Deliverable 1.1 – Preliminary model for assessing and methods form improving societal resilience

Authors: Jan Verlin (ENS), Matthieu Branlat (SINTEF), Stian Antonsen (NTNUSR), Asbjørn Lein Aalberg (SINTEF), Rolf Johan Bye (SINTEF), Tor Olav Grøtan (SINTEF)

Contributors: Burgess, James Peter (ENS), Ellen Emilie Henriksen (ENS), Adini, Bruria (TAU), Bodas, Moran (TAU), Peleg, Kobi (TAU), Stolero, Nathan (TAU), Labaka, Leire (TECNUN), Borges, Marcos (TECNUN), Adini, Bruria (TAU), Battisti, Maya (CA), Maggini, Raniero (CA), Fossen, Marita (TRC), Boland, Svein Eric (TRC)

Abstract: ENGAGE aims at linking the informal resilience naturally inherent in citizens with the formal work of authorities to prevent, prepare for, respond to, and recover from disasters. It brings together 14 partners from 8 countries aiming to show how individuals and local actions can interrelate effectively with planned preparedness and response, practitioners, and technology.

This deliverable summarizes first results of seven case studies on societal resilience by combining document analysis of historical coping actions and a survey of grassroot experiences based on data collected in interviews and focus groups. Its purpose is to lay out a road map for a theory guided

data collection intended to enable the final model for assessing societal resilience and produce criteria for methods to improve resilience. By systematizing transversal knowledge about the diversity of societal resilience across a variety of contexts and by drawing initial conclusions about contextual and target aspects of societal resilience it provides a preliminary model of conditions of societal resilience. This preliminary model clarifies the links between contextual aspects of resilience and the development of formal and informal solutions.

INFORMATION TABLE

Deliverable Number	1.1
Deliverable Title	Preliminary model for assessing and methods form improving societal resilience
Project Acronym	ENGAGE
Dissemination Level **PU: Public; CO: Confidential; CI: Classified**	PU
Grant	882850
Project Duration	July 2020 – June 2023
Call	SU-DRS01-2018-2019-2020
Topic	Human factors, and social, societal, and organisational aspects for disaster-resilient societies
Consortium Coordinator	SINTEF
Edition date	01. Mar. 2021
Version	01.00.02

AUTHORSHIP & APPROVAL INFORMATION

EDITOR	DATE
Verlin, Jan / ENS	01.03.2021

CONTRIBUTORS	DATE
Matthieu Branlat / STF	24.02.2021
Burgess, James Peter / ENS	
Ellen Emilie Henriksen / ENS	
Lein Aalberg, Asbjørn / STF	
Rolf Johan Bye / STF	
Grøtan, Tor Olav / STF	
Antonsen, Stian / NTNUSR	
Adini, Bruria / TAU	
Bodas, Moran / TAU	
Peleg, Kboi / TAU	
Stolero, Nathan / TAU	
Labaka, Leire / TECNUN	
Leire, Labaka / TECNUN	
Borges, Marcos / TECNUN	
Battisti, Maya / CA	
Maggini, Raniero / CA	
Fossen, Marita / TRC	
Bolan Svein Eric / TRC	

REVIEWED BY	DATE
Pasquini, Alberto / DBL	26.02.2021
Berggren, Peter/ KMC	

APPROVED BY	DATE
Matthieu Branlat / SINTEF	03.03.2021

ETHICS BOARD REVIEW REQUIRED?	SECURITY BOARD REVIEW REQUIRED?
NO	NO

DOCUMENT HISTORY

Version	Date	Version description / Milestone description
00.00.01	20. Nov. 2020	PCOS proposed
00.00.02	1. Dec. 2020	PCOS revised
00.00.03	10. Dec 2020	PCOS approved
00.01.00	5. Feb. 2021	Intermediate proposed
00.01.01	20. Feb 2021	Intermediate revised
00.01.02	19. Feb. 2021	Intermediate approved
01.00.01	22 Feb. 2021	External proposed
01.00.02	01 Mar. 2021	External revised
01.00.02	03 Mar. 2021	External proposed

*The project uses a multi-stage internal review process, with defined milestones. Milestone names include terms (in bold) as follows:

» **PCOS**

- **proposed:** Describes planned content and structure of different sections. Document authors submit for internal review.

- **revised:** Document authors produce new version in response to internal review comments.

- **approved:** Internal project reviewers accept the document.

» **Intermediate**

- **proposed:** Document is approximately 50% complete – review checkpoint. Document authors submit for internal review.

- **revised:** Document authors produce new version in response to internal reviewer comments.

- **approved:** Internal project reviewers accept the document.

» **External**

- **proposed:** Document is approximately 100% complete – review checkpoint. Document authors submit for internal review.

- **revised:** Document authors produce new version in response to internal reviewer comments.

- **approved:** Internal project reviewers accept the document.

» **Released:** Executive Board accepts the document. Coordinator releases the deliverable to the Commission Services.

Members of the ENGAGE Consortium

SINTEF	Stiftelsen SINTEF (SINTEF) NO-7465 Trondheim Norway www.sintef.com	**Project Coordinator:** Matthieu Branlat Matthieu.Branlat@sintef.no
deepblue CONSULTING & RESEARCH	Deep Blue Srl (DBL) IT-00198 Rome Italy www.dblue.it	**Contact:** Alberto Pasquini alberto.pasquini@dblue.it
tecnun Universidad de Navarra	University of Navarra (TECNUN) SP-31009 Pamplona Spain www.tecnun.unav.edu	**Contact:** Leire Labaka llabaka@tecnun.es
TEL AVIV UNIVERSITY	Tel Aviv University (TAU) IL-6997801 Tel Aviv Israel www.english.tau.ac.il	**Contact:** Bruria Adini adini@netvision.net.il
Røde Kors Trondheim	Trondheim Red Cross (TRC) NO-7465 Trondheim Norway www.rodekors.no/en/	**Contact:** Marita Hoel Fossen marita.fossen@redcross.no
eena EUROPEAN EMERGENCY NUMBER ASSOCIATION	European Emergency Number Association (EENA) BE- 1060 Brussels Belgium www.eena.org	**Contact:** Alexis Gizikis ag@eena.org
	Ministry of Internal Affairs, Department for Emergency Situations (DSU) RO- 010086 Bucharest Romania www.dsu.mai.gov.ro	**Contact:** Raed Arafat arafatr@smurd.ro
everbridge®	Everbridge Norway (EVBG) NO-0663 Oslo Norway www.everbridge.no	**Contact:** Håkon Straume haakon.straume@everbridge.com
ENS ÉCOLE NORMALE SUPÉRIEURE	Ecole Nationale Supérioure (ENS) FR-75005 Paris France www.ens.psl.eu	**Contact:** J. Peter Burgess james.peter.burgess@ens.psl.eu
ERTZAINTZA	ERTZAINTZA - Departamento de Seguridad – Gobierno Vasco - (ERTZ) ES- 01010 San Sebastian Spain www.ertzaintza.eus/wps/portal/ertzaintza	**Contact:** J. Jesús Alberto Alonso Velasco 06090@ertzaintza.eus
CITTADINANZATTIVA	Cittadinanzattiva (CA) IT- 00183 Rome Italy www.cittadinanzattiva.it	**Contact:** Annalisa Mandorino a.mandorino@cittadinanzattiva.it

	Azienda Sanitaria Locale Roma 1 – Dipartimento di Epidemiologia (ASL) IT- 00198 Rome Italy www.aslroma1.it	**Contact:** Francesca de'Donato f.dedonato@deplazio.it
	Katastrofmedicinskt Centrum (KMC) SE-58330 Linköping Sweden www.lio.se/kmc	**Contact:** Carl-Oscar Jonson carl-oscar.jonson@regionostergotland.se
NTNU Social Research	NTNU Social Research Ltd. (NTNUSR) NO- 7491 Trondheim Norway www.ntnu.edu	**Contact:** Stian Antonsen stian.antonsen@ntnu.no

TABLE OF CONTENTS

List of figures

List of tables

Executive summary

This deliverable summarizes the first results of eight case studies on societal resilience in order to collect data for conceptualizing a preliminary model for assessing societal resilience. It argues that spontaneous actions from citizens contribute to societal resilience and are not sufficiently integrated in existing models. Thus, its main purpose is to situate practices enabling resilience in a specific social context. This allows us to generate criteria for context sensitive solutions for improving societal resilience as a contribution to the overall aim of the ENGAGE project.

For constructing a robust model that fits the need for context sensitive disaster management, case studies from Norway, Sweden, France, Italy, Israel and Japan, were analyzed to highlight a variety of crisis situations ranging from terrorist attacks to industrial accidents to "natural" disasters like earthquakes, wildfires or flash floods including both large scale events and localized tragedies.

The methodology for generating this preliminary model is relying on document analyses of accounts of actions from citizens that contributed to societal resilience. A survey of grassroot experiences of emergent organizations from citizens based on data collected in interviews and focus groups is a second source for the model.

- The deliverable introduces first the concept of "coping actions" to be able to identify citizen's actions during crisis that contributed to cope with the situation.

- Second, to understand the interactions between citizens and formal disaster management from authorities and first responders, these coping actions are then categorized depending on their degree of formalization. By formalization we refer to the integration of citizens and their coping action in planned disaster management.

- Third, identifying these coping actions makes it then possible to understand the social conditions in which they take place.

- Fourth, by systematizing transversal knowledge about the diversity of societal resilience across a variety of contexts - represented by the case studies - specific contextual aspects are identified to generate the preliminary model for assessing societal resilience.

The preliminary model proposed by this deliverable is built on seven main groups of situated contextual aspects.We distinguish therefore between contextual aspects that prepare citizens for a crisis from those that enable action in a specific crisis situation.

- Spatial and temporal proximity,

- social bonds and group membership,

- trust and mistrust in formal disaster management,

- level of alert and preparedness,

- gendered roles and identities in crisis situations,

- material conditions and socio-economic status

- cultural conditions, values and bonds.

It further highlights that coping actions should be distinguished between their degree of formalization and their degree of organization in time.

This preliminary model provides hypotheses for the ongoing survey of grassroot experiences and lays the groundwork for task 1.4's aim to construct a more advanced model for assessing societal resilience.

1 INTRODUCTION

1.1 GENERAL PURPOSE OF THE DELIVERABLE: TOWARDS SOCIETAL RESILIENCE

This deliverable lays the groundwork for understanding the conditions of "societal resilience" for the ENGAGE project by relying on an in-depth case study analysis of the context in which people decide to act during a crisis. It relies on eight case studies representing different types of crises to do so.

Its main purpose is to provide a preliminary model with which the social production of resilience can be explained, so sensitivity of disaster managers for the complexity and variety in which the "social" affects people's ability to cope with disaster can be enhanced. By building on gaps and contributions of debates on "community", "social" and "societal" resilience, this first draft of a model guides fieldwork for developing a consolidated model and provides a conceptual "scaffolding" on which the final model will be constructed.

1.2 OBJECTIVES: UNDERSTANDING SOCIETAL RESILIENCE

The general purpose of the deliverable – presenting a preliminary model that helps to understand the conditions of societal resilience by focusing on the contributions of citizens, informal organizations as well as communities and social groups is based on four specific objectives.

1.2.1 MAPPING COPING ACTIONS AND ACTORS

Our first objective is to understand which citizens and groups emerge during and after a crisis. If the crisis is localized in a specific area, like in the case of the Utøya attack, an exhaustive mapping of all informal and semi-informal actors is envisioned. If the crisis is on the scale of a city or a region like in the case studies of the L'Aquila earthquake of 2009 or the Swedish wildfires of 2018, this will not be possible. In those cases, actors' mapping will focus on specific emerging organizations or collective acts in a given area, like in the case of spontaneously organized evacuations after the Fukushima Daiichi nuclear accident, an example of an emergent organization. In both cases, our objective is to show in this deliverable that **all types of informal and semi-informal actors in crisis situations enable us to gain an understanding on how "coping actions" are conditioned**.

1.2.2 UNDERSTANDING SITUATED ACTIONS: SOCIAL BONDS AND SOCIAL VALUES

Neither the concept of resilience nor its conditions are studied here as disconnected from the social situation in which they take place. This is what is meant by societal resilience. What people do during a crisis to overcome its effects is situated both in a larger social context and in the specific setting the crisis disrupts. Individuals and organizations act because they are attached to certain communities and involved in specific social groups. They identify themselves with certain values or beliefs in certain ideologies. In other words, they are integrated in society by social bonds that generate a specific set of values mobilized during a crisis situation. **Social bonds as the degree of integration in a social group and values as group conceptions of what is considered to be important and right help** us to measure how people's actions are situated in an event situation and a social context. Solidarity and duty are examples of how social values affect citizen's actions during a disaster. They also indicate the relevance of specific social groups or communities and their cohesion for a given crisis. Highlighting the role of social bonds and values in situation actions is for this reason the second objective of this deliverable.

1.2.3 CREATING CONTEXTUAL SENSITIVITY

Our third objective is to present a preliminary model that makes context-sensitive possible. Building on the actors mapping in our case studies we can situate their actions and therefore develop **a model that reflects the variety of conditions that influence societal resilience**. This model helps us to develop a context-sensitive approach for the field studies we are conducting and prepares the project's model presented in an updated version of this deliverable at the end of the project.

1.2.4 IDENTIFYING THE IMPACT OF MATERIAL CONDITIONS FOR RESILIENCE, SOCIAL CAPITAL

Whereas the main focus of our model is on the way people situate their actions in a social context, our interviews, focus groups and literature review enables us as well to measure the impact of material conditions for coping with a crisis situation. Creating **a model that is capable of identifying socio-economic conditions**, access to specific resources or to a certain extent as enabling or disabling contextual aspect is therefore the fourth objective of the model that is presented in this deliverable.

