside LINKS to other authorities and NGOs to show the potentials and contexts where the usage of such technologies can be valuable.

The Resilience Wheel will be developed further and tested in settings outside HBR in other Danish DMOs and jointly with DHPol within the German law enforcement context to refine the method. The Citizen Handbook is still being co-created and iterative tests will be carried out to target the future users as precise as possible. The social listening analysis is up and running in FRB. Currently, the case is beginning to get insights and will follow these analyses in the next six months. Feedback to the survey results will be validated and qualified in LCW with citizens from Frederiksberg municipality.

3.2.5 Case 5: Germany (Terrorism)

Figure 8: Case 5: Location, Stakeholders and Focus



Given the ongoing return movement of 'foreign fighters' from Syria and Iraq back to their Western home countries, as well as a general increase in radical sentiment during and in the aftermath of the COVID pandemic, security experts agree that terrorist attacks on European soil still need to be anticipated. Moreover, attacks like the ones in Vienna, Berlin, Nice, Munich, Paris, Utøya and the like, sadly demonstrate that 'European terrorism' favours so-called 'soft targets': easily accessible parts of the general public.

Accordingly, during the past several years, social media applications have not only gained recognition as tools for reputation building or recruitment in law enforcement but also in terms of actual '*Lagebewältigung*' (the management of a concrete, ad-hoc police operation). They are the most immediate channel to directly get in touch with those affected citizens during a concrete incident and spread information relevant to ensure their safety. They also receive tactically relevant information via social media in return.

During the first case assessment, DHPol assessed (conducted a survey, interviews, and workshops) the status quo of social media and crowdsourcing technologies within various areas of German law enforcement involved during terrorist attacks or amok situations. The assessments identified general needs and obstacles regarding SMCS: for example, uncertainties about data protection laws and handling of rumours or false information. They also identified specific DCT features that facilitate the flow of information within the police leadership during severe ad-hoc events that enable making decisions.

DHPol's goals for the second case assessment were a) to produce further content for and refine the LINKS Framework products based on the preliminary findings and b) to assess ways to ensure their sustainability throughout European law enforcement organizations. Both goals shall be achieved in direct collaboration with additional law enforcement practitioners (primarily from Germany but also from other countries that had to handle major incidents in the last years, see the table below).

3.2.5.1 Overview of the Outcomes of the Activities in this Period

DHPol primarily concentrated its efforts in two areas:

The Terror Case managed to contribute a great variety of examples to the Use Case Library that touch upon a broad spectrum of aspects that were mentioned as relevant for police social media use for crisis management by interviewees and workshop attendees during the first case assessment and depict how police have handled them in the past and/or what lessons were learned from those incidents. This was archived in a participatory research design: for a total of 15 cases DHPol was able to gather sufficient relevant information to draft initial versions for the use cases alongside an additional questionnaire and have those feedbacked/filled in by the police personnel in charge during those incidents; this switch from oral to written feedback also helped to overcome problems regarding the confidentiality of information that were encountered during the first case assessment, allowing police authorities more room to deliberate on which information they can share and how.

Additionally, one of three in-depth, task-based interviews (based on the think-aloud method) can be carried out and shed light on the perceived usability and usefulness of the LCC products, in particular, the Guidelines Library and the Technologies Library, from the perspective of personnel training police officers in crisis communication and implementing social media strategies. The main takeaways so far are that the LCC is perceived as relatively intuitive to navigate (respondents could perform the tasks DHPol gave them quickly and to their satisfaction) and that they would rate the usefulness of Technologies Library higher than that of the Guidelines Library (which is perceived as too generic to meet the needs of law enforcement and be in line with their guidelines). They also developed relevant input regarding established police education programs into which the LINKS products might be integrated fruitfully in the future (e.g., at CEPOL).

3.2.5.2 Outcomes of the Activities from October 2022 to March 2023

Table 7: Case 5: Overview of Activities

Activity	Date	Expected Outcome	Outcome	Input for the Product
Internal workshop with the product owners of the Use Cases Library and the Technologies Library to discuss how DHPol can contribute to the products and/or their validation within the law enforcement context	December	With this recurring activity the case hopes to be able to a) provide valuable feedback to the Use Cases Library as researchers but also b) get a better understanding of how they can additionally engage practitioners from the law enforcement sector in order to evaluate the product in a way that is most fruitful for the product owners.	They learned that the Library still needs to be populated with Use Cases that showcase a great variety of applications of crowdsourcing in disaster management contexts that depict best-practices and hint towards current problems and/or mistakes made in the past. Ideally those cases should be as precise as to actually point to concrete software solutions used and practices with which (digital) volunteers became involved. Even more ideally, those cases would relate to software, guidelines, tips etc. mentioned in the other	Together with the POs they could fine-tune their product, particularly with regards to the wording of the filters and discuss/plan content to be added.

