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LINKS

Strengthening links between technologies and society for European disaster resilience

D6.4 First LINKS Case 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 and govern the uses of SMCS in disasters. The LINKS Framework consolidates knowledge and experiences on the uses of SMCS into useful products for relevant stakeholders. 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 (Italy, the Netherlands, Germany, and Denmark). 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 (D6.4) provides the first results for the research activities taking place within the LINKS cases. The first round of case assessments took place between November 2021 to April 2022 within five practitioner-driven European cases, 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

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The case assessments included both cross-case and deep dive activities. The cross-case assessments included at total of 67 semi-structured interviews across the case countries, as well as an online survey which received 219 responses across the case countries (and 284 across Europe). The interviews and survey aimed to gather information on the experiences, good/best practices and needs of disaster management organizations (DMOs), for working with social media and crowdsourcing (SMCS) technologies in disaster management processes. The research was guided by the methodologies developed in LINKS (D2.3: Bonati, S. & Pazzi, V. 2021; D3.2: Bach Nielsen, A. et al., 2021; D4.2: Gehlhar S. et al., 2021), with specific focuses on thematic topics related to decision-making procedures, sensitivity to vulnerability, credible information, learning across phases, and technical aspects of the SMCS tools and processes currently being employed by DMOs.

The first analysis from the interviews and survey confirmed results from the desk studies (D2.1: Bonati, S. 2020; D2.2: Pazzi, V,. et al. 2020; D3.1 Nielsen, A. & Raju, E., 2020; D4.1 Habig, T., et al. 2020) conducted earlier in the project, pointing to a strong interest by disaster management organizations for engaging with SMCS in disaster management processes, but a general lack of:

- Good/best practices and procedures among institutions in Europe, on how to use SMCS in efficient ways.
- Relevant and easy-to-use guidelines on implementing SMCS in disaster management processes.
- Understanding of the potentials, and guidance on how to include citizens in disaster management processes.
- A comprehensive and understandable overview of existing solutions/technologies.

In light of these general findings, some key takeaways from the case reports included:

- Procedures and experiences using SMCS by DMOs are often unstandardized, informal, ad-hoc, and discussed from the perspectives of individuals or colleagues. Barriers for integrating formal procedures include (among other things) timing and managerial constraints; lack of knowledge on, training and resources for using SMCS technologies; and knowledge loss owing to staff turnover.
- Experiences and needs are largely orientated towards disaster response and preparedness activities, very little attention is paid to recovery and prevention phases.
- Experiences and needs are viewed less in the context of specific hazard scenarios, and more from a perspective of broader disaster management activities.
- Credible information and trust are high priority areas, and DMOs are concerned with the quality and accuracy of information which they share on social media, as well as with finding ways to manage and use information generated by others on social media.
- The concept and applications of crowdsourcing in disasters is far less considered by DMOs in comparison to social media.

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- Active engagement with citizens is a divisive topic among DMOs, with some focused on the potential benefits and others the risks. This appears to be linked to a number of factors including an unwillingness or inability (owing to lack of know-how) to involve external stakeholders in DRM activities, and general unfamiliarity with the potentials and benefits of crowdsourcing due to inexperience using it.
- Vulnerability was also a divisive topic among DMOs, with few concrete examples of addressing vulnerable groups in disasters through SMCS. Most DMOs do not differentiate among types of groups and citizens in terms of the targeting of tailored risk communication and other applications of SMCS in disasters. However, some DMOs did recognize a need for it.

The deliverable also provides an overview of the first outcomes from the deep-dive activities taking place within each case, and the updated status of ongoing activities such as LINKS Community Workshops and focus groups.

The data collection, analysis, and the compiling of results in the case reports within this deliverable is the work of experts within the individual case teams. The results from both the cross-case and deep dive activities now feed into a second round of analysis to inform the development of the LINKS Framework, and the updated methodologies for the second round of case assessments beginning in November 2022.

This is a public document and the contents will be of interest to all relevant stakeholders (e.g. disaster management organizations, decision makers, researchers, etc.) interested in the uses and challenges around SMCS in disaster management processes.

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LIST OF ACRONYMS

Acronym / Abbreviation	Description
DCT	Disaster Community Technologies
DMO	Disaster Management Organisation(s)
DMP	Disaster Management Processes
DRM	Disaster Risk Management
DRPV	Disaster Risk Perception and Vulnerability
LAC	LINKS Advisory Committee
LCC	LINKS Community Center
LCW	LINKS Community Workshop
SMCS	Social Media and Crowdsourcing
WP	Work Package

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DEFINITION OF KEY TERMS[1]

Term	Definition
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.
Case-based assessments	The cross-based assessments (or case assessments) are joint efforts between WP2-4 and investigate the specific knowledge domains across different contexts while exploring interacting themes. The cross-based assessments are thus both an attempt to explore domain-specific questions through a comparative lens and an attempt to explore the interdependent questions cutting across knowledge domains.
Crowdsourcing	Describes a distributed problem-solving model where the task of solving a challenge or developing an idea get "outsourced" to a crowd. It implies tapping into "the wisdom of the crowd" (definition builds on Howe, 2006; see also LINKS Glossary).
LINKS Community Center	An online platform providing user-friendly access to LINKS results and means to exchange knowledge and experiences.
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 organizations in their planning for using social media and crowdsourcing in disasters.
LINKS Knowledge Bases	The outputs and knowledge obtained from the assessment of three knowledge domains. This knowledge is used to develop the LINKS Framework.
LINKS Knowledge Domains	The three crucial domains of analysis for studying European disaster resilience and SMCS. These include: Disaster Risk Perception and Vulnerability (DRPV), for assessing changes in the citizens' perception of disaster risks induced by SMCS, as well as assessing the changes in the vulnerability of practitioners and citizens. Disaster Management Processes (DMP) for analysis of how SMCS changes the procedures and processes within the crisis and disaster management. Disaster Community

[1] Definitions are retrieved from the LINKS Glossary at http://links-project.eu/glossary/.

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	Technologies (DCT), for assessing SMCS related technologies used by practitioners (and citizens) in disasters.
Scenarios	In LINKS the scenarios are the hazards, contextualized 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.
Social media	A group of Internet-based applications that build on the ideological and technological foundations of the Web 2.0 and that allow the creation and exchange of user-generated content (UGC). Forms of media that allow people to communicate and share information using the internet or mobile phones (definition builds on Kaplan & Haenlein, 2010; see also LINKS Glossary).

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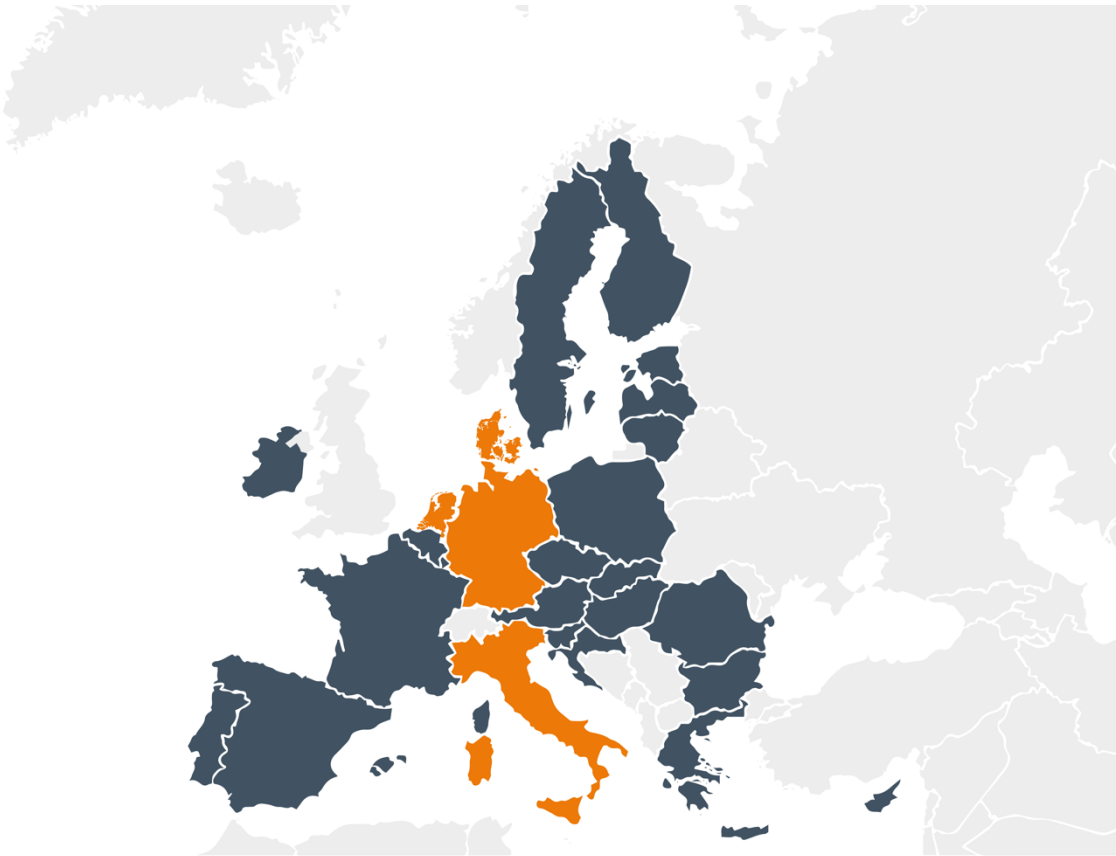
1. INTRODUCTION

The main objective of the LINKS project is to strengthen European disaster resilience by consolidating knowledge and generating learning on the uses of social media and crowdsourcing (SMCS) in disaster management processes. This is done through the development of the LINKS Framework, which can be used by different stakeholders to openly explore knowledge, and for strategic planning for applying SMCS in disaster management processes.

During the lifetime of the project, the development and evaluation of the Framework is realized through research activities in five practitioner-driven case scenarios in Europe:

- 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 Case Countries



Source: LINKS

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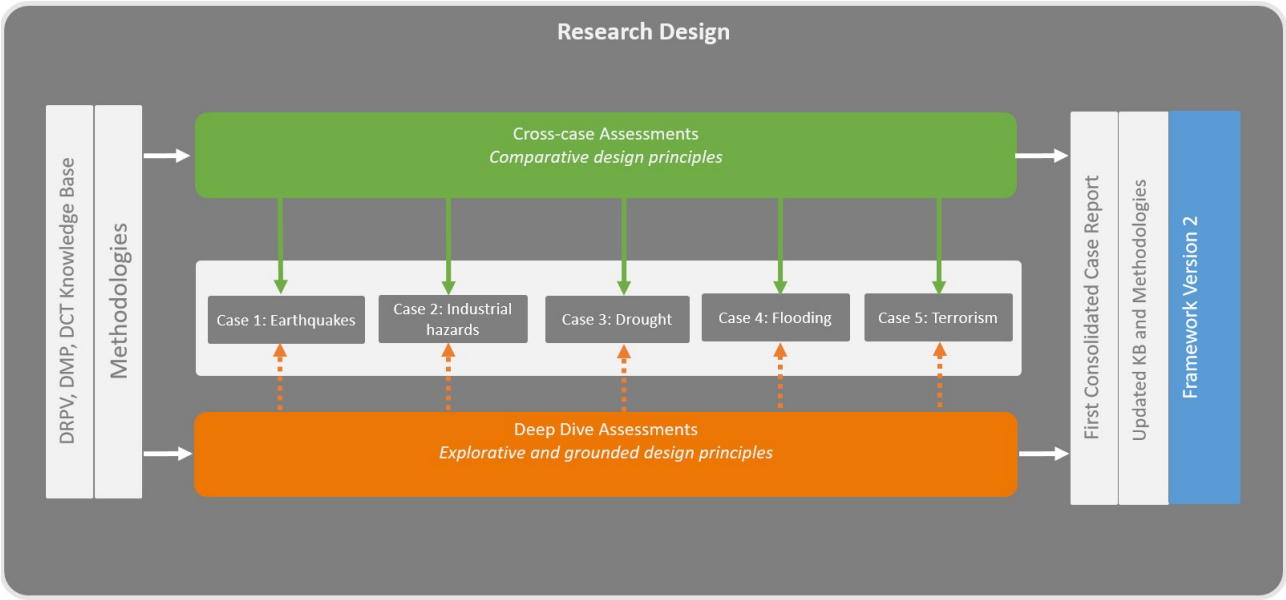
There are two rounds of case assessments during the project. This deliverable provides the first results from the first round of case assessments, which took place from November 2021 – April 2022.

The research design for the first round of case assessments was based on two levels: **cross-case assessments** and **deep dives assessments**.

Figure 2: Research design for case assessments



Source: WP2-4 contribution and adapted by WP6

The cross-case assessments were designed with a set of methods which allowed us to explore interrelated themes emerging across the different cases. For the cross-case activities, local case assessment teams distributed an online survey and conducted semi-structured interviews to examine experiences, good/best practices, needs (and challenges) around the uses for SMCS in the context of different hazard scenarios by disaster management organizations (DMOs). The survey and interviews were guided by the LINKS methodologies (D2.3 Bonati, S. & Pazzi, V. 2021; D3.2 Bach Nielsen, A., et al. 2021; and D4.2 Gehlhar S., et al. 2021) and were designed to cut across three key knowledge domains: disaster risk perception and vulnerabilities (DRPV), disaster management processes (DMP), and disaster community technologies (DCT). This design ensured that the assessments covered similar social, institutional and technical themes in the cases. This included a focus on:

- Decision-making procedures,
- Sensitivity to vulnerability,
- Credible information,
- Learning across phases,
- Technical aspects of using SMCS by DMOs.

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The cross-case activities were also complemented by deep dive activities within each case, which allow the case teams more freedom to explore topics which are of specific relevance to the local case. The deep dives are ongoing and include different activities in each case such as surveys, workshops, focus groups, action research gaming, and other activities.

The case reports in this document provide the first results from the cross-case and deep dive activities within each case. The reports have been compiled by experts within the case assessment teams which included researchers and practitioners at local levels jointly conducting the case activities. The case reports serve interrelated purposes in LINKS:

- They have been used as a sense making exercise by the case assessment teams, for ordering and summarizing the most important aspects which emerged from within their cases, and for orientating the case activities in the next phase of the project.
- They provide the first analysis of the data from each case, which will feed into a second round of analysis across the data from the cases between May – September 2022.

The second round of analysis entails a cross-case assessment of the data from the survey and interviews. The results from the case reports in this document, and from the second round of analysis feed directly into:

- The three knowledge bases (DRPV, DMP, DCT) and the second versions of the methodologies (D2.4; D3.3 and D4.3: September 2022).
- The content and design of the first (D5.3) and second (D5.4) versions of the LINKS Framework (June/November 2022) within the LINKS Community Center.

1.1 How to read this document

This document is structured as follows:

- Section 2 briefly revisits the approach to the cross-case assessments in the project, and presents a summary of the first results from the cross-case activities including:
    - Overview of the results from the online survey.
    - Summary of the interviews based on the case reports in Section 3.
- Section 3 presents the individual case reports for each country. This includes:
    - Overview of the main topics covered and key examples from the interviews in each case.
    - Summary of the first outcomes from the deep dive activities in each case.
- Section 4 provides conclusive remarks and an overview of the next steps.
- Annex I provides detailed tables on the most important good/best practices, needs and challenges identified in the interviews by each case team.
- Annex II provides tables with the updated status of deep dive activities for each case.

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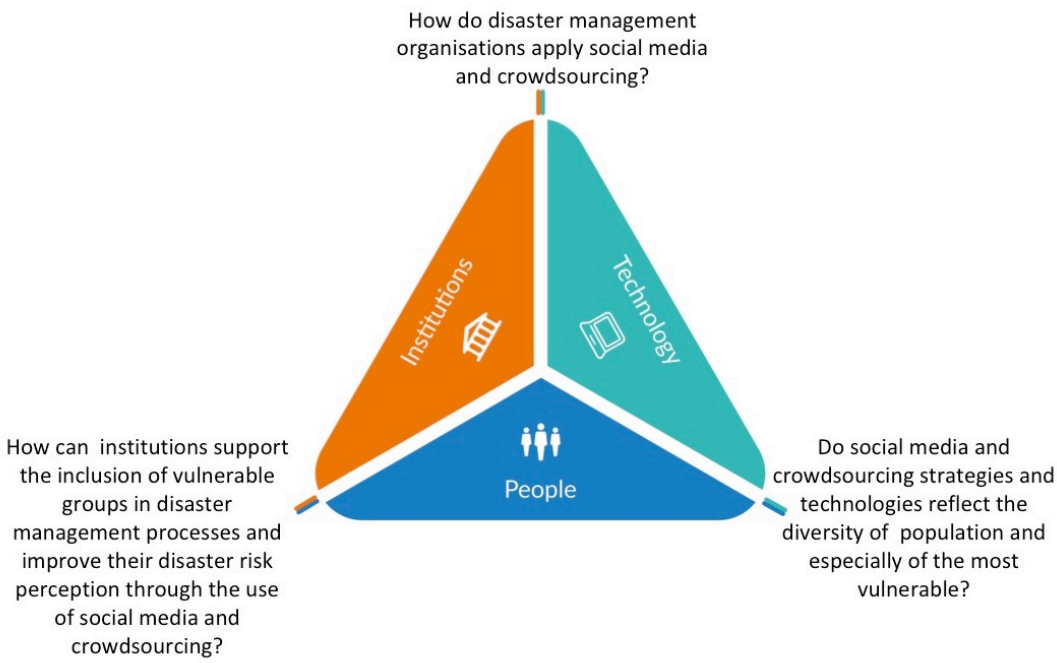
2. FIRST RESULTS FROM THE CROSS-CASE ASSESSMENTS

In this section we provide a summary of the first results from the activities taking place for the cross-case assessments. First, a short overview of the research design is provided.

2.1 Research Design

The research design for the cross-case assessments was defined in the methodological deliverables D2.3, D3.2, and D4.2 under WP2-4. The design provides a set of methods for exploring interlinking questions and themes across social, institutional and technical knowledge domains: disaster risk perception and vulnerabilities (DRPV), disaster management processes (DMP), and disaster community technologies (DCT).

Figure 3: The Interlinking Questions



Source: WP3 authors' contribution in collaboration with WP2 and WP4

The methods used in the first round of cross-case assessments included an online survey and semi-structured interviews across the cases. Assessment guidelines were developed to guide the case

assessment teams in identifying relevant research participants, and in developing specific research questions related to their cases (D6.2: Fonio, C. & Clark, N. 2021).[2]

Research participants were identified and selected based on their expertise and experiences working at operational and strategic levels within disaster management organisations, or within organisations that operate to support disaster risk management activities at different levels, and who could provide examples of good/best practices, needs and challenges, and opportunities for the application of SMCS in disaster management processes. Organization types were categorised generally by the case teams as:

- GOV: governmental organisations (e.g. police, fire brigade, municipality),
- NGO: non-governmental organisations (e.g. Red Cross, Doctors w/o borders),
- ASS: associations and federations (can vary greatly in scope and locality),
- IND: industries (e.g. insurances, tech-companies, operators of critical infrastructure),
- POL: policy/decision-makers,
- MED: media
- SCI: scientific communities (e.g. universities, other projects)

Questions for both the survey and interviews were developed to cut across the three knowledge domains, through close coordination among WP2-4 leaders and the case assessment teams. Interview questions developed by the case assessment teams were tailored to the local contexts of the cases, and were guided by interlinking thematic drivers from the DMP, DCT, and DRPV methodologies. The overall themes for the interviews included:

- **Decision-making procedures:** *Key topics: active/passive use of SMCS, efficiency in DMP processes, integration and coordination across agencies, sectors and stakeholders, the inclusion of citizens and volunteers;*
- **Sensitivity to vulnerability:** *Key topics: an overview of local vulnerabilities, targeting of (official) information, tailored information, sensitivity to diverse groups;*
- **Credible information:** *Key topics: strategic use of SMCS, consistent and reliable information (processes and concerns), mis/disinformation, hate speech and respect for privacy;*
- **Learning across phases:** *Key topics: training and education structures for using SMCS in disaster governance, technical expertise, evaluation processes, learning processes;*

[2] For assessment guidelines see Annex II: Interview Protocol for the cross-case assessments (Nielsen, A., & Andersen, N. 2021) Guidelines on how to Short Data (Nielsen, A., Clark, N., Fonio, C. & Raju, E. 2021), Online Survey Protocol (Luke, R. & Habig, T. 2021). Early interview questions identified by case assessment teams in relation the knowledge bases can also be found in D2.3, D3.2 and D4.2.

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- **Broader considerations on technical aspects:** *Key topics: specific information on SMCS uses and functions, names of providers, technical implementations.*

Data collection for the survey and interviews took place between November 2021 – March 2022. The first analysis of the survey data was done by SIC in April 2022 under the WP4. The first analysis of the interview data was conducted by the case teams and took place between February – April 2022. The case teams translated the interviews in their cases into English, and used NVIVO to transcribe and analyse the interviews along the themes identified above.

In the following sections (2.2 and 2.3), we provide summaries of the first results from the survey and interviews. For the survey we include an overview of high-level attributes (e.g. numbers of respondents and locations) and highlight interesting initial findings from both closed and open answer questions asked to respondents. For the interviews, we provide a summary of the first results from the interviews, based on the case reports in Section 3.