Central concepts and terms	Definitions
KI-Cop	Knowledge and Innovation Community of Practice. An open association including practitioners, NGOs, Virtual Operations Support Teams, scientists, researchers and citizens' representatives supporting ENGAGE as users and co-owners if its solutions.
Societal resilience	A process that enables all types of social actors to overcome a disruptive event by relying on social bonds and values.
Coping actions	Actions intended to adapt to a crisis situation for overcoming its adverse effects.
Contextual aspects	Elements that influence coping actions and that emerge dynamically in a crisis situation or that are rooted in social structures.
Target aspects	Contextual aspects that can be modified by solutions for enhancing societal resilience
Formalization	The process of integrating social actors in planned actions that use preconstructed tools or refer to predefined roles in disaster management
Social bonds	The degree of integration in a social group and its values as group conceptions of what is considered to be important and right help
Group membership	Explicit identification of a social actor with a social group.
Situational awareness	The perception of contextual elements in time and space and the capacity to give sense to these elements and project them into meaning
Alertness	Willingness to act while aware of a situation

Table 1 Definitions of central concepts

1.3 SCOPE OF THE DELIVERABLE

This deliverable is a step stone towards the project's model for assessing societal resilience (D1.4.). As such, its main ambition is to present a roadmap for the fieldwork to come, to give theoretical input to the ENGAGE project and to show the contours of our prospect to external readers. It does only provide preliminary findings and the representation of its case studies is as well still incomplete.

1.4 INTENDED READERS

This document has four groups of intended readers. The first three groups are part of the ENGAGE Consortium, composed of 14 partners from 8 countries.

- First, the deliverable addresses those partners that are contributing to developing informal and formal solutions for societal resilience as it produces criteria for context sensitivity of those solutions.

- Second, the deliverable speaks to all partners of the consortium, since its main output, the preliminary model for assessing societal resilience needs to be refined and tested for developing the final model for month 30.

- Third, this deliverable is also meant for the project's KI-CoP partners (Knowledge and Innovation Community of Practice), who as practitioners can provide valuable insight for the preliminary model.

- Fourth, the second group of readers are associated with the European research council, the European Commission and addresses the project reviewers.

The dissemination level of the deliverable is therefore public, and it scan be shared outside the consortium, the EC and the project reviewers.

2 CONCEPTUALIZING SOCIETAL RESILIENCE

2.1 CONTRIBUTIONS FOR THE PRELIMINARY MODEL

It highlights three main contributors and contributions to resilience in disaster situations that are particularly relevant for this undertaking.

2.1.1 CONTRIBUTIONS OF CITIZENS

Citizens are not only victims of crisis and disaster, but often the "first" responders on site. They self-organize for mitigating the effects of a crisis or organize the rescue and recovery of others. For this reason, these deliverable puts **citizen's "coping actions", understood as spontaneous actions, intended to actively overcome a disaster**, on the center stage.

ENGAGE's approach roots these "coping actions" in society in the sense that in our perspective they are enabled not only by material conditions, but also by discourses and representations of the event itself and of the social roles citizens identify with during crisis. By "coping actions" we want to conceptualize "resilience" not as a passive, latent ability of a group to "bounce back" after a disruption, but as **a set of actions actively transforming a disaster situation by influencing individuals, social groups or a given society as a whole**. Those actions are can be related to societal resilience, because actors believe they contribute to overcome and cope with the crisis. Individuals or groups undertake such actions because they believe they contribute to overcome and cope with the crisis at hand. The actions are situated: they motivated by the necessarily partial knowledge actors have at the moment and in the particular place. These actions represent a potential for resilience, but they might also be brittle, for instance when actions taken in one location end-up inadvertently going against actions taken in another location or by another set of actors (see Woods and Branlat, 2010, about maladaptive patterns).

Thus, the preliminary model we propose with this deliverable is based on both the various ways citizens contribute to societal resilience and the specific context they themselves and the literature on these events identify as enabling factors.

Those contextual aspects are situated in "society" in two ways. They refer to a specific social context which is enacted in a specific way depending on the crisis. Whereas formalized disaster management strives towards standardized, but adaptive actions, especially after the widespread distribution of an all hazards approach (Paton, 2013), citizens contributions tend to be much more context dependent. The comparative design of our in-depth case studies enables us to highlight their specific contribution and its conditions.

2.1.2 CONTRIBUTIONS OF INFORMAL ORGANIZATIONS

Citizens' response to crisis is defined by us as informal or semi-formal in the sense that we are dealing with actions that are not part of disaster contingency planning (informal), but that can be integrated in formal disaster management while the crisis unfolds (semi-formal). We are therefore interested in actors whose actions are spontaneous. However, even though we focus on unplanned actions, we also consider actors that can be integrated in a formal arrangement during a disaster, for example as volunteers. The ambiguity of the term "volunteer" shows at the same time the importance of distinguishing between formal, semi-formal and informal actors on a continuum. "Volunteers" can be highly trained uniformed formal disaster managers, but also citizens that self-organize and help others to cope with the crisis without ever interacting with a formal disaster management system.

For this reason, we analyze the way in which citizens are more or less formalizing their actions while interacting or not with formal disaster management systems. Does a medical professional who is in

place during a disaster just rescue others, does he claim his professional role while doing so or does he even join formal rescue operations by writing his name on a sheet for instance? How does he describe his role and what aspects does he reference to justify this? By being interested in formalization we also want to understand to what extent formal arrangements penetrate (or not) social configurations. This helps us to account for the citizens' perspective, their representations and discourses when engaging in coping actions during a crisis.

However, if citizens cope spontaneously with crisis, this does not necessarily mean that citizen's' actions are unstructured. Spontaneous self-organization can manifest itself in temporary arrangements that exist while the crisis event exists, but it can also develop stable organizations that can endure or it can transform preexisting planned structures and organizations. The conditions of emergence of these "grassroot" organizations or networks and their participation in disaster management is another focus of this deliverable.

Our model should therefore distinguish between the degree of formalization of an actor and the degree of formality of its actions. A "volunteer organization" would in this sense regroup actors from society, but in a structured way. It exists before the crisis situation. An "emergent" organization is however a spontaneous organization that is created ad hoc even though it relies on a preexisting context. Individuals may take part in both organizational contexts with varying degrees of formal participation.

2.1.3 CONTRIBUTIONS OF COMMUNITIES AND SOCIAL GROUPS

Identifying the impact of communities to resilience and to overall disaster management has been at the centre of extensive analysis, but what is understood as community is either preconstructed prior to data collection or is limited to a central community on a specific scale. **This deliverable understands community as any social group that enables citizens to act individually and collectively to overcome a crisis.** We are particularly interested in group membership by wondering under what circumstances a person identifies with a group in a disaster situation and what actions are necessary for this to take place.

This means first that the analysis is interested in which scale citizens situate their community rather than approach a certain crisis event with a preconstructed community, be it a municipality, a region or a national society.

Second, for the purposes of our preliminary model, **a community can be any social group that enables coping with the crisis**. A camping site can be a community as well as a cultural or religious minority or socio-professional group as long as its values and social bonds are enabling coping actions during a crisis. The formal structure of the camping site illustrates well how a preexisting context enables an emerging group that self organizes during a disaster.

Third, for that reason, several communities or social groups can be relevant frameworks during a crisis depending on a specific comment. Being a soldier can be a framework that enables somebody to act, but being an outsider in a rural community can simultaneously make it more difficult to engage with other citizens to give an example. The way membership to a community is enacted during disaster is therefore another cornerstone for our preliminary model.

2.2 CONCEPTS OF SOCIETAL RESILIENCE - STATE OF THE ART

Besides persistent criticism (Brand, Jax 2007, Cannon, Müller-Mahn 2010, Dunn Cavelty et al 2015, Walker, Cooper 2011), resilience is today a broadly used concept in academia. Its use by disaster managers to plan for crisis and to manage crisis situations has also steadily increased over the last thirty years both in terms of the number of public and private actors adopting the concepts and in terms of integration of the concept in a wide variety of organizational planning tools for crises (Mayunga, 2007, Ireni-Saban 2012). The varying units of analysis and targets of disaster policies (individuals, social groups, organizations, communities, social systems) are today addressed by different frameworks. For the purpose of ENGAGE, seeking better solution for interaction between

The research leading to these results has received funding from Horizon 2020, the European Union's Framework Programme for Research and Innovation (H2020/2014-2020) under grant agreement n° 882850.

18 of 58

disaster managers and society, this deliverable is notably interested in concepts like community resilience, social resilience and societal resilience. It seeks to present a preliminary model for assessing resilience tailor-made for the analysis of in-depth case studies.

Even though, detailed academic models of resilience with a focus on social dynamics already circulate today (Paton 2019), disaster managers often use resilience in an abstract sense while interacting with populations during a crisis situation or their reference to resilience reduces the complexity of social dynamics to be able to integrate it in all-hazards standardized disaster management strategies.

At the same time, the fact that resilience is used by practitioners in various ways is sometimes met with skepticism by scholars (Klein et al. 2003, Olsson et al. 2015), but rarely addressed as an opportunity to reconnect holistic academic frameworks on societal resilience, practitioners' insights and experiences of resilient individuals, organizations and communities.

Thus, we want to take seriously that resilience can be a "boundary concept" (Brand, Jax, 2007), connecting different actors during a crisis, but we argue to do so its theoretical development needs to be rooted in empirical analysis to resonate with actor's experiences. This relates also back to the origins of the concepts in the empirical analysis of ecological systems to withstand external shock (Adger 2000).

For this reason, we are interested in how resilience is used to analyse (Buckle, 2006, Keck, Sackdapolrak, 2013), but also how it is used to manage crisis (Lund-Petersen, Villumsen Berling, 2020) by working on eight historical case studies of disasters with varying units of analysis as part of a comparative approach. The model is thought to guide fieldwork comprised of interviews and focus groups and so it needs to be actor-centered and it has to be focused on people's own accounts of their actions during a disaster. The basic requirement for our model is to helps us to understand how people act in disasters situations and what makes them act.

That is also why we are not primarily focused on literature that is interested in resilience as transformation or progression (Aradau 2014), but first we want to understand resilience as adaptability (Holling 1973) and persistability (Carpenter et al 2001, Walker et al 2002), in order to understand on what conditions all social actors can be resilient.

Since our preliminary model should give us a better understanding of how people contribute spontaneously to societal coping processes and how they interact or not with formal disaster management.

Three conceptual offers enable us to do that: Social resilience, societal resilience and community resilience. Whereas definitions of social resilience tend to focus on the ability of "social systems" to withstand external shock (Braun, Asheuser 2011) including individuals, organizations and communities, community resilience is more interested in the social coherence of specific communities that enable resilience (Partel et al. 2017). Societal resilience which is less used than the other two concepts, approaches tends to have a more open conceptual framework that conceptualizes society not only by its structural components but is particularly interested in the interaction of social norms, values and bonds.

2.2.1 COMMUNITY AND SOCIAL RESILIENCE

2.2.1.1 Community resilience

Community resilience approaches are constructed around the notion that the resilience of a community is defined by the way a community is organized. Community resilience models are often measuring social cohesion as central variable, which is embedded in various other contextual variables (Berkes, Ross 2013). Some models refer to social capital instead of cohesion (Aldrich Meyer 2015) or mixing analysis of social structure of a given group with analysis of threat representation by community members (Paton 2008).

Whereas social cohesion as social capital enters as well in our model, we center more on the way social relations are represented by the actors by putting social bonds at the center of our preliminary

The research leading to these results has received funding from Horizon 2020, the European Union's Framework Programme for Research and Innovation (H2020/2014-2020) under grant agreement n° 882850.

19 of 58

model. In contrast to a more structural social capital approach, we define social bonds broadly as a variety of attachments to specific social relations, norms, values, actions, beliefs or groups and institutions that are engaged in a disaster situation. In other words, our model rather focuses on representations of a disaster event and coping mechanisms of different societal actors than on a structural analysis of a community. We argue that social bonds as contextual aspects enabling risk awareness, needs or social expectations during or after a disaster are not yet sufficiently considered by community resilience approaches as is the contribution of citizens attached to different communities in general.

2.2.1.2   Social resilience

The label of "social resilience" is not entirely used differently than "community resilience". Kwok et al. (2016) speak for example of "social resilience on the community level". As Keck and Sakdapolrak (2013) state, "social resilience" is often more about discussing resilience attached to a certain number of dimensions than a systematic definition. They identify "power", "politics", "learning" and "adaptation" as such dimensions. What social resilience approaches have in common is often the insistence on dynamics between actors inside a social group or system or between those groups (Maclean, K. et al., 2014).

We share in that sense the actor-oriented approach of social resilience, but we want to insist on the social dynamics that are actively engaged in concrete disaster situation. This inductive approach to the preliminary model based on our in-depth case studies is in that sense open to social conditions that enable people to act spontaneously rather than measuring the overall preparedness of a society.

More recent approaches develop comprehensive frameworks to measure social resilience (Reuter, Spielhofer 2017, Saja et al. 2018, Copeland et al. 2020). These frameworks often intended for qualitative research identify variables and indicators in a broad framework to measure if a community is resilient or not. Even though we share the holistic approach of these models, since we are particularly interested in the embeddedness of social actors while a disaster happens, we will stress particular dimensions that emerge from our preliminary results.

2.2.2   SOCIETAL RESILIENCE

To make the difference between organized and formalized disaster actors visible, be it as first responders or as authority and spontaneous actors from "society", we use the term of "societal resilience". Furthermore, our approach to resilience is "societal" for four reasons.

- First, we want to include all types of social units, from the individual citizen, to formalized and informal social groups to national and transnational societies. Those scales of actions are understood as social constructions that are always localized in a disaster situation. So even a global pandemic takes place in a concrete place at a given moment.