			products, so that the products can cross-reference each other.	
(Bi-weekly) participation in the ' Guidelines Library task force' to discuss how DHPol can have the German police evaluate the products in a systematic manner	November-ongoing	With this recurring activity they hope to be able to a) provide valuable feedback to the Guidelines Library as researchers but also b) get a better understanding of how they can additionally engage practitioners from the law enforcement sector in order to evaluate the product in a way that is most fruitful for the product owners.	The case team learned that the Guidelines Library is already populated with quite a bit of content but that its usability in terms of filters and data aggregation could still be improved and more guidelines from the law enforcement context should be included.	Together with the product owners they could fine-tune their product, particularly with regards to the wording of the filters, the aggregation of guidelines for a better overview, and to the sustainability of this product in the law enforcement context, particularly the possibilities for it to be advertised at certain councils and to be implemented in police training sessions
(Bi-weekly) participation in the ' Citizens Handbook task force' to discuss how DHPol can have the German police evaluate the products in a systematic manner	November ongoing	With this recurring activity they hope to be able to a) provide valuable feedback to the Handbook as researchers but also b) get a better understanding of how they can engage practitioners from the	The case learned that the project owners were particularly interested in discussing ways to make the different parts of the Handbook as hands-on and	They provided feedback on visuals to manage the gap between different stakeholder groups (vivid expectations for people working with children,

		law enforcement sector in order to evaluate the product in a way that is most fruitful for the product owners.	visually appealing as possible.	rather conservative expectations for law enforcement) and wrote a draft for an example use case (feedback on that from law enforcement practitioners is still pending).
Providing feedback to the Guidelines Library and answering the survey distributed at the review meeting	February	With their feedback, this case expected to contribute valuable feedback for the further development of the Guidelines Library .	Not applicable here because they were not the ones to launch the survey but merely respondents.	Adjusting the wording of some of the library filters and enhancement on the overall usability of the product.
Providing feedback to the Citizens Handbook and answering the survey distributed in January 2023	January	With their feedback, they expected to contribute valuable feedback for the further development of the Citizens Handbook .	Not applicable here because the case team was not the one to launch the survey but merely respondents.	Adjusting the wording of some parts of the Citizens Handbook , adding ideas for topics that might be particularly relevant from the perspective of the police.
Providing feedback to the updated version of the Resilience Wheel	February	With their feedback, the case expected to contribute valuable feedback for the further	They learned that the Wheel has already been successfully applied in several contexts but that	Making the Wheel more practitioner-oriented from a police perspective, adding ideas for how to

		development of the Resilience Wheel .	the POs are still looking for additional contexts to test it in (e.g., among police officials) and make it a bit less abstract and more hands-on	turn the Wheel into a more interactive product and how to directly integrate its contents with those from the Use Cases Library , the Technologies Library , and the Guidelines Library
Literature and news outlet research on various recent terror-related events (news articles, scientific papers, social media posts etc.)	January & February	The case team would like to get a profound understanding of major incidents (primarily terrorist attacks or amok scenarios) where police social media played an important role and would like to assess how it was discussed by the public, the media, and the scientific community). This knowledge shall feed into detailed and problem-oriented use cases.	They were able to gather a lot of information. The cases were oftentimes even better documented than expected because the case team found a lot of academic work performing professional analyses on the crisis communication during those events. Yet, a lot of the information they found only addressed top-down aspects of the crisis management and neglected the bottom-up processes. Although some of the materials also addressed perceived or	They contributed content for a total of 15 cases to the library from the law enforcement perspective. These showcase a great variety of best practices regarding the application of social media in general and crowdsourcing techniques, in particular to manage major incidents like terror attacks. They also shed light on errors that have been made in the past, current obstacles, and needs for further education or
Contribution of preliminary drafts for the following use cases to the Library and sending them to the associated police organisations for feedback and further information:	March & April	The case hopes to showcase a great variety of use cases in which social media and/or crowdsourcing technologies were used to assist police operations in the past. Their		

<ol style="list-style-type: none"> 1. Amok in Vienna 2. Shooting in Munich 3. Attack in Stockholm 4. Attack in Utøya 5. Riots in Rotterdam 6. Amok in Berlin 7. Double Homicide of Herne 8. G20 protests in Hamburg 9. Policing the Protests at the Dannenröder Forst 10. OSINT work at the PD Osnabrück 11. Attack in Würzburg 12. Terror in Paris 13. Terror in Brussels 14. Terror in Nice 15. Terror in Barcelona/Cambrills 		<p>aim is to find cases that are well-documented in the media and/or in research outputs, and that touch upon the most relevant challenges, needs, and obstacles regarding social media use in law enforcement crisis communication that were brought up during the first case assessment. They also broaden the scope beyond Germany and terror or amok attacks. In addition to the incidents in Berlin, Munich that depict how rumours were handled, for example, they add the case of a double homicide in Herne where police had to manage uncertain information and public fear while the perpetrator was on the run for several days; the riots during the Covid protests in Rotterdam and during the G20 meeting in Hamburg, where hostile crowds needed to be managed; the attack in Vienna, where crowdsourcing was applied to get hints from the public; and finally the Utøya/Oslo attack to add a diachronic perspective</p>	<p>supposed needs of the affected citizens, the actual needs were difficult to identify. The same applied for actual software products used during the incidents.</p>	<p>improvement of technologies.</p>
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		<p>because (at that time SM(CS) for police crisis management was in its infancy and the incident raised awareness for its potentials and triggered important developments). Additionally, one case depicts the open-source intelligence work carried out by the police department the case will visit jointly with all partners at the annual meeting in July.</p>		
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3.2.5.3 *Next Steps*