2.2 Summary of Survey Results

This section provides a general overview of the content of the online survey and provide some initial interesting findings. The survey ran from December 2021 – March 2022. A total of 284 respondents answered the survey from 20 European countries. The survey was designed to obtain trends, interesting and helpful examples as well as to establish contacts with suitable respondents for future project activities. In the context of LINKS, the survey is a cross-case activity but was intended to cover more than just to the four case countries (Germany, Denmark, Netherlands and Italy).

2.2.1 Countries

Figure 3 shows the absolute distribution of the number of respondents in the six most represented countries. Figure 4 shows a distribution of respondents weighted by the number of responses per ten million inhabitants. This gives an impression of the relative participant numbers of the countries.

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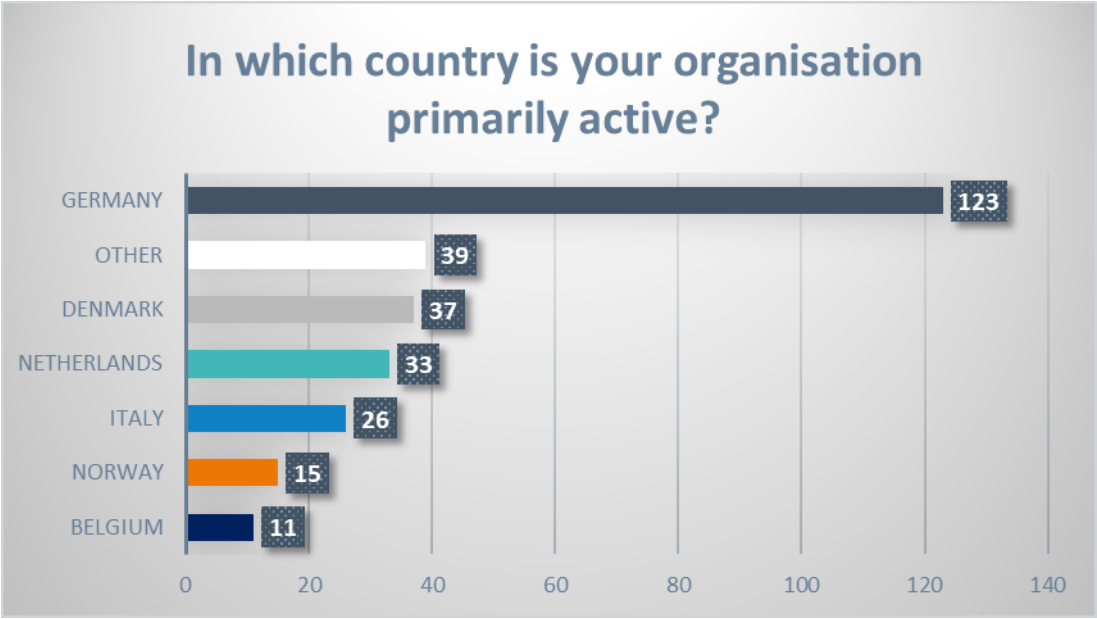
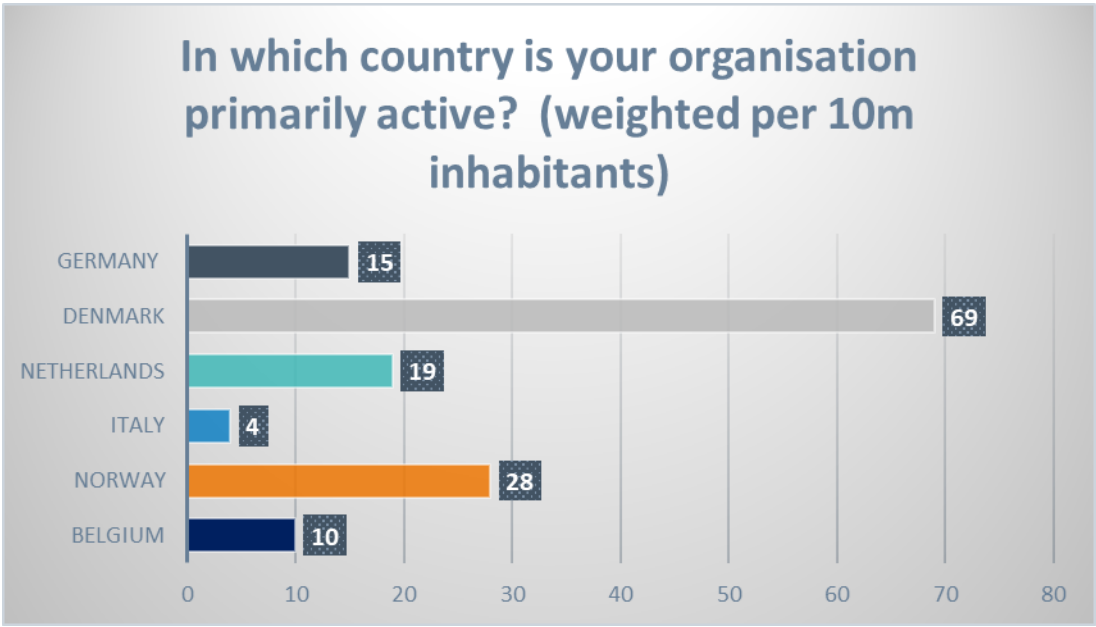
Figure 4: Distribution of the Countries of the Respondents



Source: LINKS

Figure 5: Relative Distribution to the Population of the Respondents' Countries



Source: LINKS

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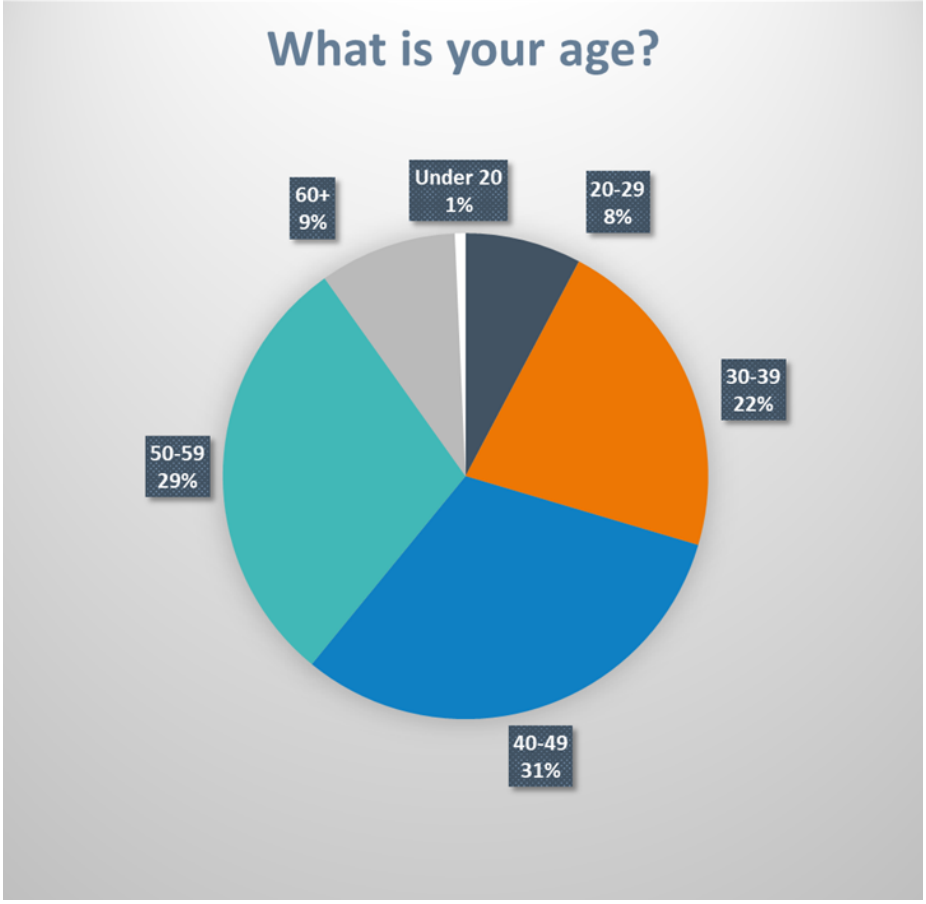
2.2.2 Age

Figure 6 shows the distribution of the age of the respondents. The majority of respondents are between 40 and 59 years old, followed by those aged 30-39. A smaller proportion is made up of those over 60 and under 29.

Figure 6: Distribution of the Age of the Respondents



Source: LINKS

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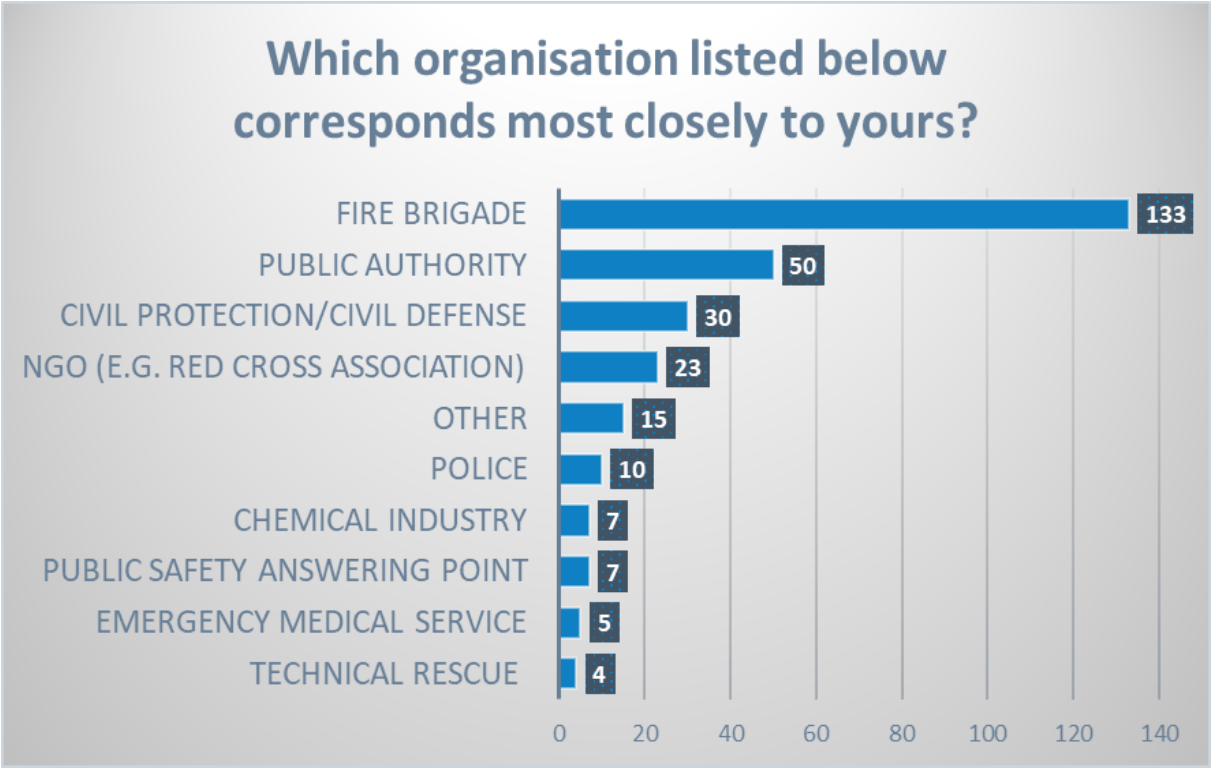
2.2.3 Type of Organisation

Figure 7 shows the type of organisation of the respondents. The fire brigades are followed next by public authorities and civil protection organisations.

Figure 7: Type of Organisations



Source: LINKS

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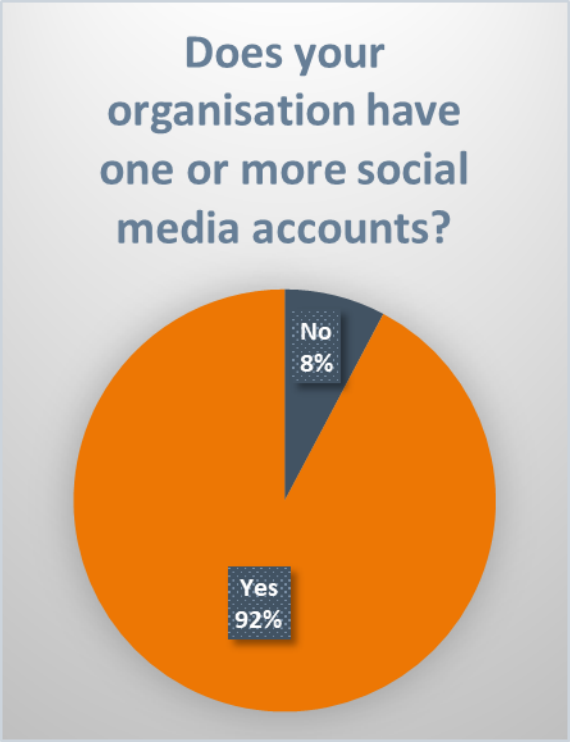
2.2.4 Social Media Usage

The entry question for the section on SMCS use is shown in Figure 8. When asked if the participant's organisation has at least one social media account, 92% answered "Yes".

Figure 8: Proportion of Organisations Using Social Media



Source: LINKS

If the answer was "No", the respondents were asked why not. Here is a small compilation of the reasons:

- *"Unrecognised necessity among higher-level decision-makers."*
- *"Data protection ; complex maintenance ; responsibility."*
- *"So far, no position has been created for this by the city. Existing staff do not have the time resources to do this work "on the side"."*
- *"Strategic choice of the regional presidency which I personally do not agree with."*
- *"No personnel, no time to deal with it intensively."*
- *"If I knew that - higher authority don't see any sense in it. Only the higher authority (district) has a FB account."*
- *"In the past there was no resources for these matter. Actually we plan a Social Media launch for 2022."*

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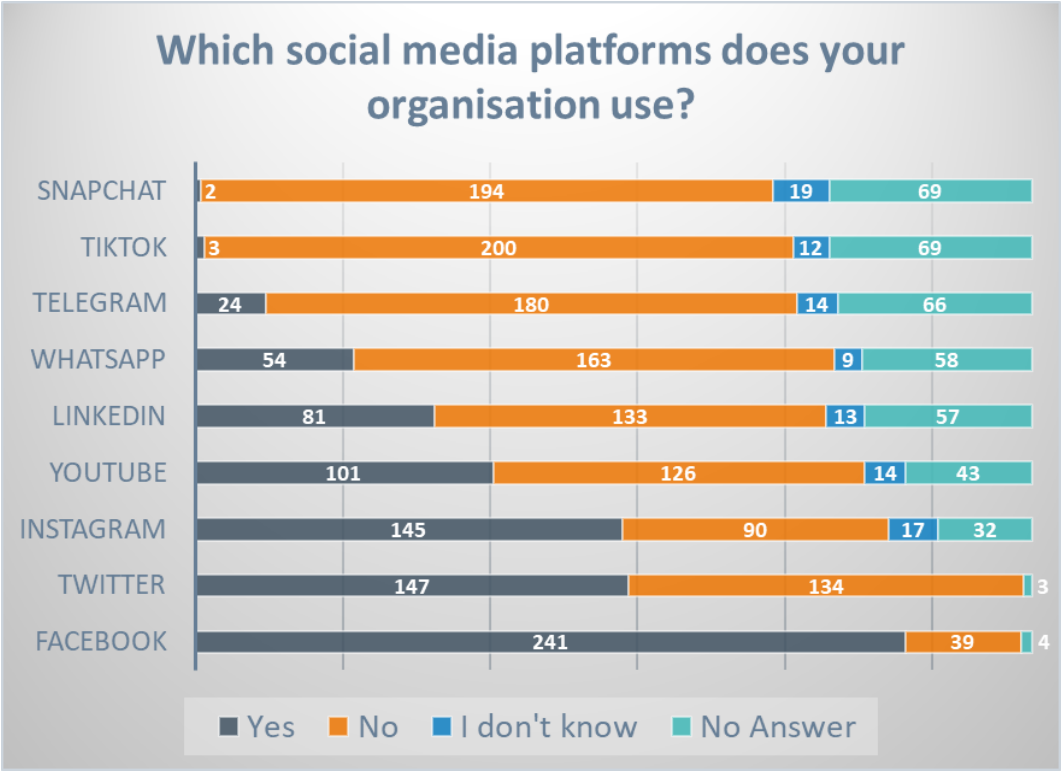
The reasons for the lack of resources for the use of SMCS as well as the lack of convincing the "higher-level decision-makers" can be found several times in the answers. These statements confirm the previous work of WP3 and WP4, in particular the gaps and needs of practice identified in Deliverable 3.1 and 4.1, which serve as a basis for the research in the project. The statements also resonate with findings within the interviews (Section 3), reinforce the need for convincing as well as the need for technical solutions to save resources (especially time).

Another set of questions asked about the organisations' social media use per platform (Figure 9). Responses clearly show the predominant use of Facebook by some margin, followed by Twitter and Instagram. The platforms Snapchat and TikTok, which are more popular with young people, are hardly used at all so far and therefore still offer a lot of potential to reach younger target groups.

Figure 9: Use of the Different Platforms



Source: LINKS

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2.2.5 Type of Hazards

Figure 10 shows the stated use of social media in specific scenarios. The use during storm and flood events stands out. The third most frequent use is for wildfires, which are particularly intensified in drought situations.

Figure 10: Type of Hazards for Social Media Usage

Source: LINKS

The following table shows some interesting examples from the case countries given in the survey:

Italy

- *"SALVAGE: information on Cultural Heritage salvage after events."*
- *"Search and rescue of missing people."*
- *"Diffusion of thematics such as natural risks."*

Netherlands

- *"Interruption/disruption of drinking water supply and/or contamination of drinking water."*
- *"We actually use social media in all incidents. Depending on the size and scope, it can be a mix of channels."*
- *"Large fires, environmental damage, traffic accidents, extreme weather such as precipitation or fog."*

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Germany

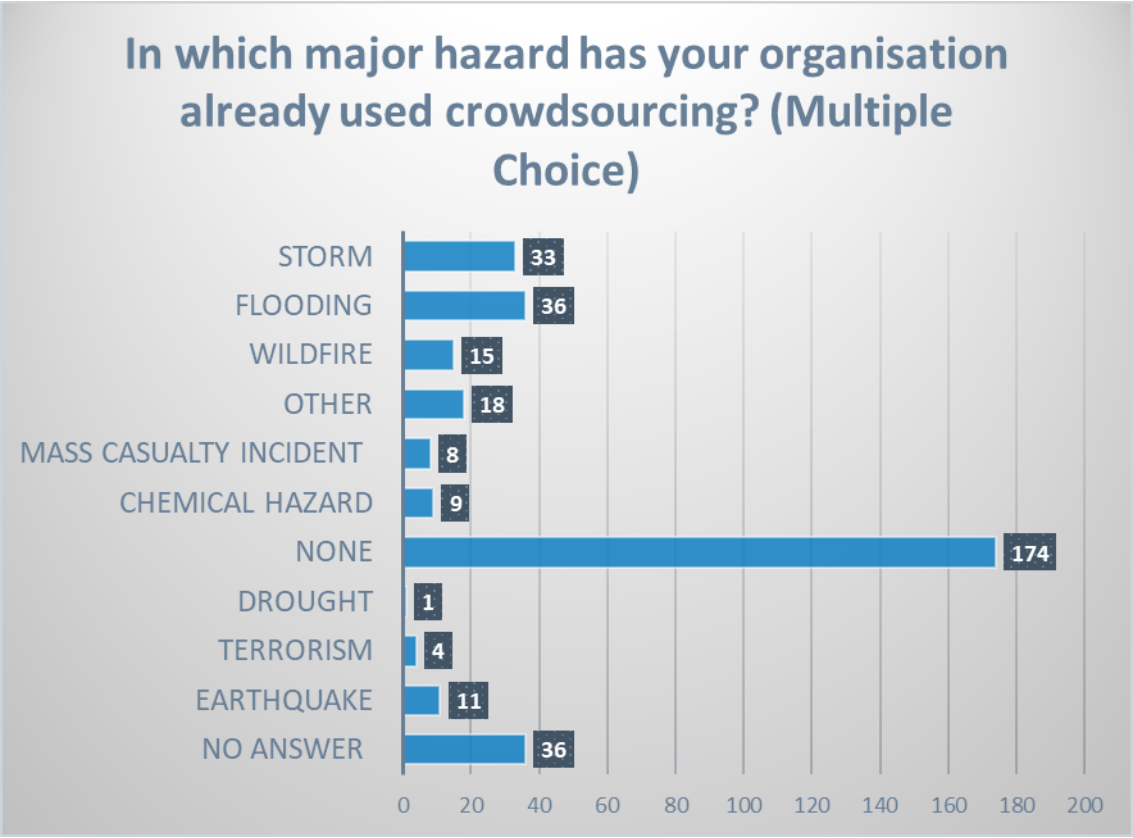
- *"Bomb disposal with evacuation of a district: Informing citizens regarding the upcoming evacuation to give them enough time for planning and decision-making."*
- *"In the event of flooding, information on the current course of events is published. Extent of the damage situation presented."*
- *"Replacement for communication due to failure radio and telephone."*

Denmark

- *"Drought = heat / prevent heat strokes. Reasonable use of 112/1813, remember to renew prescription before Christmas etc."*
- *"Supply shortage"*
- *"To find people who are missing or have disappeared from a nursing home or other institution"*

The same question was also asked for the use of crowdsourcing. Crowdsourcing turns out to be a much more complex term due to its diversity. As also noted in the interviews (see also section 3.3), the understanding of crowdsourcing differs significantly among the respondents. Depending on the respondent, crowdsourcing can mean, for example, the targeted sharing of information on social media, the search for missing persons by involving the population, the entering of data on so-called crisis maps or the coordination of volunteer helpers on site. By defining the term within the survey, we tried to give the respondents a LINKS perspective on crowdsourcing. However, as can be seen from the answers in Figure 11, (and as anticipated) crowdsourcing is used much less than social media by the respondents.

