D3.5 REPORT ON THE MONITORING OF DISASTER MANAGEMENT PROCESSES RELATED BROADER CONTEXT APPLICATION

Research Report

ANNE BACH NIELSEN, DARIO RAMON LANDWEHR, JULIETTE ELEONORE NICOLAI AND EMMANUEL RAJU – UNIVERSITY OF COPENHAGEN

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AUTHORS& CONTRIBUTORS		
Author	**Institution**	**Authored Sections**
Anne Bach Nielsen	University of Copenhagen (UCPH)	Entire Document
Dario Ramon Landwehr	University of Copenhagen (UCPH)	Entire Document
Juliette Eleonore Nicolai	University of Copenhagen (UCPH)	Entire Document
Emmanuel Raju	University of Copenhagen (UCPH)	Entire Document
Contributor	**Institution**	**Contributed Sections**
Nina Blom Andersen	University College Copenhagen (UCC)	Section 3
Nele Hingmann	The German Police University (DHPol)	Section 3
Annika Hamachers	The German Police University (DHPol)	Section 3
Lene Stolpe Meyer	Frederiksberg Municipality (FRB)	Section 3
Dieter Nuessler	Federation of the European Union Fire Officer Associations (FEU)	Sections 2 and 3
Ingeborg Sæle Helland	Greater Copenhagen Fire Department (HBR)	Section 3
Robert Laurruina	Vrije University, Netherlands (VU)	Section 3
Richard Lüke	Safety Innovation Center, Germany (SIC)	Sections 2 and 3

REVIEWS		
Reviewer	**Institution**	**Reviewed Sections**
Nathan Clark	Vrije University, Netherlands (VU)	Entire Document
Camilla Froio	University of Florence, Italy (UNIFI)	Entire Document
Nina Blom Andersen	University College Copenhagen (UCC)	Entire Document
Richard Lüke	Safety Innovation Center, Germany (SIC)	Entire Document

| Annika Hamachers | The German Police University (DHPol) | Entire Document |

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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 have been integrated into crisis management for improved information gathering and collaboration across European communities. The effectiveness of social media and crowdsourcing on European disaster resilience, however, remains unclear due to the use of social media and crowdsourcing 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 social media and crowdsourcing in disasters. This is done across three complementary knowledge domains:

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

The project will develop a framework through an iterative process and bring together 15 partners and two associated partners across Europe (Belgium, Denmark, Germany, Italy, Luxembourg, the Netherlands) and beyond (Bosnia & Herzegovina, Japan) to understand, measure and govern social media and crowdsourcing for disasters. The LINKS Framework consolidates knowledge and experiences on the uses of social media and crowdsourcing 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, and drought), cutting across disaster management phases and diverse socioeconomic and cultural settings in four countries (Denmark, Germany, Italy, the Netherlands). Furthermore, LINKS sets out to create the LINKS Community, which brings together a wide variety of stakeholders, including first-responders, public authorities, civil society organisations, business communities, citizens, and researchers across Europe, dedicated to improving European disaster resilience through the use of social media and crowdsourcing.

About this deliverable

This document presents the final deliverable from Work Package (WP) 3 and concludes the LINKS project's work on social media and crowdsourcing in disaster management processes. The complete knowledge base on disaster management processes is presented in D3.4 (Nielsen et al. 2023) and this deliverable thus focuses on the application of the results within LINKS partner organisations and in the broader context.

This deliverable should be read in tandem with D2.6 (Froio et al., 2023a), D4.5 (Lüke et al., 2023) and D6.6 (Larruina et al., 2023b), which present the application of LINKS results with a focus on

disaster risk perception and vulnerability (D2.6), disaster community technology (D4.5) and the LINKS Framework (D6.6).

The deliverable has two main parts. The first part provides an up-to-date overview of the three LINKS products included in the knowledge base on disaster management processes: The DMP Resilience Wheel, the SMCS Guidelines Library and the Including Citizens Handbook (specifically the sections on 'mobilising volunteers' and 'increasing risk awareness'). The second part provides an overview of how the overall knowledge base and the three LINKS products are applied within LINKS partner organisations and in a broader context.

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LIST OF ACRONYMS

Acronym / Abbreviation	Description
DCT	Disaster Community Technologies (LINKS Work Package 4)
DMP	Disaster Management Processes (LINKS Work package 3)
DMO	Disaster Management Organisation
DRPV	Disaster Risk Perception and Vulnerability (LINKS Work Package 2)
LCC	LINKS Community Center
LCW	LINKS Community Workshop
NGO	Non-Governmental Organisation
SMCS	Social Media and Crowdsourcing
WP	Work Package

DEFINITION OF KEY TERMS[1]

Term	Definition
Disaster Management Processes (DMP)	A collective term encompassing a systematic series of actions or steps taken to reduce and manage disaster risk. Disaster management processes are often associated directly with the phases of the Disaster Management Cycle.
Disaster Governance	Disaster governance refers to the way in which multiple actors across levels and sectors (public authorities, civil servants, citizens, media, private sector, and civil society actors) coordinate and collaborate to manage disaster risks.
LINKS Framework	A set of best practices consisting of methods, tools and guidelines for enhancing the governance of diversity among the understandings and applications of social media and crowdsourcing in disasters for relevant stakeholders. Methods in LINKS refer to approaches that will enable researchers and practitioners to assess the effects of social media and crowdsourcing for disaster resilience under diverse conditions. Tools are practical instruments supporting first responders, public authorities and citizens with the implementation of social media and crowdsourcing in disaster and security contexts. Guidelines are recommendations for

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

	improving national and regional governance strategies on social media and crowdsourcing as well as introductions and explanations of how to apply the methods and tools under diverse conditions.
Links Community Workshops	Workshops for capacity-building at the local level, conceived as a means to foster knowledge and experience exchange within the Community. They are organised locally by partners and are crucial for communicating information regarding the project's objectives and scope, for exchanging good practices among different stakeholders on the use of social media and crowdsourcing in disasters, and for the development, testing and validation of the project's results.
Social Media	A group of Internet-based applications that build on the ideological and technological foundations of 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.

Web 2.0 is the Internet we are familiar with today in which people are not just consumers of information but producers of knowledge through social networking sites and services like Facebook, Twitter and Instagram. |
| Crowd Sourcing | Describes a distributed problem-solving model where the task of solving a challenge or developing an idea gets "outsourced" to a crowd. It implies tapping into "the wisdom of the crowd".

In the context of LINKS, crowdsourcing involves using ICTs (Information and Communication Technologies). For example: crowdsource mapping in crisis zones. Digital volunteers/communities offer free services by mapping critical information related to disaster-affected zones. |
| Case Assessment | The cross-case 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-case 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. |
| LINKS Community | A community of multidisciplinary stakeholders working collaboratively hand in hand with the LINKS Consortium, learning and benefiting from the project development and results, and in turn, providing their knowledge and expertise for the improvement of LINKS research and the validation of the project's results. |

1. INTRODUCTION

This deliverable is the final report from Work Package (WP) 3 and concludes the activities conducted as part of the LINKS project on social media and crowdsourcing use in **disaster management processes (DMP)**. The state of the art on the development of the knowledge base is presented in D3.4 (Nielsen et al., 2023). This report presents the application of the knowledge base within the LINKS cases and in the broader context (T3.4). It also presents how the LINKS products included in the knowledge base on disaster management processes have developed since D3.4 was submitted in June 2023. Consequently, the report has two main objectives:

1) To monitor the knowledge base by providing an up-to-date overview of the latest developments of three LINKS products, which are part of the knowledge base on disaster management processes: the DMP Resilience Wheel, the Social media and Crowdsourcing Guidelines Library (the SMCS Guidelines Library) and the Including Citizens Handbook (the Handbook) sections on 'mobilising volunteers' and 'risk communication';

2) To provide an overview of how the knowledge base and its three products (the DMP Resilience Wheel, the SMCS Guidelines Library and the Handbook sections on 'mobilising volunteers' and 'risk communication') have been applied through implementation and dissemination activities within LINKS partner organisations and in a broader context.

The work done within the LINKS project on disaster management processes sets out to understand what role social media and crowdsourcing play in organisations working with disasters. The knowledge base addresses three main research questions formulated early in the project (see D3.2. Nielsen et al., 2021):

- How are European disaster management organisations applying social media and crowdsourcing in disaster management processes (RQ1)?
- What are the limits and potentials of this application associated with institutional resilience (RQ2)?
- Following the first two questions, how can the application of social media and crowdsourcing in disaster management processes be further strengthened (RQ3)?

These questions are answered in D3.4 based on an extensive literature review and the results of the empirical work done in five LINKS cases (D3.1 Nielsen & Raju 2020; D3.2; D6.4 Clark et al., 2022). In D3.4, we present the state-of-the-art on the use of social media and crowdsourcing in disasters, which is also published as a separate report to reach a larger audience.

To answer the final question (RQ3) on how the application of social media and crowdsourcing can be strengthened, we introduce a set of products developed as part of the LINKS project and included in the LINKS Framework (D5.5 Fonio et al., 2023) with relevance to increasing disaster resilience in disaster risk management processes:

- The DMP Resilience Wheel serves as a tool through which organisations can discuss and assess current and future uses of social media and crowdsourcing in their organisation and across organisations;
- The SMCS Guidelines Library provides an overview of relevant guidelines, standard operating procedures and legal frameworks for applying social media and crowdsourcing in disasters;
- The Including Citizens Handbook presents a set of learning modules for organisations wanting to consider citizens in their disaster management processes. This includes questions related to unaffiliated volunteers, targeted communication and awareness, accessibility and mobilisation of citizens.

1.1 Reading Guide

In the following section, Section 2, we present the progression of the three products associated with the knowledge base on disaster management processes. We will briefly present the overview from the beginning of the project to now before we address the activities related to the application, evaluation and monitoring of the products in the past 6 months. Section 2 ends with a presentation of the updated versions of the three LINKS products included in the knowledge base on disaster management processes. Finally, Section 3 presents the implementation and monitoring of the knowledge base within LINKS practitioner organisations and in a broader context. Section 4 concludes.

Strengthening links between technologies and society for European disaster resilience

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

2. DEVELOPING THE LINKS PRODUCTS: THE DMP RESILIENCE WHEEL, THE SMCS GUIDELINES LIBRARY AND THE INCLUDING CITIZENS HANDBOOK

This section provides the final overview of how each of the three LINKS products associated with WP3 were developed through co-creation processes from 2020 to 2023. A full overview of all activities taking place within the cases is presented in D6.5 and D6.6 (Larruina et al., 2023a; Larruina et al., 2023b). An overall overview of the progression of the knowledge base on disaster management processes is presented below in Figure 1.