In the upcoming months, DHPol will remain in contact with the law enforcement practitioners to finalize the cases for the Use Cases Library. The case team will also engage in further feedback-loops and discussions on the information a lot of the various contacted law enforcement organizations will hopefully provide via the use case forms but do not directly aim at the case presentation in the Library. With those inputs DHPol will rather assess general views upon the institutionalization of crowdsourcing techniques within police operation management across Europe and the potential sustainability of the LINKS products in the context of law enforcement education programs.

Moreover, DHPol will further assist with the evaluation of the LCC materials in the context of two upcoming LCWs: the first of them (the third LCW organized by this CAT) will be held in Münster in May. It will adopt the Framework for testing the Resilience Wheel that was proposed by the Danish partners and already successfully applied in the flooding context (see above). DHPol will adjust it to meet the needs of law enforcement personnel and have it evaluated by them (most likely particularly by representatives from so-called negotiation teams that inter alia rely social media to deescalate life-threatening situations). The final LCW will take place during the second day of the Project's Annual Meeting in July and will focus on the topic of '(digital) volunteers in police operations'. In this context, DHPol will have representatives of different national polices, police education organizations, from other organizations with security tasks, and VOSTs come together to discuss potentials and obstacles of volunteer engagement from the police perspective and work with the Including Citizens Handbook, particularly its 'Mobilising Volunteers' section. Finally, DHPol will also organize a site visit at the Osnabrück PD and their OSINT unit for project partners and various practitioners to showcase the work of so called 'intel officers' and discuss how they could operate as an intersection between the police and organized volunteers during disasters.

4. RESULTS FROM THE BROADER EVALUATION OF THE FRAMEWORK

This section briefly highlights the outcomes from activities aimed at evaluating the Framework with stakeholders outside of the LINKS cases. The broader evaluation of the Framework includes the use and validation of the products within the Framework and LINKS Community Center, through different activities and by different stakeholders. Some activities, such as meetings with associated partners and the LINKS Advisory Committee meetings, run throughout the duration of the project. However, most are carried out within the final year of the project (2023).

The broader evaluation is conducted across three different layers:

1. LINKS Advisory Committee (LAC) and Associate Partners
2. European Networks and Mechanisms
3. The broader LINKS Community

To date, most activities have taken place in the first layer. In the following sub-sections, a brief overview of those evaluation activities and outcomes is provided.

4.1 The LAC and Associate Partners

A number of activities for informing and evaluation the LINKS Framework have taken place with the LINKS Advisory Committee (LAC) and associate partners: the Disaster Prevention and Preparedness Initiative of Southern Europe (DPPI-SEE) and the Center for Resilient Design (CRESD).

Table 8: LAC and Associate Partner Activities

Activity	Date	Stakeholders Involved	Outcome
1 st LAC meeting (online)	19 January 2021	1 participant from research institute	Initial feedback on conceptual design of the Framework (see D8.4 for full report).
DPPI Policy to Practice Workshop (online)	16 April 2021	16 participants from 9 countries in the Balkan region, practitioners, policy & decision makers	Discuss (via scenario exercises) experiences with and potentials for procedures, practices, and guidelines on the effective uses of SMCS in their regions. The workshop shed light on the need of accessing guidelines, lessons

			learned, and best practices on the uses of SMCS via the Framework.
2 nd LAC Meeting (online)	17 February 2022	10 participants from practitioners, research, policy & decision makers, civil society, and media	LAC members' insights and comments about challenges related with the use of SMCS were gathered. The discussion provided actionable input for improvements of the LCC, and requirements and adjustments for the 3 Libraries were identified. Some LAC members provided additional information about guidelines, networks, and other sources on a bilateral basis (see D8.5 for full report).
DPPI Workshop (in person)	24 June 2022	11 participants from the Balkan region, practitioners, policy & decision makers	Feedback was provided on the format and usefulness of products in the LCC, in particular the Technologies Library and forums.
3 rd LAC Meeting (online)	13 February 2023	9 members	Feedback was provided on the format and usefulness of products in the LCC, particularly Feel Safe , and the Technologies, Use Cases, and Guidelines Libraries . The main topics covered were related to the overall designs, expectations about the products and

			possible contributions with cases or technologies (to the libraries). Other feedback focused on the applicability of the products in different contexts and possible strategies to make the LCC and its products sustainable beyond the finalization of LINKS.
CRESD Meetings (online and in-person)	Various dates	4 participants from the CRESD research institute	Gathered feedback on Framework concept and products at different points in the project. This led to ongoing contributions by CRESD to the Feel Safe platform and the Use Cases Library , including examples and lessons learned from Japanese context.