Figure 11: Type of Hazards for Crowdsourcing Usage



Source: LINKS

Nevertheless, some interesting **crowdsourcing examples** emerged which could provide further impetus for the project by contacting the participant:

- *"Search service in connection with the war in Ukraine."*
- *"Our organization was born recently, but we have had experience of managing requests and offers always in the post earthquake area."*
- *"Identifying residents at risk of flooding"*
- *"Verification of information through images on social media"*
- *"Citizens can register flooding, after which we receive data - we can use this data to prioritize efforts"*
- *"We have previously had contact with major Instagram influencers who have shared our messages / inquiries, but do not know if it qualifies as crowdsourcing"*
- *"Situation assessment in the streets of the evacuation areas"*
- *"Collaboration with citizens and volunteers who helped vulnerable or elderly citizens in connection with evacuation in the event of a large fire"*
- *"Donations in kind care situation"*

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- *"We have asked citizens via Facebook to let us know if they spot oil in the water elsewhere than those places we have informed about."*
- *"Odour nuisance: through social media we often receive messages like: " there is a strong smell of gas" or "in the neighbourhood there is a strong smell of gas". By plotting these reports on a map, in comparison with the actual interventions, it is possible to find the 'culprit' for the odour nuisance by looking at the wind direction, for example."*
- *"We called for volunteers at the start of the corona pandemic and have recently found a missing citizen using social media search"*
- *"xxxx earthquake: 16k felt reports (felt reports describe shaking and damage levels), hundreds of geo-located pictures..."*
- *"Check the position of a wildfire"*
- *"Our followers on Facebook were encouraged to help us translate the ban on open fire. We had 6 languages, and in a short time we got the preventive content translated into another 13 languages."*

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2.2.6 Guidance documents

One section of the survey asked about organisations' awareness and use of formal policies, guidelines or standard operating procedures. The responses were quite balanced for social media (Figure 12). If the question was answered positively, the respondents were also asked to write down the name of the document. The majority of respondents mentioned internal organisational documents that are not available to other organisations. The answers confirmed the previous research (e.g. see D3.1 and D4.1), that there is an urgent need to make existing and appropriate guidelines on the use of social media and crowdsourcing available in a structured overview for organisations.

Figure 12: Usage of Guidance Documents for Social Media

Source: LINKS

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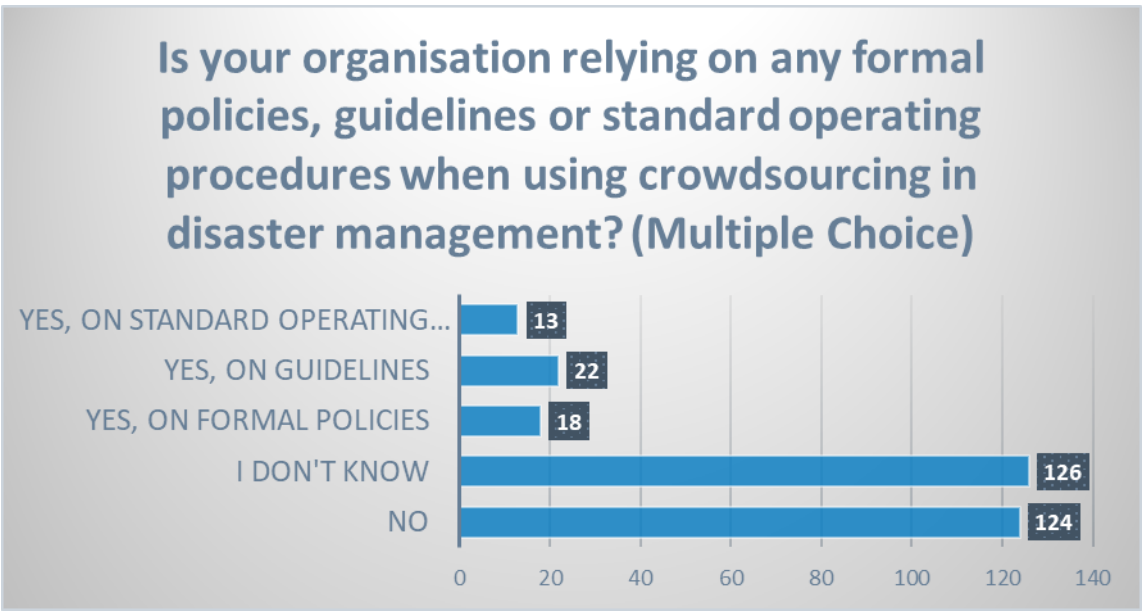
Figure 13: Usage of Guidance Documents for Crowdsourcing



Source: LINKS

The high response rates of "I don't know" and "No" regarding guidelines for crowdsourcing (Figure 13) point to the need for further research and support for disaster management organisations in this area and therefore the work being done in LINKS.

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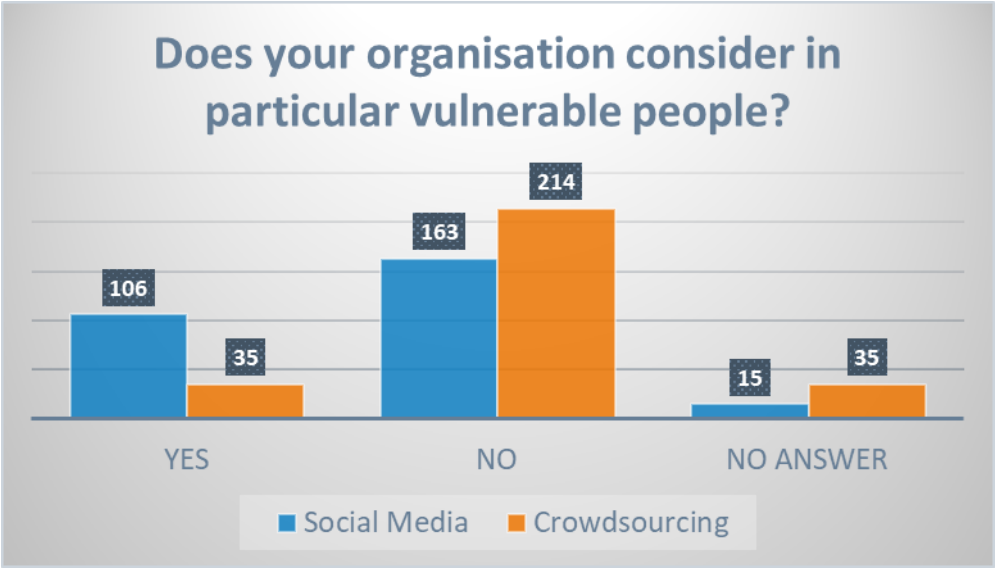
2.2.7 Vulnerability

Participants were also asked whether their organisations in particular take vulnerable groups into account in their work with social media and crowdsourcing. As Figure 14 shows, 106 respondents answered with "Yes" for social media, but only 35 answered with “Yes” for crowdsourcing. This distribution of responses also confirms the identified gaps and work done by WP2 and the findings in the interviews regarding the lack of differentiation between targeting vulnerable groups and others in local communities. There is a strong need to analyse opportunities and facilitate the Disaster Risk Reduction community's engagement with vulnerable groups especially for crowdsourcing.

Figure 14: Consideration of Vulnerable People



Source: LINKS

2.2.8 Further Involvement and Next Steps

Finally, at the end of the survey, the respondents were asked if they would like to receive the results of the survey, but more importantly for the further development in the project, if they would like to participate in future research and project activities. 159 respondents would like to receive the results of the survey and 47 would even like to be involved in future project activities. This shows a great interest in social media and crowdsourcing in crisis management. This group of people offers the possibility to invite them to participate in specific workshops as well as to conduct expert interviews depending on the expertise received in the responses. There is also the possibility to potentially invite the group of respondents who are interested in the results of the survey to the LINKS Community Center and thus to the LINKS Community.

For the next steps, a deeper analysis of the survey data will be done in the knowledge bases (WP2-4) as part of the preparation for the second methodology, which will be completed in September

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2022 (D2.4, D3.3 and D4.3). The findings will be incorporated into the development of the products related to the knowledge bases and thus also influence the design of the LINKS Framework. Respondents who wish to be involved in future research activities will be contacted to test and validate both the individual products and the Framework as a whole in the second round of case assessments.

2.3 Summary of Interview Results

In this section we provide a brief summary of the main takeaways from the first analysis of the interviews by the case teams. As with the survey, the overview in this section acts as an early interpretation of the results across all the case interviews, with the deeper round of cross-case analysis across the interview datasets still to be finalized under WP2-4.

The interviews took place across the cases from November 2021 – January 2022.[3] The case assessment teams conducted a total of 67 interviews across the cases. Figure 15 below provides a breakdown of the numbers of interviews per case.

[3] A few interviews took place outside of these dates.

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Figure 15: Number of Interviews per Case

Source: LINKS

Overall the interviews confirmed and furthered the research done previously under WP2-4, and provided context to the current uses, needs and challenges of SMCS in disaster management processes. At the highest level the results confirmed a scattering and general lack of:

- Good/best practices and procedures among institutions in Europe, on how to use SMCS in efficient ways.
- Relevant and easy-to-use guidelines on implementing SMCS in disaster management processes.
- Understanding of the potentials, and guidance on how to include citizens in disaster management processes.
- A comprehensive and understandable overview of existing solutions/technologies.

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Moreover, a number of similarities and difference emerged across the cases. At the highest level this included greater focus by participants on the uses and needs for SMCS in disasters in the response and preparedness phases, as well as a general lack of familiarity with the concept of crowdsourcing. Many of the experiences, good practices, and needs around SMCS were also deemed applicable to multiple hazard types, even if discussed in the context of a single incident.

Key differences which emerged across the interviews primarily related to the types of organisations and the positions of the participants, and the types of hazards being discussed. For instance, participants from law enforcement agencies were less forthcoming about specific procedures, good practices, and use cases, and yet were also deemed to be more formalized in their procedures than other types of DMOs working with SMCS in crises.

Table 1 below provides an overview of the main takeaways across the interview results in the case reports (Section 3). The takeaways are organized under the themes used to guide the interviews and data analysis by the case teams.

Table 1: Main Takeaways Across the Interviews

Theme	Main Takeaways
Decisions-making procedures	**Summary:** Across the cases, social media and crowdsourcing were deemed very relevant for disaster risk management, for communication and coordination of information among different stakeholders. In particularly, social media was mainly seen to be useful in communication activities in response and preparedness phases, with lesser focus on recovery and prevention overall. In spite of the perceived usefulness, few activities are driven by formal procedures within organizations, and in general there appears to be absence of (and need for) SOPs, guidelines, standards and legal/ethical materials being used by DMOs in the application of social media in DRM. At present the application/use of social media is largely done in an ad-hoc manner by DMOs with the notable exception of some law enforcement agencies. These factors, compounded with the rapid changes in technologies, make it difficult for DMOs to create formal procedures and processes internally. Finally, while participants did provide some examples of crowdsourcing activities in the interviews, the concept and applications of crowdsourcing were less considered by DMOs when compared to social media. Participants also focused more on the potential risks and complexity of crowdsourcing over the potentials. This appears to be linked to a number of factors including an unwillingness or inability (owing to lack of know-how) to involve external stakeholders in DRM activities, and general unfamiliarity with the potentials and benefits of crowdsourcing due to inexperience of using it.
Sensitivity to vulnerability	**Summary:** Sensitivity to vulnerability was a topic which many DMOs found challenging to provide concrete examples of procedures, standards or practices for in relation to SCMS, and in some cases it had not been considered at all. First, the translation of the concept of vulnerability was different across the case countries. Vulnerability was viewed on the one hand as the broader conditions related to the hazard risk in local communities

	and in this instance often there was not differentiation among groups and citizens in terms of the targeting of tailored risk communication and other applications of SMCS in disasters. On the other hands, it was also recognized by some participants (especially NGOs) that vulnerable groups need specific considerations in terms of the accessibility to SMCS in disasters. However, a number of DMOs saw this work to be done primarily by "local ambassadors" as specific agencies and social networks linked to vulnerable groups. They noted it was important to have connections with those mechanisms.
Credible information	**Summary:** Credibility of information was also a focus across the interviews and namely revolved around two interrelated perspectives: ensuring credibility of the organization, and trusting information from the public. The first topic was closely related to decision making procedures and revolved around how DMOs communicate effectively to the public before and during a disaster. Participants discussed both formal and informal roles and procedures in their organizations for ensuring the accuracy (content) and quality (grammar and conciseness) of the information they distribute, as well as procedures for countering misinformation and disinformation on social media. Themes which emerged included building local trust in the community, reputation and image management, and the need for persons with formal roles to manage communication channels. The second topic which emerged was the degree which the information collected (actively or passively) from citizens via SMCS could be trusted and used in DRM. Here opinions appeared to be split as the usefulness and trustworthiness of such information, depending to some extent on the type of organizations. For instance, some NGOs, association and media highlighted that crowdsourced information can be useful and credible, where as some publicly funded DMOs saw technical and staffing issues relating to the resources needed to validate the accuracy of information.
Learning across phases	**Summary:** Learning was addressed more indirectly in the cases and was largely related to topics already covered under the theme of decision-making procedures. Topics which emerged included lack of technical expertise and resources for implementing and applying standard procedures for SMCS in DRM. This was linked to both staff turnover, age and rank gaps to make decisions within agencies, and rapid changes in SMCS technology. Formal procedures, evaluations, and training on procedures in this domain are largely supplemented with ad hoc activities taking place among different stakeholders at local levels, and that knowledge does not always transfer across DMOs. The cases working with law enforcement organizations saw more potentials for integration of more formal training and education processes.
Broader considerations on technical aspects	**Summary:** The last category captured information related to specific technical aspects of SMCS in DRM. It emerges that the types of technologies and platforms are largely dependent on the intended uses by DMOs. Major social media platforms such as Facebook, Twitter and Instagram are the most widely used platforms for SMCS related activities in DRM (actively and passively), while closed apps such as Whatsapp and Telegram are being used for interorganizational coordination and communication purposes (where allowed). Those apps and other closed networks are also believed to be

	increasingly used by the public making it difficult for DMOs to gauge (and engage with) public sentiment. There is a need for better integration (and knowledge of) technologies for the analysis and evaluation of SMCS data in crisis. In this regard law enforcement organization are also deemed to be more progressed.

What emerges clearly across results from the case reports is that many of the themes in the interviews are interrelated and indeed some new focuses begin to surface, such as the topic of involving of citizens in disaster management process, which came up across nearly all themes. Similarly, some themes may need redefining in the next phases of work in the project. For instance, *decision-making procedur*es emerges at a level which cuts across all themes and therefore needs further qualifications. And the variation in understandings and responses around the *vulnerability* theme points towards the need for different terminological positioning, depending on the target audience. These findings feed into the ongoing work for the knowledge bases and LINKS Framework.

2.4 First Validation Step

The first round of case assessments is part of a larger research design in LINKS. The first analysis of data in this assessment round has worked to validate earlier findings from LINKS desk research in the knowledge bases (D2.1, D2.2, D3.1, D4.1) by providing additional data and information to those findings within the specific contexts of the local cases countries.

The first results from the survey and from interviews (and deep dives) now feed into a second round of analysis under WP2-4, which looks across the interview and survey datasets from the perspectives of the three knowledge domains to support the forthcoming methodologies (D2.4, D3.3, D4.3) for the next round of case assessments (November 2022).

The results from both analyses also contribute directly to the development of the actionable products and outcomes in LINKS. The refinement of specific needs and themes which resonate with the disaster risk management community, feed into the development and design of products being developed by the knowledge bases and subsequently, in the development of the LINKS Framework and LINKS Community Center.

For instance, the research and results on 'vulnerability' in LINKS has led to the development and refinement of products such as an educational toolkit and including citizens handbook, using accessible language and concepts for relevant stakeholders. And technical solutions identified in the results contribute to the ongoing development of a Social Media Crowdsourcing Technology Library; not only in terms of adding content but also presenting it in strategic and useful ways through different entry points to the LINKS Framework within the LINKS Community Center.

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Below is an overview of the current products under development in the project:[4]

- ***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 organizations in their planning for using social media and crowdsourcing in disasters.*
- ***LINKS Community Center:*** *An online platform providing user-friendly access to LINKS results and means to exchange knowledge and experiences.*
- ***Including citizens Handbook:*** *A set of instructions, guidelines, examples, check-lists, exercises to use existing social media and crowdsourcing and develop new crowdsourcing initiatives to promote more inclusive approaches in Disaster Risk Management.*
- ***Educational Toolkit:*** *Set of tools (accessible online and in person) to develop the risk awareness in minors using social media and crowdsourcing.*
- ***Pocket Ethics Guidelines:*** *A checklist and guide on how to ensure ethics in research and communication through social media and crowdsourcing, especially with vulnerable groups.*
- ***Resilience Wheel:*** *A visual model for holistically framing what organisations need to consider and prioritise when applying social media and crowdsourcing in disaster risk management. It has two layers, combining the institutional drivers of disaster resilience (learning, decision-making, vulnerability and credible information) with the use of social media and crowdsourcing.*
- ***Social Media and Crowdsourcing Technology Library:*** *A library that gathers and structures information about existing social media and crowdsourcing technologies to grasp the overwhelming market and to guide the selection and application of these technologies.*
- ***Social Media and Crowdsourcing Guideline Library:*** *it offers the possibility to access to guidelines on how to use SMCS technologies in a disaster scenario, categorized with an evolving set of categories.*

Further information on the development of the LINKS products can be found in forthcoming deliverables on the design of the LINKS Framework (D5.3) and updated exploitation strategy for the LINKS results (D9.2).

In the following Section, the individual case reports are presented, summarising the first results from the interviews conducted in each case, as well as the first outcomes of the deep dive activities.

[4] Note these products are under different stages of development and maturity, and subject to adjustments in the future.

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3. CASE REPORTS

This section includes the country case reports. The reports provide an overview of what the case assessment teams found to be the most important results identified in the interviews, as well as status updates and the first outcomes of deep dive activities in each case.[5]

As previously described in Section 2, the case teams recruited participants and created interview guides following the guidelines established in D6.2. The interviews were designed to capture the local and scenario contexts of their individual case countries along five themes which cut across the LINKS knowledge domains:

- Decision-making procedures
- Sensitivity to vulnerability
- Credible information
- Learning across phases
- Broader considerations on technical aspects

After the data collection, the case teams used the themes as guides when analysing and reporting on the data to capture the main results across the interviews in their cases, as well as specific examples **good/best practices**, and **needs and challenges** which they found to be most relevant. [6]

The reports below provide snapshots of these takeaways from each case. Further examples of good/best practices, and needs and challenges from each case are provide in the Annex I.

[5] Full reports on LINKS Community Workshops conducted within the deep dives can be found in forthcoming deliverable D8.5 (November 2022).

[6] Good/best practices and needs/challenges are not identified in every case report for each theme. This is owing to the general absence of concrete examples in this field, as well as to the level of coverage of the themes in each case.

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3.1 Case 1: Italy

3.1.1 Summary of Interviews

Figure 16: Case 1: Number of Interviews and Participant Types

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A total of 17 interviews were conducted in the Italian case. In the interviews, SMCS was seen to be extremely important in the management of disaster risks, especially in the preparedness/prevention phases and then in the post-event to provide information, aid, fundraising, how to help etc. In the first phase of the emergency social media are not frequently used to communicate with citizens (although this could vary at the organization level) because first responders seem more interested in understanding the magnitude of the event and the damages/losses/problems that it could have generated. Two important points that emerged from the interviews are the importance to take into account vulnerable people and their needs, and to try to neutralise fake news and disinformation to guarantee the right to information among people.

Table 2 below provides a summary of the results covered across the interviews in the Italian case, in relations to the themes used to guide the interviews. Thereafter we extract some interesting examples from the interviews of good/best practices, and needs and challenges per theme, as well as a short summary of the main takeaways from the interviews.