Figure 1: WP3 Activities 2020-2023
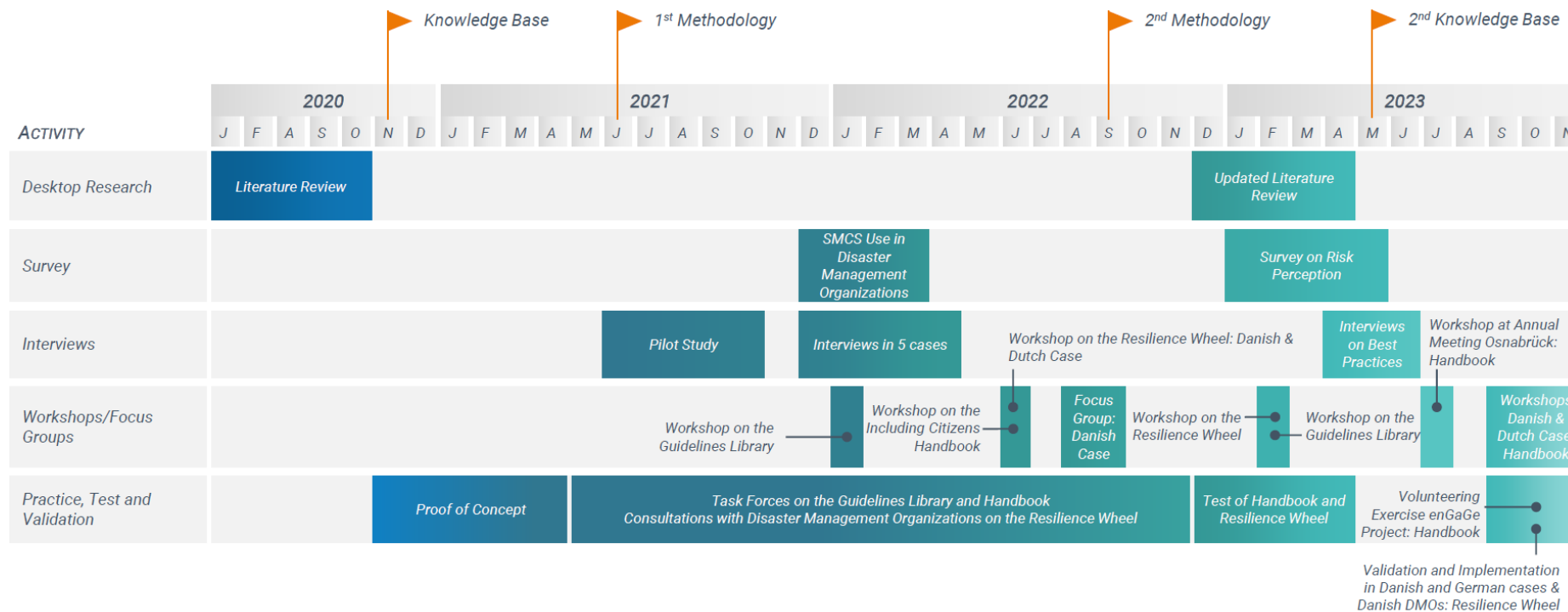
Source: Authors, based on D3.4

The Figure presented above illustrates the varied applications of LINKS products developed within WP3 by the case teams in the final part of the project. Specifically, it outlines the application of the DMP Resilience Wheel, the SMCS Guidelines Library and the Including Citizens Handbook and presents the activities carried out to promote their usage.

The two methodologies (D3.2; D2.7 Lüke et al., 2022) serve as instructions for how the LINKS cases are informing the knowledge base on the use of social media and crowdsourcing in disaster management processes. For the tasks related specifically to applying and monitoring the knowledge base outputs, we apply a practitioner-driven approach presented in D2.7.

2.1 The Practitioner Driven Approach to Assessing and Monitoring the Knowledge Base

The practitioner-driven approach is based on LINKS partners' application and implementation of the LINKS knowledge bases and outputs. As explained in D2.7 this approach takes its departure in practitioners' needs and viewpoints and the extent to which the knowledge base and the Framework can serve as a base to address these needs. It also provides the opportunity for practitioners to self-evaluate how they use social media and crowdsourcing in their organisations and how this can be improved. The practitioner-driven assessment method was carried out through a series of steps that are described in D2.7 and monitored through the case assessments in WP6 (see D6.5; D6.6). The practitioner organisations decide the specific products (cf. Section 4.2.1 in D2.7 for the process) and contribute to resilience-building in each of the cases. In this practitioner-driven approach, partners were invited to:

- reflect on current uses and potential challenges in applying social media and crowdsourcing within their organisations;
- reflect on organisational objectives in terms of how the organisation would like to apply and make use of social media and crowdsourcing within their organisation;
- contextualise the needs and aims within the scope of the knowledge bases. In the context of WP3, how the findings and products related to disaster management processes may support them in achieving their needs;
- implement the products to solve case-specific challenges and objectives;
- create an impact in the organisations partaking in the LINKS consortium.

2.2 The DMP Resilience Wheel

The DMP Resilience Wheel is a joint effort between the University of Copenhagen and University College Copenhagen developed as part of the WP3 knowledge base on disaster management processes. The DMP Resilience Wheel aims to spark conversations within and across organisations working together and to facilitate collaborative identification and prioritisation of strategic projects strengthening the use of social media and crowdsourcing in disaster risk management efforts. It is

a tool that helps to kick start holistic and context-dependent conversations about potentials and challenges associated with using social media and crowdsourcing in disaster management processes.

2.2.1 The Development of the DMP Resilience Wheel

The DMP Resilience Wheel has taken a new life as a tool for organisations with its origins rooted in the knowledge base presented in D3.1. The knowledge base identifies the need for both shifting and bridging the relationship between citizens and disaster management organisations to strengthen resilience in Europe and places social media and crowdsourcing as a medium through which these shifting and bridging mechanisms can take place. The concept of the DMP Resilience Wheel was presented in D3.1 based on the academic literature suggesting how social media and crowdsourcing may support organisations in building disaster resilience and then reworked and adjusted through the case assessments and co-creating activities with LINKS partners (see the two methodologies (D3.2; D2.7 for the approach and D6.3 Larruina et al., 2022; D6.4; D6.5; D6.6 for the activities and results of those activities). After translating the DMP Resilience Wheel into a concept for practice, it was carefully tested in four of the LINKS consortium organisations: The Greater Copenhagen Fire Department, the Safety Region of South Limburg, the German Police University and Frederiksberg Municipality. The tests were conducted through LINKS Community Workshops with different stakeholder constellations depending on the context.

Based on these tests, a set of instructions on how to apply and implement the DMP Resilience Wheel was developed. These instructions are available through the LINKS Community Center and the Framework's User Guidance and provide an overall introduction to how the DMP Resilience Wheel can be applied to guide strategic work in an organisation through workshop sessions. The instructions have since been translated and adapted to fit the needs of specific contexts and organisations (see Section 3 for details).

2.2.2 The Final Version of the DMP Resilience Wheel

The DMP Resilience Wheel consists of two layers: a set of drivers that reflect the most important focal points to alter resilience-building through social media and crowdsourcing. Connected to each driver is a set of characteristics that describe the needed qualities for building disaster resilience through social media and crowdsourcing in an organisation.

The DMP Resilience Wheel as a practical tool supports organisations working with disasters in mapping their current activities and future needs using social media and crowdsourcing in disasters. It provides a tool for dedicated sets of workshops designed to map out and assess resilience-building practices in the context of social media and crowdsourcing. Using the tool in a workshop format can support organisations in strengthening and formalising social media and crowdsourcing use in their disaster risk management efforts.

The instructions are available through the LINKS Community Center and allow organisations to work with pre-defined categories as well as to adapt the categories in the DMP Resilience Wheel themselves. Templates and instructions are included in Annex 1 in this deliverable.

Figure 2: The DMP Resilience Wheel
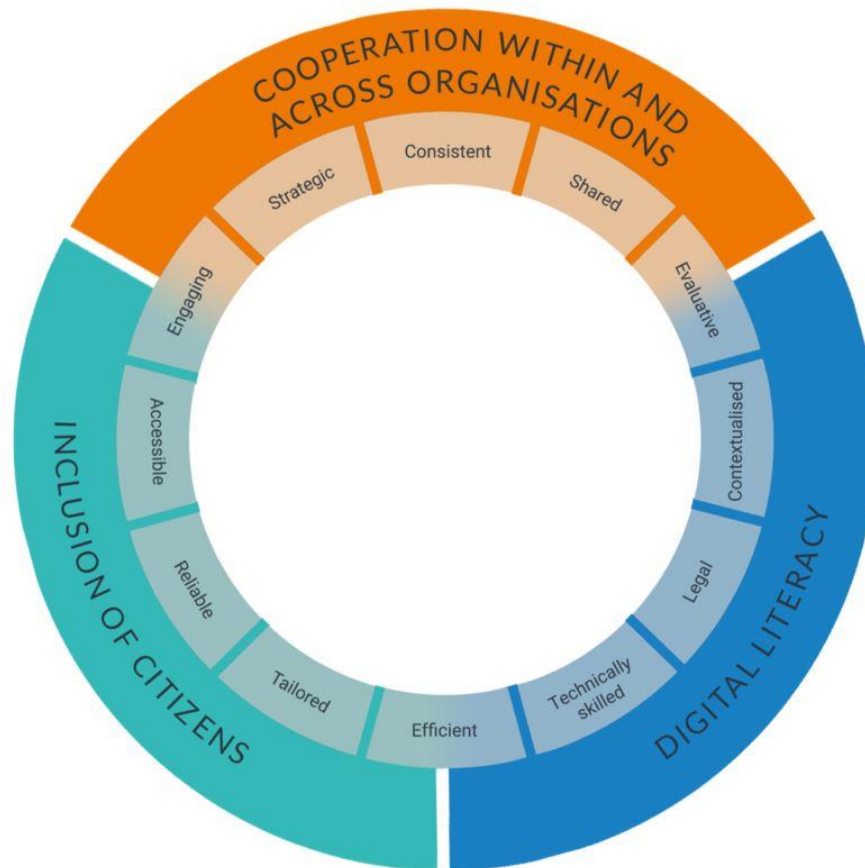
2.3 The SMCS Guidelines Library

As both social media and crowdsourcing and their integration in management are recent developments in disaster risk management, the landscape of regulatory frameworks, policies and guidelines and relatively limited. The SMCS Guidelines Library provides an overview of the very fragmented landscape of guidelines guiding social media and crowdsourcing.