- Second, **we understand resilience as a process that emerges from discourses and actions that are embedded in society**, its structure, but also its values and bonds. By focusing on actions, we can account for both the practices of citizens during a disaster, but also their intentions and the context in which actors embed their practices. This opens the analysis to social values and social bonds

- Third, societal resilience is in that sense **a relational approach to the way people cope with disruptive events and processes**. It is always situated in a set of specific social relations and their representations.

- Fourth, societal resilience is for that reason context dependent. Understanding discourses and actions that allow coping with a disaster implies **sensitivity for the social context** in which they take place. The way in which coping actions are contextualized, localized and formalized by actors are its main research dimensions.

While we argue that the term "societal resilience" is a useful concept for a comprehensive understanding of the context-dependent discourses and actions that can help societies withstand shocks and disasters, the concept is not altogether new. For instance, Haavik (2020) has argued

The research leading to these results has received funding from Horizon 2020, the European Union's Framework Programme for Research and Innovation (H2020/2014-2020) under grant agreement n° 882850.

20 of 58

that societal resilience is a "fourth age of safety" research, where the implications of global risks like climate change move into the core of safety science. This involves a break with existing approaches to societal *security*, which tends to be based on an instrumental orientation to societal functions and critical infrastructures, i.e., the state's responsibilities in providing security to its citizens. Haavik (2020:7) argues for a reorientation of the research agenda "from robust infrastructures to the shaping of resilient societies through sustainable livelihood-, scientific- and political actions".

2.3 LIMITS OF EXISTING MODELS

Our preliminary model addresses limitations of existing models. By referring to community or society some of the existing models are relying on predetermined communities. However, our methodological approach makes it possible to account for multiple and contradicting influences of communities and social groups. Since we are interested in what conditions are actually mobilized when people represent the disaster event and the actions in which they engaged, we localize resilience in a concrete setting. Our preliminary model is therefore not static model that fits all disaster situation, but a guideline for qualitative research that wants to take actors representation of a disaster serious.

2.3.1 INFORMAL AND FORMAL CRISIS ACTORS

As societal resilience, our model relies on the distinction between a societal spontaneous response to disaster and formalized and planned disaster management. Most approaches refer to community as something disconnected from formal disaster response. Others focus on disaster management without putting interactions between formal and informal actors in the center of the analysis. Our model wants to make formalization processes one of its dimensions. In our interviews and focus group discussion we are looking for **overlapping social roles and blurry boundaries of (in)formal disaster management**, enablers, mediators, brokers, but also gatekeepers. By enablers we refer to citizens that establish a connection between formal disaster management and citizens, whereas mediators intervene for appeasing possible conflicts. Brokers act as intermediaries between individuals or emergent groups during the crisis who do not have direct access to each other. Gatekeepers are finally those who give access to resources of a group during the crisis.

2.3.2 LOCAL KNOWLEDGE

- Even though local knowledge is often referenced in community resilience approaches, it is not clearly defined and situated. We argue that the **localness of knowledge is bound to a specific situation, time and place**. Not all localized knowledge is thought to be relevant in a disaster situation and so we are also interested in how local context plays into decision making of spontaneously acting citizens. This makes it for example possible to understand how high reliability organizations or successful disaster management is built on localized expertise of informal disaster management.

2.3.3 SENSE-MAKING

- Our approach wants to take the experiences of all crisis participants seriously, be it those who professionally engage in disaster management or those who take informal roles in such a situation. **The way social actors make sense of a crisis determines their capacity to be resilient**.

- Existing approaches do not sufficiently consider the social context in which social actors situate themselves, but analyze this context merely as social structure or as threat perception. Resilience is not only about behavior but about actions that take place in a context that provides sense to them. Group membership or a professional socialization cannot be activated as such, but

The research leading to these results has received funding from Horizon 2020, the European Union's Framework Programme for Research and Innovation (H2020/2014-2020) under grant agreement n° 882850.

21 of 58

it has to be related to a place and a role that the actor attributes to himself in a disaster situation. Values like duty or solidarity provide the structure in which coping practices make sense in a crisis.

- Shared sense-making makes it also possible to act as a group. A dysfunctional disaster management as a common perspective can so induce actors to organize themselves.

2.4 CONTRIBUTIONS OF THE DELIVERABLE

2.4.1 CONTRIBUTIONS TO ENGAGE

This deliverable is complementary with work package 2's focus on first responders understanding interactions between formalized disaster managers and affected populations from the point of view of citizen engaging in coping actions. It also provides orientation for work package 3's orientation for solutions improving societal resilience by defining criteria for considering contextual aspect for engaging in resilient actions. Finally, this deliverable also contributes to WP4 as the validation process of this work package needs to asses if the proposed solutions enable context sensitive approaches. The model presented here provides criteria for this.

2.4.1.1 Contributions to work package 1

This deliverable's qualitative in-depth approach is complementary to the quantitative approach of task 1.2's representative panel-based survey, conducted in the same countries in which the case studies are situated. It also provides data for task 1.3 on citizen's communication needs. And it is preparing the model for assessing societal resilience from task 1.4. This deliverable is therefore one of the four cornerstones of work package's 1 focus on citizens' response to crisis.

The approaches of 1.1 and 1.2 are different, but complementary. They differ for two reasons. First, the different methodologies call for different theoretical approaches. Task 1.1 purpose is the generation of a preliminary model presented by this deliverable. Task 1.1 use of data from in-depth case studies in a qualitative approach calls for a methodology that uses few and open hypotheses for a grounded theory approach. Task 1.2's aim is expanding and testing resilience models from the literature. 1.2's use of a survey based on internet panels needs for this reason clear criteria based on robust hypotheses from scientific literature.

The type of data used by both tasks also explains the differences between theoretical approaches; Task 1.1 uses historical cases asking what citizens did during a disaster and Task 1.2 mainly asks for respondents' preparation and perception of future risks and interactions. Task 1.1 focuses on past actions including intentions as well as representations, whereas 1.2 relies on behavior and perceptions. Together, they can therefore inform the final model for assessing societal resilience as the central contribution of work package 1.

2.4.2 CONTRIBUTIONS TO SCIENTIFIC DEBATES

The deliverable shows in the following section how ENGAGE's model for societal resilience can contribute to debates on resilience and disaster management in disaster studies, risk sociology, sociology of organization, disaster psychology or security studies. It is specifically interested in debates on community, social and societal resilience and strives to develop and propose a new context-sensitive approach to fit the qualitative approach of the in-depth case studies. With its insistence on citizen's actions and representations, this approach can resonate and dialogue with other models of resilience.

2.4.3 CONTRIBUTIONS FOR USERS

The preliminary model we propose here shows the importance and variety of "context" for what happens during a crisis. Its interest for interaction between formal and informal disaster managers and for the situating citizen's response in a concrete situation, can enhance context sensitivity for

authorities and first responders. As a preliminary model, this deliverable cannot provide definitive solutions, but it can open a dialogue with practitioners and structure a discussion about effective solutions to enhance societal resilience.

3 METHODOLOGY

3.1 RESEARCH QUESTION

What makes people act spontaneously when confronted by a disaster is the central research question to which our preliminary model gives some initial answers. This question targets conditions of societal resilience.

3.2 CASE STUDIES

3.2.1 CASE SELECTION FOR CASE STUDY ANALYSIS

Eight cases were selected for the analysis in working package 1. **Case studies vary in type of crisis, scale of the crisis and type of crisis management**. They entail "natural" disasters like the earthquake of L'Aquila in central Italy from 2009, flash floods in the Negev desert in Israel in 2018, the Japan tsunami of 2011, the Swedish wildfires of 2018, the coronavirus pandemic of 2020 and 2021, but also terrorist attacks like the Utøya attack in Norway in 2011 and the Thalys train attack in Belgium and France in 2015 and industrial accidents like the Fukushima Daiichi nuclear accident of 2011. They are localized on a local, regional, national or even global scale. Some of the cases show a deployment of formal disaster management that is considered sufficient and other are thought to be "failures" having enable spontaneous reactions from citizens and organizations. The cases were therefore collected to vary the context in which coping actions take place.

Case study	Scale	Crisis type
Utoya terror attack	local	Terror attack
L'Aquila earthquake of 2009	regional	"Natural" disaster
Swedish wildfires of 2018	national	"Natural" disaster
Tōhoku Tsunami of 2011	regional	"Natural" disaster
Fukushima Daiichi Nuclear accident of 2011	regional	Industrial accident
Negev flash floods of 2018	local	"Natural" disaster
Thalys train attack of 2015	local	Terror attack
Covid-19 pandemic	global	"Natural" disaster

Table 2 Typology of case studies

3.3 DATA COLLECTION

The objective of all three data collection methods is to identify the relationship between contextual aspects of societal resilience and existing solutions. Needs and expectations of individual and collectively organized citizens and disaster managers for proposing solutions are analyzed for this reason.

3.3.1 DOCUMENT ANALYSIS

An extensive literature research on the eight case studies and on social, community and societal resilience was conducted for this deliverable by using Scopus, Web of Science and Google Scholar. Keywords were based on the denominators of the case studies (e.g. "L'Aquila", "earthquake"), and key words that indicate coping actions and disaster management ("resilience", "emerging groups", "solidarity", "grassroots", "social movement", "protest", "rescue", "recovery", "disaster management"," assistance"). If possible, the native language of the countries in which the case studies are situated was also used.

3.3.2 SURVEY OF GRASSROOT EXPERIENCE

3.3.2.1 Expert interviews

To understand the specific context of the eight case studies, **this preliminary model relies mostly on expert interviews**. For this preliminary model academic experts were favored for getting to know the cases and for identifying relevant entry points to the cases.

Academic experts were used for the L'Aquila case studies relying on two Italian disaster psychologists familiar with the earthquake. In the case of the Swedish wildfires, two Swedish experts on crisis volunteers from a disaster studies perspective were interviewed. For the two Japanese case studies, expert interviews were conducted with two French sociologists working on evacuations after the disasters of 2011 and with a Japanese physicist who worked on the Fukushima Daiichi nuclear accident. For the Negev flash floods an Israeli psychologist working on organizational resilience was interviewed. Finally, for the Covid-19 case studies, two French sociologists, experts on solidarity networks provided information on spontaneous neighborhood organizations during the first lockdown.

Since its purpose is to provide research dimensions for the collecting data for the project's model D1.4., expert interviews could identify relevant groups or individual citizens that engaged in coping actions. Experts were selected for having academic knowledge of the case, having conducted fieldwork on the case or having indirectly participated in crisis management.

3.3.2.2 Semi-structured interviews

Even though semi-structured interviews with citizens were only used for the L'Aquila case study so far, the model will mostly be tested by conducting interviews with citizens that took spontaneous action to rescue others, to help communities to recover or to organize groups that interacted with formal disaster management. Interviews are based on a guideline document detailing the topics on which questions were based (see ANNEX). The topics and the general procedure are clearly explained to respondents before the interview starts. A consent form, signed by respondents explains the objective of the interview, it states its topics and it details data protection measures. Interviewers asked what people think happened during the event.

For this deliverable, **semi-structured interviews were only used in one case as a precautionary measure**. As part of the ethical guidelines of the ENGAGE project, victims of crisis should only be interviewed with an adequate support mechanism in place for cases of psychological distress. It will be case specific and entail the possibility to consult with a health professional. This mechanism is under construction for all case studies.

3.3.2.3 Focus groups

When actors collectively helped to cope with the disaster and when people engaged with varying degrees of formalization in spontaneous disaster management, focus groups also provide data to inform and test the preliminary model. Focus groups are also guided by the same structure used in the interviews, but the interviewer encourages interactions between respondents. They should be held in presence to enable interaction between respondents. Both for the limitations of the ongoing pandemic and for the precautionary measures detailed before and below, **focus groups are only planned for deliverable 1.4**.

3.3.2.4 Ethical considerations

The informal character of a semi-structured interview and of a focus group based on open questions allowing for a discussion between interviewer and respondent entails ethical risks for participants, since they are not always conscient about data collection during the interview situation. A formal framework helps to ensure data protection and respondent's safety.

ENGAGE's interest for resilience in crisis situations can compromise the psychological safety of participants who are trauma victims, both in the case of citizens and first responders. The interviewer should be aware of issues involving respondent's safety when undertaking an interview. Thus, risks for respondent's health are made explicit before the interview starts. A secure and confidential interview setting is provided. Respondents can end or interrupt the interview at any time. The interview can be conducted with support persons of the respondent.

 The in-depth nature of the interview can also lead to exposure of personal data not relevant to the ENGAGE project. As part of data protection measures, which are detailed in deliverable 6.1, respondents should not be named during the interview situation. The interviewer should also not mention personal information of respondents.

Questions therefore focus on the immediate crisis situations in which citizens acted. Open questions identify chains of resilient actions and interactions during the event and afterwards. A particular attention lies on the interaction between citizens, first responders and authorities.

Respondents are asked what posed problems in this situation and during these interactions. They are further asked to identify their needs and expectations and how they perceived risk during the crisis situation.

Respondents are then asked to reflect on conditions of engaging in coping action. Interviewers follow-up on geographical, socio-economical, cultural and gender aspects to understand the conditions of societal resilience.

4 PRELIMINARY FINDINGS

The scope of our preliminary findings presented in the subsequent section vary depending on the case study. The first two case studies can already rely on a larger basis of findings linked to the limited scale of the disaster event, the high priority given to those case studies and the easy access for the ENGAGE team. The Utøya attack takes place on an island and its disaster management stretches to the opposed shore and a nearby village. The L'Aquila earthquake is on a larger scale, covering the city of L'Aquila and its surroundings. Both the language skills of WP1 teams and the relative proximity to project partners enabled a quick and efficient preliminary research.

The Swedish wildfires, the Japanese tsunami of 2004, the Fukushima Daiichi accident and the Negev flash floods can also rely on first interviews, but the preliminary data is limited to initial conclusions on contextual aspects.

Finally, the Thalys train attack and the Covid-19 case study in France are still at an early stage given to the low priority given to those case study at this stage of the project.