Table 2: Case 1: Summary of Results per Theme

Themes	Summary
Decision-making procedures	Not all the participants use social media to communicate with the population and most of them declared to not have internal official procedures about the use of SMCS, although some informal practices are in place; disaster management operators especially use social media for internal organisational procedures (e.g., WhatsApp and Telegram) but radio systems are preferred because during big emergencies telephones are usually not available (Telegram is considered the most reliable system but few of them use it). According to the most of the participants, social media could be useful especially in the prevention and preparedness phases, to help people to understand the risks and the behaviours to have during an emergency (this is also the main use governmental organizations seem doing of social media). There is also a difference in the way social networks are used at the different geographical scales by the governmental organizations. At the local level, for instance, policy-makers are more likely to use social platforms to communicate and interact with citizens. Any experience of crowdsourcing has been identified in the interviews with policy-makers and rescue operators. They do not seem open to the possibility to activate systems of crowdsourcing in the future. However, they would like to receive indications on how to produce more effective communication using social media platforms. On the other hand, non-governmental organisations see crowdsourcing and social media as a potential tool also in emergencies and in post-

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	disaster, thus some of them have activated new platforms or used the existing ones to provide a space where people could interact, receive support and help. Another point raised is related to the lack of procedures on how to manage spontaneous (virtual) volunteerism. These kinds of actions are at the moment discouraged by the official response system although there are a lot of previous examples in Italian disasters. Contrariwise, organised volunteerism is well included at the moment in the Italian Civil Protection system, although only some kind of associations can be included. In particular, there is a problem with recognizing online activism (e.g., civic hacking) as a form of volunteerism. Some of the volunteers would like to contribute without officially subscribing to the civil protection. Furthermore, non-governmental organisations that are not volunteer based cannot officially be included in civil protection; nevertheless, alternative forms/practices of collaboration have been developed locally between civil protection and these NGOs.
Credible information	Problems of fake / false /not completely correct news have been raised by most of the participants, especially policy-makers and rescue operators. In particular, they referred to situations of defamation or situations of fake news that could create risks for the others and that have moved them to bring legal actions against the responsible. The question of credible information was also raised discussing how to use SMCS for collecting information/relief requests coming from citizens. This is considered at the moment one of the main obstacles to the use of crowdsourcing systems in the emergency procedures.
Sensitivity to vulnerability	Vulnerable people are always taken into account during an emergency, but it is not always easy to find information about who they are and their specific needs. This is also connected to procedures, as there are some problems of communication between organisations. Elderly, minors, people with disabilities and psychological disorders, drug addictions, and migrants/foreign citizens are the most vulnerable groups considered, and they are usually taken into account especially by the non-governmental organisations that support the official response system. However, vulnerability has to be considered also in a larger perspective, especially in big emergencies like earthquakes. Furthermore, what emerged is the need to have professionals that know how to act and interact with vulnerable people in the post-disaster (in general and in relation to SMCS), to be able to adequately meet their needs (e.g., considering for example the difficulties of living in camps for displaced people or in general of displacement, and all the psychological

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	disorders that could follow these disasters). Social media platforms have been identified as important tools to provide psychological support but also for cathartic purposes by non-governmental organisations. They are really important to 'rebuild' communities especially in situations of displacement. However, there are no specific guidelines or strategies on how to communicate with vulnerable people using SM.
Learning across phases	After their experiences in disasters and emergency situations, researchers, civil protection technicians and experts believe that it is necessary to have an institutional social media account to provide the right communication during an emergency. The use of the official pages instead of e.g., personal ones could better ensure the circulation of credible information and reduce the risk of disinformation. Internally to the different institutions, it could be also useful to have more than one page, according to the purposes of the organization, reducing in some cases the centralized approach to information sharing that could slow down the information flow. If people and citizens understand that from the institutional social media pages, few but important and accurate information arrives, it is a good way to reduce the fake news and disinformation.
Technical aspects	Social platforms like Facebook and Instagram or Twitter are more used as a personal space to share information and in some cases to interact with people by policy-makers at the local level. They use functions like Facebook direct or videos, but also chats. In some cases, also WhatsApp is used, especially groups option. The rescue system prefers using these platforms to inform citizens and not to receive information, thus options like chat are usually disabled. WhatsApp and Telegram are used in particular to organise volunteers' activities and relief systems. On the other hand, Facebook and WhatsApp are used by some non-governmental organisations to create a safe space for people to interact and receive support but also to share founding campaigns (e.g., private groups).

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3.1.1.1 Good/Best Practices

Figure 17 provides some examples of interesting good/best practices on the uses of SCMS described in the interviews, in relation to the themes.

Figure 17: Case 1 Good/Best Practice Examples

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3.1.1.2 Needs and Challenges

Figure 18 provides some examples of the most important needs and challenges described in the interviews, in relation to the themes.

Figure 18: Case 1 Needs and Challenges

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Summary Key Takeaways from the Italian Interviews[7]

- SMCS are useful especially during the pre-event phases to provide information on behaviours and guidelines to follow, and in the post-event phase, to provide information on what happens, the fundraisings, the needs of people, how to help them etc. because immediately when the event happens, they do not represent the right and efficient way to communicate. (GOV)
- Using social media to provide information could generate problems of fake news which create misunderstanding and confusion among people. (GOV)
- It is important to have information about vulnerable groups that are in the territory to create a specific plan to help them taking into account the events that can occur in the area. (GOV)
- The different categories of interviewees prefer different social media platforms based on the use they make of them: i.e., civil protection technicians and operators prefer WhatsApp for organisational procedures, policymakers use Facebook to communicate with citizens, NGOs prefer Twitter and Facebook to have a direct contact with people and so on. (GOV/NGO)

3.1.2 Deep Dive

In the following section, we provide a status update for the Italian deep dive activities. This includes a short overview of the objective in the Italian deep dive and first outcomes for completed activities. A full list of past/ongoing activities and their statuses can be found in Annex II.

[7] The takeaways are also qualified by their relation to participant types from the interviews: **Org Types:** GOV: governmental organisations (e.g. police, fire brigade, municipality), NGO: non-governmental organisations (e.g. Red Cross, Doctors w/o borders), ASS: associations and federations (can vary greatly in scope and locality), IND: industries (e.g. insurances, tech-companies, operators of critical infrastructure), POL: policy/decision-makers, MED: media, SCI: scientific communities (e.g. universities, other projects)

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3.1.2.1 Status of Activities

The main focus of the Italian deep dive is to identify and study new ways to involve citizens, and in particular minors in the disaster risk management. The work aims to support the DRR community by helping to ensure a more effective engagement of children during the different phases of disaster, and more inclusive DRR plans and responses.

Alongside to desk research, some fieldwork has been conducted in this period. On the one hand, LINKS Community Workshops (LCWs) and focus groups have been useful to implement information on the use of SMCS in the Italian context, with a specific focus on the risk of earthquakes, on the other hand the activities done in the school have been used to develop the educational toolkit and increase awareness in minors, providing them also knowledge on how to act as active agents in the information flow. The table below provides more details on these activities and how the outcomes contribute to the LINK Framework.

3.1.2.2 First Outcomes for Deep Dive Activities

Table 3: Case 1: First Outcomes for Deep Dive Activities

Activity	Objectives	Outcomes	Contribution to the LINKS Framework
School Workshops (October 2021 / February 2022)	Raise awareness on the use of digital technologies as a tool for risk management and risk reduction and learn more about the risks and vulnerabilities of our community. Participate in the design and development of action plans to increase community resilience and share them with relevant authorities. Educate and raise awareness on digital citizenship and the appropriate use of digital	Initiated a child friendly glossary for DRR; The students gained a better understanding on **accessibility of places and resources during emergencies;** They also acquired a better understanding of the **risks and benefits** related to the use of **social media** and communication, also during emergencies (including misinformation and disinformation);	Input to the design of the Multimedia Educational Kit on DRR and social media.

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	technologies and social media during emergencies.	In addition, they applied basic competencies on how to develop a **social media campaign.**	
School Action Research Games (November 2021 / April 2022)	Increase awareness in minors about their role as active citizens. (See also what included under school workshops)	The students gained a better understanding of social media and crowdsourcing technologies and practices of crowd mapping; They also experiment **experiential learning** via the use of **Google Earth** in order to explore the topic of access to places and resources during emergencies; In addition, they gained a better understand on how to use hashtags # and how to avoid fake news.	Input to the design of Multimedia Education Kit on DRR and Social media.
LINKS Community Workshop (November 2021)	**Promote inclusive communication** languages for groups potentially more vulnerable to the risk of disasters Reinforce **community resilience** through an enhanced engagement and exchange among minors and senior citizens	**Data** were acquired **through roundtables** and **FGDs** on the use of social media and crowdsourcing (practices and challenges) from local authorities and civil protection experts and other emergency organizations.	Eventually the follow up LCWS feed into development of DRPV related products for the Framework (e.g. including citizens handbook).

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3.2 Case 2: Netherlands

3.2.1 Summary of Interviews

Figure 19: Case 2: Number of Interviews and Respondent Types

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A total of 12 interviews were conducted in the Netherlands. From the interviews we derived that social media is seen as extremely important in the management of an emergency, especially in the response phase when it is used to provide information to the public and to gain information from them (via social monitoring tools). This is often a passive, non-intervening process: most organizations monitor social media to determine whether operational decisions are necessary. When it comes to providing information, NL-Alert (the Dutch alerting system for crisis and disaster situations) is often mentioned in the interviews, sometimes even as 'the most important channel to communicate to the population'. However, NL-Alert can only be used to send information to the public and does not lead to two-way communication. This reflects how many organisations organize their communication: they are mostly senders. Police services are different from other organizations in their use of social media and crowdsourcing, since they actively monitor social media in the prevention phase as well. Furthermore, they actively use crowdsourcing processes to investigate cases and ask citizens to share videos, photos or other information.

An important point that emerged from the interviews is that building an online community or two-way relationship with citizens via social media is more effective when existing 'offline' social networks are used. In that way, organisations do not need to involve, or communicate with, all surrounding citizens at once. Instead, organizations reach out to ambassadors or people representing a larger group of other people. Those people function as mediators and get the message across. Another important point that emerged from the interviews is that, generally, little attention is paid to vulnerable groups. If organizations do take vulnerable groups into account, no unambiguous definition is used.

Table 4 below provides a summary of the results covered across the interviews in the Dutch case, in relations to the themes used to guide the interviews. Thereafter we extract some interesting examples from the interviews of good/best practices, and needs and challenges per theme, as well as a short summary of the main takeaways from the interviews.

Table 4: Case 2: Summary of Results per Theme

Themes	Summary
Decision-making procedures	Many organizations use social media as an information source to monitor sentiments from the community. Frequently mentioned tool used for this purpose is OBI4WAN, followed by Coosto. Based on the information retrieved and the analysis of the information, operational decisions will be based.

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	More and more people are in private WhatsApp or Telegram groups where you as an organization can't watch. But there are also neighbourhood groups on WhatsApp, like NextDoor, were a district policeman of someone from the municipality is a member as well. Unfortunately, often this kind of app groups end up like a sort of 'market place'. (e.g. Can I lend your lawnmower?) And often, when the official concerned leaves or retires, the connection to and knowledge about this group disappears. Most interviewees/organisations don't know what crowdsourcing is, they think of crowdfunding first, collecting money for good causes or innovative projects. During incidents the public organizes a lot themselves (e.g. sharing cabs if there are no trains, arranging sandbags during a flood, sharing water pumps, arranging shelter for people who have to leave their house). The fact that the public takes action itself is traditionally seen as a safety risk, since they have to be 'controlled' and 'protected from further harm'. As such, their help and utility is not always used. Bystanders sometimes obstruct professional responders. People are therefore often kept at a distance. But organizations find more often that they need to channel and coordinate citizen initiatives, because they happen anyway. There are no good examples of this yet, except maybe for Ready2Help from the Red Cross. There is little to no practical experience yet and organizations are searching for best practices and examples. The police *do* actively use crowdsourcing in their investigations and ask citizens to share videos, photos and other information.
Credible information	When something is posted on Twitter or Facebook that people have doubts about, readers immediately dive on top of it to contradict fake news. This includes checking how long an account has existed, nuancing messages or pointing out that a picture has been used before. Sometimes photos and videos from previous incidents reappear in a later incident, even though they are not relevant at the time. Practitioners must be alert to this or they may base their operational decisions on misinformation. Practitioners use previous experiences (e.g., trusting a fake news report about a fatality that supposedly occurred, because they couldn't imagine somebody made that up) by checking news for truth/reliability more quickly and thoroughly next time.

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Sensitivity to vulnerability	Many organizations do not take vulnerable groups into account. They just communicate on their website and their social media accounts and assume that their message will arrive and be understood by the recipients. Vulnerable groups are also defined differently by the interviewees. There is no generally accepted definition of what constitutes vulnerability. Some interviewees think of people with disabilities (not being able to see or hear/not being able to walk). Some interviewees think of people who are not digitally literate, are low-literate or have difficulties with the language (like immigrants) or do not have many social contacts. These people are best approached through their neighbourhood networks, such as the hairdresser (one interviewee proposed to get your message across via the hairdresser, since he/she is often a reliable source for people in the neighbourhood). Some interviewees mention young people as vulnerable ('not able to think independently'). Socio-economically weaker groups are also mentioned as being vulnerable. It is precisely the less educated people with few resources who often live in the vicinity of a factory/port/railway/industrial site. One interviewee indicates that the governmental tendency in the Netherlands is to be as inclusive as possible, meaning that actions are only carried out, or tools are only developed, if most citizens are able to understand and use them. This often leads to tools not being developed, since it cannot be guaranteed that everybody's demands can be taken into account. According to this interviewee, it would be good to change this. The interviewee proposes to develop tools if it is able to reach 80 percent of the people with them. You can then work on the other 20 percent once the tool is there.
Learning across phases	Practitioners, researchers and consultants learn incidentally and individually about risk, crisis and disaster communication by watching colleagues or professionals from other companies and following them (online and offline). Several interviewees say that they follow professionals especially on LinkedIn where, for example, they also see when a new paper has been published. Many interviewees indicate that you need to invest in the relationship with local residents or other stakeholders during the cold phase (when nothing is happening). In that phase, for example, you can do an evacuation exercise. This gives you a lot of information about how prepared people appear to be and about how you should communicate during an incident.

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3.2.1.1 Good/Best Practices

Figure 20 provides some examples of interesting good/best practices on the uses of SCMS described in the interviews, in relation to the themes.

Figure 20: Case 2: Good/Best Practice Examples

CASE 2

NETHERLANDS

Social media monitoring tools, such as the tool OBI4WAN, are commonly used to monitor, gauge and measure public sentiments and informational needs during an incident, disaster or crisis. In crisis organisation the social media analysis is often one of the most important foundations of the communicational strategy and approach. As such, the analysis plays a vital part in the communicational and operational decisions made during crisis.

Development and usage of a telephone line that citizens surrounding a large chemical industrial site can call in case of complaints. They report their complaint (for example about a substance, bad odor or strange sound) and the industrial site sends out someone who is going to check it. He or she reports back to the person making the complaint. If there are many complaints at the same time, this gives a picture of the affected area.

When communicating before crisis (in the phase of preparedness) is it very important to use existing (offline) social networks. In that way, organisations do not need to involve, or communicate with, all surrounding citizens at once. Instead, organizations reach out to ambassadors or people representing a larger group of other people. Those people function as mediators and get the message across. Shell Moerdijk uses such a social networks approach by setting up a so-called 'neighbourhood council', which is represented by a few representatives of surrounding citizens. Things are discussing between and are shared further by the 'ambassadors'.

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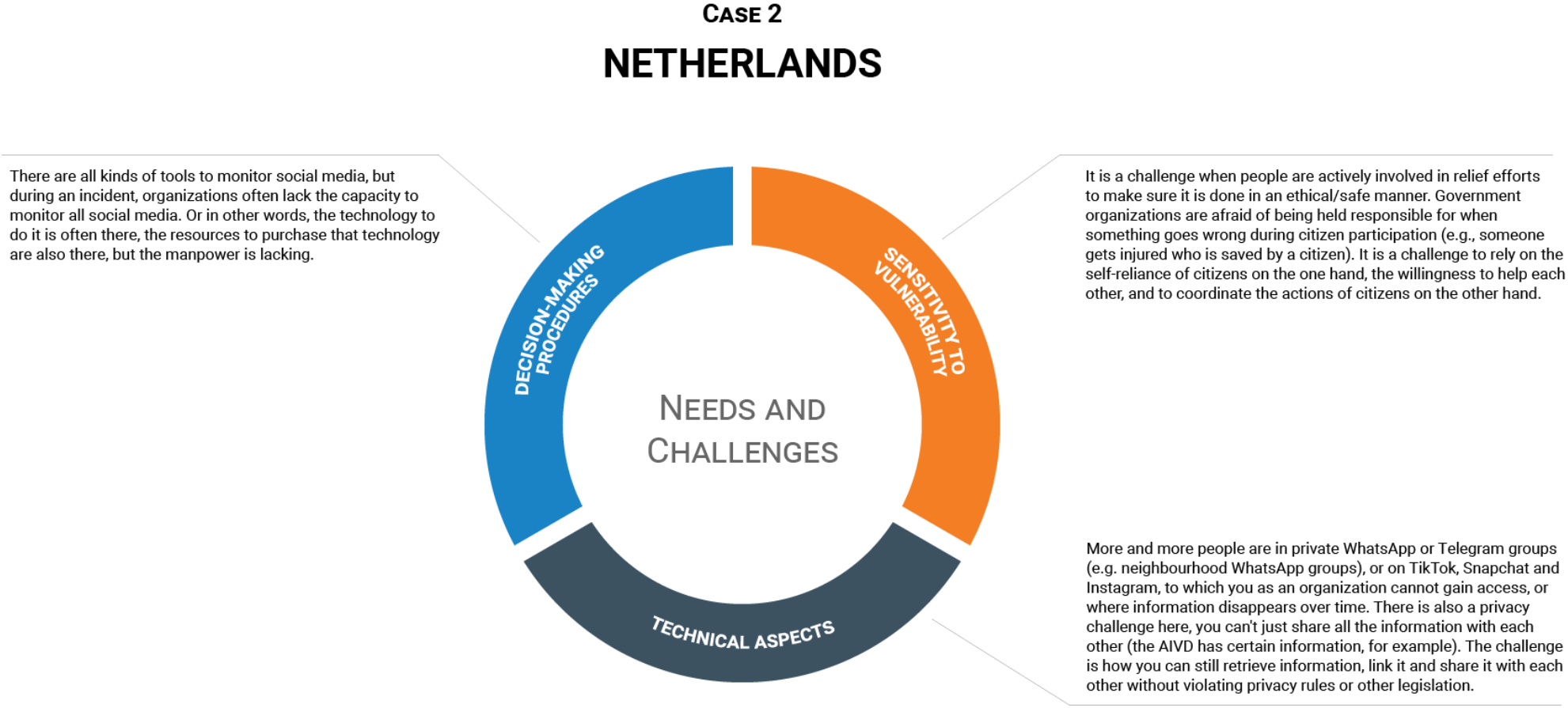
3.2.1.2 Needs and Challenges

Figure 21 provides some examples of the most important needs and challenges described in the interviews, in relation to the themes.

Figure 21: Case 2: Needs and Challenges



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Summary Key Takeaways from the Dutch Interviews

- In addition to all the tools and technological resources available, it is a prerequisite to build and maintain a relationship with your stakeholders in the phases when there is no incident. Both with local residents and with the other professionals with whom you work. (GOV/ASS/IND/NGO)
- Digital developments are rapid, and the popularity of social media platforms changes; not everyone gets and shares their information in the same place. You have to take this into account when using a monitoring tool, for example. (ASS)
- The publicly accessible social media sources are now used by Safety Regions to gauge information needs/sentiments, but the question is to what extent these sources are representative of what is going on. (GOV)
- More and more communication between citizens happens in places that are not public, for example neighbourhood apps, family apps/groups. This makes it harder for organisations to gauge sentiment and information needs and what people think of your organisation. (ASS)
- It was needed to clarify the concept of crowdsourcing. No specific crowdsourcing tools are used. (GOV/ASS/IND/NGO)
- There are few internal guidelines and no specific laws and regulations regarding the use of social media & crowdsourcing during disasters. (GOV/ASS/IND/NGO)
- In crisis communication, little attention is paid to vulnerable groups. And there is no unambiguous definition of who belongs to a vulnerable group. There are many "types" of vulnerable groups to define. (GOV/ASS/IND/NGO)

3.2.2 Deep Dive

In the following section, we provide a status update for the Dutch deep dive activities. This includes a short overview of the objectives of the deep dive and first outcomes for completed activities. A full list of past/ongoing activities and their statuses can be found in Annex II.

3.2.2.1 Status of Activities

The Dutch deep dive focuses on industrial hazards in the Netherlands and in particular on improving crisis and risk communication with local stakeholders. During the preparations for the deep dive activities in Q4 2021, it emerged that several projects were being carried out in the immediate vicinity of

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Chemelot. These projects were all aimed at improving the self-reliance of local residents, institutions and companies. Over the past few months, the Dutch case team has used the cooperation with these partners to improve and, in consultation with these partners, has drawn up a plan of approach for five LINKS Community Workshops (LCWs).

The LCWs are being held with different stakeholders, such as healthcare institutions, (secondary and primary) schools and shop owners. This plan of approach has also been coordinated with the administrators of the three municipalities surrounding Chemelot (municipality of Sittard-Geleen, Beek and Stein). This approach will eventually lead to a better and more sustainable result, but has also led to some months of delays in order to align priorities among the stakeholders in the region.

Moreover, the planned LCWs focus on different stakeholder groups than “citizens”, but citizens will be taken into account as well. Thanks to the projects and studies already running around Chemelot, we are already familiar with the needs of local residents. We are familiar with the needs of specific target groups, specifically health institutions, shop owners, educational institutions. As such, the LCWs primarily focus on those stakeholder groups, but one LCW will also be organized with citizens. Overall, the workshops have different goals: (1) gaining insight into the information needs of various stakeholders with regards to a possible chemical incident at Chemelot: what do organizations need in order to act appropriately? (2) investing in a sustainable network/community of professionals and (ambassadors of) local residents in relation to incidents at Chemelot (3) supporting entrepreneurs, companies and institutions in their (operational) preparations for a possible chemical incident (4) discussions and integration of LINKS results into concrete ideas and actions for using SMCS during incidents by the different stakeholders in the region.

The first LCW with healthcare institutions took place on May 10th. A short summary of the outcomes is provided in Table 5 below.