The SMCS Guidelines Library is based on the joint effort between the University of Copenhagen, the Safety Innovation Center and the Federation of the European Union Fire Officer Associations. The SMCS Guidelines Library is one out of four SMCS Libraries (see also D4.4 Lüke & Habig 2023; D4.5), which operate as a tightly integrated information model (see D2.7) accessible through the LINKS Community Center.

2.3.1 The Development of the SMCS Guidelines Library

The guidelines included in the SMCS Guidelines Library are based on a systematic review of existing guidelines on social media and crowdsourcing (see D3.1; D4.1. Habig et al., 2021). The review has continuously been updated between 2020 to 2023 by the Guidelines Taskforce (see D3.2; D2.7). The structure, filters and synopsis are informed by and tested through a survey, and workshops with representatives from European disaster management organisations as well as within the German Police University and the Federation of the European Union Fire Officer Associations. The structure and the filter system were co-designed between the Federation of the European Union Fire Officer Associations, the University of Copenhagen, the Safety Innovation Center and the German Police University between 2021 and 2023.

The Taskforce has been continuously feeding the SMCS Guidelines Library with relevant materials. Recently, the terms of use for various social media platforms were added to inform disaster management organisations about the legal considerations associated with using these platforms. Additional guidelines were also added about social media data verification, a key concern expressed by practitioners in the case assessment. A policy filter was added and guidelines created as part of the LINKS project were added along with relevant material from other EU projects.

The Federation of the European Union Fire Officer Associations created a comprehensive guidance document for establishing a social media team within a local fire brigade, addressing a specific knowledge gap identified in the SMCS Guidelines Library. The document is now available in the SMCS Guidelines Library in both English and German. Similarly, University College Copenhagen has developed a white paper on legal considerations for the use of social media and crowdsourcing in disasters and a flow chart for how to approach legal issues. These documents contain an assessment and a visual overview of regulations that disaster management organisations need to comply with when they apply social media and crowdsourcing. This includes the GDPR as well as terms and

conditions from social media tech companies. These newly added guidelines serve as a great example of how researchers, as well as practitioners, can strategically contribute to the SMCS Guidelines Library, addressing gaps in available guidance and actively improving and enriching the product by sharing their best practices with fellow disaster management organisations.

Finally, the Taskforce conducted a brainstorming session to create catchy snippets aimed at promoting the product to external audiences (see D7.6 Schmidt et al., 2023). These snippets, one for each thematic filter in the SMCS Guidelines Library, offer insights into the different features of our product. They will be strategically displayed on social media and on the LINKS Community Center to capture the attention of potential users and expand our current user database.

2.3.2 The Final Version of the SMCS Guidelines Library

As introduced in D5.3 (Fonio et al., 2022), D4.4 and D4.5, the SMCS Guidelines Library is strongly connected to the three other SMCS Libraries created as part of the LINKS project. As stated in D4.5, the SMCS Libraries provide a joint structured, accessible, and searchable overview of technologies, guidelines, use cases and communication advice which are all accessed through the LINKS Community Center and guided by the Framework's User Guidance. Figure 3 illustrates the LINKS Library approach. The "blank" library at the bottom of Figure 3 represents future potential libraries.

Figure 3: LINKS Library Model
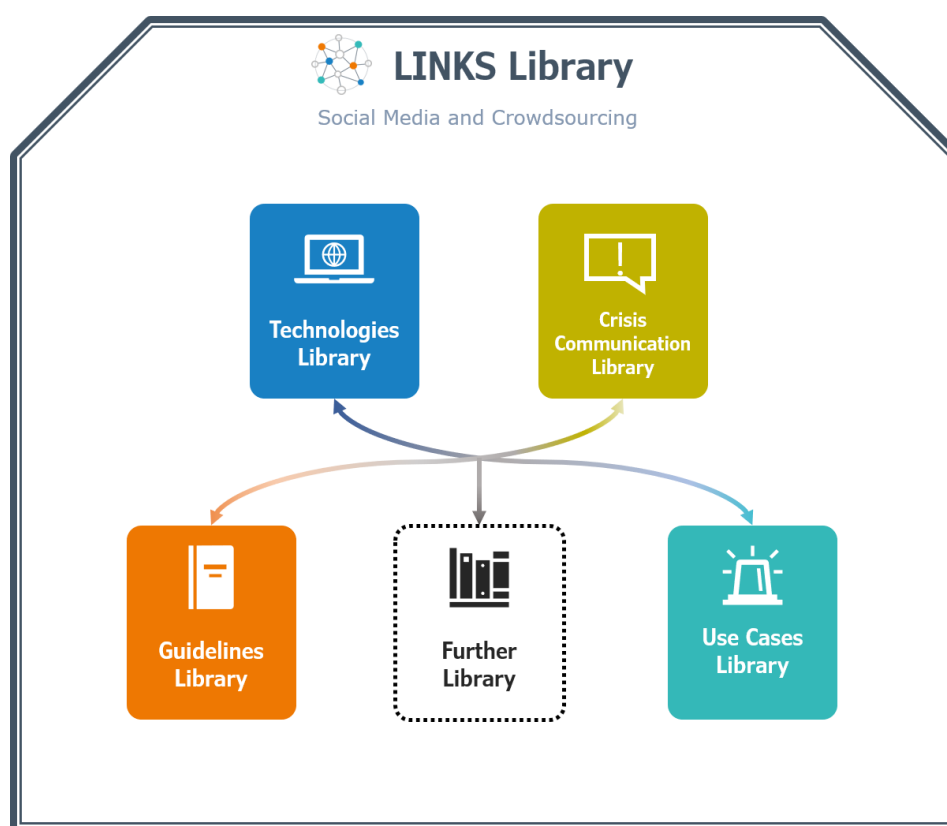
Source: D4.5.

A filter structure is created for all libraries to facilitate systematic organisation and navigation within a library (e.g. "target group" or "disaster phase"). The SMCS Libraries furthermore connect to support the user in accessing as much relevant information as possible when searching the libraries. For example, the SMCS Guidelines Library links to the SMCS Technologies Library when a technology may support the information provided in the SMCS Guidelines Library and vice versa.

The mapping of current guidelines includes global, European and national levels. The SMCS Guidelines Library contains guidelines in various European languages as well as a small synopsis of each of the guidelines that allows users to quickly get an overview of the content (see Figure 4 below). It contains a total of 76 documents – still counting, which are described and categorised at the LINKS Community Center. The guidelines cover a range of topics that guide organisations in addressing the challenges that we have highlighted in this report related to formalising social media and crowdsourcing in an organisation, how to maximise resources and build a team, issues of verifications and how to consider vulnerable groups.

Figure 4: The SMCS Guidelines Library

VIEW ALL GUIDELINES

Created: 5 June 2023
Last edited: 14 August 2023

Building a Social-Media-Team in a local fire brigade

Source ↗

Quick Facts

Publishing Organisation: Max Nüßler, FEU

Year: 2023

Primary Target Country: Germany

Languages: English

Status: Published

Covers Thematic
- Community management ❓
- Content creation ❓
- Crisis communication ❓
- Social Media Strategy ❓
- Social Media Team ❓

Target audience
- Practitioners ❓

Audience experience level
- Intermediate ❓

Disaster Management Phase
- Before ❓

Synopsis

In the document, suggestions from various guidelines available in the LINKS Guidelines library have been used

The document is also available in German https://links.communitycenter.eu/index.php/Einrichtung_eines_Social-Media-Teams_bei_einer_städtischen_Feuerwehr

User Story

A social media team is to be set up and established in a medium-sized public fire brigade with around 400 to 600 emergency personnel.

A variety of questions need to be addressed, such as:

- What are the fire brigade's goals in entering the social media world?
- Which of the numerous platforms should a fire brigade use?
- How can one monitor if objectives have been achieved?
- How much staff is needed for implementation of the Social Media strategy?
- Are there technologies that are required and/or desirable to ease the use?
- What regulations, standards, or rules should of have to be followed?
- Are there examples of successful social media use, or templates, tools, and documents that are useful for setup, operation, and various scenarios when using social media in emergency response?

Implementation

The following steps are suggested for implementation:

- Definition of objectives
- Definition of target audience
- Definition of content types and categories
- Determination of type of content
- Definition of community management rules

Source: LINKS Community Center – SMCS Guidelines Library

2.4   The Including Citizens Handbook

The Including Citizen Handbook provides learning modules on how to reach and include citizens through social media and crowdsourcing in disaster management processes. The Handbook is based on the joint effort between the University of Florence, University College Copenhagen, Save the Children Italy and the University of Copenhagen. The Handbook consists of four overall themes. Two themes (mobilising volunteers and communicating risk) are presented in this deliverable and the remaining two are presented in D2.6.

Figure 5: Including Citizens Handbook

1. Increasing Risk Awareness
2. Mobilizing Volunteers
3. Mobilizing Citizens
4. Making Information Accessible
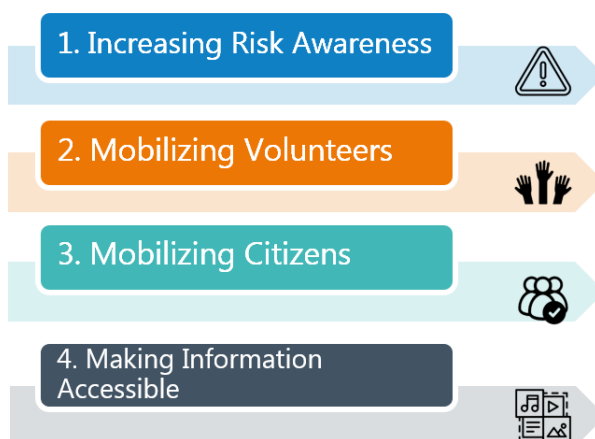
Source: D3.4, online accessible here

2.4.1 The Development of the Including Citizens Handbook

The idea of the Handbook builds on the results of the first case assessment that showed how organisations rarely harvest the full potential of citizen engagement when using social media and crowdsourcing (See Section 3 of D3.4; D2.7). The concrete themes and sub-themes were co-developed within the LINKS Consortium (e.g. LINKS Annual Meeting in 2022) and in an interdisciplinary Taskforce of disaster management practitioners and researchers from across Europe. This Taskforce was a weekly co-creation meeting where practice organisations brought their perspectives on the themes, sub-themes and structure of the Handbook. This process facilitated close researcher-practitioner collaboration (see D3.4) and led to several consortium meetings and workshops that tested the Taskforce's decisions. The online modules were validated with additional practitioners outside the Taskforce to ensure their practical relevance. This includes the Danish Red Cross in January and February 2023 and representatives from European law enforcement agencies in July 2023 at the LINKS Annual meeting.