4.1 UTØYA ATTACK OF 2011

4.1.1 EVENT REPRESENTATION

After setting of a car bomb in the middle of Oslo the 22th of July 2011, killing 8 people and injuring 209, the perpetrator moved to an island for a second attack. At 17.21 the perpetrator started the shooting at Utøya island, where the youth wing of the Norwegian Labour Party held their annual summer camp. Armed with a pistol and a semi-automatic rifle, he shot and killed 69 and injured 33 (gunshot wounds) of the camp participants.

To get to the island - by a boat operated by the organizers of the camp - he pretended to be a police officer who came to inform about the recent terror attack in Oslo and protect the participants. Immediately after arriving on the island, he killed the security guard (a volunteer policeman) and the camp manager. He proceeded to move around the island, shooting and killing youngsters. The young people tried to save themselves by hiding in the woods and inside buildings or trying to swim ashore. The perpetrator lured several of the young people from their hiding places by posing as police and assuring them that the attack was over, and then executing them.

Based on emergency calls from the victims, the police initiated rescue operations. This involved local police and national special forces, the so-called Delta force. The attempt to come to the rescue was delayed by several factors. This included e.g. insufficient knowledge of the island's location, inadequate coordination between the local police and Delta, insufficient staffing and weak communication system, focus on the safety of emergency personnel (Gjørv 2012), informal institutionalized conventions within the police combined with the switch to a more centralized response mode, marginalization of the operational and strategic levels of the emergency organization and inadequacies in the "knowledge-based" parts of the work (Bye et al. 2018). The Gjørv report estimates that the police had the potential to reach the island at approximately 18.05 if the operation had been more coordinated. Instead the first group of police arrived at the island at 18:27, and the perpetrator was captured at 18:41.

During the attack, several non-affiliated volunteers in the area (at a local camping site and nearby houses) took initiatives to help rescuing the youngsters trying to escape from the island. These initiatives were both spontaneous and self-organized. They used their boats to pick up survivors from the water, provided first aid medical treatment (including lifesaving care, Gjørv 2012: 20) and transported injured survivors to nearby medical personnel or hospitals. They were willing to expose themselves to danger that the organized response personnel tried to avoid. During the rescue operation, some of the boats were shot at by the perpetrator on the island.

Some volunteers transported the police towards the island when the police boat broke down due to incorrect use. These initiatives were mainly coordinated or directly guided by the police. It is

reasonable to assume that the police would have used significantly more time before they had arrived on the island if these volunteers had not participated.

Later, in the chain of events and after the capture of the perpetrator, the work of the volunteers became more affiliated with the formalized emergency response. They helped ambulance personnel and conducted tasks at the local ad-hoc emergency center that was established at a nearby hotel (Sundvollen hotel).

The Gjørv report praises the volunteers and claims that the consequences of the incident would have been significantly worse if they had not participated.

4.1.2   MAPPING OF SOCIETAL ACTORS

Both the literature and official documents of the terror attack at Utøya have attributed citizens' spontaneously actions to overcome the crisis to different groups of actors (Sollid et al. 2012, Rimstad et al. 2014, Sommer, Njå, Lussand 2017), but no systematic exploration of these actors has been undertaken. Based on official reports, academic texts and informal interviews with red cross members and the survivor association the following preliminary actors mapping could be made.

We classified volunteers into *affiliated volunteers* and *non-affiliated volunteers* to reflect this heterogenous group of actors, to use the aforementioned distinction by degrees of involvement in formal disaster management activities and to map actors clearly. This distinction is also used in the Gjørv-report (2012) to distinguish volunteers that are affiliated to Non-Governmental Organizations that have been established in order to provide rescue and health services and those who are not. The non-affiliated volunteers consisted in that sense of civilians that autonomously and spontaneously took part in the rescue operations, providing resources or carried out actions to handle the situation.

Among this group there are several elements that seem to have been relevant to enable their contributions. Those categories should not be understood as mutually exclusive categories, but as contributing factors that can characterize both non-affiliated and affiliated volunteers' actions and their contributions during the events. Each set of aspects can be used independently. The following categories can help to map actors during the event:

- Phases of the event
- Degree of proximity to the event
- Professional or non-professional volunteering
- Actions carried out autonomously or guided by disaster managers

4.1.2.1 Phases of the events

In the Utøya case study, the extent and type of contributions from volunteers were structured by different phases of the event. We can distinguish between actions taken during the approximately one hour of the attack, the immediate recovery after the attack (several days), and in the aftermath of the event (months and years).

- During the attack, several citizens contributed by carrying out rescue operations, social support, first aid, transportation of and providing intelligence (information about the attack, local knowledge regarding the geographic area and available resources). Some of the victims at the Island helped to organize hiding and evacuation from the island, as well as providing first aid.Non-affiliated volunteers contributed to rescue victims from the island and from the water. Affiliated volunteers at the island (NPA) provided first aid during the attack, organized hiding and took actions in order to intervene in the actions of the perpetrator.

- Immediately after the attack (the capture of the perpetrator) both affiliated and non-affiliated volunteers contributed in search and rescue operation, provided transportation, first aid and social support.

- In the aftermath of the event, volunteers (organized as NGOs) have extensively carried out work related to social support to victims, families, and citizens in general.

4.1.2.2 Degree of spatial proximity to the event

Some of the volunteers were acting because of their spatial proximity to the area of the events (e.g. cabin owners, camping site residents, local residents, persons travelling by the area). Others travelled to the area intentionally, in order to contribute, of course within reasonable distance. Lastly, there were several citizens that provided information that was relevant for both volunteers and official response units about the event through the use of social media, but who were not close to the event in physical distance.

4.1.2.3 Professionals and non-professionals

Among non-affiliated volunteers, persons with professional skills related to formalized roles during rescue and health care operations, stood out. Examples of such professionals were fire fighters, police, physicians, psychologist, psychiatrist, priests, retired professionals etc). Some of those roles were announced to formal disaster managers and some of the persons were integrated in a formalized role in disaster management. Others were relying on their professional socializations without making them explicit. **The way professional skills become coping skills and are formalized is one of the research dimensions of this case study that helps to inform the preliminary model**.

A high number of non-affiliated volunteers had no professional skills that could be formalized in disaster management.

4.1.2.4 Autonomous or coordinated

In the Utøya incident, there were many volunteers who operated autonomously and detached from the formal response organizations (Police, special forces, fire department, ambulances etc.). A significant proportion of the non-affiliated volunteers contributed without any requests or guidance from the governmental emergency organizations. The responses from NGOs were also initially rather detached or loosely coupled to the governmental response organization.

Spatial proximity partly explains this high presence of coping actions by citizens, since many of the unaffiliated volunteers carried out autonomous rescue operations before the governmental rescue organizations were able to reach the area.

Some of these activities were informally and spontaneously coordinated with other volunteers. When police and medical personnel were present in the area, several volunteers still carried out rescue operations in parallel and detached from the formalized efforts. **Some volunteers carried out tasks that could have been carried out by medical personnel or the police, which due to consideration regarding safety, did not perform similar tasks**. Group membership, proximity and a sense of security and duty may explain these coping actions.

The interaction and coordination with the formal emergency services became more extensive during rescue operations. In the initial phase, locals were contacting the emergency organizations offering information and resources. Later, the police and medical personnel guided many of the volunteers. However, some of the orders given by the police were ignored by several volunteers, prioritizing the rescue of the victims. This resistance to formalization efforts will be further investigated.
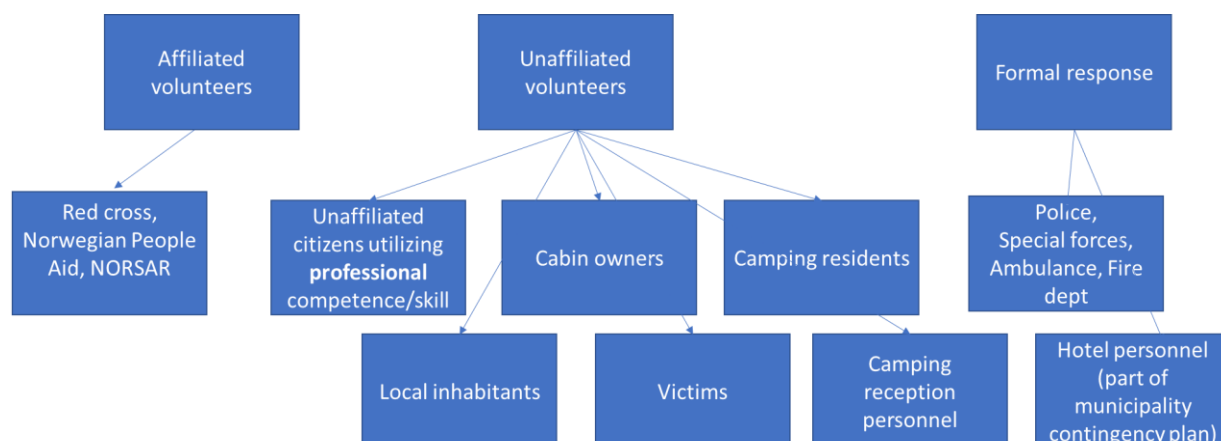
Figure 1. Draft overview of actors responding to the Utøya attack.

4.1.3 COPING ACTIONS

In the following, coping actions from citizens that seems to have contributed to overcome the event are mapped for the purpose to structure the initial model. This mapping is based on preliminary results from the literature and data review, as well as initial informal interviews, most notably with the association of survivors. The results are biased in the sense that there are still unanswered questions, and initial inquiry has been more directed towards unaffiliated volunteers with boats, originating from Utvika camping. Further study will consider other aspects of the event.

Main categories of coping actions are

- The actions of primary victims[1] at Utøya

- The actions that contributed to rescue primary victims at Utøya

- The actions that contributed to cope with the effects of the event by delivering psychosocial care

4.1.3.1 Coping actions of primary victims at Utøya

Primary victims engaged in the following actions to overcome the event.

- Victims used their swimming skills to swim ashore from Utøya to landside.

- Victims hid on various locations across the island.

- Victims organized and helped each other to escape, and organized triage for determine rescue priorities.

- Victims managed to sail by boat to get off the island.

- Victims used social media to alert and inform disaster management and the general public.

4.1.3.2 Coping actions related to rescuing victims at Utøya

There are two main groups of actions from citizens who engaged in rescue operations. Those situated at the ad hoc informal emergency care centres near Utøya island, and those of several local inhabitants, camping site residents, local cabin owners and bypassers that used boats to rescue victims at Utøya.

---

[1] Several affiliated and unaffiliated volunteers might be considered as victims as they were close to the actual scene.

Concerning the ad hoc emergency care center next to the island, we can distinguish the following actions that guide our interviews:

- Residents of the Utvika camping took care of around 250 victims.

- Utvika camping resources were used immediately, both the camping site's infrastructures, private resources of the campers, and their tools (boats). The reception of Utvika camping provided shelter, food and drink, a warm shower and other facilities.

- A camping site resident used her life rescue training from her daily occupation (pedagogical worker in a kindergarden) to guide victims swimming towards the shore, which may have prevented some from drowning.

- Cabin owners and the Lien farm habitants provided resources as well and helped victims ashore.

Concerning rescue operations by boat, we have identified the following actions that are the basis for further inquiry and interviews:

- Several actors, cabin owners, camping site residents, land side local inhabitants, used their boats independently from each other.

- One citizen embarked on his boat following the prime minister early address on national television.

- Several campers collaborated to provide efficient rescue of swimming victims.

- Campers made phone calls to emergency services alerting about the situation in the fjord as well as offering boat resources.

- A camper assisted the Delta forces by providing his boat instead of the overloaded one the special forces acquired, which may have been pivotal for the following capturing of the perpetrator.

- A cabin owner provided the Delta forces with a boat, explained its use and indicated directions, which led to the capturing of the perpetrator.

- Several camping owners rescued victims from the fjord as well as on the island.

- A cabin owner north of the island was the first to respond to the Utøya shootings. He heard shootings and spontaneously departed from the neighbouring island.

- A former ambulance driver passing by the area spontaneously joined others on a boat and embarks to Utøya island. There he saved severely injured victims by utilizing his professional skills.

4.1.3.3 Coping actions contributing to psychosocial and physical care to victims and affected

The following actions laid the groundwork for coping with the aftermath of the attack:

- Campers were the first to bring victims to Sundvollen Hotel, which was appointed the formal rescue center.

- Both hotel personnel and affiliated and unaffiliated volunteers took part in the psychosocial care at the neighboring village of Sundvollen.

- The camping site structure and culture contributed to recovery for persons involved in rescuing. It enables camper to be self-sufficient on site and creates an informal network of neighborhood and friendship. Through the camping, they had a place to meet, established social practices around eating, which provided a natural ground for processing and sensemaking the event, as well as being instrumental for social support.

- Localised support activated across the country when victims arrived at their homes.

4.1.4 CONTEXTUAL ASPECTS

Based on the preliminary findings, the following situated contextual aspects appear as influencing factors for coping with the attack. Depending on the specific crisis situation, some of them can be modifiable and could become target aspects of solutions discussed in WP3.

- Spatial proximity and topographical aspects

- Local knowledge

- Professional knowledge compatible with a crisis event

- Trust and constructive mistrust in formal authorities

- The age of victims influenced the escape and rescue methods/actions and social bonds

- Social bonds between various communities (between campers, between victims and volunteers, between local residents, between hotel personal, between police and the local community)

- The alertness of the surrounding community and specific individuals. Alertness explains both the knowledge of the ongoing situation as the willingness to act on this knowledge.

4.2 L'AQUILA EARTHQUAKE OF 2009

4.2.1 EVENT REPRESENTATION

The earthquake that largely destroyed the historical city of L'Aquilla in the Abruzzi region of central Italy occurred on April 6 2009. It killed 309 citizen, injured 1500 and left more than 67.000 homeless.