4.2 European Networks and Mechanisms and the Broader LINKS Community

Most activities related to EU networks and mechanisms and with the broader LINKS Community are planned for the final year of the project and will be reported in D6.6 (November 2023). Nevertheless, some activities have already taken place which were used to introduce the LINKS Framework and to gather feedback on the concept, design, and products at different stages of the project. Some key activities are highlighted in Table 9.

Table 9: European Network and LINKS Community Activities

Activity	Date	Stakeholders Involved	Outcome
ISCRAM Conference Presentation	May 2021	ISCRAM community	Presentation and feedback on early

			schema for the Technologies Library.
Meeting with JRC	June 2021	2 JRC members working with SMCS data in crisis	Feedback on early concepts of the LINKS Framework and project ambitions.
EENA Conference Presentation	April 2022	EENA and DRS community	Presentation and feedback on Technologies Library and LCC.
Survey during first case assessment	March 2022	284 respondents from 20 countries, disaster management organizations	Outcomes feed into existing/known guidelines and technologies which could be added to the two Libraries. The needs collected also helped with the design of the overall products in the LCC.
LINKS/RESILOC workshop Copenhagen	November 2022	4 LINKS Partners and 4 RESILOC partners, practitioners and researchers.	Presentation and discussion on project outputs including the Framework, and how the project outputs may integrate with those from RESILOC.
CERIS DRS Event and Policy Roundtable	November 2022	CERIS members, LINKS, ENGAGE, RESILOC partners, and relevant DGs	LINKS also distributed information for participants on how to engage with and provide feedback on the Framework during their presentation at the CERIS event. LINKS also had the opportunity to meet with relevant DGs at the RESILOC policy roundtable and understand their

			expectations for project results. The meeting will feed into future dialogs and discussions around the Framework (e.g., how to integrate with EU mechanisms such as the Knowledge Network) and policy outputs from LINKS.
Presentation at BOSAI Forum Sendai	March 2023	Participants of BOSIA forum working in DRR, ENGAGE project	Presentation and meetings on LINKS outcomes with participants feed into interesting examples of DRR education with students from Japan which may feed into the Feel Safe platform. LINKS also distributed information for participants to register, engage, and provide feedback on the LCC and Framework products.

More details about the results from the outcomes of the external evaluation activities can be found in specific reporting deliverables on the LACs (D8.4 and D8.5), as well as deliverables providing development updates on the products (e.g., D2.7) the LINKS Framework (e.g., D5.4), and the LCC (e.g., D7.4). Furthermore, D9.4 and D9.2 provide a full overview of dissemination and exploitation activities and events, many of which have influenced the development of the Framework in different ways. In the following section, the overall conclusion from this report is detailed as well as the next steps feeding into the final evaluation of the LINKS Framework.

5. CONCLUDING REMARKS AND NEXT STEPS

5.1 Conclusion

Based on the five LINKS cases, this deliverable provides a detailed overview of the activities carried out by the cases in the second round of case assessments between November 2022 and March 2023, and the outcomes from those activities.

First, this document presents the overall results and then elaborates on the activities executed by each of the five Case Assessment Teams (CATs) (D6.3). The document details the specific LINKS products on which each activity focused, the stakeholders, the expected and actual outcome of the activities, and how the input generated contributes to the product development or improvement (when applicable). Secondly, this deliverable offers initial results from the broader evaluation of the Framework with stakeholders outside of the LINKS cases.

Some of the key out comes from the individual reports are captured below:

- The **Feel Safe** product was part of workshops engaging children, teachers, and LINKS partners. They also included site visits. The overall inputs that the product received were connected to improvements in terms of content and layout. They received advice to improve the activities (aiming at their target group) already in the product, which led to improving its overall applicability. The activities for **Feel Safe** were aimed at **engaging citizens** (sub-theme collecting and organising information) and **improving communication** (sub-theme making information accessible) to school children in the Italian case. The outputs led to better ways for teachers and students to access information on SMCS communication via exercises and games embedded in the platform. The contributions to the product have the potential to increase disaster resilience by improving children's digital skills, community engagement and participation in disaster prevention, also at the scenario level of enhancing the understanding of Earthquakes.
- Regarding the **Including Citizens Handbook**, the cases and product owners organised workshops and activities to explore the product and its applicability, and to decide how to organize its content into a user-friendly format. The most relevant inputs for the product involved further interconnecting the four topics in which the handbook is divided (accessibility, mobility, awareness and volunteering), adjustments to its format, general aesthetics, and engagement of the different type of citizens potentially using the product. Overall, the activities for **Citizens Handbook** aimed at **engaging citizens** (sub-theme mobilising citizens) and **improving communication** (sub-theme targeting communication). The outputs of the activities could assist DMOs and citizen groups/organisations to access information on SMCS communication. They give the