3.2.2.2 First Outcomes for Deep Dive Activities

Table 5: Case 2: First Outcomes for Deep Dive Activities

Activity	Objective	Outcomes	Contribution to the LINKS Framework

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LCW with healthcare organizations surrounding Chemelot (May 2022)	(1) Introduce LINKS to the stakeholders. (2) Gaining insight into the information needs of various stakeholders with regard to a possible chemical incident at Chemelot. Also focusing on SMCS. (3) Investing in a sustainable network/community of professionals. (3) Support institutions in their (operational) preparations for a possible chemical incident.	The workshop helped outlining needs of healthcare institutions and their expectations to the governmental actions during a chemical incident. These expectations were not aligned to realistic that can be put into practice during an incident. This knowledge is important, since it calls for further cooperation within communities in order to set realistic mutual expectations. Through the workshop health organizations have become aware that Chemelot and the government can alert them quickly when there is a chemical incident, but that further information about the situation may take some time to arrive. In the time between 'raising the alarm' and 'informing' them, healthcare organizations are left to their own devices and must act in a self-reliant manner, for themselves and their employees/customers/residents. At such instances health organizations must ensure that their employees/clients/residents are safe. They need to prepare their actions for	Topics of risk/crisis communication dynamics where discussed which can feed into results designed around the decision-making procedures which institutions need to taking into consideration, when communicating coordination with local stakeholders.

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		that. Because of the workshop, this awareness is there.	

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3.3 Case 3: Germany (Drought)

3.3.1 Summary of Interviews

Figure 22: Case 3: Number of Interviews and Participant Types

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In the German drought case, 9 interviews were conducted (4 together with DhPol). Across the interviews, social media and crowdsourcing (SMCS) are seen as an important tool to interact with the public and collect important information during incidents but are not used widely or embedded in disaster management organisations so far. When established in the organisation SMCS are used already during the prevention phase and the response phase. The most common uses are

- warning of the population,
- improving the operational picture by obtaining information,
- and the communication with volunteers.

The interviews with the German stakeholders showed how diverse the status and use of SMCS are among disaster management organizations. This starts from the "simple" use of a social media channel to inform the public to the establishment of a Virtual Operation Support Team (VOST), which filters and analyses the relevant posts for the command staff in disasters.

Due to the large number of channels, groups and posts, the extent to which social media is incorporated into disaster response organizations is dependent primarily on the available resources and technologies to manage the information coming from social media. The coordination and information exchange about the identification of the relevant information and the assessment of the credibility of the post should be supported by a technology. Standards and guidelines for the general usage of SMCS and especially the technical applications are not commonly available or even known. Furthermore, the need for an overview of technologies and assistance in selecting the appropriate technology was confirmed during the discussions.

Table 6 below provides a summary of the results covered across the interviews in the German (drought) case, in relations to the themes used to guide the interviews. Thereafter we extract some interesting examples from the interviews of good/best practices, and needs and challenges per theme, as well as a short summary of the main takeaways from the interviews.

Table 6: Case 3: Summary of Results per Theme

Themes	Summary

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Decision-making procedures	The fundamental relevance and influence of SMCS on the work of organisations and the population in crisis situations is often not recognised by the decision-makers in the organisations. Where it is used, the experiences have been consistently positive. For example, crisis teams have content from social media that is relevant to the operation provided by the Virtual Operation Support Teams (VOST). In general, it can be said that the use is extremely heterogeneous and can depend on the commitment and skills of individuals in the organisation. Furthermore, organisations tend to be slow in planning resources and implementing processes for the use of social media and crowdsourcing that are integrated into the operational organisation. To deepen the state of the art of the current use of social media the interviewees were asked on the media type, the used channels and type of information. The potentials of social media, especially chances and challenges were also examined. From this it was possible to derive the needs of social media, the number and function of responsible people for social media, resources and funding. Other topics discussed on social media were existing processes, responsibilities, guidelines for the use of social media and common uses. For the most parts, the responsibility lies with the social media teams and are approved among themselves or by the superiors. When guidelines were available, they were usually more internally developed instructions than official documents. For the view outside of their own organizations, the topics experiences, lessons learned, problems and interaction with other organizations were discussed. While the exchange with other DMOs was considered as lively, within the recent disasters more and more experiences and lessons learned were made which stressed the importance of the use of SMCS. Regarding to crowdsourcing the state of the art is also different, but less established than the use of social media. In recent disasters experience in disasters and emergencies are collected and crowdsourcing is seen very useful. The integration of “Virtual Operations Support Teams” would facilitate the extraction of relevant post in disasters. Different potentials, needs and challenges of crowdsourcing are seen. Regarding to the procedures of crowdsourcing a fixed contact person was discussed.
Credible information	Regarding to the credibility of the information from SMCS the credibility should be observed but is not doubted in general. The differences between the credibility of information from social media and emergency service on site were discussed. In particular the credibility of information provided with the help of volunteer helpers was asked, because in

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	the established ways of information gathering the facts are taken by a member of the disaster management organisation, who is classified as trustworthy already in advance.
Sensitivity to vulnerability	A direct question addressed the consideration of vulnerable groups when interacting with the population in SMCS. Vulnerable groups were not explicitly considered in most cases in the context of the organizations of the interviewees. One interviewee is in close contact with vulnerable groups but reported about the contact with authorities from the perspective of spontaneous volunteers.
Learning across phases	In this topic, questions on the training and education on the use of social media from the perspective of a disaster management organisation was asked. It also includes the learning about available technologies for obtaining information within an organization. These technologies are implemented in the daily routine but often depend on the personal interests. The responders are not trained in an official course, but now and then social media and crowdsourcing are topic in weekly training sessions.
Technical aspects	The topic of technologies was addressed as a major content focus. The availability of technologies for interaction on social media varies a lot depending to the disaster management organisation. The usage of technologies for social media in the organisation extends from the simple use of a social media channel to inform the public to the establishment of a Virtual Operation Support Team. For example, an online excel spreadsheet, in which certain social media posts can be rated by several digital volunteers in parallel, has already proved as a working concept. Other free tools such as Tweetdeck.com (structured listing of selected Twitter channels) or maps.snapchat.com (public available image view of localised *snaps*) have shown to be helpful. Technologies that automatically collect and filter information from social networks and analyse it with various functions were also discussed. In particular, the tool Scatterblogs was discussed. The available functionalities were assessed and the interviewees were asked for their expectations and requirements for future functionalities/technologies. Thereby, an automatic gathering of relevant information from different social media networks at the same time without much additional effort by the social media personnel was identified as the main need by the interviewees.

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3.3.1.1 Good/Best Practices

Figure 23 provides some examples of interesting good/best practices on the uses of SCMS described in the interviews, in relation to the themes.

Figure 23: Case 3: Good/Best Practice Examples

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3.3.1.2 Needs and Challenges

Figure 24 provides some examples of important needs and challenges described in the interviews, in relation to the themes.

Figure 24: Case 3: Needs and Challenges

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Summary Key Takeaways from the German (Drought) Interviews

- The integration of a function for information analysis from social media in an existing or a standalone subject area in a command staff is necessary to consider the situation awareness from the social networks. (GOV)
- Spontaneous volunteers are currently hardly accepted, there is little experience with spontaneous volunteers so far. First experiences show big support by spontaneous volunteers in disasters, but an official point of contact is necessary to use the benefit of the spontaneous volunteers in the most efficient way (ALL)
- A lot of experience was gained with SMCS during the "Ahrtal"-flooding in Germany in the summer of 2021. The interviewees saw many parallels to the use during a drought. In general, however, few considerations have been made for such a scenario so far. (ALL)
- The missing possibility of selecting a technology for the needs of the organization is mentioned, because with the help of an overview benefits or disadvantages of a certain choice could be estimated. A central point/platform for this is considered very useful for the exchange of experience, guidelines, practice examples, technologies and networks. (GOV)

3.3.2 Deep Dive

In the following section, we provide a status update for the German (drought) deep dive activities. This includes a short overview of the objectives of the deep dive and first outcomes for completed activities. A full list of past/ongoing activities and their statuses can be found in Annex II.

3.3.2.1 Status of Activities

The deep dive in case 3 focuses on the use of social media and crowdsourcing in droughts and the application of technologies for social media and crowdsourcing in disasters. Drought is becoming a worsening scenario in the coming years. Therefore, dealing with it from the preparedness phase onwards through the support of social media and crowdsourcing will be key to successful coping.

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To be able to assess the application of SMCS in droughts, an observation and analysis of SMCS usage in recent droughts take place. That serves as input to get a broad view on the needs, challenges and current use. The key elements of a strategy for using SMCS in droughts are assessed as well as the current use of technologies and needed functionalities for extracting the relevant information.

Three LCWs were conducted which will feed into the work on DCT and drought by gaining local knowledge on the use of technologies and specific needs for drought. In the first workshop the key elements of a potential strategy (e.g. potential use cases, application of technologies, legal aspects etc.) for using SMCS in droughts were collected. The second workshop focused the SMCS technologies to improve the overview of existing tools to provide the best possible access for the user. For this purpose, previous assumptions were evaluated. Furthermore, the previous findings were put into the context of the drought scenario in order to take into account potential needs from this case. A third workshop was done to collect the opinions to SMCS technologies from the point of view of the police as an additionally stakeholder.

In addition, relevant research participants were identified for the online survey to capture the perspective as broad as possible. The subsequent pilot test of the online survey was designed to improve the usability of the survey.

3.3.2.2 First Outcomes for Deep Dive Activities

Table 7: Case 3: First Outcomes for Deep Dive Activities

Activity	Objective	Outcomes	Contribution to the LINKS Framework
LCW about a social media strategy in an upcoming drought within the "safety camp 2022" (April 2022)	Development of a strategy for the usage of SMCS for DMOs.	Key elements of preparation on handling droughts with the help of social media and crowdsourcing and considering the cooperation and communication with the population.	Approaches and key elements of a social media strategy in the context of a drought. Gathering of practitioner insights and needs. This exercise helped to identify needed topics and requirements for the Social Media and Crowdsourcing Guideline Library.

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LCW about social media and crowdsourcing technologies within the "safety camp 2022" (April 2022)	Identification of needs and potentials of SMCS technologies.	Needs and challenges for SMCS technologies and overview of required functions during a drought.	Confirmation of the current version of the Social Media and Crowdsourcing Technology Library.
LCW with German special forces on the applications of social media, organised by DHPol (May 2022)	Presentation of the LCC and the SMCS Technologies library.	Consideration of the police perspective on the needs, challenges and experience regarding to SMCS technologies.	Answers to the questions which challenges occur at the work of the police with SMCS and which functions of SMCS-technologies are interested for your organisation. These discussions gave important feedback to the Social Media and Crowdsourcing Library.

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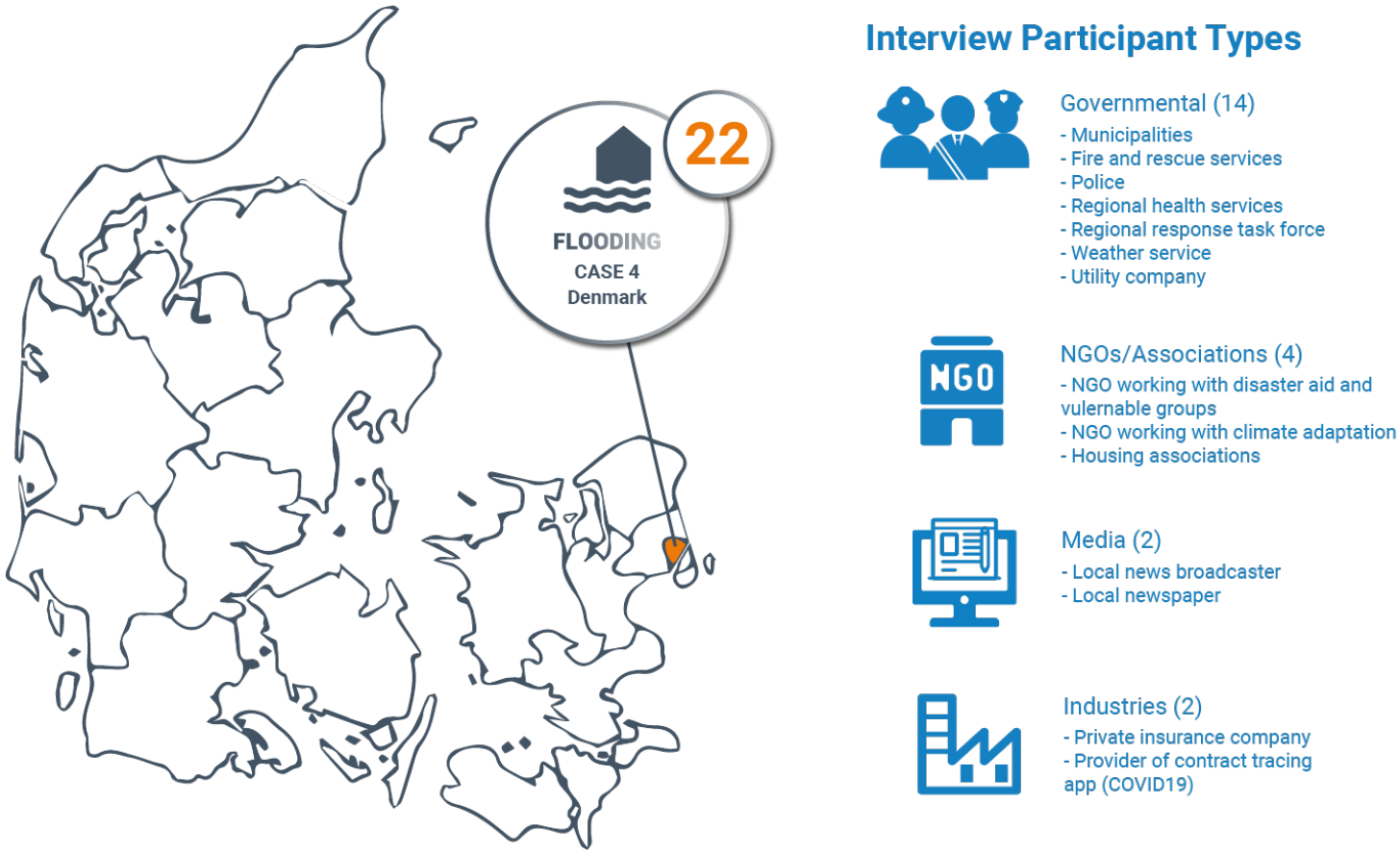
3.4 Case 4: Denmark

3.4.1 Summary of Interviews

Figure 25: Case 4: Number of Interviews and Participant Types



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In Denmark, 22 interviews have been carried out with relevant stakeholders who are all somehow engaged in activities concerning the task of communicating to citizens in response situations and during preparedness phases. However, communication from disaster management organisations and authorities is carried out more extensively in response situations compared to preparedness phases. Amongst the stakeholders interviewed, there seems to be a strong focus on the use of social media as an efficient tool to reach a large group of citizens very fast. It is well known that Danish citizens are known to make efforts to stay updated during a crisis by searching information from relevant news media and on social media. The stakeholders/organisations prioritize to communicate on their own platforms and social media profiles as well – and not least in times of crises. This applies for almost all stakeholders regardless the type of organisation they represent. However, there is a differentiation in the way stakeholders consider and perceive the benefits (or lack thereof) of SMCS. Some stakeholders (especially those representing NGO's and the news media) are comfortable with the idea of SMCS and find that they benefit from SMCS because they consider the citizens as resourceful during crises. The argument for this relies on the fact that the stakeholders perceive citizens as important contributors due to their important insights and/or knowledge about a specific situation or incident. The type of organisations that NGO's and news media represent, follow procedures that resemble crowdsourcing activities and that embrace the idea of the public as a contribution, because they are eligible to carry important information about the ongoing emergency.

Other stakeholders, such as Housing Associations, emergency response services and fire brigades do acknowledge and see the benefits of SMCS, but they are uncertain how to proceed with implementation of SMCS, because they experience lack of knowledge or/and resources. In this case, resources refer to personnel scarcity in communication teams, but also a result of time pressure in a response phase, where decisions have to be taken very fast. Finally, stakeholders from law enforcement doubt if SMCS is useful or if it has any relevance at all. They are mainly concerned with the validity and credibility of the information that can be crowdsourced from citizens, not least in a crisis. This especially concerns issues with spread of mis- and disinformation. Additionally, they are unsure how to carry out and practice crowdsourcing during an ongoing operation and how to provide technological knowhow and competent personnel to conduct SMCS in a useful way. Except for NGOs, the stakeholders are not concerned with vulnerability and they perceive the public as one homogenous group with identical needs for information.

Table 8 below provides a summary of the results covered across the interviews in the Danish case, in relations to the themes used to guide the interviews. Thereafter we extract some interesting examples from the interviews of good/best practices, and needs and challenges per theme, as well as a short summary of the main takeaways from the interviews.

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Table 8: Case 4: Summary of Results per Theme

Themes	Summary
Decision-making procedures	There are numerous procedures regarding operations and emergency management among the GOV stakeholders, which relate to response phases. It can be very time consuming to following these guidelines/procedures. However, there are less and only few procedures regarding how to carry out the communication tasks, both in general and on social media specifically. The stakeholders report that the units responsible for communication are guided by experience and professionalism more than preformulated guidelines and procedures. Associations don't hold many procedures for anything. Coordination inside the organisations and between the organisations (intra- and inter organisational) has high priority and it involves many people during an incident. It takes much effort. It is of great importance for the GOV stakeholders to coordinate in regard to the given event and context. This is superior to prewritten and generic procedures. This relates to the coordination of operations in general, to coordination of communication tasks and coordination of communication on social media. Once again, there is not many considerations concerning communication tasks that concern preparedness.
Credible information	In general, the stakeholders are very focused on own credibility, how to ensure own credibility. They are concerned with the way they are perceived by the public. They have, however, different means to ensure credibility by being active on their own social media channels, this varies between the different types of institutions. Some believe that they should avoid humour to appear credible, some believe that correct spelling secures credibility, some believe that information needs to be correct and validated to secure the credibility. This is stressed in relation to communication in general and communication on social media specifically. Some stakeholders from GOV (especially within the police and crisis response managers from authorities) do not believe that citizens' hold credible information, not least in crises. Others find citizens credible and believe that they are resourceful as a contribution to creating an adequate and precise situational picture.

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	The media and associations (MED + ASS) find the citizens credible. All stakeholders are concerned about dis- and misinformation. They are uncertain how to counter the spread of potential false or wrong information.
Sensitivity to vulnerability	There is in general sparse insights and concerns on vulnerability among citizens except from one NGO. Not least in crises, the population is often perceived by the stakeholders as if they hold the same needs for communication. There is no distinction concerning choice of channels, media, messages for different target groups. The communication is not tailored to the different needs among the citizens. Only few stakeholders differentiate their communication in relation to vulnerability concerns. In general, most interviewees lack insight in understanding the concept of 'vulnerability' and need help to grasp the theme from the interviewer. The majority of the stakeholders interviewed hasn't seen the need for differentiation and they conceptualize the Danish population as a group of people with homogeneous needs. Most GOV place the responsibility of taking care of the vulnerable citizens with the municipalities and therefore they don't express that they are responsible for a segmentation/differentiation in information and communication.
Learning across phases	Stakeholders emphasise that learning from previous incidents are important in general. Evaluations of ordinary incidents are not very formalized processes, but are attempts made to catch up on central 'take-aways' from incidents among the stakeholders' organisations. Evaluations are also carried out across organizations. Learning and insights from incidents are sometimes implemented in the existing guidelines and procedures. This relates both to the processes in general, to communication and to communication on social media. In general, the stakeholders state that communication is not prioritized enough in exercises, and many find a need to emphasize a greater focus on the communication dimension in exercises.

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	All statements regarding learning and evaluation only relates to the response phase and doesn't regard preparedness and other phases.
Technical aspects	In relation to SMCS activities in Denmark, it seems there is a distinction in the use of SMCS and choice of media and platform whereas Twitter is the main channel for communication in response phases, in case of urgent, or severe matters. Facebook is on the contrary applied regarding communication that concerns preparedness and prevention. Only one stakeholder exclusively focuses on technical aspects of CS. They work to develop apps that apply CS technologies, the SM dimension is however not included. In Denmark there is only sparse tradition for using SMCS as such. There is, in general, much focus on monitoring activities on social media – digitalized as well as handheld, depending on the type of organization – which can be considered as a precursor to social media crowdsourcing.

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3.4.1.1 Good/Best Practices

Figure 26 provides some examples of interesting good/best practices on the uses of SCMS described in the interviews, in relation to the themes.

Figure 26: Case 4: Good/Best Practice Examples

CASE 4

DENMARK

The staff working with operational tasks and emergency management are very driven by formal procedures. These procedures are tightly coordinated with other organisations – interorganizational and intraorganizational coordination. The coordination secures that all stakeholders involved are aligned also in their communication to the public.

The stakeholders have a strong focus on own credibility – they believe it is important to be credible in both the eyes of the citizens, and in own organisation, not least concerning the political level. This regards legitimacy and trust: communication secures legitimacy in the eyes of the public and the political level. If they are not perceived as credible, people will not listen, and they will lose their influence and ability to manage the operation, and therefore they see their practice of communicating in a credible way as a crucial good practice.

It is a core value to many of the stakeholders to tell people what to do, what they can do themselves in a crisis or in a preparedness phase. Good advice to the public on how they can help themselves and take care to avoid further damage is an important part of the communication activities.

Tasks concerning communication are procedure-driven, but very often in an informal way. There is consensus on how to communicate in the communication teams, but it is not formalized and described in detail. This is the culture among the stakeholders working with communication. Some refer to their experiences and to a 'gut feeling' of what is the right way to do it.