Using state level emergency planning, Italian authorities prohibited access to the historical city center (the so-called red zone) and highly damaged neighborhoods. The civil protection agency relocated 32 000 citizens to hotels and non-affected houses as part of a mandatory process. 35 000 were place in tents in camps for up to eight months. The camps were organized and managed by the civil protection agency. Self-organized housing structures emerged parallel to the official camps.

In rural communities surrounding L'Aquila, municipalities collaborated with NGOs and emergent organization in organizing recovery (housing, psychological, medial and social assistance, cultural activities).

In a second part of the disaster management, citizens were again relocated to permanent new settlements (CASE) situated outside the historical city of L'Aquila. Reconstruction of the city continued mainly finished until 2015, which led to the resettling of up to 80% of residents to their former homes.

4.2.2 MAPPING OF SOCIETAL ACTORS

Both the literature and official reports on the Aquila earthquake from 2009 stress the importance of emergent organizations after the earthquake (Alexander 2013, Fois, Forino 2014, Forino 2014, Bock 2017, Ciccaglione 2019). Rehousing and reconstruction efforts, logistical support and political actions are highlighted (see also Twigg, Mosel on emergent organizations in urban settings (2017). However, the contribution of individual citizens is rarely mentioned by these sources. Expert interviews with two psychologists working on vulnerable groups in L'Aquila were first entry points for the analysis.

We followed this entry and interviewed citizens that self-organized after the earthquake and whose emergent organizations were institutionalized afterwards. These emergent organizations are specified in 4.3.2. Relying on still existing organizations made them easily identifiable, but this entry excludes for the moment spontaneous, but temporary coping actions and reproduces the same bias visible in the literature on the event. Nevertheless, we believe that we can go beyond these limitations by building on those initial interviews and identifying both temporary emergent organizations and contributions of individual citizens.

In a first step we mapped actors that contributed in the formation of emergent organizations in the sense that they were present during the formation of such a group and coordinated with others in an informal way. None of our interview partners was affiliated with an emergency organization or integrated in another way in formal disaster management.

Several contextual aspects can be identified to explain their contributions. As in the case study before, those contextual aspects are not mutual exclusive categories. The following contextual aspects guided our actors' mapping:

- Phases of the event
- Degree of social proximity to the event
- Interaction and constructive mistrust of formal disaster management

4.2.2.1 Phases of the events

In the Aquila case study, the extent and type of contributions from citizens were structured by three different phases of the event. We can distinguish between actions taken immediately after the

seismic shock, actions during the relocation of citizens in camps (the day of the seismic shock and the following weeks), and in the aftermath of the event (months and years).

After the initial shock, citizens contributed by carrying out rescue operations by helping victims under the rubble, informing and guiding first responders, social support, first aid and logistical aid (providing blankets, water and food).

After camps were established and citizens were relocated by the civil protection agency, citizens self-organized to provide information, to improve the quality of service of formal disaster management, to deliver psychological support, reorganize temporary shelters, create civil protection structures in rural villages and provide cultural events.

In the months and years following the earthquake, self-organizations institutionalized as political, cultural and social associations.

4.2.2.2 Degree of spatial proximity to the event

Some of the volunteers were acting because of their spatial proximity to the area heavily affected by the earthquake, but most of the actions we mapped are linked to the proximity created by the civil protection camps. Preexisting neighborhoods were not considered for temporary housing and the lack of social proximity as well as the **forced spatial proximity, enabled self-organization**, facilitated by demographics and shared group membership (students, activists etc.).

Those who self-organized from a distance, identify family or friendships in the affected area as enabling contextual factors, but they also often reference the camps as an enabling site that helped them to organize.

The fact that the city center was declared an exclusion zone shortly after the earthquake displace the zone of self-organized action also towards rural villages affected by the earthquake, but less central to formal disaster managers.

4.2.2.3 Professionals and non-professionals

The militarized organization of the Italian civil protection and the fact that volunteers are highly formalized made it difficult for citizens with professional skills to participate in rescue operations by declaring a formal role. Here again, **the camp sites made it possible to formalize professional skills**. Especially psychologists and social professionals used their skills informally or communicated them to NGOs and to civil protection agencies by using lists or platform tools.

Emergent organizations were typically created by a mix of citizens with professional skills, with political activism and those who do not reference prior experience as an enabling factor.

4.2.2.4 Autonomous or coordinated

Citizens spontaneously engaged in coping actions in the case of the l'Aquila earthquake before civil protection arrived in the city, opposing and completing civil protection arrangements or organizing in rural communities, where civil protection was less present. They acted without or against guidance from authorities, but often in a semi-formalized arrangement with NGOs.

The **high degree of organization of formal disaster management and the deep penetration in preexisting social arrangements** (closure of the city center, mixing of social groups in camps, detailed regulations for camp management, highly formalized disaster volunteers closing participatory possibilities to local groups) enabled the creation of emergent organizations. Spatial proximity on public places and in tents allowed citizens to gather and self-organize without interactions with formal disaster management by authorities.

Individual coping actions were quickly integrated in spontaneous self-organization often related to prior professional and political socialization.

Over the first weeks, interactions with rescue NGOs and notably the Red Cross intensified and participatory spaces in formal disaster management by authorities opened.

4.2.3 COPING ACTIONS

Coping actions from emergent organizations in the L'Aquila region after the earthquake are mapped in the following to help to inform the preliminary model for societal resilience. This mapping relies on the preliminary interviews conducted with citizens that self-organized spontaneously after the earthquake in organizations that were institutionalized afterwards, notably the CGIL (Confederazione generale italiana del lavoro) camp, 3e32 Committee, 180amici L'Aquila, Psychologists for Peoples and Pico Fonticuliano. It also uses data from scientific literature, media sources and official reports.

The results are biased towards emergent organizations that still exist today, but those organizations enable us at the same time to identify temporary emergent organizations and individual coping actions for the final model on societal resilience (D1.4).

Main categories of coping actions for the L'Aquila earthquake case study are:

- The actions of citizens in the historical city center during the seismic shock.
- The actions of citizens at the outskirts of the city.
- The actions of citizens in rural communities affected by the earthquake.
- The actions of citizens in the temporary camps.
- The actions of citizens from a distance often followed by actions in the camps

4.2.3.1 Coping actions in the historic city center of L'Aquila
Citizens that were present in the city center engaged in the following actions:

- Citizens helped people under the rubble or to vacate fragile buildings.
- Citizens applied first aid.
- Citizens joined public places with resources (blankets, food and water, medical supplies).
- Citizen organized and helped each other to relocate to provisional camp site.
- Citizens used social media and phones to alert and inform disaster management and the general public.
- A preexisting association established "listening desks" to orientate victims and give psychological support

4.2.3.2 Coping actions at the outskirts of the city and in rural communities
Concerning the spontaneous self-organization of citizens after the L'Aquila earthquake in communities surrounding the city we can distinguish the following types of action:

- Citizens helped people under the rubble or to vacate fragile buildings in rural communities.
- Citizen applied first aid.
- Citizens provided housing for victims.
- Citizens provided transportation.
- Bars at the outskirts of the city became informal information desk.
- The Italian labor union CGIL set up a camp for victims that allowed informal information sharing and participation of victims.
- Home-owners self-organized in several rural communities to house victims.
- In a rural community citizen's organized to establish an autonomous civil protection structure.

4.2.3.3 Coping actions in the refugee camps
The spatial proximity in the camps enabled specific emergent organizations:

- A web-radio was founded to share information on the disaster.
- Autonomous camp committees organized logistics and discussion groups.

- Emergent groups organized contact lists and enabled people to locate relatives.
- Emergent groups organized outside communication.

4.2.3.4 Coping actions by citizens from afar

- Facebook groups to coordinate relief efforts emerged.
- Information networks were created by university students in Rome.
- Emergent groups organized resource donations.

4.2.4 CONTEXTUAL ASPECTS

Based on the preliminary findings from first interviews and literature the following contextual aspects appear as enabling factors for engaging in coping actions.

- Spatial proximity (camps, public places, buildings)
- Local knowledge (connections with local authorities, knowledge of unoccupied housing)
- Professional knowledge compatible with a crisis event (psychological training, social work)
- Political socialization (activism)
- Constructive mistrust in formal authorities
- Demographics (organization along generational groups, gendered spaces like bars)
- Social values (solidarity, mistrust of authorities)
- Social bonds between various communities (between students, between activists, between teenagers, inside a rural community, between family members)

4.3 SWEDISH WILDFIRES OF 2018

4.3.1 EVENT REPRESENTATION

In May and June 2018, a historical heatwave affected Sweden. First wildfires appeared in May mounting to 50 active hotspots in June. 250 km2 of forest all over Sweden were affected. Disposable barbecues in combination with the unusual climatic conditions facilitated the disaster. The largest wildfires were situated in central Sweden with one wildfire covering 85 km2.

Whereas wildfires were initially under control, the situation overpowered Swedish firefighters in June. International assistance was requested via European civil protection and lead to an international disaster management integrating firefighters from Norway, Denmark, Finland, Germany, France Lithuania, Estonia, Portugal and Poland.

During this second stage of the crisis, large rural areas had to be evacuated due to the direct danger of the fire, but also due to the smoke production. To organize evacuation and logistics NGOs and authorities coordinated with a large number of volunteers at this stage. By the end of June, linked to disaster management and to rain, the international disaster management ended and most of voluntary actions as well. Whereas voluntary participation to formal disaster management has evolved, few emerging organizations institutionalized over time.

4.3.2 MAPPING OF SOCIETAL ACTORS

The Swedish wildfire is situated on a regional and national scale. Its defining feature for the purpose of our project is that fact that it constitutes the largest volunteer mobilization after the second world war in Sweden. The few analyses on the 2018 wildfires focus on how volunteers were used by NGO's and firefighters by relying both on formalized recruiting schemes and on **ad hoc volunteer recruiting tools** (Murphy 2020). Citizen joined formalized efforts spontaneously or organized themselves to a lesser extend independently from formal disaster management (Bodin et al. 2019). The few academic texts on the wildfires of 2014 insist as well on volunteer recruitment and actions from NGOs, but do not cover spontaneous voluntary actions (Lidskog 2018).

Contrary to the two case studies before, an exhaustive actor mapping of resilient citizens is not feasible, due to the national character of the disaster. Our analysis therefore focus on two communities.

4.3.3 COPING ACTIONS

The preliminary data point to the following types of coping actions that are interesting for further developing the preliminary model for societal resilience.

- Citizens who self-organize to assure recovery of firefighters (food, sleeping facilities, relaxation)
- Citizens that self-evacuated or helped in organizing evacuations independently of formal disaster management
- Citizens that provided local knowledge to firefighters (hunters, famers etc.)
- Citizens informed authorities of wildfires by scouting rural areas.

4.3.4 CONTEXTUAL ASPECTS

The following contextual aspects appear from literature and preliminary interviews:

- Local knowledge of rural areas

- Physical and social proximity to the wildfires

- Demographics (whereas first volunteers were older, spontaneous volunteers were often rather young)

- Professional skills and resources to organize logistic chains.

4.4 TŌHOKU TSUNAMI OF 2011

4.4.1 EVENT REPRESENTATION

The 2011 Tōhoku earthquake occurred on March 11, 2011, at 14:46 off the coast of Miyagi Prefecture northeast of Tokyo triggering tsunamis that inundated an area of more than 500 km2.It was the largest known tsunami in Japanese history. 600,000 people were directly affected by the tsunami and 22.199 persons died.

470,000 people were evacuated by authorities or self-evacuated. They remained in temporary housing for several days, since up to 400,000 buildings were partially or entirely destroyed. Electricity was only restored in April and relocation and reconstruction effort took years. Japanese authorities estimated in march 2012 that another 1331 people died due to the secondary effects of the disaster.

4.4.2 MAPPING OF SOCIETAL ACTORS

The Japan tsunami of 2011 is situated on an interregional scale, which makes it not feasible to focus on a variety of coping actions. Literature points to the importance of **self-organized evacuation efforts, informal solidarity actions and traditional neighborhood networks** that covered areas where authorities were overwhelmed (Okada 2012, Shaw, Takeuchi, 2012, Nakaya 2018, Sun, Sun, 2020). Evacuations sites were underequipped with heating and food and water for several days and local communities self-organized to assist evacuated victims. The demographics of an aging population as well as personality factors have notably influenced evacuation behavior (Sun, Sun 2019, Sugiura et al. 2019) Citizens also organized communication tools to identify relatives or to inform about the disaster.Experts interviews with two French sociologist working on evacuation dynamics after the Tsunami confirmed these entry points.

The difference in self-organized evacuation between the Sendai coast planes and the Sanriku coastal mountains has been highlighted by several sources and is one of the entry points for preliminary interviews. Whereas in the Sanriku region, habitants focus on self-evacuation to higher ground without taking care of relatives or neighbors for assuring rapid and efficient evacuation (the tendeko system, see Yamori 2014), habitants of the Sendai coastal planes would evacuate to public buildings such as schools or community centers. This cultural difference is a contextual aspect this case study could investigate to strengthen the preliminary model by focusing on the comparison of two communities.

4.4.3 COPING ACTIONS

Resilient actions from citizens from two affected communities in the Sendai and the Sanriku region enable us to focus on the following types of actions: The actions of citizens in the historical city center during the seismic shock.

- The actions of citizens that self-evacuated or helped to evacuate others

- The actions of citizens that provide logistical assistance and first aid to victims of the tsunami

- The actions of citizens that provided logistical assistance to evacuation centers or to people camping on higher ground.