opportunity to improve the mobility and accessibility of vulnerable groups in their immediate surroundings (e.g., street, neighbourhood, area). The outputs and ongoing activities assist stakeholders (e.g. in the Dutch, Danish, and German (terror) cases) to better organise and optimize resources at the moment of mobilising citizens and targeting their communication.

- Concerning the **Technologies, Use Cases and Guidelines Libraries** (they are different products but with similarities and under the responsibility of the same product owner), the most salient activities were expert interviews, site visits, reviewing media coverage related to droughts, participating in conferences, testing and applying their content, feedback and testing in the LCC and meetings between the CATs and the product owners. The main outputs from the activities had to do with recommendations for some (minor) improvement in the usability and understandability of the products, adjusting the filters' wording, and general feedback to expand the content. Overall, the activities for the three **Libraries** focused on **engaging citizens** (sub-theme collecting and analysing information) and **improving communication** (sub-theme targeting communication). The outputs generated during the activities could assist DMOs in all cases to update, find, select and/or access information regarding SMCS communication. The ongoing activities provide opportunities for users to update the relevant Libraries and explore ways to make the products more sustainable.
- Regarding the **Resilience Wheel**, the main activities concerning this product were expert interviews, workshops with practitioners, and meetings between the CATs and the product owners. The main inputs concerned the adjustment of the vocabulary to the organisational jargon, explaining some key terms, feedback on usability, and simplifying the elements used to navigate the product. The activities for the **Resilience Wheel** mainly focused on **engaging with citizens** (sub-theme collecting and organising information). The recommendations generated during the activities provide opportunities to make the product more user-friendly. Using the **Resilience Wheel** in the ongoing case activities can assist the relevant stakeholders (e.g. Dutch and Danish cases) in understanding their organizational practices by making them aware of their challenges and opportunities regarding SMCS technologies.

The following section points to the next steps for the evaluation of the Framework, including an overview of the broader evaluation activities in the remaining period of the project.

5.2 Next Steps

The results from the case reports in this period feed into ongoing development of the three knowledge bases (D2.5, D3.4, D4.4) in May 2023, and the final version of the LINKS Framework (D5.5) in July 2023.

The final period of the project is largely focused on the external evaluation of the final version of the LINKS Framework. Nevertheless, the activities in the cases are ongoing and feed into the external evaluation through the LINKS community building activities which will take place at local levels.

The CATs will continue to work closely with the products relevant to their organizations and local contexts (see Annex II). This will include both applying the products at local levels, and continuing to contribute content to some products, such as the Use Cases Library. Their work and local ownership of the products feeds into the exploitation plan for the project and into the long-term sustainability of the LINKS Framework and LCC. Moreover, the CATs (and all partners in LINKS) will be increasingly engaged in the ongoing dissemination and communication activities under WP9, as well as the community building activities under WP8 (detailed in D8.3 in August 2023) at the local levels. The activities will include engagement/recruitment activities of LINKS Community members and networks at local levels, many already identified in the LINKS contact database and mapping of networks (see D7.7).

The overall external evaluation of the LINKS Framework is largely linked to the dissemination and community building activities under WP8 and WP9 and will include the following levels of activities:

- A social media campaign aimed at recruiting users and evaluators of the LINKS Framework and LCC. This will also utilize existing networks such as CMINE and the DRS cluster projects.
- A user recruitment survey with built in evaluation processes distributed at upcoming online and in person events, including the upcoming EENA conferences and CERIS events.
- Ongoing workshops, meetings, and roundtables planned with LAC members, associate partners, cluster projects, and relevant EU networks/mechanisms to evaluate and discuss the Frameworks' utility and sustainability.
- The final evaluation of the LINKS Framework will be detailed in D6.6. in November of 2023. The impact assessments from these activities will be also be detailed in upcoming reports under WP9 (D9.5 in June 2023) and WP1 (D1.7 in November 2023) which cover the overall scientific, societal, and economic impacts of the project.