Social media are regarded as a very important tool to reach a large audience, both citizens and news media, very fast . They all state that communication on social media is crucial to reach a large audience in a response phase. The stakeholders with Twitter accounts stress that tweets are efficient to reach journalists (all Danish journalists and news media survey Twitter) in crisis. All tweets from the stakeholders will be conveyed to the media by the journalists in a crisis, and journalists will always cover crises extensively. In that way an even larger audience can be reached, since some citizens get the information on SM but most Danes follow and seek information in news media in crises.

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3.4.1.2 Needs and Challenges

Figure 27 provides some important examples of needs and challenges described in the interviews, in relation to the themes.

Figure 27: Case 4: Needs and Challenges

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Summary Key Takeaways from the Danish Interviews

- There are well-coordinated communication efforts and processes in relation to *when* something is communicated to the public and *where* (which channel) the message is communicated. However, the actual content of *what* is communicated, and the specific substance of the message is not coordinated, or procedure driven in that exact matter.
- Lack of understanding of the benefits of engagement and interaction with citizens – citizens not always perceived as credible among some GOV stakeholders. GOV is reluctant to rely on information from citizens, they are not certain if the information is valid and credible.
- It is mainly police and emergency management responsible entities who are most concerned for mis- and disinformation. (GOV)
- Citizens are regarded as resourceful and credible among some GOV and all ASS, MED and IND. (GOV/ASS/MED/IND)
- Most of the stakeholders (except housing associations) use social media very extensively. They push information out on SM, but most of them don't apply digital crowdsourcing and they don't use any technical programs to crowdsource. (GOV)
- Other stakeholders besides GOV are more experienced in using SMCS, and benefit from it. (MED/ASS)
- They carry out manual and low-tech crowdsourcing, but they don't see that this is what they are doing. They don't call it crowdsourcing, they argue that they survey social media to get an insight into the opinion of the citizens, the news media, and the politicians. (GOV)
- There are some, however sparse, examples of SMCS in the Danish context. These are primarily driven by the news media and seen as citizen-to-citizen activities, and mainly include local initiatives. This is not reflected upon by the stakeholders though, as they don't consider or speak of these efforts as being crowdsourcing. In this light, there must be no doubt that there is only very little basis for SMCS in Denmark at this point.
- SMCS in general is an unknown or sparsely known concept in Denmark among these stakeholders. (GOV/MED/ASS/IND). This not only regard the use of SMCS in context of disasters but in all aspects of communication and citizen involvement.

3.4.2 Deep Dive

In the following section, we provide a status update for the Danish deep dive activities. This includes a short overview of the objectives of the deep dive and first outcomes for completed activities. A full list of past/ongoing activities and their statuses can be found in Annex II.

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3.4.2.1 Status of Activities

The main objective of the Danish deep dive is to understand the different layers of the SMCS-communication processes in both preparedness and response phases. So far, the cross-case analysis has provided insights about the practices of stakeholders (GOV, ASS, MED, IND) that communicate to citizens. They report about extensive communication on social media, not least in a response phase. The deep dive will aim to investigate communication processes among citizens in order to understand how they seek, perceive and apply the information that the stakeholders provide during a response phase. The Danish case assessment team monitor relevant social media platforms regarding Frederiksberg since November 2021, in order to analyse the communication activities both in case of given incidents and also information preparedness initiatives (very often campaigns). In the upcoming focus group interviews, the Danish CAT will investigate the interplay between the different modes of communication (social media, news media and non-digital network communication among citizens) to describe which activities can be enhanced on social media, and how crowdsourcing can strengthen future activities.

Below, we elaborate on the distinction between the communication modes in a response phase and a preparedness phase.

Preparedness

There is only sparse communication activity on social media regarding preparedness initiatives. The deep dive will look into how citizens living in Frederiksberg perceive and experience this sparse communication effort.

So far, the findings confirm there is almost no activity on social media, which indicates that the engagement on preparedness communication is low. It is however the case that much preparedness communication in the municipality is non-digital (flyers, posters, letters, meetings, events etc.). The stakeholders don't apply crowdsourcing in a formalized, digitalized and standardized way.

Response

Data shows that communication activity in a response phase is quite comprehensive. This includes communication through social media. We hope it will be possible to observe communication activities on social media communication during a crisis. The aim would be to get an insight in procedures and practices and hopefully see potential on how to develop procedures, guidelines and technologies for SMCS.

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The first outcomes from the deep dive activities are summarised in Table 9.

3.4.2.2 First Outcomes for Deep Dive Activities

Table 9: Case 4: First Outcomes for Deep Dive Activities

Activity	Objective	Outcomes	Contribution to the LINKS Framework
Survey of social media activities (Ongoing)	Understand interaction on social media concerning preparedness and response	The communication activities are low regarding preparedness, there is more activity in response phases. The stakeholders communicate much more in a response phase and the media show more interest in sharing information from GOV in a response phase, and the citizens pay more attention. Communication on preparedness has very little interest from media and citizens.	This analysis will provide insight on the sparse activities on social media concerning preparedness. In case there are inspiration, examples of good practices, suggestions for tools, technologies etc, these insights will be a contribution to the Framework. If SMCS is applied concerning preparedness, the good examples will also be shared: there is not only a need for procedures, tools, and technology, but a need to understand that the public will benefit from SMCS and that SMCS can strengthen emergency management also regarding preparedness. The findings from use of social media, and the potential for SMCS in a response phase will also be a contribution to the LINKS framework regarding the further need for tools and guidelines. Insights from both perspectives may feed into the different products within the Framework, such as the including citizen handbook.

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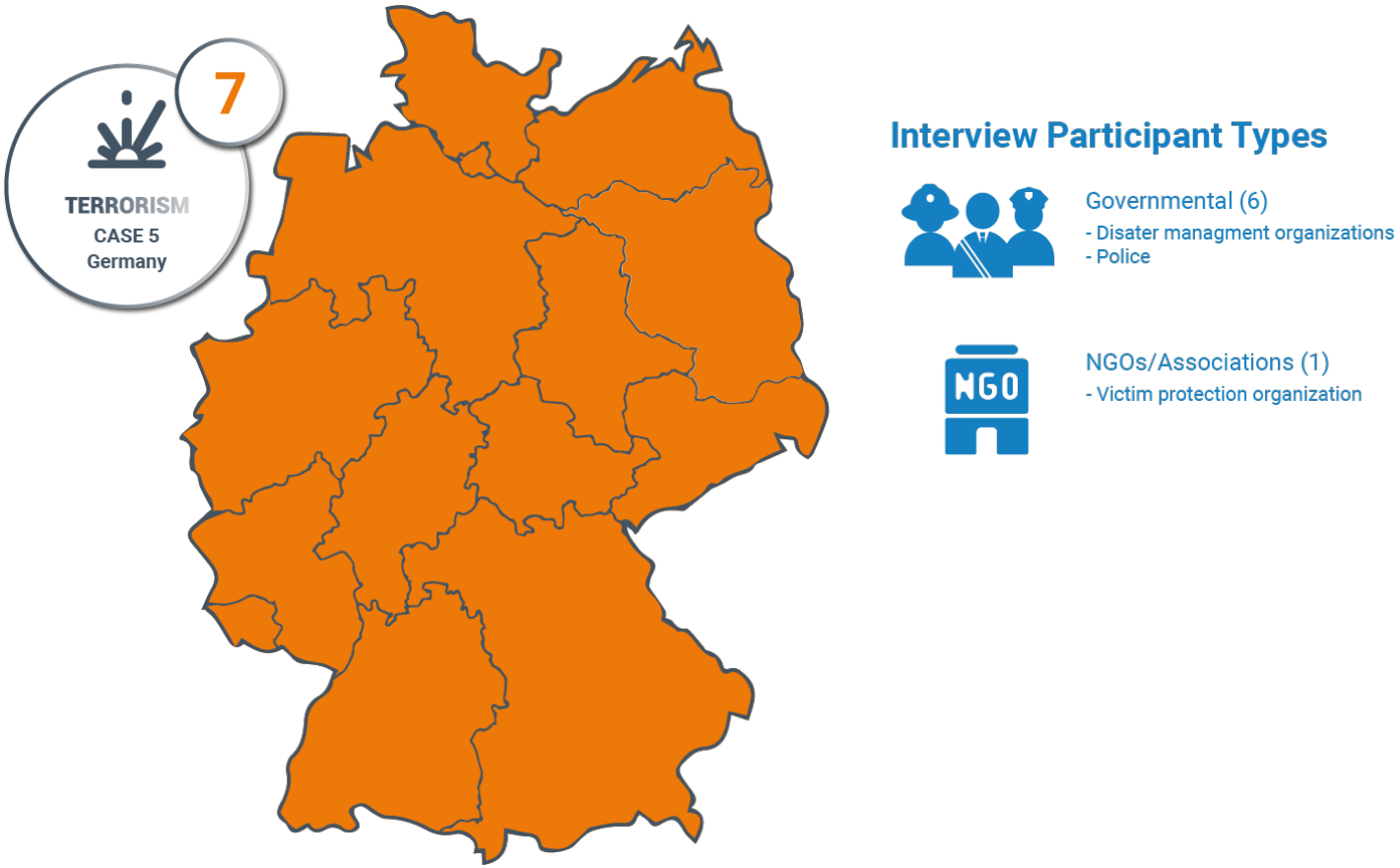
3.5 Case 5: Germany (Terror)

3.5.1 Summary of Interviews

Figure 28: Case 5: Number of Interviews and Participant Types



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In the German terror case, 7 interviews were conducted (4 of which took place together with SIC). The majority of participants worked for German police forces in areas of open-source intelligence, special forces, psychological services, and social media teams. During the interviews, social media were depicted to be extremely important means in the response to severe crimes such as terrorist attacks. The adequate management of such like emergencies is hardly imaginable without them anymore by the interviewees. Social media in general enhance the pace and reach of outgoing information in such situations and offer low-threshold communication channels for the public to actively participate in the crisis-relevant communication and get in contact with authorities. Extended social media technologies and tools built on top of them help to facilitate these processes further by scheduling tasks or filtering out particularly relevant information from the large amount of social media content. Crowdsourcing, though hardly ever addressed under this notion by the interviewees, is also becoming increasingly crucial in order to respond to terrorist threats – particularly for investigation purposes (e.g., in the case of public searches, when authorities ask the public for help in order to identify and/or locate witnesses, endangered citizens and/or potential perpetrators).

Table 10 below provides a summary of the results covered across the interviews in case 5, in relations to the themes used to guide the interviews. Thereafter we provide a snapshot of some interesting good/best practices, and needs and challenges per theme, as well as a short summary of the main takeaways from the interviews.

Table 10: Case 5: Summary of Results per Theme

Themes	Summary
Decision-making procedures	The importance of different social media channels was discussed by the interviewees (highlighting especially the status of Facebook and Twitter for communication during major incidents like terror attacks). The crisis communication within these channels as well as related crowdsourcing tasks are governed by formal as well as informal guidelines. and are to a good deal also restricted by legal and ethical constrains. General processes triggered within the organizations of the interviewees by an amok/terror event were depicted (the internal procedures during an ongoing incident/police mission (particularly the chain of commands, freedom of decisions and to speak for the social media team, their relation to the mission control/chief of operations) as well as the particular collaboration with other BOS (organisations with security tasks) though social media seems to play a subordinate role in this respect (compared for example to face-to-face

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	interaction of communication on the phone).The use of extended social media technologies like TweetDeck etc. was also discussed in more detail and interviewees reported quite a different amount of experience with such like tools. The same applied to the conceptualization of the concept and the familiarity with the term crowdsourcing: most research participants do not come across this notion on their job but some implicitly already apply social media strategies that could fall under this umbrella term (e.g. public searches).
Credible information	Verification strategies for information obtained from social media play a big role in the work of police authorities, particularly for the so-called 'intel officers'. Additionally, counteracting rumours has become part of police social media work because of attempts by third parties to instrumentalize terrorist attacks.
Sensitivity to vulnerability	Communication endeavours tailored specifically towards groups of people that are being perceived as particularly vulnerable are extremely rare.
Learning across phases	Advantages of social media over other communication channels were mentioned frequently by law enforcement as well as the victim protection interviewee: they are perceived as more unfiltered and timely and offer much greater reciprocity. Yet, for some, social media still lack some desired functions, e.g. for even more appropriate and quick filtering of/navigating through social media content under time pressure. Interviewees also touched upon the internal workarounds they developed for training/specialization of social media communication officers on the job and the professional background and personal profiles of the people working in such areas for the police body. Training and learning opportunities for the people working for the police body involve mainly in-house activities but they also engage in international exchange and exchange with researchers for such topics.
Technical aspects	Facebook and particularly Twitter are the main information channels via which communication is spread during major police operations such as terrorist attacks (and through which information is gathered to assist investigations) but additional channels such as TikTok, Snapchat, or Instagram are being used by some police bodies in an experimental fashion to see if this helps to bind younger target groups and to increase the reach of crucial information. Additional tools that operate on top of the police social media accounts (e.g., upload portals for large amounts of data or tools that

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	help facilitate scheduling communication tasks or navigating though large amounts of posts) are becoming increasingly more known to law enforcement and are thus being implemented more frequently.

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3.5.1.1 Good/Best Practices

Figure 29 provides some examples of interesting good/best practices on the uses of SCMS described in the interviews, in relation to the themes.

Figure 29: Case 5: Good/Best Practice Examples

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3.5.1.2 Needs and Challenges

Figure 30 provides some important examples of needs and challenges described in the interviews, in relation to the themes.

Figure 30: Case 5: Needs and Challenges

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Summary Key Takeaways from the German (Terror) Interviews

- The term 'crowdsourcing' is hardly used in the crisis management of the practitioners and often hard to grasp for them. (GOV/NGO)
- The concept of crowdsourcing is to some degree contradictory to the work of some law enforcement bodies since they rather try to establish strategies to keep the crowd out (aka safe) during a severe, potentially life-threatening incident. (GOV)
- Social media is seen as crucially important in the digital age for image gain and responsiveness (in crisis situations). (GOV)
- Facebook, Twitter and Instagram are still the most important channels; TikTok is being increasingly experimented with for crisis communication. (GOV)

3.5.2 Deep Dive

In the following section, we provide a status update for the German (terror) deep dive activities. This includes a short overview of the objectives in the deep dive and first outcomes for completed activities. A full list of past/ongoing activities and their statuses can be found in Annex II.

3.5.2.1 Status of Activities

The Deep Dive in case 5 focuses on the use of social media and crowdsourcing during events linked to terrorist attacks. Like other European countries, Germany has experienced a rise in terrorist attacks over the past decade, so the deep dive carried out by DHPol addresses major concerns in relation to the lack of information standards and accountability mechanisms, information overload, interoperability between information and communication technologies used by the first responders in such like events. To gather information on these potential deficiencies, the deep dive assessment for case 5 is twofold: it consists an exploratory **survey** across all German states as well as qualitative **interviews** and **focus group discussions** with people in charge during or affected by past terrorist attacks.

The assessment is particularly concerned with the potentials of SMCS for fostering collaboration between BOS (Behörden und Organisationen mit Sicherheitsaufgaben; engl.: organizations with security tasks), for informing investigations, and containing the spread of rumors, as well as the institutional and judicial preconditions that govern and restrict the implementation of SMCS by German law enforcement. Therefore, the deep dive assessment for case 5 is designed to start by primarily involving police practitioners from various levels (local, state, federal) but will step-by-step broaden the scope to

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their various stakeholders during, before, and after a terrorist attack: other BOS such as the fire fighters and the Federal Agency for Technical Relief, representatives of vulnerable groups (such as the Jewish or Muslim community or victim protection organizations), municipals governing local decision making processes, journalists as important mediators between law enforcement and the public, and finally district attorneys in order to also be able to touch upon legal limitations of SMCS use by the police.

As to now, the survey, the first set of interviews and the first two LCWs with the respective focus group discussions could be completed. Those activities could shed light on important aspects of SMCS applications during terrorist events and fed into several building blocks for the LINKS Results including:

- Awareness of the **LCC** and interest to get involved in it could be raised among various German police bodies and representatives of a victim protection organization. The German police is keen to learn how other practitioners (from other countries) work with SMCS. For the organisers, this is a welcomed insight, as this shows that the planned LCC and, in general, the connection through the project is a good way to connect different practitioners and to give them the opportunity for a simple and fast exchange.
- A list of the most important guidelines governing police SM(CS) use could be compiled to contribute to the **Social Media and Crowdsourcing Guideline Library** as well as the **Pocket Ethics Guidelines** (alongside general laws, such as the European General Data Protection Regulation, the most important of these guidelines is the 'Polizeidienstverordnung (PDV) 100').
- The most frequently used tools to facilitate SM(CS) communication for the police (as well as the usefulness of their features along different phases of the DMP) could be assessed to add to and validate the **Social Media and Crowdsourcing Technology Library** (the knowledge about such tools as well as their implementation by various police bodies is relatively heterogenous, accordingly the interest to receive more information on appropriate tools, e.g., via the LCC, is high; yet, the usefulness of tools such as *Tweetdeck* or *Facelift*, that help to a) sort incoming social media quickly during an exceptional event such as terrorist attack and b) help the schedule collaborative tasks were mentioned several times).

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3.5.2.2 First Outcomes for Deep Dive Activities

Table 11: Case 5: First Outcomes for Deep Dive Activities

Activity	Objective	Outcomes	Contribution to the LINKS Framework
Survey (February - June 2021)	Assessing which polices across Germany already employ SMCS during major incident.	SM use for crisis communication and particularly the application of crowdsourcing varies greatly across different police bodies and states: some apply crowdsourcing already successfully, some are interested in looking into that topic in the near future, and some merely use social media in general; while in most bodies social media work is considered to be part of the press and PR department's work which is often directly subordinate to the leadership level, some states implement social media work at different hierarchical structures	Basic need and knowledge gaps regarding the use of SMCS were identified that fed into the assessment of institutional drivers for the Terrorism Case for the Resilience Wheel.
Interviews (November 2021 – February 2022)	Evaluation of the uses of SM(CS) during terrorist attacks.	Functionalities and problems associated with social media (and crowdsourcing) for managing terrorist threats	During the interviews and discussions, law enforcement practitioners particularly stressed problems such as insecurity about the credibility of information obtained from SM, a perceived increase in fake news during terrorist attacks, a lack of education on the application of SM during terrorist attacks (not so much within the communication or

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			investigation units but at the tactical forces). These findings particularly helped to refine the Resilience Wheel for the terrorism case. Best/good practices for mobilizing large publics to support in a crisis situation and needs and potential regarding the application of SMCS were discussed which validated the dimensions of the terrorism case Resilience Wheel and the inputs of the Social Media and Crowdsourcing Technology Library as well as the Social Media and Crowdsourcing Guidelines Library and Including citizens handbook.

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1st LCW and accompanying focus group discussions (February 2022)	Get a deeper insight into the similarities and differences of the SMCS-uses and needs within the German Police	It was achieved to get a better insight into the use of SMCS of the different polices in Germany (federalism). Also, the needs of the practitioner regarding the use of SMCS got clearer and it definitely should help to guide the project a bit more (e.g., need for precise and working guidelines). Moreover, other aspects regarding the use of SMCS got clear, such as the non-transparent protection of data privacy. This helps the organisers to plan more workshops regarding the use of SMCS.	The workshop helped outlining needs of the practitioners and their expectations in relation to the outcomes of the project. This knowledge can be used further in the project, by including it in the construction of the Framework (tools, guidelines), but also for the knowledge-bases.

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4. CONCLUSIVE REMARKS AND NEXT STEPS

4.1 Summary

This deliverable provides the first results from the first round of case assessments in LINKS. It provides individual case reports compiled by the case assessment teams, for the cross-case and deep dive activities in each case.

From the cross-case activities, we conducted an online survey and semi-structure interviews. The survey spanned across Europe to obtain trends, interesting and helpful examples about the uses social media and/or crowdsourcing by disaster management organizations (DMOs), as well as to establish contacts with suitable participants for future project activities. The interviews took a more in-depth look into the experience, needs and challenges of DMOs working with SMCS in the individual cases. In total the survey received 284 answers and 67 interviews were conducted.

For the deep dives, teams conducted various activities such local surveys, focus groups/interviews, and workshops. These activities allow the teams to go even deeper into the uses of SMCS by DMOs and other related stakeholders within the specific contexts of the case scenarios.

The first results in this document confirmed the previous research conducted in LINKS under WP2-4, which found that in Europe there are few examples of:

- Good/best practices and procedures among institutions in Europe, on how to use SMCS in efficient ways.
- Relevant and easy-to-use guidelines on implementing SMCS in disaster management processes.
- Understandings of the potentials, and guidance on how to include citizens in disaster management processes.
- A comprehensive and understandable overview of existing solutions/technologies.

While a number of interesting experiences and procedures for using SMCS by DMOs were collected in the case assessments, those examples are generally informal and ad-hoc. Participants noted several reasons for barriers for integrating more formal procedures, include timing and managerial constraints; a lack of knowledge, training and resources for useful SMCS technologies; and knowledge loss owing to staff turnover.

Some key takeaways across the interviews discussed in the case reports included:

- Experiences and needs are largely orientated towards disaster response and preparedness activities, very little attention is paid to recovery and prevention phases.
- Experiences and needs are viewed less in the context of specific hazard scenarios, and more from a perspective of broader disaster management activities.