- The actions of citizens that organized information sharing on site or from a distance

4.4.4 CONTEXTUAL ASPECTS

Preliminary interviews and literature stress the importance of several contextual aspects for self-organized and spontaneous coping actions:

- Proximity to the event
- Regional values
- Demographics (notably age and gender)
- State of evacuation canters (damaged, well equipped etc.)
- Professional socialisation
- Social status

4.5 FUKUSHIMA DAIICHI NUCLEAR ACCIDENT OF 2011

4.5.1 EVENT REPRESENTATION

The earthquake of March 11 led to the loss of external power supplies to the Fukushima Daiichi reactor site and when the tsunami hit the site fifty minutes later the internal power supply as well as the heat sink were destroyed. Without the possibility of cooling the reactors and the spent fuel rods experienced a temperature increase. Voluntary depressurization of the operator led to the release of radioactive material in the atmosphere as did onsite fires and release of cooling water contaminated soil and ocean water. Citizens start to spontaneously evacuate their homes. Official evacuation starts with a 2 km radius around the site on March 11 that is enlarged during the day to 20 A 30km voluntary radius is added and later transformed to preparation for evacuation radius.

On Saturday, March 12 at 3:36 pm, a large hydrogen explosion occurred in Reactor no. 1. On Monday, March 14 at 11:01 a.m., a second explosion damaged reactor no. 3. Eleven people were injured. On Tuesday, March 15 at 6:10 a.m., a third explosion, this time at reactor 2 heavily damages the building of reactor No. 4. From this point on, massive release of radioactive material occurs.

The storage pols for fuel rods become also overheated over these days, which leads to fires that also provokes the release of radioactive material.

On march 15, all but 50 workers will be evacuated, but the number increases to up to 1000 workers until march 23. Until the end of march electricity is reestablished and the cooling system runs again. Inhabitants returned to their homes over the following years after large-scale decontamination efforts. Some zones are still uninhabited.

4.5.2 MAPPING OF SOCIETAL ACTORS

The Fukushima Daiichi industrial accident is situated on a regional scale with national implications in the sense that it lead to large scale evacuations around the nuclear site but it also led to decisions to self-evacuate in faraway regions of Japan linked to fears of radiation. As in the case of the Swedish wildfires and in the case of the Tōhoku coast tsunami, this scale makes it not feasible to do an exhaustive actors mapping. A comparison between a community in the voluntary and a community in a mandatory evacuation zone makes it however possible to map the way citizens cope with the accident in a representative way. Literature stresses the importance of voluntary evacuation during the first days after the accident influenced by demographics or professional socializations (Sato et al. 2015, Morita et al. 2018, Do 2019). An expert interview with a Japanese physicist and voluntary expert after accident confirmed this entry. This expert was consulting on evacuation decision of citizens.

The **analysis of self-organized evacuation efforts and the solidarity networks connected to relocation** of disaster victims is the main contribution of this case study. It also includes emergent organizations that gave psychological and logistical support during this crisis.

4.5.3 COPING ACTIONS

Coping actions in two communities that underwent voluntary and mandatory evacuations as well as solidarity actions in relocation areas are targeted by this case study.

- Citizens that self-evacuate before the official announcement
- Citizens that others to evacuate
- Citizens that provide psychological and logistical aid for those who decide to stay
- Citizens that provide assistance on relocation sites

4.5.4 CONTEXTUAL ASPECTS

Preliminary interviews indicate the following contextual aspects that can structure the preliminary model:

- Being situated in a specific evacuation zone
- Alertness and prior disaster training
- Professional socialization (medical profession self-evacuated earlier, psychologist volunteered)
- Demographics (notably age and gender)
- Membership in solidarity networks

4.6 NEGEV FLASH FLOODS OF 2018

4.6.1 EVENT REPRESENTATION

On April 26, 2018 25 students of the Bnei Zion leadership academy for high school graduates based in Tel Aviv departed for a three-day bonding experience hiking in the Tzafit Wadi in the Negev desert. While hiking in a riverbed with steep slopes, a sudden flash flood, caused by a storm, killed ten teenagers and injured two others.

A large-scale rescue operation including jeeps, boats and helicopter located the 13 survivors and 2 staff members as well as the bodies of the victims. Volunteers as well professionals from police and specialized rescue and recovery organization participated in the day-long search.

Two staff members were subsequently arrested on charges of reckless endangering. Parents, friends and relatives self-organized and sued the Bnei-Zion organization. This trial is still active. The organization itself changed its directorate and underwent reform and counseling process including all of its components.

4.6.2 MAPPING OF SOCIETAL ACTORS

Contrary to the other case studies the event takes place in an unpopulated desert area, so only organized volunteers that were not one of the 25 persons affected by the flood did participate in relief efforts. However, the aftermath of the tragedy with ten dead teenagers mobilized coping efforts on a national level, linked to the nationally renowned organization, Bnei Zion a pre-military academy with links to the defense and education ministries. In absence of academic literature in the incident and based on preliminary expert interviews with psychologist that consulted on this case and media reports, the self-organization of both parents, friends and relatives, as well as the efforts of the Bnei Zion organization enables a limited field of actors that could be exhaustively mapped.

This case study provides therefore data on **long term societal resilience** complementary to the other case studies.

4.6.3 COPING ACTIONS

This case study focuses on two types of coping actions:

- Citizens that were part of the search and rescue operations in the Tzafit Wadi.
- Survivors, victim families, relatives and friends that self-organized for grief counseling and legal action (the direct access to the survivors and victims' families takes only place after advice and approval of our consulting psychologists. A focus on a larger with less directly affected individuals remains an alternative).
- Citizens that assisted in reorganizing the Bnei Zion organization for coping with the event.

4.6.4 CONTEXTUAL ASPECTS

The following contextual aspects appear in preliminary interviews and reports of the case study.

- Local knowledge and proximity for the volunteers that participated in search and rescue operations
- Membership in the Bnei Zion larger social group including alumni, family of alumni, military and authorities
- Social values associated with the Bnei Zion social project.

4.7 THALYS TRAIN ATTACK OF 2015

4.7.1 EVENT REPRESENTATION

On Friday 21 August 2015, a 26-year-old, armed with a Kalashnikov assault rifle boarded the high-speed train Thalys from Amsterdam to Paris in Brussels. On the French territory, the individual exits the train's toilet when he is attacked by a French 28-year-old passenger who tries to disarm him. A 51-year-old French-American assists him and takes possession of the assault weapon. The attacker manages to use another weapon, a pistol and shoots the French-American in the back. He manages to retrieve the rifle and enters the next wagon. While opening fire, his weapon malfunctions. Two American passenger overwhelm the attacker assisted by two other passengers and a train driver.

One of the passengers is wounded by a knife. After fixing the attacker to the ground, he tries to get into contact with the train crew that locked itself in the engine. The train is diverted to the French city of Arras where police gets hold of the attacker and the train and all luggage is searched.

4.7.2 MAPPING OF SOCIETAL ACTORS

The very localized incident makes it possible to make an exhaustive actor mapping of all citizen who spontaneously intervened in the situation. So far, the numerous media reports of the incident and the reports of the trial against the attacker were the basis of the preliminary analysis. Conducting interviews with the actors makes it also possible to analyze how they coped with the event during the last five years. Interviewing the train staff will provide us with further insights in determining to what extent contingency planning and individual initiative contributed to the incident. The case is particularly interesting, because it is both a failed attempt of a terrorist attack, but it also shows the ambivalence of the notion of resilience, revealing the capacity to overcome a crisis situation only once a certain number of actions have proven successful. This case helps a to further our analysis on **the contingency of crisis situations**.

The malfunctioning of the attacker's weapons are is for instance a contributing factor to the failure of the attack. Without it, a successful attack might have taken place even though, citizen intervened. This stresses the importance of relying on representation of events and not only on behavior, since what is "bouncing back" is also determined by what society believes it is.

4.7.3 COPING ACTIONS

The case makes it possible to focus on two types of actions:

- The attack on the assailant to impeach him to open fire
- The self-organization of the train personal

4.7.4 CONTEXTUAL ASPECTS

From the official reports, media coverage and court document several contextual aspects arise enabling passenger's actions:

- Professional socialisation (military training as well as being part of the train crew for the driver)
- Social values (heroism)
- Gender

4.8 COVID-19 CRISIS

4.8.1 MAPPING OF SOCIETAL ACTORS

The COVID-19 case study is still at a preliminary stage while the crisis is ongoing. First academic analysis and preliminary data on **online support groups indicate the importance of self-organized solidarity networks using social media tools** to overcome the limitations of lockdowns (Spear, Erdi, Parker, Anastasiadis, 2020, Trautwein 2020, Cano-Hila, Argemí-Baldich 2020, Carlsen, Toubøl, Brincker 2021). Social media and messenger groups that organize along city areas or buildings have been observed and interviews with founding and active members of those groups are planned to understand the contextual factors that enable citizens to participate and to organize those groups.

4.8.2 COPING ACTIONS

Preliminary targets for the Covid-19 case study are following actions:

- Citizens that self-organize to take care of elder citizens during lockdown by using social media tools
- Citizens that transport patients to medical services.
- Citizens that organize diversion online during lockdown.

4.8.3 CONTEXTUAL ASPECTS

Preliminary contextual aspects of the pandemic that are interesting for the project are the following:

- Proximity while being unable to directly communicate or interact
- Membership to a neighbourhood or to a building
- Social values (duty, solidarity)
- Constructive mistrust of authorities

5 DISCUSSION

5.1 SYNTHESISING CONTEXTUAL ASPECTS

The different case studies point to some common characteristics that are underrepresented in current models of resilience that are interested in social actors. As argued before they show the necessity to rely on actor's accounts of what happened during a crisis and what helped them and their community to overcome it. It also shows contextual aspects that motivate and enable citizen to act. That their action has to make sense to them and that they are rooted in complex social contexts is the premise of this model.

The following recurring contextual aspects appear in the different case studies:

5.1.1 SPATIAL AND TEMPORAL PROXIMITY

As several case studies have shown, citizens that are close in space and time to a disaster event can act on it. This is not self-evident for several reasons. Proximity is not mere physical proximity, it has to be visible and tangible to the actor to be able to act on it. A citizen could be next to an evacuation center in need of help. If he or she is not aware of this proximity or do not feel close to it, they won't act.

Proximity can also be understood as **access to a certain zone** that can vary depending on the role or status of an individual. The Utøya case study shows for instance that citizens could operate in zones that were considered too dangerous for professional rescue personal. Proximity can also mean to share a common confinement like in the case of the relocation camps in L'Aquila shows.

Finally, **situated knowledge, skills and resources** mediate the relationship between proximity and coping actions. Rather than acting in general, coping happens in a specific time at a specific place. Being close to an island translates into being a potential boat owner and navigations skills as it was the case for citizen's that assisted victims near Utøya. Being tourist guide in the Negev desert makes it possible to volunteer for a research and rescue operation, because it entails detailed knowledge of the surroundings and a professional obligation to assure the wellbeing of hikers. Evacuating spontaneously a disaster zone enables assistance to others in accordance with regionally specific evacuation priorities as the Fukushima Daiichi case shows. Or standing next to a train toilet while a gun is audibly loaded, makes it possible to prevent a terrorist attack as in the case of the Thalys train attack when it is based on military training and an obligation to act against hostiles. Even coping actions that operate from far via social media rely on a bond to a place affected by disaster.

5.1.2 SOCIAL BONDS

Attachment and involvement with a specific group based on collective sense-making of events appears as contextual aspect in all eight cases studies. Be it as a specific group membership as a student, activist, citizen of a city or a member of a voluntary organization. It is not only the amount and density of social capital, but **a specific set of values that are associated with social bonds that make people act to help themselves or their community** to bounce back. The emotional attachment to a neighborhood in online lockdown support groups during the Covid-19 pandemic or being part of the Bnei Zion organization as in the case of the coping process after the Negev flash floods motivates actors to enhance the resilience of their social group.

Notably emergent organizations arise in the case studies out of feeling to belong to a group. The shared life of the camping site let citizens in the case of the Utøya attack to organize themselves to rescue and assist survivors. Collective sense-making of a disaster situation, for instance the fact that civil protection regulations were experienced as bureaucratic and oppressive in the case of the L'Aquila earthquake lead to the self-organization of action committees. A strong professional sense

of duty enabled the Fukushima Fifty, the nuclear worker that remained on the nuclear site to volunteer for staying.

The way in which social bonds are activated in disaster is however difficult to anticipate, since strong social bonds like family ties may not be relevant in a situation where this family is absent like the L'Aquila camp self-organizations show. The fact of sharing specific political ideals impacted self-organization more.

5.1.3 TRUST IN FORMAL ARRANGEMENTS

Whereas trust in authorities is a central element in several resilience approaches, it is often understood as a contributing factor to resilience of a community. Several of our case studies show that **mistrust can be a contextual aspect** contributing to societal resilience as well. The Toholu tsunami case studies show for example how strong trust in official evacuation centers may not be justified which can lead to poor preparation of evacuation efforts. The Swedish wildfires showed for instance that trust in existing official volunteers lead to a late mobilization of new volunteer groups.

This constructive mistrust allows for parallel and complementary informal disaster management. Too much trust can in that sense lead to a passive reaction to crisis. Trust in formal arrangements is at the same time present when citizens declare their professional skill for participating in official disaster management as it is documented for several case studies. Specific social roles need in that sense trust in disaster management for being activated. Thus, we can say that trust in formal arrangements is dynamic and context-dependent in its relationship with societal resilience.

5.1.4 LEVEL OF ALERT AND PREPAREDNESS

Another contextual aspect that is very present in the case studies is the level of alertness and preparedness of citizens. **By alertness we understand the combination of situational awareness and the willingness to act**. Especially, the Utøya and the Thalys case study show citizens that were alert, possibly due to their professional socialization, when others were not.

*Individual and collective preparedness can affect alertness, when individuals remember emergency training like in the case of the kindergarten teacher during the Utøya attack who remembered and activated her rescue skills while helping victims to swim ashore.