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7. ANNEX I: TABLES WITH STATUS OVERVIEW OF THE CASE ACTIVITIES

7.1 Case 1: Italy

Table 11: Case 1 Activity Status

Activity	Date	Product Focus	Activity Focus	Participants	Status (Delayed, on Track, Completed, TBC)
Workshops with children, testing “Feel Safe”	October 2022	Feel Safe	Exploring the use of SMCS among children and designing a multimedia tool for the awareness campaign	Approximately 45 students from 3 different classes (School: Istituto Fanciulli)	Completed
Links Event in Florence testing “Feel Safe” during AIIG, UNIFI and StC	October 2022	Feel Safe	Testing and validating resources with school and university geography teachers	School and university geography teachers	Completed
Feel Safe workshop with LINKS partners	October 2022	Feel Safe	Online workshop. Update on the product, testing resources, sharing ideas and promoting ownership	LINKS partners	Completed
Resilience festival in Gorizia	October 2022	Feel Safe	Roundtable discussion on children's participation in emergency preparedness	RESILOC – LINKS – CIVIL PROTECTION	Completed

Action Research Game with children on 'Mobility' (UNIFI)	November 2022	Feel Safe/ Including Citizens Handbook	Explore how mobilising citizens through technologies and social media use	Approximately 45 students from 3 different classes (School: Istituto Fanciulli)	Delayed
Site Visit, Twente	November 2022	Feel Safe	Showcase the risk factory project	Video shooting	TBC
Feedback collection from key stakeholders	January 2023	Technologies Library (and Guidelines Library)	Collect feedback on the material included in the Libraries	At least three experts interviewed	Completed
Site Visit, Iserlohn Municipality	March 2023	Feel Safe	Showcase Iserlohn fire fighters' education project	Video shooting	TBC
Simulation (role-play) testing the multimedia product	March 2023	Feel Safe	First test of the multimedia product with civil protection volunteers	Approximately 45 students from 3 different classes (School: Istituto Fanciulli)	On track
Inter-generational dialogue LINKS Community Workshop (StC)	March 2023	Feel Safe	Children meet their grandparents. They discuss memories of disasters. Analog meets new technologies. Sharing strategies for risk management	Approximately 45 students from 3 different classes (School: Istituto Fanciulli)	On track
Online survey with Protezione Civile di Terni	TBD (within March 2023)	Online survey with specific questions on the two parts of the	The survey is addressed to DMOs and local authorities, aiming to test	Still waiting for the results from the practitioners.	On track

on the Accessibility part of the Handbook		Handbook , followed by an online discussion to better articulate the results.	and validate the Handbook. The team expects to receive specific feedback on the product's efficacy and punctual suggestions on improving the Handbook and guarantee its accessibility.		
LINKS Community Workshop (PDT)	April 2023	Feel Safe/ Including Citizens Handbook	Final project event	Children from Fanciulli school present to local project's stakeholders the achievements and Feel Safe	On Track
Dissemination event (with other StC partner schools? - webinar? - or video campaign)	April 2023	Feel Safe	Dissemination event on the Feel Safe	Methodology to be discussed. It could be a video (motion graphics?)	On track

7.2 Case 2: The Netherlands

Table 12: Case 2 Activity Status Overview of Activities

Activity	Date	Product Focus	Activity Focus	Participants	Status (Delayed, on Track, Completed, TBC)
Site visit (and workshop) from the	October 2022	Technologies Library & Use Cases Library	Potential mutual support from the Dutch case on SMCS Libraries . This also includes	LINKS practitioner and researcher partners	Completed

Danish and Dutch case team to Paderborn			planning for the second case assessment.		
Site Visit Italy	Tbd *Suggestion: End Nov/ Early Dec 2022	Feel Safe	Learn more about Feel Safe and how the Italian case team approaches the target group of children. The information will be used for a workshop directed specifically at schools/children.	The Dutch case team & the Italian case team.	Completed
LCW/Focus group: Schools (directors & upper-management)	November 2022	Including Citizens Handbook & Feel Safe	Investigating the information needs of school directors and students in case of an emergency at Chemelot, or long before such an emergency occurs.	The workshop will focus on upper management (directors and those in organising functions) from the municipalities of Beek, Stein and Sittard-Geleen.	Completed
LCW/ Focus Group: Shop Owners	November 2022	Including Citizens Handbook	Investigating the information needs of shop owners in case of an emergency at Chemelot, or long before such an emergency occurs.	Shop owners within the municipalities of Beek, Stein and Sittard-Geleen.	Completed
LCW/Focus Group: Schools (teachers & children)	Tbd	Including Citizens Handbook	This may be scheduled if it is revealed during the workshop with schools that there is a desire for a second workshop (this time specifically catered towards teachers and children).	A potential second workshop would specifically focus on the students and teachers from the municipalities	On track for 2023

				of Beek, Stein and Sittard-Geleen.	
LCW Citizens & Community Ambassadors	Jan/Feb 2023	Including Citizens Handbook & Use Cases Library	Investigating the information for those living in the general surroundings of Chemelot. This workshop is to explore gaps left unexplored during the previous workshops.	Citizens living in the surroundings of Chemelot and ambassadors (for example, sports clubs).	Completed
(5)LCW Final (with mayors & members from the previous workshops)	March/April 2023	Technologies Library	This workshop has as its main focus to reflect on the learnings from the previous workshops and to direct our focus to what they can practically do to improve risk communication.	Citizens living next to the industrial park, especially the people living in the Lindenheuvel area (part of municipality Sittard-Geleen). Ideally, involvement of the mayors from the municipalities Beek, Stein and Sittard-Geleen and other key figures from the government.	On track