The Handbook starts from the theoretical results of the Disaster Risk Perception and Vulnerability model developed in WP2 (see D2.1 Bonati, 2020; D2.2 Pazzi et al., 2021; D2.3 Bonati et al., 2021). As initial results from the LINKS Community Workshops indicated that the Handbook should be made available in an accessible interactive format (see D6.4), the Handbook was iteratively turned into an interactive product. It developed from a static text-centred booklet into an interactive multimedia learning platform that disaster management organisations can use to train and onboard their staff.

Rise Articulate[2] was chosen as the learning platform as University College Copenhagen had experience with developing modules targeting firefighters on this platform. Therefore, Rise Articulate was already validated in a closely related context. Between February and July 2023, the first version of the Handbook was integrated into Rise Articulate. Specifically, each of the four chapters of the Handbook (see D3.4) were turned into separate learning modules. In parallel to this, short explainer videos were developed by an external production company, in collaboration with researchers from the University College Copenhagen, the University of Copenhagen and the University of Florence who developed the storyboards.

During the LINKS annual meeting in Osnabrück, in July 2023, the different chapters of the Handbook as implemented in Rise Articulate were tested in a workshop followed by roundtable discussions, involving practitioners from different European law enforcement organisations, the German Police University, Safety Region of South Limburg, Chemelot, the Province of Terni and the Greater Copenhagen Fire Department. The workshop aimed at testing all three pillars of the learning platform: Content, interface and explainer videos, focusing on two main objectives. First, the content produced for the learning platform is intended to be implemented in different cultural contexts. Therefore, the animations produced for the Handbook must be understandable without conveying stereotypes.

Second, the workshop tested whether the content produced resonates with the types of practitioner organisations intended as the target audience (i.e.: Operational and strategical practitioners working in disaster management organisations, such as law enforcement). Concerning the overall content, the participants favoured clearly defined and actionable concepts and the provision of practice examples and cases to exemplify how specific tools introduced in the Handbook, such as volunteering hubs, are used by other disaster management organisations. Concerning the interface of the learning platform, the participants positively mentioned the interactive elements such as flip cards or quizzes, while some parts of the chapters were too text-heavy. Concerning the explainer videos, it was mentioned that some animations were misleading and that some concepts should be explained more clearly.

From July 2023 onwards, the workshop results were fed back into the development of the learning platform and the explainer videos. Amongst others, streamlining the structure of the different modules, updating the animations in the explainer videos, using them as recurrent elements and expanding on the case examples. In parallel, additional testing was carried out by the Greater Copenhagen Fire Department in June and November 2023 to provide internal feedback and the team at the University of Florence conducted a second workshop at the 2023 final LINKS meeting in Rome to test the Handbook chapters on Mobility and Accessibility (see D2.5 Froio et al., 2023a).

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[2] Rise Articulate is a web-based learning platform, specialized to create employee learning systems. Learn more here: https://rise.com

2.4.2   The Final Version of the Including Citizen Handbook

As described above, this Rise Articulate enables the integration of texts with interactive elements and the developed explainer videos. Furthermore, it allows tracking the progress, making it suited for training and onboarding people within an organisation. Despite being hosted on a separate platform, the modules are interlinked with the Framework and the LINKS Community Center in two ways: First, the different chapters of the Handbook as implemented in Rise Articulate can be directly accessed through the LINKS Framework in the LINKS Community Center through links. Secondly, users can directly access selected relevant resources from Rise Articulate (such as Guidelines on Unaffiliated Volunteers from the Volunteering chapter of the Handbook) through links to the LINKS Community Center. Figure 3 below shows an example of the Handbooks Interface in Rise Articulate:

Figure 6: Mobilising volunteers chapter of the Including Citizens Handbook on the interactive learning platform Rise Articulate.
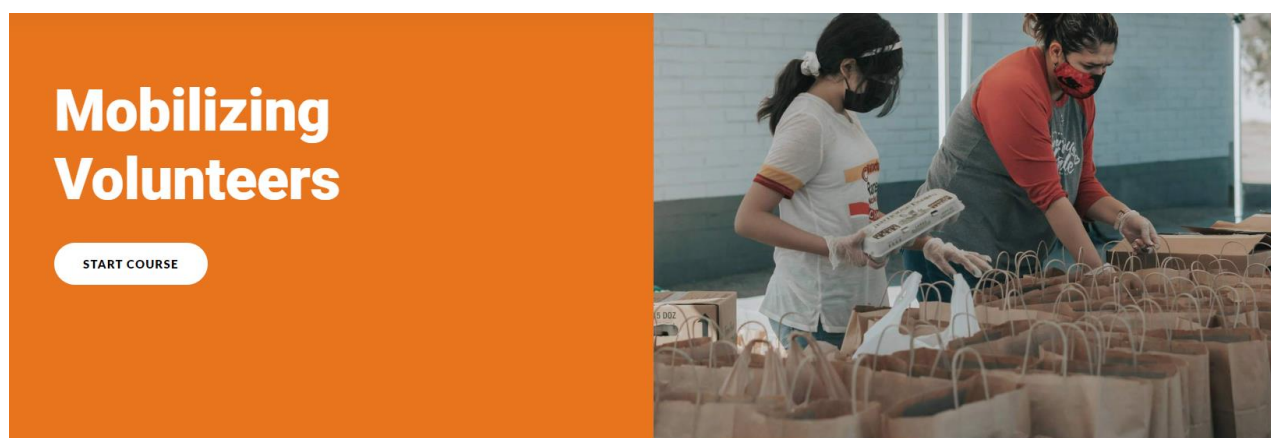
Source: Including Citizens Handbook, accessible here

Concerning the content, the Increasing Risk Awareness and the Mobilising Volunteers sections are further divided into sub-sections. Each of those (sub-) sections is introduced with an explainer video that summarises the most relevant points, such as definitions of the key terms. Second, the sections provide practice examples from the field, as requested by practitioners across workshops. These

also complement the examples already given in the LINKS Use Case Library. The "How to Mobilize Unaffiliated and Spontaneous Volunteers" subsection for example provides a detailed overview of a case provided by Save the Children Italy, which used a wide network of organisations to mobilise volunteers for education during the COVID-19 pandemic. Third, each section derives multiple action steps for each (sub) section. Those elements are furthermore complemented with optional knowledge checks through quizzes and links to further resources in the form of guidelines and other literature related to each (sub-) section.

Figure 7: Interactive elements in the Rise Articulate learning platform of the Including Citizens Handbook – Flip cards for definitions.
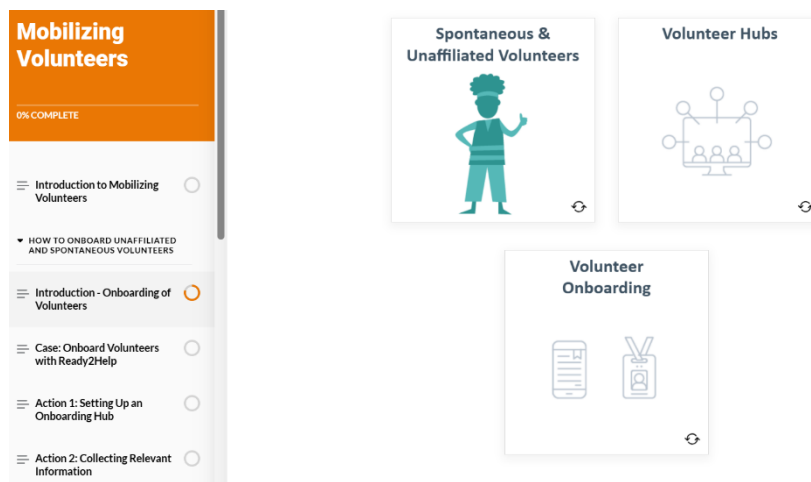
Source: Including Citizens Handbook, accessible here

3. THE APPLICATION OF THE KNOWLEDGE BASE WITHIN LINKS PARTNER ORGANISATIONS AND IN A BROADER CONTEXT

In the final six months of the LINKS project, WP3 activities have revolved around the application, implementation and dissemination of the results of the knowledge base. This section presents these activities, which were carried out within LINKS partner organisations and in the broader context. These activities have not been done in isolation and the sections below should thus be read in tandem with D2.6, D4.5, D5.5, D6.6 and D9.6 (Sciarretta & Sposato, 2023). The application and use of the knowledge base results are directly connected to the activities carried out within WP5 (the LINKS Framework), WP6 (the LINKS cases), WP8 (the LINKS Community Workshops) and WP9 (dissemination). The case teams have actively engaged with the LINKS products through the pivotal avenue of LINKS Community Workshops. These workshops not only provide a space for local practitioners and stakeholders to exchange valuable insights and best practices in employing social media and crowdsourcing in disaster risk management processes, but they also play a crucial role in spreading information about the project's goals and showcasing its accomplishments. More details on the outcomes of each LINKS Community Workshop can be found in D8.6 (Reeson, K., Nuessler, D., 2023) and D6.6. Information about the results from the outcomes of the broader application of the Framework can be found in D6.6 and deliverables that provide updates on the products and the LINKS Community Center (D2.6; D4.5). In addition, D9.6 provides a complete outline regarding dissemination and exploitation activities. Many of these activities have contributed to the broader application of all LINKS results including the products associated with the knowledge base on disaster management processes.

The results are accessed through the LINKS Community Center. It offers cross-references between the results (e.g. certain technologies and guidelines are directly linked) and thus more comprehensive and holistic approach to using social media and crowdsourcing in disasters. Moreover, the Framework (see D5.5) provides users with a guided introduction to LINKS results and how the products may serve the needs of the organisation through the User Guidance. As such, the Framework functions as a knowledge resource for disaster management organisations and other relevant stakeholders, to guide them in the application of social media and crowdsourcing in disasters. The User Guidance is organised under two thematic areas (engaging with citizens and improving communication) and sub-themes (D5.5). In the final version, the User Guidance provides easy access to the products through the LINKS Community Center. This guidance provides thematic questions and answers, which are linked via the thematic areas to the LINKS products (D5.5 and D6.6).