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- Credible information and trust are high priority areas, and DMOs are concerned with the quality and accuracy of information which they share on social media, as well as with finding ways to manage and use information generated by others on social media.
- The concept and applications of crowdsourcing in disasters is far less considered by DMOs in comparison to social media.
- Active engagement with citizens is a divisive topic among DMOs, with some focused on the potential benefits and others the risks. This appears to be linked to a number of factors including an unwillingness or inability (owing to lack of know-how) to involve external stakeholders in DRM activities, and general unfamiliarity with the potentials and benefits of crowdsourcing due to inexperience using it.
- Vulnerability was also a divisive topic among DMOs, with few concrete examples of addressing vulnerable groups in disasters through SMCS. Most DMOs do not differentiate among types of groups and citizens in terms of the targeting of tailored risk communication and other applications of SMCS in disasters. However, some DMOs did recognize a need for it.

Across the case reports it also became clear that there were strong overlaps between themes. For instance, decision-making procedures and technical aspects cut across various other topics such as those under credible information and sensitivities to vulnerability. And new themes began to emerge such as the focus on including citizens in disaster management processes.

The results in this report do not intend to overrepresent or generalize the state of use for SCMS for all DMOs working across Europe. However, they do work to confirm the need for the consolidation of existing and new knowledge in this field, into actionable and easy-to-use outputs for DMOs and other relevant stakeholders working with SMCS in disasters. The results also help to shape those outputs in a way which is holistic and cross-cutting, taking into consideration diverse social, institutional and technical aspects. In the next phases of the project, LINKS will continue to work in the cases to further develop and validate these outputs together with relevant stakeholders in the disaster risk management community.

4.2 Next Steps

The data collected in the cases, and the first results, now feed into a larger process for the first case assessments. The datasets are currently undergoing a second round of analysis by the knowledge bases under WP2-4. This process includes conducting deeper levels of coding and analysis across the datasets based on the interconnected themes of the three knowledge domains. The results from the second analysis will inform the knowledge bases and LINKS Framework in the following ways:

- The results inform the three knowledge bases by enriching the information (e.g. new guidelines, technologies) and also by exposing interconnections among them. These changes feed into the adjustment of the methodologies across the LINKS knowledge

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domains and into the second round of case assessments beginning in November 2022. The methodologies will be orientated towards assessing domain specific products within the Framework, as well as the Framework as a whole. The second versions of the methodologies (D2.4, D3.3, D4.3) is forthcoming September 2022.

- The results will feed into the ongoing development of the Framework by helping to define strategic thematic areas to orientated, interlink, and present the LINKS products and results based on the needs and goals of relevant stakeholders. The first (D5.3) and second (D5.4) versions of the Framework forthcoming in June and November 2022.

In preparation for the second round of case assessments starting from November, the case assessment teams will continue to work closely with WP2-4 and WP5 to align their case results, objectives and activities with the ongoing development of the knowledge base related products and the Framework. The ongoing deep dive activities in each case will play an important part in these developments, as the communities of local stakeholders established during the first round or assessments will become further embedded in the development and uptake of the actionable results in the project. At the highest level this includes:

- Local discussion/validation of the results from the first round of case assessments.
- Further contextualization of results within scenario focus of each case, through LCWs and other activities.
- Establishing product/Framework ownership and validation by local stakeholders at case level, through LCWs and other activities.
- Assessing local barriers and further development concepts (ideas prior to thoughts on implementation)

The next updates of the cases will be provided in the third workplan for the five cases (D6.3) in November 2022 and the second case report (D6.5) in March 2023.

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ANNEXES

4.3 Annex I: Case Reports: Good/Best Practices and Needs and Challenges

In the tables below, the case teams have highlighted important examples of good/best practices, and needs and challenges, described in the interviews. They are related in the table to the main themes from the interview guides, and to the specific organization types and disaster management phases.[8] Teams were asked to list themes in the first column in order of priority.

4.3.1 Case 1: Italy

Good/Best Practices

Table 12: Case 1 Good/Best Practices

Theme	Good/Best Practices	Organization Types	Phase
Decision-making procedures / Learning across phases	"Io non rischio (I do not risk)" is a campaign promoted by the civil protection to sensitize people on risks that uses also social media channels to inform citizens about initiatives and procedures; furthermore, during COVID-19 emergency they have also activated the *io non rischio* virtual squares where to promote their campaign on Facebook as an alternative to in person events	GOV	Prevention/Preparedness

[8] **Org Types:** GOV: governmental organisations (e.g. police, fire brigade, municipality), NGO: non-governmental organisations (e.g. Red Cross, Doctors w/o borders), ASS: associations and federations (can vary greatly in scope and locality), IND: industries (e.g. insurances, tech-companies, operators of critical infrastructure), POL: policy/decision-makers, MED: media, SCI: scientific communities (e.g. universities, other projects)

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Learning across phases / Technical Aspects	Piattaforma Terremoto Centro Italia (Centre-Italy earthquake platform): a platform created during the 2016-2017 earthquake to collect information and needs from citizens to try to help them during the emergency. A similar platform has been created for the COVID-19 pandemic.	GOV	Response/Recovery
Credible information	The role of social influencers could support the diffusion of quality information, using their networks to spread official news and channels and right procedures (i.e., Ferragni-Fedez during the COVID-19 pandemic to promote fundraising/good practices) although also cases of bad use of popularity have been detected.	MED	Response/Recovery
Credible information	Some municipalities in the Empolese-Valdelsa area (Tuscany) organised a common communication on SMCS for the weather alerts. They created guidelines for the communication of the alerts to be sure that everyone can understand the information provided and to not create misunderstanding among citizens	GOV	Prevention
Sensitivity to vulnerability / Technical aspects	Some municipalities (i.e., Prato, Monza, Riccione) and associations create specific communication or interaction spaces for vulnerable people (i.e., using WeChat for Chinese community or creating LIS videos or Telegram channels for hearing-impairment people)	GOV	Prevention/Response
Decision-making procedures / Technical aspects	Some municipalities have a free Wi-Fi available for all the citizens around the town both to allow everyone to have a connection and also to use it during an emergency, so all the citizens can receive the social media communication.	GOV	Multiple

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Table 13: Case 1 Needs and Challenges

Themes	Needs and Challenges	Organization Types	Phase
Decision-making procedures	Provide moments of training for, e.g., new municipalities personnel; create a common language to use also in the social media communication.	GOV	Prevention/Preparedness
Decision-making procedures	Create communication guidelines at national and local level to be applied both during the emergency situation and the prevention/preparedness phases.	GOV/MED	Multiple
Decision-making procedures; learning across phases	Usually, the recovery phase is left behind after a disaster, people are more involved in the first phases of the emergency providing their help, but the recovery phase is not taken into account in the right way. Communication on SMCS can play an important role on this: providing the right communication to involve people also in the recovery phase could be a useful and important help for the territory.	GOV	Recovery
Credible information	Institutions should provide few but clear and easy information to understand. Usually, there is too much information provided by institutions to the citizens which could generate problems of disinformation and fake news. Moreover, it is important also to use a clear language, without technical words and acronyms.	GOV	Response
Credible information	Work in the prevention/preparedness phases with citizens to provide them social media guidelines, behaviours and information on the risks that could occur in their area, providing videos, information, images on social media pages.	GOV	Prevention/Preparedness

Sensitivity to vulnerability	To have a register of vulnerable people available to timely inform them about risks and disasters; To have some guidelines on how to communicate with them.	GOV	Multiple
Learning across phases / Technical aspects	SMCS could be useful to provide a one-to-one communication. When an alert is given for a specific area, usually quite large, it is not sure that the whole area will be hit in the same way. So, using the social media geo-localization, people could be informed providing them specific and right information about the alerts.	GOV	Prevention
Technical aspects	An important challenge for the future could be use the social media information about risks as a monitoring tool for the civil protection: usually the information arrives first on social media, e.g., when there is an earthquake, people use immediately Facebook to inform and to receive information about the event and only eventually later they control also the official website.	GOV	Response

4.3.2 Case 2: Netherlands

Good/Best Practices

Table 14: Case 2 Good/Best Practices

Themes	Good/Best Practices	Organization Types	Phase
Decision-making procedures / Technical aspects	Social media monitoring tools, such as the tool OBI4WAN, are commonly used to monitor, gauge and measure public sentiments and informational needs during an incident, disaster or crisis. In crisis organisation the social media analysis is often one of the most important foundations of the communicational strategy	GOV, ASS	Response

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	and approach. As such, the analysis plays a vital part in the communicational and operational decisions made during crisis.		
Decision-making procedures	The police actively involve citizens when they need their help, for example if they need additional information about perpetrators or criminal suspects. They do this via traditional media (television), social media channels (e.g., Facebook) and owned digital channels (e.g., Burgernet).	GOV	Response
Decision-making procedures	A fire service actively used social media during floodings. The fire service asked the public to share pictures of the situation. As such, they could get a clear overview of the situation at hand. Furthermore, they did an appeal to the public to share resources with each other, such as water pumps to remove the water.	GOV	Response
Decision-making procedures / Sensitivity to vulnerability	When communicating before crisis (in the phase of preparedness) is it very important to use existing (offline) social networks. In that way, organisations do not need to involve, or communicate with, all surrounding citizens at once. Instead, organizations reach out to ambassadors or people representing a larger group of other people. Those people function as mediators and get the message across. Shell Moerdijk uses such a social networks approach by setting up a so-called 'neighbourhood council', which is represented by a few representatives of surrounding citizens. Things are discussing between and are shared further by the 'ambassadors'.	IND	Preparedness
Decision-making procedures	Citizens are often quite active and self-reliant during a crisis. Crisis organizations do not always acknowledge this self-reliance. They still prepare things that are actually unnecessary, such as shelter spots for people that need to be evacuated or cannot go home anymore because of a problem with public transport. In the Dutch situation this is often not necessary: people often find shelters themselves,	GOV	Preparedness

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	visiting friends or family or other people that offer their help via social media. The safety region in Friesland (one of the provinces in the Netherlands) has taken this into consideration and only uses one shelter location in their preparatory plans. This shows how SCMS plays an important citizen-to-citizen role in disaster management processes. A role that is often overlooked by crisis organizations. In some police cases the public wants to help searching for missing persons. Then the police try to coordinates the search.		
Decision-making procedures / Credible information	A Belgian governmental response organization started an emergency initiative when large parts of Belgium were experiencing foul odors because of an accident at a large Belgian port (the accident was caused by a boat losing styrene). People were actively asked to fill out a Google Form indicating their exact location. As such, the response organization was able to get a grasp of the entire location experiencing the nuisance.	GOV	Response
Decision-making procedures / Credible information	Development and usage of a telephone line that citizens surrounding a large chemical industrial site can call in case of complaints. They report their complaint (for example about a substance, bad odor or strange sound) and the industrial site sends out someone who is going to check it. He or she reports back to the person making the complaint. If there are many complaints at the same time, this gives a picture of the affected area.	IND	Response
Decision-making procedures	The Ready2Help initiative of the Netherlands Red Cross is a civilian support network initiated in November 2014 to engage willing people whenever help is needed. Whenever a response in an area needs extra human capacity quickly, Ready2Helpers in an area are called in via a text message.	NGO	Preparedness, response

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Table 15: Case 2 Needs and Challenges

Themes	Needs and Challenges	Organization Types	Phase
Decision-making procedures/ Technical aspects	More and more people are in private WhatsApp or Telegram groups (e.g. neighbourhood WhatsApp groups), or on TikTok, Snapchat and Instagram, to which you as an organization cannot gain access, or where information disappears over time. There is also a privacy challenge here, you can't just share all the information with each other (the AIVD has certain information, for example). The challenge is how you can still retrieve information, link it and share it with each other without violating privacy rules or other legislation.	GOV, ASS	Preparedness, response
Decision-making procedures	Most interviewees don't know what crowdsourcing is. If we ask them what they think about crowdsourcing, they immediately ask a counter-question: what do you mean by crowdsourcing? If we don't answer what our definition is, they mostly come up crowdfunding: collecting money for good causes or for innovative projects. Some interviewees only look at their own social media channels to get information/sentiment, but not to other social media sources. The first challenge is to be aware as an organization that you can really benefit from crowdsourcing. And the second challenge is how you then use crowdsourcing.	GOV, ASS, IND	Preparedness, response
Decision-making procedures	During incidents, the public organizes a lot itself (for example, sharing cabs together when there are no trains, arranging sandbags during a flood, arranging sleeping places for people who can no longer go home). The fact that the public itself takes action is traditionally seen as a risk. People are therefore often kept at a distance. Organizations find that they need to channel, coordinate and	GOV, ASS	Response

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	control citizen initiatives, but there are no good examples of this yet. There is little to no practical experience yet.		
Decision-making procedures/ Sensitivity to vulnerability	It is a challenge when people are actively involved in relief efforts to make sure it is done in an ethical/safe manner. Government organizations are afraid of being held responsible for when something goes wrong during citizen participation (e.g., someone gets injured who is saved by a citizen). It is a challenge to rely on the self-reliance of citizens on the one hand, the willingness to help each other, and to coordinate the actions of citizens on the other hand.	GOV	Response
Decision-making procedures	There are all kinds of tools to monitor social media, but during an incident, organizations often lack the capacity to monitor all social media. Or in other words, the technology to do it is often there, the resources to purchase that technology are also there, but the manpower is lacking.	IND	Response
Decision-making procedures	As an governmental organization (fire department in this case) you can actively ask people to deliver you certain images or information. For example in a case of flooding ask people to share online if they have emptied their own cellar that someone else can use their pump.	GOV	Response

4.3.3 Case 3: Germany (Drought)

Good/Best Practices

Table 16: Case 3 Good/Best Practices

Themes	Important Good/Best Practices	Organization Types	Phase

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Technical aspects	Use of simple and partly free software to monitor social media information (e.g., Tweetdeck, map.snapchat.com). These tools are free and easy to set up by any organisation and already help to get an overview of their location and area of operation. Tweetdeck, for example, lets you simultaneously follow and clearly display several targeted accounts or Hashtags on Twitter. Maps.snapchat.com displays public snaps on a map and can thus contribute valuable information for situation assessment.	GOV	Response
Technical aspects/ Credible information	When a big amount of social media posts occurs during emergencies, relevant information must be identified. Sometime fake news is also spread via social media. The coordination and information exchange about the identification of current fake news and rumours for example within VOST should be supported with a technology. The VOST evaluated the veracity of selected posts. As a tool for collaborative online working excel spreadsheets were used for this purpose and are considered effective. Questionable posts could thus be judged by several people to determine credibility.	GOV	Multiple, stuck out in response
Technical aspects / Credible information / Decision-making procedures	If a social media channel of an organization is not used except in disasters nobody will look at it, nobody will follow it, so it is important to create activity also in daily life. Therefore, daily business, smaller activities and deployments can be used to raise the awareness of the citizens for their local disaster management organizations. With established social media channels information and warning can be distributed in a disaster more effectively, because the channels achieve more reach.	GOV	Response
Decision-making procedures	To avoid chaos and unintended negative consequences with the spontaneous volunteers (for example obstructing the emergency services through lack of information) a fixed contact person helps with the integration of spontaneous	GOV/OTH	Response

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	helpers in the tactical structure of a disaster response. This contact person should be proclaimed in daily life before a disaster to establish the point of contact and the responsibility.		
Technical aspects / Decision-making procedures	Information from the social media must distributed among the responsible persons of an emergency organization. Therefore, the use of an internal news channel to exchange daily information from social media is considered helpful. This could be implemented for example with a function of a live chat or an internal forum.	GOV	Response
Decision-making procedures	The population was scheduled to water trees during prolonged droughts. This ensured that the trees survived in a big city (population > 500.000). This would be possible after volunteers from the population were also successfully involved in the removal of the aftermaths of a storm.	OTH	Response

Needs and Challenges

Table 17: Case 3 Needs and Challenges

Themes	Needs and Challenges	Organization Types	Phase
Decision-making procedures / Learning across phases	The importance of social media and crowdsourcing is yet not fully realized in the organizational culture. This is reflected in several dimensions. For example, not enough is invested in staff, staff is withdrawn for other tasks in times of crisis, or no social media monitoring is considered necessary at all.	SCI/GOV	Preparedness

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Decision-making procedures	Disaster management organisations need a finer sense of noticing spontaneous volunteers, as they can then be involved more effectively and interfere as little as possible with the actual work of the organisations. Spontaneous volunteers help either way and should be dealt with in a disaster with an assigned contact person.	GOV	Preparedness
Decision-making procedures	In a disaster situation, the relevance of social media communication is still largely underestimated. Often the responsible staff is taken to other areas of disaster response work.	GOV	Preparedness
Credible information / Technical aspects / Decision-making procedures	Validation of the credibility of information requires many resources and takes a lot of time. Semi-automated or assisting technology would be desirable for validation of the credibility.	GOV	Response
Technical aspects	An overview of easy-to-use software that can assist in gathering and analysing information from social media would be very helpful. Manual analysis takes a lot of time.	MULTI	Preparedness
Decision-making procedures	It is difficult to find a suitable guideline for the implementation and usage of SMCS.	GOV	Preparedness
Sensitivity to vulnerability	Vulnerable groups were not explicitly considered within the organisations of the interviewees. In some cases, very little is known about certain vulnerable groups. SMCS could help to reach and inform these groups better in disasters.	GOV	Preparedness

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4.3.4 Case 4: Denmark

Good/Best Practices

Table 18: Case 4 Good/Best Practices

Themes	Good/Best Practices	Organization Types	Phase
Decision-making procedures / Technologies	Many stakeholders find it crucial to have predefined procedures about how to apply and operate with social media as a communication tool during a response phase. Social media are regarded as a very important tool to reach a large audience, both citizens and news media, very fast. They all state that communication on social media is crucial to reach a large audience in a response phase. The stakeholders with Twitter accounts stress that tweets are efficient to reach journalists (all Danish journalists and news media survey Twitter) in crisis. All tweets from the stakeholders will be conveyed to the media by the journalists in a crisis, and journalists will always cover crises extensively. In that way an even larger audience can be reached, since some citizens get the information on social media but most Danes follow and seek information in news media in crises.	GOV/MED/IND - some ASS	Response
Decision-making procedures / Learning across phases	Tasks concerning communication are procedure-driven, but very often in an informal way. There is consensus on how to communicate in the communication teams, but it is not formalized and described in detail. This is the culture among the stakeholders working with communication. Some refer to their experiences and to a 'gut feeling' of what is the right way to do it.	GOV	Response

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Decision-making procedures	The staff working with operational tasks and emergency management are very driven by formal procedures. These procedures are tightly coordinated with other organisations – interorganizational and intraorganizational coordination. The coordination secures that all stakeholders involved are aligned also in their communication to the public.	GOV/MED	Response
Credibility / Learning across phases	The stakeholders have a strong focus on own credibility – they believe it is important to be credible in both the eyes of the citizens, and in own organisation, not least concerning the political level. This regards legitimacy and trust: communication secures legitimacy in the eyes of the public and the political level. If they are not perceived as credible, people will not listen, and they will lose their influence and ability to manage the operation, and therefore they see their practice of communicating in a credible way as a crucial good practice.	GOV	Response
Vulnerability / Credibility	It is a core value to many of the stakeholders to tell people what to do, what they can do themselves in a crisis or in a preparedness phase. Good advice to the public on how they can help themselves and take care to avoid further damage is an important part of the communication activities.	GOV/ASS	Response, preparedness
Credible information	Extensive use of social media – and communication in general is sign of credibility. Communication about the situation secures knowledge sharing.	GOV	Response
Credibility / Decision-making procedures	Among news media, citizens are regarded as very credible in a response phase. Citizens hold precise and valuable information concerning the incident and its impact. In a crisis, the media and associations believe that the audience/citizens hold important insight into what is going on in the area/town/municipality/region/country. The media and associations rely on	MED, ASS	Response

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	the audience to observe, report, share pictures of the event etc. These are the two groups of stakeholders who express most intensively that SMCS is beneficial (they do however not apply the opportunity to crowdsourcing fully). The media express that their coverage of an incident is much better and correct, when they survey social media for information shared by the audience.		
Credible information	The associations perceive their members as highly credible – housing associations are grass root organizations and the representatives are selected in democratic elections. They don't use SMCS, they don't have the resources, but they are aware of what is going on among the members, they rely on their members insights, views and experiences. It is the principles of crowd sourcing, they build on, but they don't apply the crowdsourcing technology.	ASS	Preparedness
Learning across phases / Sensitivity to vulnerability	Some stakeholders – across the sectors – describe how they experiment with new ways of communicating, of new ways to reach the public. They test new ideas and initiatives and find out if the attempts have the effect they seek for. This can concern new ways of reaching target groups or test of new media (both digital media and non-digital media). One stakeholder (GOV) test different ways of communicating to the audience in the public space, on the roads when they e.g. reconstruct or rebuild. Another stakeholder (an NGO) test how websites or apps can be applied in crises to mobilize volunteers to help vulnerable people.	Some GOV/some ASS/MED	Response, preparedness

Needs and Challenges

Table 19: Case 4 Needs and Challenges

Themes	Needs and Challenges	Organization Types	Phase

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Decision-making procedures	Awareness of the need for SMCS and procedures to inspire and inform how to gain insight and benefit from SMCS	GOV	Response
Sensitivity to vulnerability	Many stakeholders believe that all citizens are alike in a crisis, and that they are a homogeneous group with homogenous needs.	GOV/MED	Response
Credible information	Some stakeholders hold the view, that citizens perspectives and insights are not credible or resourceful to manage a response phase. They don't see that citizens can hold credible information and insights. They reject the idea of benefits of citizens sharing information and knowledge with each other in a crisis as a benefit.	Some GOV	Response
Sensitivity to vulnerability / Decisions making procedures	Many stakeholders believe that other stakeholders will take care of the vulnerable groups. They don't believe that they can do otherwise than what they do, and they think that it is some other sectors responsibility to communicate to vulnerable groups with specific needs (it is mainly the responsibility of the municipality, they believe).	GOV/MED	Response
Sensitivity to vulnerability / Decision-making procedures	Most of the stakeholders don't have an awareness of vulnerability and different needs among citizens. They don't differentiate communication – either in general or on social media - and they don't understand that some citizens are more vulnerable than others, and that specific information and use of different means to target these groups are needed.	GOV, MED, ASS	Response
Decision-making procedures/ Sensitivity to	Most focus is on communication in the response phase, very sparse reflections on preparedness among most (but not all). Communication is crucial, both communication in general and on SM.	GOV, MED, ASS	Preparedness