<p>Large Scale Exercise</p>	<p>April Onwards *at least until after all the workshops are completed.</p>	<p>Including Citizens Handbook & Feel Safe</p>	<p>Potential exercises with civilians in preparation for an incident on the Chemelot grounds. The goal will be to organise a largescale exercise with the municipalities in the surroundings of Chemelot.</p>	<p>Preferably all parties (scale will be determined further down the line).</p>	<p>On track</p>
<p>Online Platform Slogan: 'Together Safe Around Chemelot'</p>	<p>Ongoing</p>	<p>Use Cases Library, Including Citizens Handbook & Feel Safe</p>	<p>A long-term ambition of Case 2 is that the case outputs can support the development of a local app/platform for practitioners to learn from each other and find information geared to specific needs. The platform for local ambassadors to use to navigate their social networks quickly (think neighbourhood WhatsApp groups or traditional chain calls but more sophisticated). In combination with an app, for two-way communication, a kind of 'Toolkit library' in one place.</p>	<p>The Dutch Case team will need to work closely with established partners in the field to support the development.</p>	<p>On Track This is an initiative of Chemelot, the three municipalities surrounding Chemelot, and the South Limburg Safety Region and the Province of Limburg.</p>

7.3 Case 3: Germany (Drought)

Table 13: Case 3 Activity status

Activity	Date	Product Focus	Activity Focus	Participants	Status (Delayed, on Track, Completed, TBC)
LCW with members of VOST organisations	May 2023	Technologies Library & Use Cases Library	To assess and evaluate the current status of the SMCS (e.g., discussion of selected functions in detail). Also the current structure and potential of the Use Cases Library will be focussed.	Members of VOST organisations (mainly practitioner)	Site visit (and workshop) from the Danish and Dutch case team to Paderborn
Workshop – Internal workshop for the development of the Use Cases Library	July 2023	Use Cases Library	The basis for the newest product – the Use Cases Library – is already developed. For further improvement and assessment of contributions of use cases so far, a	LINKS consortium	LCW

			discussion is needed.		
Involvement of drought-related stakeholders	Ongoing	LINKS Libraries	Following the comments from the review report (March 2023), the case will include selected stakeholders, which are important in the context of droughts in Germany, in the case. The aim is to identify and analyse innovative applications of SMCS usage in drought and exploit future potentials.	To be defined	Meeting to get insight into citizens risk perception and organising spontaneous volunteers
Annual conference of the Association for the Promotion of German Fire Protection (vfdb)	May	LINKS Libraries	They will present and discuss the SMCS Libraries and the implementation in the LCC with a wide range of fire brigades and expect valuable	wide range of fire brigades	Implement a social listening technology

			practitioner-oriented input there.		
					LCW
					Meeting to investigate the potential for establishing a Danish VOST
					Meeting to get insight into citizens risk perception and organising spontaneous volunteers

7.4 Case 4: Denmark

Table 14: Case 4 Activity status

Activity	Date	Product Focus	Activity Focus	Participants	Status (Delayed, on Track, Completed, TBC)
Site visit (and workshop) from the Danish and Dutch case team to Paderborn	October 2022	Technologies Library & Use Cases Library	Learning from LINKS partner concerning LINKS products. Learning about German practitioners' work (observation of crisis management exercise).Also	Danish, German and Dutch partners	Completed

			presenting first results from Danish deep dive to LINKS partners.		
LCW	November 2022		Workshop for Danish practitioners. Presentation of findings from RESILOC and LINKS.	Danish practitioners, Danish LINKS partners and RESILOC partners	Completed
Meeting to get insight into citizens risk perception and organising spontaneous volunteers	November 2022	Including Citizens Handbook	Task Force ⁴	Danish LINKS partners, Dutch partners, external partners from Red Cross, Denmark	On track - the co-creation is in process
Implement a social listening technology	November 2022	Technologies Library	Implement a social listening technology at Frederiksberg municipality to monitor social sentiments in open local Facebook groups and investigate the	Danish LINKS partners	Implementation is completed, from April-November, analyses of the results will be carried out to find results

			potential for further engagement.		
LCW	January 2023	Resilience Wheel	Workshop – practitioners with operational crises management responsibility. Collaboration on the use of new methods to integrate crowdsourcing and strengthen the focus on the needs of the citizens in crises.	Danish LINKS partners (potentially extended to other cases)	Completed
Meeting to investigate the potential for establishing a Danish VOST	February 2023	Technologies Library & Use Cases Library	Understand if HBR can use the Technologies Library to establish the first Danish VOST of trained volunteers to apply digital crowdsourcing technology to support authorities in crises	HBR- Hovedstadens Beredskab	Not completed The reason for not including a test of VOST in DK is that the VOST-system is to be applied nationally. It cannot be used by one organization alone.