3.1 Application and Dissemination Activities: The Knowledge Base on Disaster Management Processes

A complete overview of dissemination, exploitation and communication activities for promoting the products associated with the knowledge base on disaster management processes can be found in D9.4 (Opromolla & Jagarnathsingh, 2021), D9.5 (Opromolla, 2023) and D9.6. These include showcasing the products at conferences, LINKS events and presentations as well as through social media posts, newsletters and educational activities. Nevertheless, this section highlights three avenues for the dissemination and application of our results: policy work, academic papers and conferences.

3.1.1 Policy Work and Strategic Application of the Knowledge Base

Within the frame of the knowledge base on disaster management processes, it has been important to impact policy and strategic development in organisations working with disasters. To support this ambition, we have completed a range of tasks to support the wider dissemination of our results.

First of all, we have drafted **policy-relevant documents** with the specific attention of targeting policymakers and decision-makers in disaster management organisations. The first document is a policy brief on targeted communication which disseminates the results on how authorities may improve their communication with citizens. It explains why targeted communication is paramount in improving disaster resilience and provides a set of recommendations to be implemented in organisations that want to work strategically with targeted communication.

Figure 8. Policy brief on targeted communication

POLICY BRIEF

Targeting Communication in Disasters

Populations in disasters are often assumed to be homogenous. However, targeting communication for different groups of citizens based on their individual needs and capacities allow for efficient disaster risk management. Targeted communication is also important in the context of increased use of digital technologies such as social media and crowdsourcing to manage disasters. In order to be effective, communication should be inclusive and consider specifically vulnerable populations.

Context

The primary goal of communication with citizens before, during and after a disaster is to provide information and advice that potentially reduces disaster impacts and ensures citizen safety. This serves a dual purpose: first, it helps to prepare and protect citizens from harmful impacts of disasters and second, it facilitates efficient operations for the organisations working with disaster risk management by encouraging cooperation with their advice. It is crucial to acknowledge that citizens possess valuable skills, resources, and they are more likely to act on advice from the organisations working with disaster risk management when they are sufficiently targeted and informed. Communication is a two way street and citizens can play an active role in this process. However, citizen's skills are ignored and it is commonly assumed that large populations at risk of disasters have uniform information needs. This assumption fails to take into consideration the inherent diversity and vulnerability of large populations and in turn their differential needs, capacity, and resources. This exacerbates peoples' vulnerabilities during different disasters. Therefore, effective communication requires targeting different groups who are most susceptible to a specific hazard followed by targeted messaging that meets the varying needs of different groups.

Targeted communication meets the dual purpose of citizen's needs and the goals of organisations working with disaster risk management.

Authors:

Nina Blom Andersen (*University College Copenhagen*)

Tejal Patil, Anne Bach Nielsen and Emmanuel Raju (*University of Copenhagen*)

Acknowledgements:

Nathan Clark, Chiara Fonio and Kees Boersma (*Vrije Universiteit Amsterdam*)

Sara Almeida (*University of Copenhagen*)

Source: WP3 Policy Brief in Prevention Web.

The second document communications the state-of-the-art of the WP3 knowledge base and seeks to disseminate our results to national and international organisations with an interest in the state-of-the-art related to social media and crowdsourcing in disaster risk management processes. The report will be accessible on PreventionWeb as well as the websites of the Copenhagen Center for Disaster Research, the Links Community Center and the LINKS webpage.

Secondly, members of the LINKS Consortium continue to provide **high-level presentations** on WP3 results to actively impact the understanding of how social media and crowdsourcing can support disaster risk management. Examples include participation and presentations at the CERIS events, the Danish Ministry of Climate, Energy and Utilisation and Danish Municipalities. The University College Copenhagen has presented results on several occasions for staff in leading positions in communication departments in Danish Municipalities. These people hold a pivotal role when it comes to communicating with the citizens regarding both prevention and in case of response. 75 persons from all over Denmark have joined a workshop where results have been applied (see also D8.6).

Thirdly, we worked closely with LINKS partner organisations to make sure that our scientific results were translated and i**mplemented in the organisation's policy and practice**. One key example is the strategic work done within the Frederiksberg Municipality in enhancing the understanding and communication with citizens.

As part of the knowledge base on disaster risk management (see also D3.4), a survey and focus group interviews were carried out to understand flood risk perceptions of people living in Frederiksberg Municipality. Even though 38% per cent of the citizens of Frederiksberg have experienced flooding, only 13 % are worried that flooding will be a problem in the near future. The citizens trust that the municipality is preparing the city for cloudbursts. 55% feel that they have a responsibility to secure their own houses, however, not all know what to do. The data also shows that 8 % have participated in some type of event concerning cloudburst management.

This information gave the municipality valuable insights that will be used in the future when communicating with the citizens. The insights were communicated in a report for the project managers working with climate adaptation in Danish municipalities so that they can take it into account when meeting with citizens concerning a specific project. Frederiksberg Municipality started a discussion within the organisation to try to figure out how they best meet the citizens as they often have very low attendance when having citizens meetings.

![LINKS logo - Strengthening links between technologies and society for European disaster resilience]

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Figure 9. Report on flood risk perception among citizens

Source: Draft version of the report by University College Copenhagen, Frederiksberg Municipality and University of Copenhagen. Subject to changes before publication

Highlights from the report will be presented in a flyer in Danish to share with the local politicians, to make sure that they are aware of how risk perception can influence the work done by the municipality when depending on citizens to be a part of the city's flood risk management processes. The department at the municipality dealing with climate adaptation hosts six meetings for a year together with the utility company where the insights will be presented. Here it is decided which project will be carried out and also how the good stories are told to both politicians and citizens.

At the moment, a new strategy for handling everyday rainwater and cloudburst is written and the information from the survey concerning the need for knowledge will be elaborated in a section in the strategy picturing what the citizens themselves can do. The municipality will, when communicating the new strategy, hold meetings and send out information in different ways taking

into account the wishes for different communication channels that were found in the surveys and group interviews. The municipality aims to make a campaign using social media as one of several channels for communication. The importance of which channels the municipality uses to communicate will be considered carefully as the survey showed that no size fits all.

3.1.2 Academic Papers and Conferences

The second and third avenues for disseminating the overall knowledge base on disaster management processes are through research dissemination. In this context, we have primarily relied on traditional channels for communication research; namely journal papers and conference presentations.

In terms of academic papers, the knowledge base results are disseminated in three papers with more expected to be done in 2024:

- Nielsen, Anne Bach, Bonati, Sara & Andersen, Nina B. 2023b. Discover the dynamics: An intersectional analysis of overt and hidden vulnerabilities to flood risk in urban Denmark. *Landscape and Urban Planning*, 237, 104799.
- Nielsen, Anne Bach, Landwehr, Dario, Nicolai, Juliette, Patil, Tejal and Raju, Emmanuel. Social Media and Crowdsourcing in Disaster Risk Management: Trends, Gaps and Insights from the Current State of Research. Submitted to *Risk, Hazards & Crisis in Public Policy*.
- Nielsen, Anne Bach, Raju, Emmanuel and Andersen, Nina Blom. Enhancing social media and crowdsourcing in disaster management processes: a tool for organisational resilience. To be submitted to *Climate and Development* spring of 2024.

The knowledge base has been presented at the following academic conferences:

- The Earth System Governance Conference in 2021 and 2022 (both online)
- The Sustainable Transitions Research Network Conference in 2022 (Lyon)
- EURAC International Conference in 2022 (Bolzano)
- The Northern European Emergency and Disaster Studies Conference (NEEDS) in 2022 (Copenhagen)
- The Northern European Emergency and Disaster Studies Conference (NEEDS) in 2023 (Enschede, Netherlands)

3.2 Application and Dissemination Activities: The DMP Resilience Wheel

3.2.1 Application and Dissemination of the DMP Resilience Wheel within LINKS Cases

A range of different activities have taken place to apply and disseminate the DMP Resilience Wheel within LINKS partner organisations and cases in the past 12 months of the project. These are listed in Table 1 below. Following the table, we present three examples of how the case activities were used to implement the DMP Resilience Wheel in three of the LINKS Partner organisations: the

German Police University, the Safety Region of South Limburg and the Greater Copenhagen Fire Department.

Table 1: Motivation and Application of the DMP Resilience Wheel within LINKS cases

	Case 2: Netherlands (Industrial Hazards)	Case 4: Denmark (Flooding)	Case 5: Germany (Terrorism)
Motivation	An internal workshop at the Safety Region of South Limburg resulted in them not wanting to adopt the tool for their organisation. Instead, they suggest targeting the tool to disaster management organisations that have less experience and for kick-starting processes or newly established cooperation between organisations.	Danish partners have decided to implement the DMP Resilience Wheel to support the integration of new technologies that involve intra- and inter-organisational coordination, to be applied in workshops with practitioners. Many participants in the LINKS Community Workshops plan to make use of the DMP Resilience Wheel for example before a planned operation or to make annual assessments on the digital maturity of their organisations.	The German Police University has decided to incorporate a contextualised version of the DMP Resilience Wheel into the curriculum for police students. For this purpose, the DMP Resilience Wheel has been translated into German and tailored to the German case.

Application	Dutch partners conducted an internal workshop on the DMP Resilience Wheel at the Safety Region of South Limburg to assess its possible applications for the organisation as a workshop and discussion tool.	Danish partners conducted a workshop involving practitioners with operational crisis management responsibility, to collaboratively develop new methods to integrate crowdsourcing and strengthen the focus on citizens' needs in crises (01/23). Furthermore, they conducted a LINKS Community Workshop (09/23) with 18 organisations affiliated to the Risk Management degree at University College Copenhagen, including authorities, NGOs and private companies and a workshop (11/23) with Copenhagen's municipal utility provider HOFOR (Hovedstadsområdets Forsyningsselskab).	To tailor the DMP Resilience Wheel to the needs of German partners, a LINKS Community Workshop has been conducted with practitioners and academics from for example law and police law, and leadership for law enforcement (06/2023). Furthermore, an internal workshop with members of the Department of Communication Science at the German Police University and a graphic designer was held (10/2023) to identify interfaces with the curriculum and turn the wheel into visually appealing learning material, before disseminating it to the German Police University (11/2023).