Early evacuations of individuals from medical professions and of women with children as is documented for the Fukushima Daiichi nuclear accident, shows as well how gender roles and professional roles enable coping actions by creating a state of alertness. This contextual aspect can be targeted to improve societal resilience, since it is possible to enhance it.

5.1.5 GENDER

Gendered roles and sense-making of a crisis appears as a contextual aspect in several case studies. It explains the motivation of the ex-soldiers attacking the assailant during the Thalys train attack and explains logistical supply chains during the Tohoku tsunami.

The use of male dominated bars to share information on the L'Aquila show for instance as well how this contextual aspect can be inhibiting. Gendered division of labor can in that sense dis-encourage men to engage in care activities or exclude women from high-risk activities.

Informal psychological care is for instance mostly provided by women in various case studies, whereas boats in the Utøya case study are conducted by men.

5.1.6 MATERIAL CONDITIONS

A dimension that is not yet sufficiently present in contextual aspects are material conditions. The availability of resources and the access to preparation training for vulnerable groups appear less in interviews and are less highlighted by the literature in our case study.

Nevertheless, references to **socio-economic status** and successful coping mechanism are visible. From boat and car ownership in the Utøya case study to the capacity to provide housing in the L'Aquila case study or have free time to volunteer because of well-paying and dematerialized labor during lockdown, access to resources are decisive for creating societal resilience.

Critical infrastructures often at the center of resilience approaches would appear as material conditions. They can also be specifically targeted by disaster tools, policies and models.

This dimension is less mentioned in the interviews, since the selection bias for the interviews, individual that self-organized in emergent groups may already exclude marginalized social groups.

A particular attention needs to be given to this contextual aspect for developing the projet's model for assessing societal resilience.

5.1.7 CULTURAL CONDITIONS

Cultural values and membership to certain cultural groups is a final contextual aspect that appears in the preliminary data. Be it the specific culture of a camping site next to Utøya island that structured rescue operations or the local culture of rural villages around L'Aquila that made it possible to spontaneously create a cultural organization after the earthquake, the aforementioned social bond manifest themselves through cultural identities.

This is also visible in the Swedish wildfires case study, where the specific culture of sparsely populated rural villages made productive interactions between firefighters and volunteers possible. The case of the Tohoku tsunami shows how belonging to certain regions determines evacuation practices.

5.2 TOWARDS A MODEL OF SOCIETAL RESILIENCE

The following figure (2) illustrates a first cornerstone of the preliminary model, a model of coping actions. A horizontal axis indicates the time before and after a disruptive event takes place. A vertical axis represents the degree of formalization of actions. By formalization we refer to planned actions that use preconstructed tools or refer to predefined roles (like the role of a trained volunteer) in disaster management. The line graphs represent individual or collective coping actions. They take the form of curves when, since they can interact and align with formal disaster management over a given moment after having emerged spontaneously. They can also rely on preparations that took place before the disaster event.
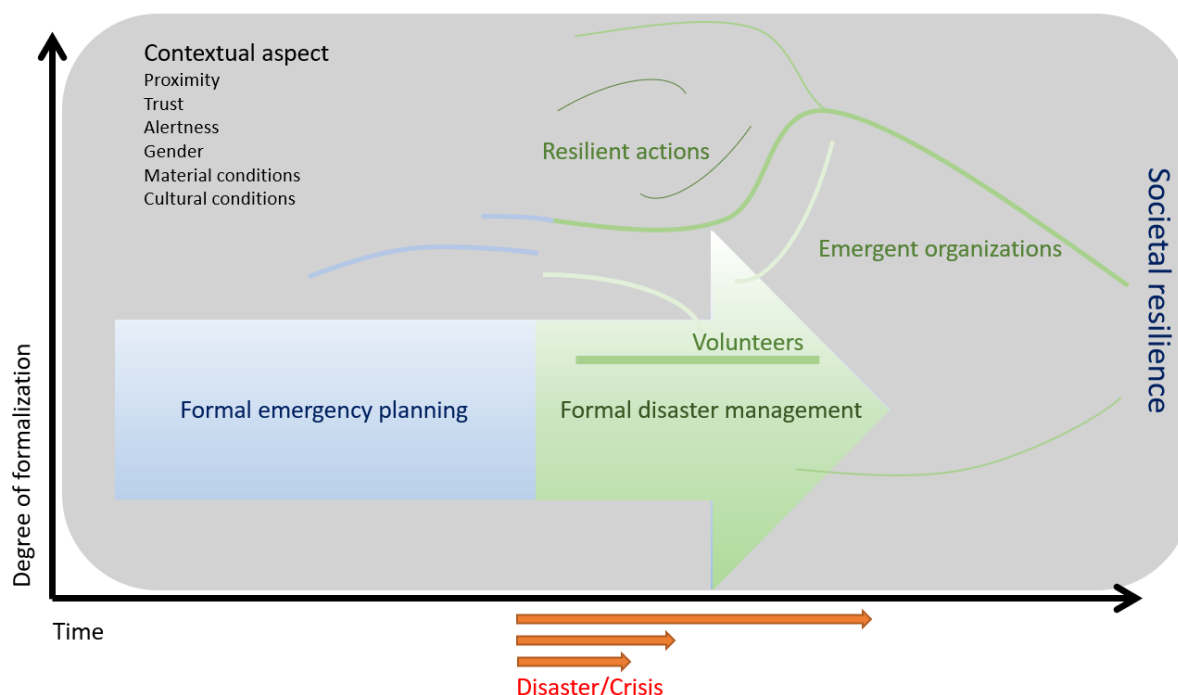
Figure 2. A visualization of coping actions

Coping actions and formal disaster management take place in a larger social context. Modelling those coping actions allows us to identify the elements of this social context that are relevant for enabling actions in different cases.

Figure 3 shows in a second step how these contextual aspects of societal resilience can be further modelized. They are first situated on a continuum ranging from contextual aspect that can and should not be targeted for enhancing societal resilience to target aspects that can be influenced by the type of solutions ENGAGE wants to propose.

A typical example of a contextual aspect that cannot directly be influenced would be general trust in authorities and first responders. However, the way that trust is created in interacting with first responders can to a certain extend be modified, even though it is rooted back in general conception of trustworthiness. Risk awareness and preparedness can as well be targeted, but the socio-economic resources they depend on are out of reach for the solutions ENGAGE intents to produce. This continuum also allows us to differentiate between group memberships that are mostly permanent like being in a specific religious group and those that are more contingent referring to a group that become relevant in a disaster situation. The Utvika camping site would be an example for the later.

These aspects are also situated on a second continuum measuring the level of genericity. This enables us to distinguish between aspect that are rooted in the structure of society from those that are enacted in a given crisis situation. Whereas gender assigns for instance specific roles to citizens in a crisis, the way these roles are enacted in a given situation may differ considerably. Awareness of certain risks does not necessarily translate into situational awareness.

The position of each aspect depends on the specific case that is modelized. Thus, this preliminary model enables us to assess the conditions of societal resilience and compare the different case studies without losing the specific characteristics of each case.
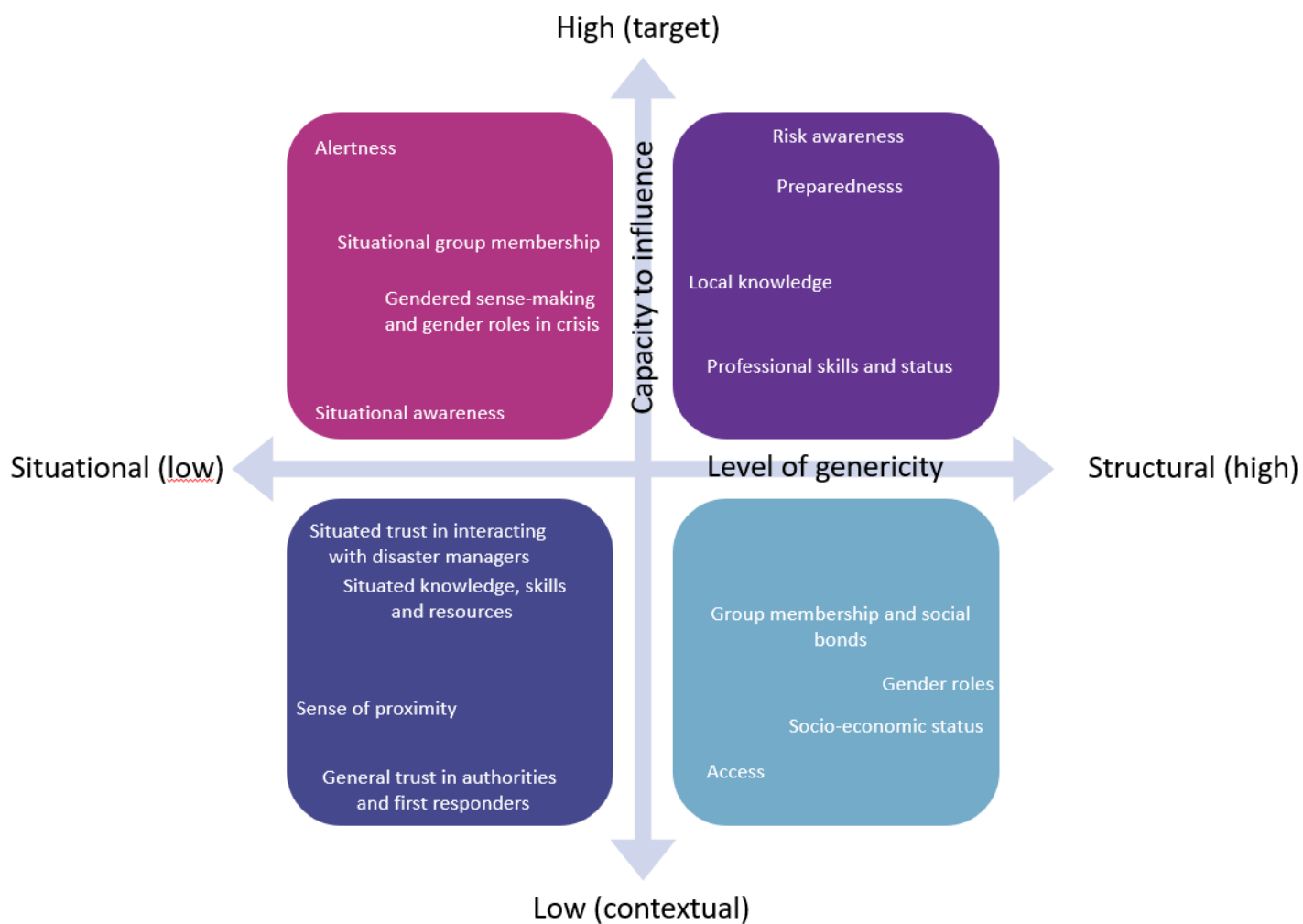
Figure 3. A preliminary model for assessing societal resilience

6 CONCLUSION AND LIMITATIONS OF THIS APPROACH

The preliminary model presented in this deliverable does not pretend to be a general standardized model that can be applied to determine or measure the degree of societal resilience. Neither do the case studies analysed here provide sufficient representative and robust data to inform such a model, nor would this be in line with the theoretical arguments mobilized below. Contextual aspects are by definition context-dependent and can only be standardized by reducing complexity to a degree that would not allow a context sensate approach.

The main purpose of this preliminary model is therefore also its main limit. It can show how a certain number of contextual aspects mattered in specific case studies for showing how specific values and specific situational arrangements mattered. This is in line with its function inside the ENGAGE project, most notably distinguishing contextual from target aspect by showing what can be modified, but also what should not. Several of the case studies show that spontaneous reactions of citizens cannot always be absorbed by formal disaster management or those reaction would lose their capacity to improve society.

A second limitation is its preliminary character. The model is based on heterogenous data varying from case to case, but also remaining very imitated for the most advanced case study. It will be revised and refined and maybe even partly invalidated by further data collection and analysis.

This preliminary model identifies seven main groups of contextual aspects, spatial and temporal proximity, social bonds and group membership, trust and mistrust in formal disaster management, level of alert and preparedness, gendered roles and identities in crisis situations, material conditions and socio-economic status and cultural conditions, values and bonds. It highlights that coping actions should be distinguished between their degree of formalization and their degree of organization in time. Figure 2 presents a possible visualization of this model.

The combination of those elements allows to clarify the impact of contextual aspect and distinguish target aspect in a second step. Target aspects are in this model contextual that can be modified and whose modification does not result in a decrease of spontaneous coping with a crisis. This model can in that sense inform the further discussion inside the project and providing orientation for identifying solution for enhancing societal resilience.

7 REFERENCES

- Adger WN (2000). "Social and ecological resilience: are they related?" *Progress in Human Geography* 24(3):347-364.

- Aldrich DP, Meyer MA. (2015). "Social Capital and Community Resilience". *American Behavioral Scientist* 59(2): 254-269.

- Alexander, D. (2013). "An evaluation of medium-term recovery processes after the 6 April 2009 earthquake in L'Aquila, Central Italy". *Environmental Hazards* 12(1): 60-73,

- Aradau, C. (2014) "The promise of security: resilience, surprise and epistemic politics". *Resilience* 2(2).

- Berkes, F. and Ross, H. (2013). "Community Resilience: Toward an Integrated Approach". *Society and Natural Resources* 5: 35-45.

- Bock, J.-J. (2017). The second earthquake: how the Italian state generated hope and uncertainty in post-disaster L'Aquila. *Journal of the Royal Anthropological Institute* 23: 61-80.

- Bodin, Ö., Nohrstedt, D., Baird, J. et al. (2019). Working at the "speed of trust": pre-existing and emerging social ties in wildfire responder networks in Sweden and Canada. *Regional Environmental Change* 19: 2353–2364.

- Brand, F. S., and K. Jax (2007). "Focusing the meaning(s) of resilience: resilience as a descriptive concept and a boundary object". *Ecology and Society* 12(1): 23.