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vulnerability/ Learning across phases			
Decision-making procedures	There is a manual and non-digital SMCS among several stakeholders. They don't apply any technology, but they work to gain insight in the public opinion in crises through surveying the social media themselves, but they do not share these insights with the other citizens. This is mainly done to survey if their own organisation appears credible.	GOV	Response
Decision-making procedures	Time consuming resources are needed to implement SMCS. In a response phase much effort is used to take decisions and manage the operation and the stakeholders don't see how they will have the time to SMCS also.	GOV	Response
Decision-making procedures	Uncertainty of the limits of GDPR guidelines in relation to crowd sourcing	GOV	Response, preparedness
Decision-making procedures / Sensitivity to vulnerability	Not only a need of guidelines, more fundamental need of culture and informal ideas of vulnerability, target groups and crowd sourcing	GOV, ASS	Response, preparedness

4.3.5 Case 5: Germany (Terror)

Good/Best Practices

Table 20: Case 5 Good/Best Practices

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Themes	Good/Best Practices	Organization Types	Phase
Decision-making procedures	Though only established in 2019, so called Intel officers (officers supporting missions with social media investigation) are steadily gaining recognition and support within the ranks of police leadership (which results e.g., in more resources, higher wages for personnel).	GOV	Response
Decision-making procedures	Intel officers are well networked and established a quick exchange in severe events even across national borders (e.g., during the Vienna attack)	GOV	Response
Decision-making procedures	Most interviewed police social media teams have short chains of commands during a critical situation; the social media team 'sits' directly in the mission control staff, more or less next to the police leader in charge of the operation and they have an officer close to the public prosecutor's office, thus outgoing information is fast and very reliable.	GOV	Response, Preparedness
Decision-making procedures	Special forces have been quite successful using social media to get access to/locating different vehicles, vehicle types, through mainly photo and image material posted to social media and could thus locate and arrest target persons.	GOV	Response
Decision-making procedures	One police authority has developed several concepts and their own guidelines for crisis management in severe situations (including the concept of 'face and voice', their own language regulations for adequate wording), so that all forces communicate equally	GOV	Response, Preparedness
Sensitivity to vulnerability	Victim protection organizations see the greatest advantage of social media in the relatively low threshold with which they can reach people since they implemented them in their communication strategy – people come forward and discuss things now which they would probably not otherwise	NGO	Response, Recovery

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Credible information	Special forces have quite a pragmatic, non-technical approach to securing the credibility of information obtained from SM: they are a 'ground force' and as such they physically check alerting information by visiting the site – even if it might turn out to be a false alarm, however they adjust the manpower a bit to a credibility assessment beforehand: if alerts are accumulating, similar observations are being posted from multiple (and trustworthy) accounts it is more likely that the situation is actually severe.	GOV	Response
Credible information / Learning across phases	Victim protection organizations developed good strategies/internal training to ensure the credibility of outgoing information	NGO	Multiple
Credible information / Learning across phases	Intel officers have developed good workarounds to secure credible information and deal with potentially noncredible information (e.g., when they forward information retrieved from social media like photos of the assumed victims or perpetrators to other officers, they mark those materials, directly indicating the credibility status of these materials, e.g., if the identity of the portrayed person has already been confirmed or not)	GOV	Response, Preparedness
Credible information / Learning across phases	One police body mentioned a particularly good workaround they established to ensure information quality: The have four sub-areas and a sub-area is precisely there to collect, secure and cross-check information with the various other sub-areas So, they have a body that tries to collect information and verify information, and this body then works for the other bodies, namely the office for language regulation, i.e. for wording; the body that communicates internally; and basically all areas that communicate to the outside world.	GOV	Response, Preparedness

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Learning across phases	Most police bodies developed a good workaround for training social media communication officers on the job, relying on internal and external education offers. In some cases, this includes extremely well-supervised side-by-side work together with an experienced college over the course of several months.	NGO	Preparedness
Learning across phases	Two police authorities mentioned that they successfully employed a social media managing tool that helps with quality (particularly during extreme situations such as terror attacks), for example by first writing a draft answer instead of answering directly on this platform and it has certain functionalities that allow them to schedule posts, create them, and then send them to another person for sharing, which ultimately improves collaboration.	GOV	Response
Learning across phases	Some years ago, there was concrete suspicion that there would be an explosive attack in a large German city which caused great uncertainty; yet through very transparent social media work, though which the police showcased that they were on it and what exactly they were doing to investigate the case and contain the situation, they succeeded in keeping the public relatively calm.	GOV	Response
Sensitivity to vulnerability / Decision-making procedures /Learning across phases	Victim protection organizations established good exchange with authorities such as the police but this happens rather via interpersonal contact then via SM	NGO	Multiple

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Sensitivity to vulnerability / Decision-making procedures / Learning across phases	Public searches via social media work particularly well, the police communication officers/social media teams managed to gain a large amount of followers and especially when it comes to certain topics such as child pornography or sexual abuse, they record success and are often amazed at how high willingness to share information with the authority is.	GOV	Response

Needs and Challenges

Table 21: Case 5 Needs and Challenges

Themes	Needs and Challenges	Organization Types	Phase
Decision-making procedures	Coordination of services and personnel during larger incidents (making sure that not everyone does the same thing, e.g. researches the same social media channels for information or tries to verify the same information)	GOV	Response
Decision-making procedures / Technical aspects	The question of data protection is always a big issue, regulations regarding personal data are needed in general and more clarity or transparency regarding the processing of personal data would be desirable from the sides or from the social media platform operators.	GOV	Multiple
Credible information / Decision-making procedures	Amount of communication via different social media channels is becoming increasingly more difficult to handle, interviewees want to have a tool that helps sorting incoming information/navigating quicker though social media information; particularly the police are wishing for improved filter/search	GOV	Response

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	functions and more control over the algorithms of SM, so to control a bit what is displayed to them.		
Decision-making procedures	One interviewee expressed that special forces are still 'lagging a bit behind' in their knowledge about the possibilities of how to exploit the full potential of social media within the given legal constraints	GOV	Response
Decision-making procedures / Technical aspects	The police see quite a big potential in warning apps such as NINA or KATWARN (special forces might e.g., give advice how to hide during an acute threat) but are unsure about which information and how much police could contribute there in a terrorism scenario without making people afraid and in general what information and how much should be posted on an every-day basis to bind large amounts of followers so that you can actually reach people in case of an emergency	GOV	Response
Decision-making procedures	A perpetrator can be a social media user, too, and as such a potential part of the audience of social media messages, so communication must consider him as a target-group, as well	GOV	Response
Sensitivity to vulnerability	Polarization of discussion on social media regarding police operations, particularly when a perpetrator is sought who has a 'foreign' background, infiltration of such discussions by populist/nationalist actors	GOV	Response, recovery
Sensitivity to vulnerability	The police body actually tries to identify special target groups, vulnerable groups during attacks and tries to target them in a specific, tactically advantageous manner (e.g., families of victims which are held hostage and might thus be contacted by a perpetrator) which also includes social media communication	GOV	Response

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	implicitly or explicitly directed towards them, but for a terrorist scenario no groups are being identified and/or trained preventively		
Sensitivity to vulnerability	If special forces become too active/visible in social media they themselves might become targets of perpetrators (revenge seekers)	GOV	Response
Credible information / Decision-making procedures	Establishing Interpretational sovereignty by providing credible information for the public (to counteract rumors) while respecting the secrecy of investigations and the personal rights of third parties.	GOV	Response, Preparedness
Learning across phases / Technological aspects/ Decision-making procedures	The age structure within organizations: many people in charge in the NGO are in their 60s or 70s and in their 50s and 60s in the police, so newer technologies such as social media in general or crowdsourcing in particular are viewed sceptically or are not discussed at all; social media communication is not ideal to convey a lot of background information which particularly 'older' colleagues and superiors usually still expect	GOV, NGO	Response, Recovery
Decision-making procedures / Learning across phases	Concepts to deal with challenges arising from the different social media platforms' algorithms (such as vanishing content of 'stories' and/or recommendation algorithms)	GOV	Multiple
Learning across phases /	Staff fluctuation in the social media teams in the police headquarters is quite high; no one has been in the team for more than five years	GOV	Multiple

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Decision-making procedures			
Technical aspects / Decision-making procedures / Learning across phases	Interfaces/infrastructure within the police (police computers are e.g., not connected to the internet which makes investigation and forwarding of relevant information difficult)	GOV	Response

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4.4 Annex II: Deep Dive Activities

Annex III provides a status update of the deep dive activities carried out at case level. The tables below, updated from D6.2, provide an overview of what has been done so far by the case assessment teams in each country. In some cases, new activities have been scheduled. Those are marked as "new" in the respective tables. Delays owing to COVID-19 or other risks and challenges (e.g. difficulties in engaging with stakeholders) are also described. It should be noted that the deep dives are on-going extra activities which are more prone to changes as opposed to the cross- case ones. This is due to the complex dynamics and socio-cultural aspects of the context in which additional investigations are carried out.

4.4.1 Case 1 Italy: Deep Dive Activities

Table 22: Case 1 – Overview of Activities

Activity	Date	Activity focus	Participants	Status (Delayed, On track, Completed)
Phase 1				
Workshop with children on ''Accessibility of places and information'' during emergencies	October 2021	Identification of the risks affecting 'our' community. Debate on how children usually access information, places and resources through social media.	Approximately 45 students from 3 different classes (School: Istituto Fanciulli[9]).	Completed
Action Research game with children on ''Accessibility''	November 2021	Introduction to crowdsourcing technologies and applying crowd mapping to accessibility analysis.	Same as above.	Completed

[9] It should be noted that the main school is located in a mountain village (Arrone), while a smaller one is located in another village but they both have the same name.

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Workshop with adults **(LINKS Community Workshop, LCW)**	November 2021	Introduction of the LINKS project and debate on the potential of SMCS in disaster management and prevention. Focus groups with civil protection volunteers and roundtable with local authorities.	Local authorities and experts.	Completed
Workshop with children on ''Connectivity: how to connect to people and places during an emergency via social media'	February 2022	Group work on vulnerability and social media. Role play to implement a social media campaign on the risks present in our community. Exercise our capacity to check the quality of information.	Approximately 45 students from 3 different classes (School: Istituto Fanciulli).	Completed
Action Research game with children on ''Connectivity''	April 2022	Exploring connectivity through technologies and SMCS use. Exploring the use of Hashtags during emergencies and on different social media; work on the risks of connectivity, and in particular on how to identify fake news.	Same as above.	Completed
Workshop with children on risk management	May 2022	Role play on risk management during an emergency.	Same as above.	On track
Workshop with adults and children	May 2022	Intergenerational workshop with civil protection operators and children: disaster calendar,	Local authorities, experts, students and their families, teachers.	On Track

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(LINKS Community Workshop, LCW)		memory of the risks of our community. Round table with local authorities and experts		
Phase 2				
Focus Group Discussion with children	October 2022	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).	On track
Action Research Game with children on ''Mobility''	October 2022	Explore how mobilizing citizens through technologies and social media use.	Same as above.	On track
Testing of the multimedia product	November 2022	First test of the multimedia product with local authorities and stakeholders.	Same as above.	On track
Simulation (role-play) with the use of a multimedia product	April 2023	Strengthening child participation to DM.	Approximately 45 students from 3 different classes (School: Istituto Fanciulli).	On track
Inter-generational dialogue workshop	April 2023	Children meet local authorities and civil society.	T.b.d.	On track
Final Dissemination event	May 2023	Final event on project's results and launch of the awareness campaign.	T.b.d.	On track

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4.4.2 Case 2 Netherlands: Deep Dive Activities

Table 23: Case 2 – Overview of Activities

Activity	Date	Activity focus	Participants	Status (Delayed, On track, Completed)
LINKS Community Workshop (LCW) with schools, hospitals and other healthcare organisations, shop owners	February 2022	Originally scheduled in February, the LCW has been postponed and rethought, as mentioned below. Within this workshop we bring together all the results of the different focus groups: What are the main results? What are things that can be solved easily? And what are things that we have to take action on together? We do this together with the stakeholder representatives who participated in the workshops and the mayors of the municipalities of Sittard-Geleen, Stein and Beek will also participate in this LINKS community workshops.	Local communities from the municipalities of Sittard-Geleen, Stein en Beek.	Delayed to November-December 2022. T.b.d.
LCW/Focus group with schools	March 2022	Investigating the information needs of school directors and students in case of an emergency at Chemelot, or long before such an emergency occurs.	Students and schools within the municipalities of Beek, Stein and Sittard-Geleen.	Delayed to June-July 2022 T.b.d.

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LCW/Focus group with hospitals and other healthcare organizations	May 2022	Investigating the information needs of hospital representatives, and other healthcare workers, in case of an emergency at Chemelot, or long before such an emergency occurs,	Representatives from hospitals and other healthcare organizations within the municipalities of Beek, Stein and Sittard-Geleen.	Completed
LCW/Focus group with shop owners	May 2022	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.	Delayed to June-July 2022 T.b.d
NEW - LCW/Focus group with citizens	September/October 2022 T.b.d.	Safety perception and informational needs of surrounding citizens have been gauged already by research done by RIVM. This means there is no need to investigate informational needs further. This workshop with a group of citizens will be about the possibilities of the use of social media and technology during crisis in order to make citizens more resilient.	Citizens living next to the industrial plant, especially people living in Lindenheuvel (part of municipality Sittard-Geleen).	On track.

4.4.3 Case 3 Germany (Drought): Deep Dive Activities

Table 24: Case 3 – Overview of Activities

This project has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement No. 883490

Research activities	Date	Activity focus	Participants	Status (Delayed, On track, Completed)
Observation and analysis of SMCS usage in recent droughts	ongoing	Investigation of SMCS-related activities in drought scenarios.	Various Disaster Management Organisations – DMO - (e.g. authorities of cities and districts, fire brigades, police, relevant NGOs (e.g. Red Cross).	On track
NEW - Feedback, pilot testing and contribution to the online survey from WP4	October 2021-January 2022	Contribution to the development of the online survey from a practitioners' point of view.	WP2-6	Completed
NEW - Identification of research participants for the online survey and distribution of the online survey	November 2021-March 2022	Research and compilation of addressees and mailing lists for the survey.	WP6	Completed
Deep dive -Interviews	November 2021-March 2022	Current usage, potentials and limitations of SMCS and DCT in general and in the context of droughts.	Practitioners (e.g. strategical leadership positions of fire departments). Policy makers, Researchers, Software Provider of DCT.	On track
LCW with practitioners of the police (together with DHPol)	~~Winter~~ ~~2021/22~~	Experiences in the uses of SMCS and DCT (which DCT features have proven valuable to facilitate police work?).	Practitioners (law enforcement only but across all three levels – local, state and federal).	Canceled due to COVID, postponed to 05/2022 (see last row).

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LCW at the Federal Academy for Civil Protection and Civil Defence (together with DHPol)	February 2022	Evaluating different DCT features for the communication and coordination between DMO in disaster situations.	Practitioners (various DMO).	Delayed (due to Covid, the academy cancelled this workshop). Then the LCW with the special police forces in May was organised which covered the needs the case drought had towards this workshop. If a workshop will be organised at the Federal Academy for Civil Protection and Civil Defence next year, a participation of this case will be analysed.
NEW - LCW about a social media strategy in an upcoming drought within the "safety camp 2022" (New)	April 2022	The first workshop revolved about the development of a social media strategy in the preparedness phase of an upcoming drought.	Policy/decision makers, practitioners, researchers.	Completed
NEW - LCW about social media and crowdsourcing technologies within the "safety camp 2022" (New)	April 2022	The second workshop revolved around potentials of social media and crowdsourcing technologies in a the response phase of a current heatwave.	Practitioners, policy/decision makers, researchers	Completed
NEW - LCW with German special police forces on the applications of social media, organised by DHPol (New)	May 2022	Get overview of the features of DCTs that are seen as valuable to facilitate the work of special forces during an acute terrorist attack. Understand which	Primarily practitioners (law enforcement from Germany and Sweden), potentially also researchers (the full program has not yet been circulated) .	Completed

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		features might hinder them or are superflues		

4.4.4 Case 4 Denmark: Deep Dive Activities

Table 25: Case 4 – Overview of Activities

Activity	Date	Activity focus	Participants	Status (Delayed, On track, Completed)
Pilot interviews, qualitative	Spring 2021	Insight into risk perception and community communication.	Citizens from French diaspora	Completed 5 interviews
Pilot interviews, qualitative	March, April 2021	Insight into disaster management processes and stakeholder communication.	Stakeholders from HBR and FRB	Completed 7 interviews
Focus group interviews	January-April 2022 (extended until the summer)	In-depth insight in the risk perception and the communication practices (online and non-mediated communication) among citizens with a variety of vulnerability profiles (e.g. citizens who cannot secure their home).	Citizens from Frederiksberg who are vulnerable in different ways	On track. The planning of the focus groups will begin March 1st. Five to seven focus groups will be carried out before the summer 2022.
Social Media analysis	November 2021 – ongoing	Insight in communication dynamics on selected Facebook groups in Frederiksberg, as	Facebook groups (two open groups, two closed groups)	On track

		citizens and professionals exchange views with each other or citizens exchange views with other citizens.		The analysis of the open Face groups began in November 2021 and is ongoing. The analysis of the closed groups will take place parallel to the focus groups (we need to get access through members)
Participants observation	November 2021 – to be determined	Analysis of practices in crisis management teams work (exercises and/or planned events) to investigate potentials and obstacles for integration of new practices, e.g. following the upcoming LINKS Framework.	Emergency managers	Delayed. T.b.d. As expected, it is difficult to obtain access to crisis management teams. Especially if the police participate. We investigate if we can approach alternative settings with less strict level of security and concerns from the police. Lately we got a connection to a police district where they are positive towards our request to observe. The acceptance is however not yet final.

4.4.5 Case 5 Germany (Terrorism): Deep Dive Activities

Table 26: Case 5 – Overview of Activities

Activity	Date	Activity focus	Participants	Status (Delayed, On track, Completed)

This project has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement No. 883490

Survey	February-June 2021	Assessing which polices across Germany already employ SMCS during major incidents and to find out basic aspects relating to their particular needs and application areas of SM(CS) in order to assess the institutional drivers for the terrorism case Resilience Wheel.	practitioners (law enforcement only)	Completed
Interviews (New)	November 2021-February 2022	Use, potentials and needs of SMCS generally and in the case of emergencies and specifically in the case of terrorism to further develop the dimensions of the Resilience Wheel.	Practitioners Feedbackers	Delayed for one interview (due to ongoing investigations in the aftermath of one terrorist attack, there is no authorization to discuss the case with us, yet)
LCW followed by interviews and focus groups discussions (with SIC)	February 2022	Get a deeper insight into the similarities and differences of the SMCS-use within the German Police and to better understand the practitioners' needs for a more effective use of SMCS during emergencies., assess which particular tools and guidelines are already known and applied to add to the Social Media and Crowdsourcing Technology Library and the Social Media and Crowdsourcing Guidelines Library of the LINKS Framework and to raise awareness of/interest in the	practitioners (law enforcement only but across all three levels – local, state and federal)	Completed

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		LINKS Community Center (and potential participation therein).		
Participation at an BABZ training session	March 2022	Get an overview of the features of particular DCTs that have proven valuable to facilitate BOS coordination during major terrorist attacks and/or to understand which features hindered them --> particularly with the aim to evaluate the usefulness of the tools collected in the Social Media and Crowdsourcing Technology Library.	practitioners (law enforcement and other BOS)	Cancelled (due to Covid, the BABZ was cancelled) and thus replaced by another workshop (see next row)
NEW - Participation at a workshop for the leadership of German special forces on the applications of social media (with SIC and UCC)	May 2022	Get an overview of the features of particular DCTs that have proven valuable to facilitate BOS coordination during major terrorist attacks and/or to understand which features hindered them --> particularly with the aim to evaluate the usefulness of the tools collected in the Social Media and Crowdsourcing Technology Library.	Primarily practitioners (law enforcement from Germany and Sweden), potentially also researchers (the full program has not yet been circulated)	Completed
LCW followed by interviews and focus groups discussions	Summer 2022	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 (law enforcement, prevention council members, media)	On track

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		Understand how to protect and engage potentially vulnerable groups using SMCS. Assess how the public evaluates the credibility of information shared in SMCS. Reflect upon how to prevent rumours and the spread of false information in social media. This LCW shall particularly try to evaluate the Citizens Handbook and the Pocket Ethics Guidelines made available in the LCC.		
LCW followed by interviews and focus groups discussions	Spring 2023	Understand how the guidelines for SMCS use during major terrorist incidents are developed to further evaluate particularly the Social Media and Crowdsourcing Guidelines Library as well as the Pocket Ethics Guidelines from the LINKS Framework	practitioners & decision makers (law enforcement, ministries, DAs)	On track