The German Police University sees the DMP Resilience Wheel as a tool in support of education on how social media and crowdsourcing can be used in police operations as well as to conduct training for police officers across Germany. To kick off the implementation process, a LINKS Community Workshop was held to collect valuable feedback on the benefit of the approach within the German Police University as well as to understand the need for local adaptation and tailoring for the local context.

Based on the LINKS Community Workshop, the German Police University has translated the DMP Resilience Wheel into German and is collaborating with a graphic designer to facilitate its printing. Additionally, the German Police University is creating a set of cards with the graphic designer. On one side of these cards, they feature the smaller drivers, resulting in 12 cards, while the other side includes relevant questions linked to these drivers.

Their intention for this product is to utilise the DMP Resilience Wheel as a catalyst for discussions and as a self-assessment tool in our learning environment at the German Police University. Furthermore, the German Police University aims to make this resource accessible to other organisations, enabling them to conduct self-assessments and workshops for their staff. The German Police University believes that this tool will prove to be an effective means for organisations, particularly within their safety departments, to evaluate their disaster preparedness.

The Safety Region of South Limburg has discussed the application and contribution of the DMP Resilience Wheel within their organisation and has translated and adapted the DMP Resilience Wheel to Dutch. They believe that there are relevant topics included in the DMP Resilience Wheel, and they liked the questions that were formulated to guide its use. However, they concluded that the DMP Resilience Wheel would not be able to provide the Safety Region of South Limburg with the answers they are currently looking for as they already have an established dialogue and strategic approach on how to use social media and crowdsourcing in disaster management processes. The Safety Region of South Limburg indicates that the topics are important and can provide organisations with less experience with a coherent and comprehensive set of themes and questions for productive discussions.

While the outcome of the application and implementation attempt in the Safety Region of South Limburg was unexpected, it also provides important insights for the target group and the value that the DMP Resilience Wheel brings to an organisation. Based on this feedback, activities on disseminating and implementing the DMP Resilience Wheel were to a much larger extent targeted organisations with a strategic goal to kick-start conversations on the use of social media and crowdsourcing in their organisations or with partners and collaborators.

The Greater Copenhagen Fire Department has applied the DMP Resilience Wheel to start a conversation internally on the potential use of social media and crowdsourcing in their organisations as well as to strengthen their dialogue with other organisations working on social media and

crowdsourcing in the Danish context. The DMP Resilience Wheel provides a foundation for facilitating discussions and understanding how practitioners can communicate risk concerning external actors and citizens within the organisation as well as the possibility of involving citizens to a larger extent. They find that the DMP Resilience Wheel is a valuable tool when introduced within a facilitation frame and when adapted to the specific needs of the organisation.

3.2.2 Application and Dissemination of the DMP Resilience Wheel in a Broader Context

In general, the DMP Resilience Wheel is included in the general dissemination and implementation activities as well as in general activities promoting LINKS results beyond the LINKS Consortium (see D9.6). Moreover, dedicated efforts to disseminate and implement the DMP Resilience Wheel have taken place within the Danish context. Below are two examples of how the DMP Resilience Wheel was introduced to two Danish organisations working with disaster risk management: RFX – Roskilde Festival Experience (NGO) and the Danish Immigration Services.

Practitioner's viewpoint

"The DMP Resilience Wheel offers a great opportunity to dwell in a table top exercise. Table top exercises are often characterises by too many actions and the traditionally format seldom leaves time to dwell with dialogue regarding the competences and resources available, and it is often also the case, that evaluations and learning is difficult to structure afterwards. The resilience wheel format is a tool, that supports dwelling and that directs and guides the dialogue in a more concrete way"
- participant from a Danish disaster management organisation in a training session on the DMP Resilience Wheel

RFX – Roskilde Festival Experience is a Danish NGO that organises large events like music festivals, and among many other tasks is responsible for the security of a large number of guests and attendees. The main event is the Roskilde Festival, where approximately 100.000 guests are gathered for a week each summer. RFX plans to apply the DMP Resilience Wheel in an internal workshop within the next months. The NGO chose to apply the DMP Resilience Wheel for this occasion since RFX believes that this can be a tool to challenge the existing practices and way of thinking in target groups in the organisation. Organisations need disturbance in their routine thinking, and RFX believes that the DMP Resilience Wheel is a well-chosen tool.

There are multiple sub-target groups on a large music festival, and in case of risks, there is a need both to understand how RFX can get in touch with all participants (also through social media) and to understand their needs and questions (crowdsourcing). There is always a need for an organisation like this to get closer to its target groups, combining the use of social media and crowdsourcing and other channels and media are however very important when a large group of people are gathered in a short but very intensive period.

At the workshop employees from both the safety and emergency department and the communication department will participate, but volunteers (safety-hosts), who walk around at the festival and safeguard the crowd will also participate.

Danish Immigration Service was acquainted with the DMP Resilience Wheel at a workshop at University College Copenhagen. Following this, they hosted a workshop on supply safety among a broad range of their collaborating partners. At this workshop, they adjusted the DMP Resilience Wheel for the needs of their partners on the matter. They chose to focus on fewer categories in the DMP Resilience Wheel, due to the aim of the workshop and the timeframe. The Head of Emergency reports that the DMP Resilience Wheel was an excellent tool to keep the dialogue and discussions going among the participants – it was a driver for the conversation.

To apply the DMP Resilience Wheel in its full length requires more time than provided in their programme, mainly due to the introduction of all of the nine categories. This is why the Immigrant Service appreciated the editable version of the DMP Resilience Wheel that can be tailored to a shorter format.

3.3   Application and Dissemination Activities: The SMCS Guidelines Library

The SMCS Guidelines Library is tightly integrated with the three other SMSC Libraries, which are accessed through the LINKS Community Center and guided by the User Guidance. As stated in the introduction to Section 3 and in D4.5, the LINKS Library Model and the implementation of the SMCS Libraries in the LINKS Community Center play a central role in application and dissemination activities. The LINKS Community Center creates and fosters a lively community around the project's results and strives to be a valuable tool for establishing and sustaining the LINKS Community beyond the duration of the project.

3.3.1   Application of the SMCS Guidelines Library within LINKS Cases

A range of different activities have taken place to apply and disseminate the Guidelines Library within LINKS partner organisations and cases. These are listed in Table 2 below. Following the table, we present specific examples of how the case activities were used to implement the SMCS Guidelines Library in LINKS partner organisations.

Table 2: Motivation and application of the SMCS Guidelines Library within LINKS cases

	Case 1: Italy (Earthquake)	Case 5: Germany (Drought)	Case 5: Germany (Terrorism)
Motivation	The Italian case provided Contextualised Feedback for potential application in the Italian context (for example automatic translation).	Disseminating the SMCS Libraries to a broad range of experts from fire protection, policy and decision-makers and researchers	Evaluate the suitability of the SMCS Guidelines Library for improving the capacities of emergency-response organisations in using social media and crowdsourcing in Germany.
Application	Feedback was collected through an online survey on the Guidelines Library (01/23).	This goal was achieved by participating and presenting the Libraries and conferences with participants from different stakeholder organisations, such as the Annual Conference 2023 of the Association for the Promotion of German Fire Protection	The German case carried out a LINKS Community Workshop and focus group discussions to understand how the guidelines for SMCS use during major terrorist incidents are developed to further evaluate the Guidelines Library (03/23). They also carried out 3 semi-structured expert interviews to gather feedback on the SMCS Guidelines Library from practitioners responsible for training police officers on crisis communication (04/23). They conducted a scenario-based evaluation with senior management police staff (11/23). Here, they evaluated the use of a guideline from the guidelines library based on a fictitious scenario of a terrorist attack in the participant's districts.

The evaluation and application of the SMCS Guidelines Library in LINKS organisations was largely done jointly with the three other libraries as all the SMCS Libraries are integrated (see Section 2).

Practitioner's viewpoint

"The Guidelines Library, together with the Use Case Library, are excellent tools for information about best practices, especially for newcomers on social media.

The guidance about developing a social media strategy and the information about legal requirements are particularly important.

The information about the advantage of embedding VOSTs in disaster management may be relevant for already advanced social media users, especially when their own personnel capacity is limited to provide the best service" - *representative from* the European Union Fire Officer Associations *participating in the LINKS Consortium*

Representatives from the **Federation of the European Union Fire Officer Associations** have been an integral part of developing the SMCS Guidelines Library from the very beginning. Their commitment stems from an observation that a comprehensive overview of existing resources would benefit members with various experiences of using social media and crowdsourcing in disasters. Their application of the SMCS Guidelines Library has thus been organic throughout the project and several representatives have participated in evaluation exercises and LINKS events. The next step for the Federation of the European Union Fire Officer Associations is to make the SMCS Libraries more visible throughout the organisation's platforms such as the website.

The German Police University has equally worked with the application of the SMCS Libraries since the beginning of the LINKS project and participated in the Guidelines Taskforce together with the Federation of the European Union Fire Officer Associations, Safety Innovation Center and the University of Copenhagen. They have conducted several workshops and events to understand its value for law enforcement. The connection between the libraries (e.g. use cases and guidelines) provides an important foundation for training and communicating with police officers.

Finally, **site visits** organised as part of the LINKS project have been important for the broader application of the LINKS Libraries. During a two-day site visit in Paderborn, the Greater Copenhagen Fire Brigade, Frederiksberg Municipality, University College Copenhagen, University of Copenhagen, Sitech Services, and the Safety Region of South Limburg, discussed the progress of the SMCS Libraries and Safety Innovation Center's work with the Paderborn fire brigade.

3.3.2   Application of the SMCS Guidelines Library in a Broader Context

The application of the SMCS Guidelines Library in a broader context is carefully described in D4.5. The following activities are worth highlighting as they were central to the application and dissemination of the SMCS Guidelines Library.

Cooperation and joint events with sister projects in the Disaster Resilience Society (DRS) cluster have been important for the broader application of LINKS results. One example is the ENGAGE meeting in Rotterdam in 2023 where common synergies and exploitation routes where explored between the two projects. This included sharing results and discussing the potential of merging and integrating products highlighting the workshop's significance in broadening the application and ensuring sustainability of the SMCS Libraries in a wider context.