- Braun, B. and Assheuer, T. (2011). "Floods in Megacity Environments: Vulnerability and coping strategies of slum dwellers in Dhaka/Bangladesh". *Natural Hazards* 58: 771– 87.

- Buckle, P. (2006) "Assessing social resilience". In: Paton D, Johnston D (eds) *Disaster resilience*. Charles Thomas, Springfield, pp 88–104.

- Cano-Hila, AB, Argemí-Baldich R. (2020). Taking Care of Us from the Neighborhoods in Times of Quarantine. Citizen Solidarity Practices in Vallcarca, Barcelona (Spain). *Space and Culture*. 23(3): 237-245.

- Carlsen H. B., Toubøl, J., Brincker, B. (2021). "On solidarity and volunteering during the COVID-19 crisis in Denmark: the impact of social networks and social media groups on the distribution of support". *European Societies* 23.

- Carpenter, S., Walker, B., Anderies, J. and Abel, N. (2001). "From Metaphor to Measurement: Resilience of What To What?" *Ecosystems*. 4: 765-781.

- Ciccaglione, R. (2019). "Resilience and resisting resilience: ethnographies in neoliberal L'Aquila post-earthquake". *Disaster Prevention and Management* 28(4): 501-512.

- Copeland, S., Tina Comes, T., Bach, S., Nagenborg, M. H., Schulte, Y., and Doorn, N. (2020). "Measuring social resilience: Trade-offs, challenges and opportunities for indicator models in transforming societies". *International journal of disaster risk reduction*, 51.

- Do, X. B. (2019), Fukushima Nuclear Disaster displacement: How far people moved and determinants of evacuation destinations". International Journal of Disaster Risk Reduction 33: 235-252.

- Dunn Cavelty, M., Kaufmann and M., Søby Kristensen, K. (2015). "Resilience and (in)security: Practices, subjects, temporalities". *Security Dialogue* 46(1): 3-1.

- Eckerberg, K., Buizer, M. (2017), "Promises and dilemmas in forest fire management decision-making: Exploring conditions for community engagement in Australia and Sweden". *Forest Policy and Economics* 80: 133-140.

- Fois, F., Forino, G. (2014). "The self-built ecovillage in L'Aquila, Italy: community resilience as a grassroots response to environmental shock". *Disasters* 38: 719-739.

- Forino, G. (2015) "Disaster recovery: narrating the resilience process in the reconstruction of L'Aquila (Italy)". *Geografisk Tidsskrift-Danish Journal of Geography* 115(1): 1-13.

- Haavik, K. (2020). "Societal resilience – Clarifying the concept and upscaling the scope", *Safety Science* 132.

- Holling, C. (1973). "Resilience and Stability of Ecological Systems". *Annual Review of Ecology and Systematics* 4(1): 1-23.

- Ireni-Saban L. (2013). "Challenging Disaster Administration: Toward Community-Based Disaster Resilience". *Administration & Society*. 45(6):651-673.

- Keck, M. and Sakdapolrak, P. (2013). "What Is Social Resilience? Lessons Learned and Ways Forward". *Erdkunde*. 67: 5-18.

- Klein R., Nicholls R. and Thomalla, F. (2003), "Resilience to natural hazards: How useful is thisconcept?" *Environmental Hazards* 5: 35-45.

- Kwok, A., Doyle, E., Becker, J., Johnston, D. and Paton, D. (2016). "What is 'social resilience'? Perspectives of disaster researchers, emergency management practitioners, and policymakers in New Zealand". *International Journal of Disaster Risk Reduction* 19: 197-211.

- Lidskog, Rolf. 2018. "Invented Communities and Social Vulnerability: The Local Post-Disaster Dynamics of Extreme Environmental Events". *Sustainability* 10(12): 44-57.

- Lund Petersen, K. and Villumsen Berling, T. (2020), "Designing resilience for security in the Nordic region. Implications for strategy". In, Larsson, S. and Rhinard, M. *Nordic Societal Security. Convergence and Divergence*, London, Routledge: 131-153.

- Mayunga, J. (2007). Understanding and applying the concept of community disaster resilience: A capital-based approach. Summer Academy for Social Vulnerability and Resilience Building. 1-16.

- Maclean, K., Cuthill, M. and Ross, H. (2014). "Six attributes of social resilience". *Journal of Environmental Planning and Management* 57(1): 144-156.

- Morita T, Nomura S, Furutani T, Leppold C, Tsubokura M, Ozaki A, et al. (2018). "Demographic transition and factors associated with remaining in place after the 2011 Fukushima nuclear disaster and related evacuation orders". *PLoS ONE* 13(3).

- Müller-Mahn, D. and Cannon, T. (2010): "Vulnerability, resilience and development discourses in context of climate change". *Natural Hazards* 55(3): 621-635.

- Murphy, M. (2020). Crisis Response Volunteer Processes and Digitalisation: A Case Study in the Aftermath of Swedish Forest Fires Year 2018. Linköping University.

- Nakaya, N., Nemoto, H., Yi, C., Sato, A., Shingu, K. et al. (2018). "Effect of tsunami drill experience on evacuation behavior after the onset of the Great East Japan Earthquake". *International Journal of Disaster Risk Reduction* 28: 206-213.

- Okada, A. (2012). "East Japan Earthquake and Tsunami: Evacuation, Communication, Education, Volunteerism", *Journal of Comparative Policy Analysis: Research and Practice* 14(4): 371-372.

- Olsson, L., Jerneck, A., Thorén, H., Persson, J. and O'Byrne, D. (2015). "Why resilience is unappealing to social science: Theoretical and empirical investigations of the scientific use of resilience". *Science Advances* 1(4).

- Paton, D. (2019). "Disaster risk reduction: Psychological perspectives on preparedness". *Australian journal of psychology* 71(4): 327-341.

- Paton, D. (2013). "Disaster Resilient Communities: Developing and testing an all-hazards theory". *Journal of Integrated Disaster Risk Management* 3: 1-17.

- Paton, D. (2003). "Disaster Preparedness: A Social-Cognitive Perspective". *Disaster Prevention and Management* 12(3): 210-216.

The research leading to these results has received funding from Horizon 2020, the European Union's Framework Programme for Research and Innovation (H2020/2014-2020) under grant agreement n° 882850.

53 of 58

- Paton, D and Johnston, D. (2006). *Disaster resilience: An integrated approach*. Springfield, Charles C. Thomas.

- Patel, S., Rogers, B., Amlôt, R. and Rubin, G. (2017). "What Do We Mean by 'Community Resilience'? A Systematic Literature Review of How It Is Defined in the Literature". *PLoS Currents*. 9.

- Reuter, C. and Spielhofer, T. (2017). "Towards social resilience: A quantitative and qualitative survey on citizens' perception of social media in emergencies in Europe". *Technological Forecasting and Social Change* 121: 168-180.

- Rimstad, R., Njå, O., Rake, E.L. and Braut, G.S. (2014). "Incident Command and Information Flows". *Journal of Contingencies & Crisis Management* 22: 29-38.

- Saja A., Teo, M., Ashantha, G., Zivath, A. (2018). "An inclusive and adaptive framework for measuring social resilience to disasters". *International Journal of Disaster Risk Reduction* 28: 862-873.

- Sato Y, Hayashida N, Orita M, Urata H, Shinkawa T, Fukushima Y, et al. (2015). "Factors Associated with Nurses' Intention to Leave Their Jobs after the Fukushima Daiichi Nuclear Power Plant Accident". *PLoS ONE* 10(3).

- Shaw, R. Takeuchi, Y. (2012). East Japan Earthquake and Tsunami: Evacuation, Communication, Education and Volunteerism. Research Publishing Services, Singapore.

- Sollid, S.J., Rimstad, R., Rehn, M. et al. (2012) "Oslo government district bombing and Utøya island shooting July 22, 2011: The immediate prehospital emergency medical service response". *Scandinavian Journal of Trauma Resuscitation and Emergency Medicine* 20(3).

- Sommer, M., Njå, O., Lussand, K. (2017). "Police officers' learning in relation to emergency management: A case study". *International Journal of Disaster Risk Reduction* 21: 70-84.

- Spear, R., Erdi, G., Parker, M., Anastasiadis, M. (2020). "Innovations in Citizen Response to Crises: Volunteerism & Social Mobilization During COVID-19". *Interface. A Journal for and about social movements* 12 (1): 383-391.

- Sugiura, M., Sato, S., Nouchi, R., Honda, A. et al. (2019). "Psychological Processes and Personality Factors for an Appropriate Tsunami Evacuation" *Geosciences* 9(8): 326.

- Sun, Y., Sun, J. (2020). "Self-assessment of tsunami evacuation logistics: Importance of time and earthquake experience". *Transportation Research Part D: Transport and Environment* 87.

- Sun, Y., Sun, J. (2019). "Perception, preparedness, and response to tsunami risks in an aging society: Evidence from Japan". *Safety Science* 118: 466-474.

- Trautwein S, Liberatore F, Lindenmeier J, von Schnurbein G. (2020). „Satisfaction With Informal Volunteering During the COVID-19 Crisis: An Empirical Study Considering a Swiss Online Volunteering Platform". *Nonprofit and Voluntary Sector Quarterly* 49(6):1142-1151.

- Twigg J, Mosel I. (2017). "Emergent groups and spontaneous volunteers in urban disaster response". *Environment and Urbanization* 29(2):443-458.

- Walker, B., Carpenter, S., Anderies, J., Abel, N., Cumming, G., Janssen, M., Lebel, L., Norberg, J., Peterson, G and Pritchard, R. (2002). "Resilience Management in Social-Ecological Systems: A Working Hypothesis for a Participatory Approach". *Conservation Ecology* 6.

- Walker, J. and Cooper, M. (2011). "Genealogies of Resilience: From Systems Ecology to the Political Economy of Crisis Adaptation". *Security Dialogue* 42: 143-160.

- Yamori K. (2014). "Revisiting the Concept of Tsunami Tendenko: Tsunami Evacuation Behavior in the Great East Japan Earthquake". In: Kawase H. (eds) *Studies on the 2011 Off the Pacific Coast of Tohoku Earthquake. Natural Disaster Science and Mitigation Engineering: DPRI reports*. Springer, Tokyo.

8 APPENDIX

WP1 Interview guidelines

8.1 TASK 1.1 PRELIMINARY MODEL FOR ASSESSING AND METHODS FOR IMPROVING SOCIETAL RESILIENCE

The task will survey the aspects that provided societal resilience in seven case studies, by means of document studies, focus groups and interviews.

8.1.1 SEMI-STRUCTURED INTERVIEWS AND FOCUS GROUPS

This section will outline

- Proposed general guidelines
- Proposed interview and focus group questions

1. General guidelines

Interviews and focus groups for T1.1 are based on a guideline document detailing the topics on which questions will be based. The topics and the general procedures are clearly explained to respondents before the interview starts.

A consent form, signed by respondents explains the objective of the interview, it states its topics and details data protection measures. ENGAGE's interest for resilience in crisis situations can compromise the physical safety of participants who are trauma victims, both in the case of citizens and first responders.

The interviewer should be aware of issues involving respondent's safety when undertaking an interview. Thus, risks for respondent's health are made explicit before the interview starts. A secure and confidential interview setting will be provided. Respondents can end or interrupt the interview at any time. The interview can be conducted with support persons of the respondent. Interviews may also be conducted through online platforms.

In particular, the in-depth nature of semi-structured interviews and the interactive dynamic of focus groups can lead to exposure of personal data not relevant to the ENGAGE project.

A part of data protection measures, which are detailed in another document, respondents should normally not be named during the interview situation and personal information of third parties should neither be mentioned by the interviewer.

2. Interview and focus group questions

(These questions provide a general guideline which is adapted *in situ* to the information provided by respondents.)

Opening questions	Objective	Rationale
1. What happened during the event?	Understanding the way social bonds are enacted in a crisis situation to enable societal resilience.	The opening question has the objective to immerse respondents in the crisis event. Respondents should highlight both chains of resilient action (1) as the constitution and enactment of social networks as well as the construction of meaning of the event itself (2) as discourses on the value attributed to objects, practices and communities.
2. What were your reactions and what made them possible at this moment?	This second question invites respondents to think of the condition of their resilient actions.	Answers could enable a deeper understanding of contextual aspects of societal resilience (1). Hints to community bonds, social-economic positions, gender roles and identity as well as cultural conditions could appear in the respondent's narratives. The self-reflective component of the question gives respondents the opportunity to make tacit knowledge and resources explicit (2).

Follow-up questions	Objective	Rationale
3. How did you know what to do/where to find/who to ask in this given moment? Who did you approach?	Respondents are invited to reflect on decision making processes.	At this point of the interview the objective is to delve further into the topic of societal resilience by connecting the enabling contextual aspect of resilience (1) to needs (2).
4. What interactions did you have during the crisis?	Respondents are asked to narrate networks and chains of interactions	This second follow-up questions points more explicit in the direction of needs for societal resilience (1). It allows also to speak about possible interactions with first responders (2) and authorities (3)
5. Where did you get the information/the resources you needed?	This third follow-up questions is interested in information sources (1) and solidarity actions (2). Again the role of grassroot networks could appear.	This questions enables a dialogue on communication and resources.
6. What problems appeared in the crisis situation?	Respondents could speak about expectations also focus on limitations in interacting with others	At this point of the interview the objective is focus on expectations (1), failed interactions (2) or missing information (3).

Key question	Objective	Rationale
7. How did your community help you to withstand the crisis?	This question focuses directly on societal resilience.	•The question invites respondents to define their community (1), to make their individual bonds to it explicit (2), and to reflect on what makes them resilient during the crisis (3).

Exit question	Objective	Rationale
8. What would you do different in your community in times of crisis? What should be done differently?	This question enables a normative answer to improve disaster management for a specific community.	The question lets respondents speak again about their community (1) and its values (2) and develop a last reflection on needs (3) and expectations (4).