Meeting to get insight into citizens risk perception and organising spontaneous volunteers	February 2023	Including Citizens Handbook	Task Force	Danish LINKS partners, Dutch partners, external partners from Red Cross, Denmark.	Completed
LCW	February 2023	Including Citizens Handbook	Workshop with citizens to explore their risk perception of cloud bursts. This workshop builds on findings from the Danish deep dive. The aim is to develop campaign material to inform citizens of future cloud bursts and investigate the upcoming dissemination on social media and through related platforms, channels, and forums.	Citizens of Frederiksberg municipality	Delayed, will be carried out in May

Implement a social listening technology	February 2023	Technologies Library	Implement a social listening technology at Frederiksberg municipality to monitor social sentiments in open local Facebook groups and investigate the potential for further engagement.	Danish LINKS partners	Completed
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7.5 Case 5: Germany (Terrorism)

Table 15: Case 5 Activity Status

Activity	Date	Product Focus	Activity Focus	Participants	Status (Delayed, on Track, Completed, TBC)
LCW followed by interviews and focus group discussions	January 2023	Including Citizens Handbook, Use Cases Library	Assess how the police and the media communicate during terrorist incidents. Understand if the public turns to the media instead of the police.	Practitioners & citizens	Delayed (the concept of the workshop and the interviews was modified to feed into the needs of the product owners. Thus, the LCW and the interview set are not directly connected anymore and evaluate different Framework Products. As in

			<p>Understand how to protect and engage potentially vulnerable groups using SMCS.</p> <p>Assess how the public evaluates the credibility of information shared in SMCS.</p> <p>Reflect upon preventing rumours and the spread of false information in social media. This LCW shall try to evaluate the Including Citizens Handbook and the Pocket Ethics Guidelines made available in the LCC.</p>		<p>the table above, the interviews will be carried out until the end of March, the date for the LCW and the scope of its participants will be set together with the POs for the Handbook(s) and the Resilience Wheel</p>
LCW followed by focus group discussions	March 2023	Guidelines Library, Technologies Library & Use Cases Library	<p>Understand how the guidelines for SMCS use during major terrorist incidents are developed to further evaluate particularly the Guidelines Library as well as the Pocket Ethics</p>	Practitioners & decision makers (law enforcement, ministries, DAs)	<p>Delayed (since the host for the Annual Meeting changed and DHPol is now in charge of the event, the fourth LCW will take place as a part of this meeting and will likely need to have a slightly different focus since some partners already expressed that the sustainability of</p>

			Guidelines from the LINKS Framework		the LINKS products and results should be at its core.
<p>Refinement of the following cases based upon the feedback sent by the police organisations.</p> <ol style="list-style-type: none"> 1. "Amok in Vienna" 2. "Shooting in Munich" 3. "Attack in Stockholm" 4. "Attack in Utøya" 5. "Riots in Rotterdam" 6. "Amok in Berlin" 7. "Double Homicide of Herne" 8. "G20 protests in Hamburg" 9. "Policing the Protests at the Dannenröder Forst" 10. "OSINT work at the PD Osnabrück" 11. "Attack in Würzburg" 12. "Terror in Paris" 13. "Terror in Brussels" 14. "Terror in Nice" 	April 2023	Use Cases Library	<p>The case would like to fact-check the collected information on the use cases with insights from people actually involved in the police crisis communication during those incidents, thus refine the use-cases in a way that makes them even more practitioner-oriented. In particular, they would hope to get insider information on specific tools that were used or obstacles and problems regarding the social media work that was not detailed in public materials like press releases etc.</p>	TBC	TBC

15. "Terror in Barcelona/Cambrills"					
3 semi-structured expert interviews to gather feedback on the Framework products - particularly the DCT library and the Guidelines Library	April	Guidelines Library & Technologies Library	They would like to evaluate how practitioners responsible for training police officers on crisis communication perceive the usability and usefulness of the LCC and how well they can navigate it to find information relevant to them. Accordingly, this shall give them a better understanding of how the different tools, particularly the Guidelines and DCT Library would need to be further developed to make the LCC a relevant resource for police training	TBC	TBC
Site visit at the mission control center of the	July	Including Citizens Handbook	The case would like to visit the OSINT team of	Police practitioners & LINKS partners	On track



<p>Osnabrück Police Department</p>			<p>the PD and introduce the project partners and selected practitioners to the 'intel officers' who carry our open-source investigations upon incoming emergency calls (for details see the associated Use Case in the Use Cases Library). They also to use this site visit to discuss with the participants whether OSINT teams should engage more in crowdsourcing and how it could function as an intersection between the police and communities of digital volunteers in large-scale police operations</p>		
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