Moreover**, LINKS Advisory Committee (LAC) meetings** have been paramount in aligning the LINKS project with users and stakeholders beyond LINKS partner organisations. The LINKS Advisory Committee (LAC) is composed of selected experts from different disciplines in the field. They have followed the development of the project results from the beginning and are connected with a wide network of practitioners and researchers working in disaster risk management. The second LAC meeting, organised by the Safety Innovation Center (see D8.4 (Bianchi et al., 2022) for details), focused specifically on promoting and evaluating the SMCS Technologies Library, the Guidelines Library, and the LINKS Community Center. The LAC provided in-depth feedback on the overall utility of the Libraries and ensured their practical applicability and relevance in diverse disaster management scenarios.

3.4   Application and Dissemination Activities: The Including Citizens Handbook

A range of different activities have taken place to apply and disseminate the Handbook within LINKS partner organisations. These are listed in Table 3 below. Because the Including Citizen handbook was developed in the final 1,5 years of the project, most activities relate to developing, testing and applying the product within LINKS partner organisations and cases.

Table 3: Motivation and Application of the Including Citizens Handbook within LINKS cases

	Case 1: Italy (Earthquake)	Case 2: Netherlands (Industrial Hazard)	Case 4: Denmark (Flooding)	Case 5: Germany (Terrorism)
Motivation	The overarching goal is to overcome challenges regarding digital education, by working directly with citizens and educators but also disaster management organisations to improve mobility and accessibility at the local level.	Dutch partners have decided to work closely with the Including Citizens Handbook to establish strong communication channels across the community and produce a contextualised version of the Handbook (*Together Safe Around Chemelot*), that local practitioners, ambassadors (i.e.: key figures within the community), and youth can utilise for their own needs, and to learn from each other.	Danish partners have decided to work closely with the Including Citizens Handbook to precisely target communication and address the diverse information needs of citizens.	Get insight into the Including Citizens Handbook and its potential relevance and applicability for disaster management in a German context

| Appli cation | To achieve this, the Italian case conducted an Action Research Game with 45 students from the Instituto Fanciulli on Mobility (UNIFI), to explore how to mobilise citizens through social media and crowdsourcing technologies (11/22). They shared an online survey with local practitioners from the Protezione Civile di Terni to test and validate the Accessibility part of the Handbook (03/23). They also conducted a LINKS Community Workshop with children from the University of Florence presenting the Handbook to local stakeholders (04/23). In (05/23) they conducted a roundtable with staff from the Province of Terni and Save the Children Italy to collect suggestions from different stakeholders, such as a workshop on (07/23) and (10/23) with participants from outside the LINKS partner organisations to test and disseminate the product. | To achieve this, they conducted three LINKS Community Workshops with business owners (11/22), schools (11/22) and ambassadors (01/23) in the Chemelot vicinity, to explore their specific information needs and knowledge gaps related to emergency scenarios. They also conducted a large-scale exercise with civilians to prepare for a potential incident on Chemelot ground (04/23). In addition, they conducted a combined case activity in collaboration with the Dutch Red Cross, the Safety Region of South Limburg and Vjrie University (05/23) and an internal case discussion (06/23) to provide in-depth feedback on the handbook. Such as a LINKS Community Workshop (10/23) where they tested the Handbook together with the Links Community Center with representatives from local organisations. | They held two meetings with Dutch partners and the Danish Red Cross to get insights into citizens' risk perceptions and how to organise spontaneous volunteers (11/22, 02/23). They conducted a Links Community Workshop with citizens of Frederiksberg to explore their risk perceptions of cloudbursts, building on findings from the Danish deep dive. The aim is to design campaign materials to inform citizens of future cloudbursts through social media platforms, channels, and forums (05/23). Furthermore, the Greater Copenhagen Fire Department hosted two internal workshops (11/23) on the Risk Communication and Mobilizing Volunteers chapters as a starting point for possible applications in their organisation | They conducted a LINKS Community Workshop, focus group discussions and interviews to assess how the police, the media and the public communicate and trust each other during terrorist incidents, understand how to protect and engage potentially vulnerable groups through S and reflect upon the credibility of information and prevention of misinformation in social media and crowdsourcing (01/23). They organised a site visit at the mission control centre of the Osnabrück Police Department, to introduce the project partners and practitioners to the intel officers who carry the open-source investigations upon incoming emergency calls and discuss how OSINT teams engage with digital volunteers and crowdsourcing in large-scale police operations (07/23). |

> **Practitioner's viewpoint**
>
> "The Handbook available at the LINKS Community Center, has been useful for us in initiating fundamental discussions within the four respective handbook topics; communicating risk, making information accessible, mobilising citizens, and mobilising volunteers. The introduction videos within each leg of the handbook, has enabled us to get a general introduction to the topics and ask some general question about our current approaches within the field. This has started interesting discussion, and we look forward to use them as a starting point for strategic considerations in the future. "
>
> *-representative from the Greater Copenhagen Fire Department participating in the LINKS Consortium*

One channel for dissemination, currently under development for the Including Citizens Handbook, is using it directly for the training and teaching of staff within disaster management organisations. Within the LINKS Consortium, we are therefore developing a framework for how the Handbook could be included in the teaching at the German Police University.

The German Police University is the only Police University in Germany for postgraduate studies and has the aim to train police officers for management positions and higher public service, such as to create a link between science and practice. Currently, the University offers the degree "Public Administration – Police Management" and from 2024, a second degree in "Public Governance and Democratic Resilience". According to the German Police University, as of 2023, there are around 500 students currently enrolled in the former degree program. Therefore, we see the possibility of integrating the Including Citizens Handbook into the curriculum of courses taught at the German Police University as a great chance for dissemination. Not only because of the number of students directly exposed to the content but also because the University is a countrywide hub for officers from all over Germany. Therefore, we would expect that this geographically diverse audience disseminates the Including Citizens Handbook to a number of actors outside the LINKS Consortium such as local precincts, taskforces and units within the German Police on both a federal and state level. Furthermore, the German Police University is also engaged in international exchange with visiting students from across Europe, enabling us to reach a wider international audience.

Based on the publicly available curriculum, we developed a proposal on where the Handbook might be integrated into teaching and how it complements the course contents. Table 4 below presents the outcome of this assessment.

Table 4: Possible links in the German Police University curriculum for using the Including Citizens Handbook. All course descriptions and titles are translated from German to English.

Course	Relevant content from course description	Relevance of Including Citizens Handbook for those learning outcomes
Module 14: Phenomenon-Related Police Operations Management II	*"Competencies are expanded […] with regard to dealing with outstanding national and international gatherings, outstanding operational situations in daily service, events (especially in the football domain), <u>major damage events, the risk of major damage events and disasters.</u>"* *"Students can: Strategically plan tactical goals and operational concepts for complex operational situations, taking into account the <u>interrelationships between the state, society, politics, media, law and the police</u>."* *"The students know: The interests and roles of other parties involved (e.g. other security-relevant agencies and organisations, private security services, culprits, <u>unaffiliated volunteers</u>, critical infrastructure companies)"*	Module 14 of the curriculum of the program in "Public Administration – Police Management" at the German Police University focuses on the role of the police during outstanding events, major damage events and disasters. Those events tend to affect society at large and therefore require the police to cooperate and coordinate their efforts with different organisations as well as citizens. The Including Citizens Handbook in general emphasises different aspects of how Disaster Management Organisations should interact with citizens. Amongst others, the LV 2 of Module 14 at the German Police University also covers the role of unaffiliated volunteers during major damage events. It is evident that during such events, organisations often lack the capacities about how to cooperate with volunteer groups. The Mobilising Volunteers chapter of the Including Citizens Handbook provides various insights into how the resources of unaffiliated and spontaneous volunteers can be used and how they could be managed efficiently. Hence, in order to understand the behaviour of volunteers this chapter could be a valuable

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		additional resource for this course at the German Police University.
Elective Module 6: Strategical Communication in the Police	*"How do I plan a campaign? How do I control communication? <u>Who do I have to reach and how can I reach it? How do I know if my message is being received?</u>"* *"In this module, we deal with the strategic planning of organisational communication. <u>It's about target groups, organisational structures and cross-media communication channels</u>. But also about media impact, the connection between image and reputation, the balancing act between appealing <u>social media</u> use and the necessary seriousness"* *"<u>Students can analyze, interpret and critically evaluate communication activities in situations of crises</u> and organisational changes and are able to outline communication concepts"*	Elective Module 6 on Strategical Communication in the Police focuses on how the police can plan different internal and external communication strategies for example, with respect to different media and their challenges or to reach a certain target group. It also involves how to communicate in crises. The Including Citizens Handbook provides best practices concerning these topics, especially in the chapter on "Communicating Risks". In particular, this chapter provides specific actions on how to use different media channels to bring messages across and what behaviours and attitudes of a target group are relevant to consider when reaching out. Furthermore, it has a special emphasis on communication through social networks. Therefore, this handbook chapter could complement many aspects of this the German Police University course, by providing hands-on examples and action steps that connect theory and practice.

In parallel to this assessment of the curriculum for possible interface with the Including Citizens Handbook, the German Police University is ongoingly conducting interviews with staff from the different departments to assess interfaces of the LINKS Community Center. Initial results suggest using it for case-based real-world scenarios.

The two sections of the Including Citizens Handbook "mobilising volunteers" and "communicating risk" are especially relevant in a Greater Copenhagen Fire Department context, as they serve as relevant stepping stones for internal discussions on the topics of risk communication, volunteering and the possibility of involving the citizen. In the last month of the LINKS project, the Greater Copenhagen Fire Department introduced the handbook to two different groups of internal actors to start an overall conversation about how we, as practitioners, can use and adopt the tools in the

future. The experience was that the Handbook sections created a good foundation for the organisation's ambition to enhance the use of spontaneous volunteers in disasters and resources will be further implemented in upcoming activities.

As the Danish case activities related to the Handbook come to an end, there is a change in the way the need to address citizens, use of communication technologies, non-digital communication, and resilience are spoken about within the Greater Copenhagen Fire Department and the Frederiksberg Municipality.

4. CONCLUSION

D3.5 is the final deliverable from Work Package 3 (WP3) on disaster management processes and thus concludes the activities carried out as part of this knowledge base. The work done within the LINKS project on disaster management processes sets out to understand what role social media and crowdsourcing play in disaster risk management processes.

As described in D3.4, the findings from our studies highlight a need for a drastic shift from solely focusing on technologies to a focus on decision-making processes and disaster risk governance for social media and crowdsourcing to support resilience building in European disaster management. The knowledge base suggests new ways to examine and reflect on the increasing use of technologies and how organisational structures and processes can be considered in a world with rapid technological developments. Social media and crowdsourcing use in disasters will only increase and how can this be channelled to ensure a safer society without leaving anyone behind? This entails including citizens as active participants in disaster risk management processes without absolving the different organisations of their responsibility to reduce disaster risk and impacts. Further, there is an immediate need to shift focus on understanding and placing emphasis on citizen vulnerability and diversity for social media and crowdsourcing to be effective agents for disaster resilience. The work developed within this knowledge base thus presents novel approaches rooted in co-created and tested processes to navigate complexity in using social media and crowdsourcing in disasters for organisations.

To approach some of the challenges identified within the knowledge base and to strengthen the use of social media and crowdsourcing in European disaster management organisations, three products were designed, tested and applied in LINKS partner organisations and its broader context:

- **The DMP Resilience Wheel** serves as a tool through which organisations can discuss and assess current and future uses of social media and crowdsourcing within their organisation;
- **The SMCS Guidelines Library** provides an overview of relevant guidelines, standard operating procedures and legal frameworks for applying social media and crowdsourcing in disasters;
- **The Including Citizens Handbook** presents a set of learning modules for organisations wanting to consider citizens in their disaster management processes. This includes questions related to unaffiliated volunteers, targeted communication and awareness, accessibility and mobilisation of citizens;

While Deliverable 3.4 served as the conclusion and final version of the knowledge base on disaster management processes, this report presented the monitoring and the assessment of the application of the knowledge base within the LINKS cases and in the broader context. This report thus finalised the work of WP3 by:

- Providing an overview and update on the application and monitoring of three LINKS products associated with the knowledge base on disaster management processes: the DMP Resilience Wheel, the SMCS Guidelines Library and the Handbook sections on 'mobilising volunteers' and 'risk communication'. We presented how these three products have been developed in the last period of the LINKS project (from June to November 2023) and how the overall knowledge base is applied in the LINKS cases and partner organisations;
- Providing an overview of the broader application of this knowledge base and its three products: the DMP Resilience Wheel, the SMCS Guidelines Library and the Handbook sections on 'mobilising volunteers' and 'risk communication'.

For the tasks related specifically to applying and monitoring the knowledge base outputs, a practitioner-driven approach was developed to ensure LINKS partners' implementation of the LINKS knowledge bases and outputs. As explained in D2.7, this approach took its departure in the practitioners' needs and viewpoints and the extent to which the knowledge base and products could serve as a base to address these needs. As presented in this deliverable, our work on the DMP Resilience Wheel, the SMCS Guidelines Library and the Handbook has already been incorporated into most of the organisations taking part in the LINKS Consortium. Moreover, several steps are taken to implement the knowledge base in a broader context to ensure impact in practice (e.g. policy work) as well as in research (e.g. publications).

4.1 Future Research Agendas

As the LINKS project is coming to an end, we have significantly enhanced our understanding of the use of social media and crowdsourcing in disaster management processes in Europe. While the knowledge base identifies a widespread use of social media and crowdsourcing in European disaster management organisations, we also show how this use is very diverse and unequal across different contexts, disaster phases and types of organisations. Moreover, many communication activities have proven to be one-directional (e.g. organisations communicating to citizens) and often informal and ad-hoc based. The knowledge base and its proposed solutions hold a promise for strengthening the institutionalisation of social media and crowdsourcing in disaster management processes. Nevertheless, there continues to be much work ahead in both research and practice to steer and support the constantly changing nature of technology applications in disasters.

In research, this includes a continuous insistence and emphasis on understanding the workings of disaster management organisations and the context they operate in when they apply social media and crowdsourcing. How are organisational structures and practices changing with the increasing use of social media and crowdsourcing in disasters and how do these technologies continue to impact the services they provide and the relationships they have with both citizens and other organisations? For practice, there continue to be many open questions concerning the implementation of social media and crowdsourcing use in strategies and practices. In many organisations, the application of social media and crowdsourcing requires new types of methods,

new organisational structures and additional funding which are considered 'risky' or beyond the scope of the organisation's key tasks. The knowledge base on disaster management processes provides the first step to addressing some of these needs and serves to provide a foundation for both research and practice in many years to come.

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WORKSHOP INSTRUCTIONS

Purpose

The Resilience Wheel is developed to spark conversations within and across organisations working together and to facilitate collaborative identification and prioritisation of strategic projects strengthening the use of social media and crowdsourcing in disaster risk management efforts.

The format is flexible in the sense that it allows organisations to customise an approach that suits local needs while serving as a starting point for having such dialogue. The template found here provides a template with predefined sub-categories. The template found here allows organisations to adopt and tailor their own context-specific subcategories.

> **Workshop**: The wheel provides a tool for conducting workshops designed to map out and assess resilience-building practices within or across organisations. Using the tool in a workshop format can support organisations in strengthening and formalising social media and crowdsourcing use in their disaster risk management efforts.
>
> **Participants: 5 – 50**
>
> **Time frame: 2-4 hours**

We suggest designing the workshop around a thorough introduction, two rounds of discussions around the wheel in small teams and a conclusion and evaluation round.

Before the workshop

Select participants: This exercise can be done by bringing different departments together or by bringing different organisations together, which work closely in disaster risk reduction efforts. The format is a workshop where teams of 4-6 people discuss the resilience drivers in relation to a scenario.

Consider the meeting space and get supplies: Depending on the number of participants, select a workshop space that allows participants to comfortably sit around a table in teams and discuss. For the best results, print the wheel in a large format – one for each team of 4-6 people – and get post-its and pens to document the discussions in each team.

Identify facilitator(s): Identify a facilitator for each team ahead of the workshop and instruct the person(s) in the purpose of the workshop. The facilitator is responsible for

> **The role of the facilitator**
>
> When testing the Wheel as a workshop tool across different organisations and European contexts, we found that facilitation is key for a successful workshop.

driving the discussion at each table; getting participants "back on track" if the conversations diverge; and making sure all drivers are discussed before the session ends. In addition to a facilitator, consider appointing a note-taker responsible for documenting the conversation on post-its and the wheel template

Translate and create sub-categories (optional): If the workshop organisers wish to adapt the characteristics of each driver to fit organisational and contextual needs, use the template here. Alternatively, the standard template may be used.

Design scenarios relevant for the invited participants: To allow for the best possible conversation around the table, scenarios may be used to link each of the

> **Scenario**
>
> The Copenhagen area has been exposed to continuous rain for a week, and the Danish Weather Authority predicts the rain will continue for a week more. The situation is not critical here and now, but major flooding is expected within the next 3 days. Due to uncertainty about the amount of rain, we do not know exactly when

drivers and/or characteristics with a relatable and relevant series of events. Design 1 or 2 scenarios ahead of time that is presented as part of the introduction and discussed in the first workshop round.

During the workshop

Set up the room: Divide participants into teams of 4-6 people and place them around a table with a printout of the Wheel. A facilitator and a note-taker should be assigned to each team

*Introduce the workshop purpose and the Wheel:*
- Explain what you hope to get out of the workshop
- Explain the wheel, its drivers and the workshop format. Address one driver at a time and discuss the three characteristics. Ensure there is time for dialogue on all drivers and characteristics.
- Present and explain the scenario participants should link their conversation to when discussing the drivers and characteristics of the wheel.

Workshop round I (30-45 minutes): Identify current practices and approaches: Organisations working with disaster risk should begin by identifying their current uses of social media and crowdsourcing in disaster risk reduction and how these practices speak to organisational collaboration, citizen inclusion and technical skills. The scenario is used as the basis for discussing each of the drivers and characteristics in turn.

Participants and note-takers place post-it notes or/and write directly on the printout of the wheel when they identify practices and approaches.

Workshop round II (30-45 minutes): Where do organisation want to go? In the second step, workshop participants should discuss the outcome of the initial mapping. Are some of the drivers and sub-themes more prioritised in current activities compared to others? Where do participants see the need for further formalisation of social media and crowdsourcing use and what future activities are needed in the organisation?

Place post-it notes on the characteristics where you would like to see development. Write on the Post-it notes the desires you have.

Resilience workshop conducted at the Greater Copenhagen Fire Department in February 2023
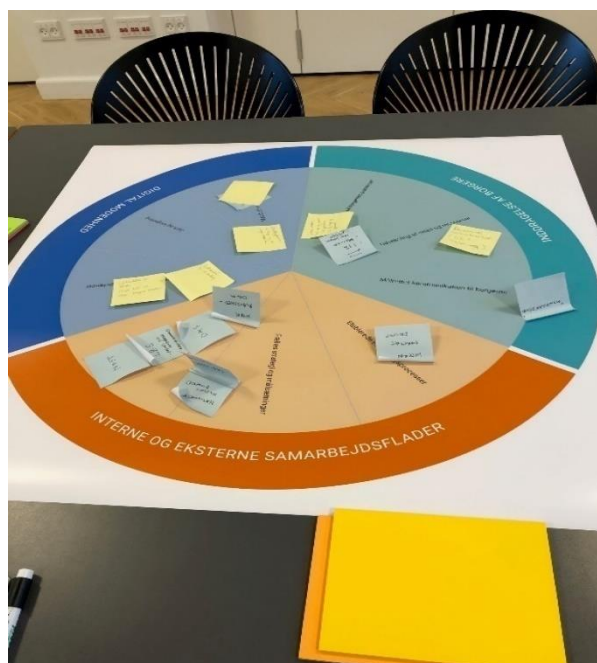
Workshop round III (20-30 minutes): The results and conclusion of the two workshop sessions: Each team develop a list of potential actions for strategic activities based on the mapping exercise carried out in rounds I and II. What is needed to create the change? Place post-it notes on the characteristics where you can identify a solution and write them in the result template found here.

Organisations should conduct a feasibility analysis of the proposed actions to identify which is more suited for implementation in the concrete context. Here, it becomes paramount that organisations consider the specific circumstances – from financial resources to overlapping and conflicting interests within the organisation. Once a list of actions has been completed, the organisation may consider including these activities in formal planning and strategies.

After the workshop

Collect and analyse the post-its and result templates developed by each team: The outputs from the workshop can be used to conduct further assessment/feasibility analysis of the use of social media and crowdsourcing within or across organisations. What actions and activities should be prioritised by the organisation?

Follow up with participants: Share results and next steps with participants depending on the agreement made when recruited to the workshop. In some cases, it might make sense to conduct a second workshop on the outcomes.