



## **D1.2: FINAL REPORT OF THE UNIFIED THEORETICAL FRAMEWORK ON THE CONCEPTS OF RISK AWARENESS, SOCIAL CAPITAL, VULNERABILITY, RESILIENCE AND THEIR INTERDEPENDENCIES**

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## Executive Summary

The outputs provided by WP1 serve both as a foundation for the following WPs, but also as a direct contribution to the existing knowledge-base on resilience building directed at vulnerable groups. Specifically, D1.2 builds on D1.1 and provides the BuildERS project's theoretical framework of how risk awareness, social capital and vulnerability connect to the overall work of resilience building.

The literature surrounding BuildERS concepts, drawn largely from research on crisis and disaster risk reduction, is vast and contested. As such, this deliverable D1.2 first reviews the literature to ensure BuildERS is building from the state-of-the-art. The second part of this deliverable then models the *specific BuildERS approach* to studying resilience building considering existing insights. We select key definitions and make concrete operationalisations of concepts, and then stipulate how we, as a project, envisage their relationship. After several model building efforts, which were verified and evaluated by outside experts and advisory board members, we settle on the final model for WP1, in Section five of this deliverable.

The effort below is thus the *BuildERS approach* to understanding how to build resilience through greater attention and understanding to the dynamics of risk awareness, social capital, and vulnerability. It both guides the project and can be subsequently evaluated by the work of the project.



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## List of Acronyms

BuildERS Building European Communities Resilience and Social Capital project

D - Deliverable

DRR- Disaster risk reduction

EU-European Union

NGO Non-governmental Organisation

T-Task

UN-United Nations

WP-Work Package





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# 1. Introduction

This document is the second and final report on how the concepts of BuildERS' theoretical framework – resilience, risk awareness, social capital and vulnerability - are connected to the overall work of resilience building of European communities against natural and man-made crises and disasters. It presents: 1) the understanding of these concepts, which is the basis for all BuildERS' activities, taken from the scholarship; 2) BuildERS' understanding of the causal relationships among these concepts; 3) the final model that shows these relationships within the crisis management cycle. This theoretical framework and the model will guide the work in WP3 and WP4 and will be tested in those WPs.

## 1.1. Background

The enhancement of European communities' social capital and resilience, in the face of an increased use of new technologies and media, is one of the most important goals of BuildERS. Supporting societies to prevent, withstand and recover from any crisis or disaster is fundamental in minimizing potential human and material losses. Indeed, societal resilience heavily depends on how citizens behave individually and collectively and how governments and civil society organisations design and implement policies for mitigating risks, preparing for, reacting to, overcoming, and learning from crises and disasters. Increasing resilience can be realised only by taking into account the living situation and needs of those most vulnerable in society, since knowing about what decreases their social capital and risk awareness will allow for measures to improve the overall societal resilience.

The pursuit of resilience building is not only based on technical and administrative solutions, but it should primarily begin by empowering people, groups, communities and societies. Improving our understanding of risks and vulnerabilities, preventing and reducing the likelihood of crises and disasters, strengthening capacity building and risk awareness raising, and improving social capital are the cornerstones of societal resilience and the overall work of resilience building. This is underlined by the Sendai Framework for Disaster Risk Reduction, which states that “there is a need to address existing challenges and prepare for future ones by focusing on monitoring, assessing and understanding disaster risk and sharing such information and on how it is created; strengthening disaster risk governance and coordination across relevant institutions and sectors and the full and meaningful participation of relevant stakeholders at appropriate levels; investing in the economic, social, health, cultural and educational resilience of persons, communities and countries and the environment, as well as through technology and research; and enhancing multi-hazard early warning systems, preparedness, response, recovery, rehabilitation and reconstruction” (UN, 2015: 11).

## 1.2. Aim of the final report on the unified theoretical framework

This report D1.2 accomplishes the following objectives from WP1 (BuildERS, 2019: 13):

“O1.1: to construct our theoretical framework of how risk awareness, social capital and distribution of vulnerability among populations connect to the overall work of resilience building”.

“O1.4: to analyse linkages between risk awareness, social capital and vulnerability, with special reference to implications for disaster risk reduction and resilience”.



In particular, D1.2 fulfils T1.1, which aims to provide the theoretical framework of the BuildERS project by: 1) conducting a literature review on the key concepts applied through the project; 2) studying their interdependencies; 3) designing a conceptual model that presents a synthesis of this framework. The first version of the theoretical framework was submitted in October 2019 as D1.1. This last report contains the full literature review of the concepts in addition to reflections about the interdependencies and an updated version of the model. Finally, the report contains a synthesis of WP1 findings (from T1.1 to T1.4) to fulfil T1.5.

### **1.3. Structure of the report**

After this introductory Section 1, Section 2 summarises the methodologies and methods. Section 3 offers our literature review of the key concepts and BuildERS' definitions of these concepts. Section 4 presents the process that led to the final conceptual model, while Section 5 presents the BuildERS model. Section 6 provides the conclusion in form of academic reflections for further research as well as synthesis of the major findings from WP1. Section 7 lists the references. Appendix A contains an updated version of the Appendix A from D1.1 - list of all the concepts and definitions used throughout the BuildERS project, thus encompassing a wider range of concepts, such as hazard, risk, and emergency management, and their definitions. This Appendix A will be later saved in TEAMS as independent document and constantly enriched of new terms and definitions until the end of the project. Appendix B is a "working tool" for WPs 3 and 4 on how to incorporate the theoretical framework in WP activities.

### **1.4. Relationship to other Deliverables and WPs**

D1.2 and the overall work within WP1 will serve as the basis for the subsequent WPs. The model will be used throughout BuildERS and is constructed to support further and more specific work within the other WPs, in particular deliverables from WPs 3, 4 and 6, within which the theoretical framework and its model will be tested. In addition, the analysis of the relationship between concepts will serve the policy recommendations from WP5. D1.5 – two scientific publications – are based on the content and the results of this report.



## 2. Methodology and methods

D1.2 reviews relevant scientific literature in combination with an iterative simplified Delphi process (Fletcher and Marchildon, 2014). The participants of this last process are the consortium’s contributors for this deliverable, other consortium’s partners, who contributed with their own expertise, the Advisory Board and stakeholders contacted via the on-line platform Howspace.

### 2.1. Research design

The research design was based on stages that fed into each other and over time, in an iterative writing/rewriting process, which generated the content of the report. The stages were: 1) first version of the literature study, which contributed to the development of the model and submission of D1.1 (October 2019), which contains the draft model; 2) continuation of the literature study and iterative writing; 3) on-line and physical validation workshops and simplified Delphi process, also using the on-line platform Howspace. The phases are visualised in the figure below.

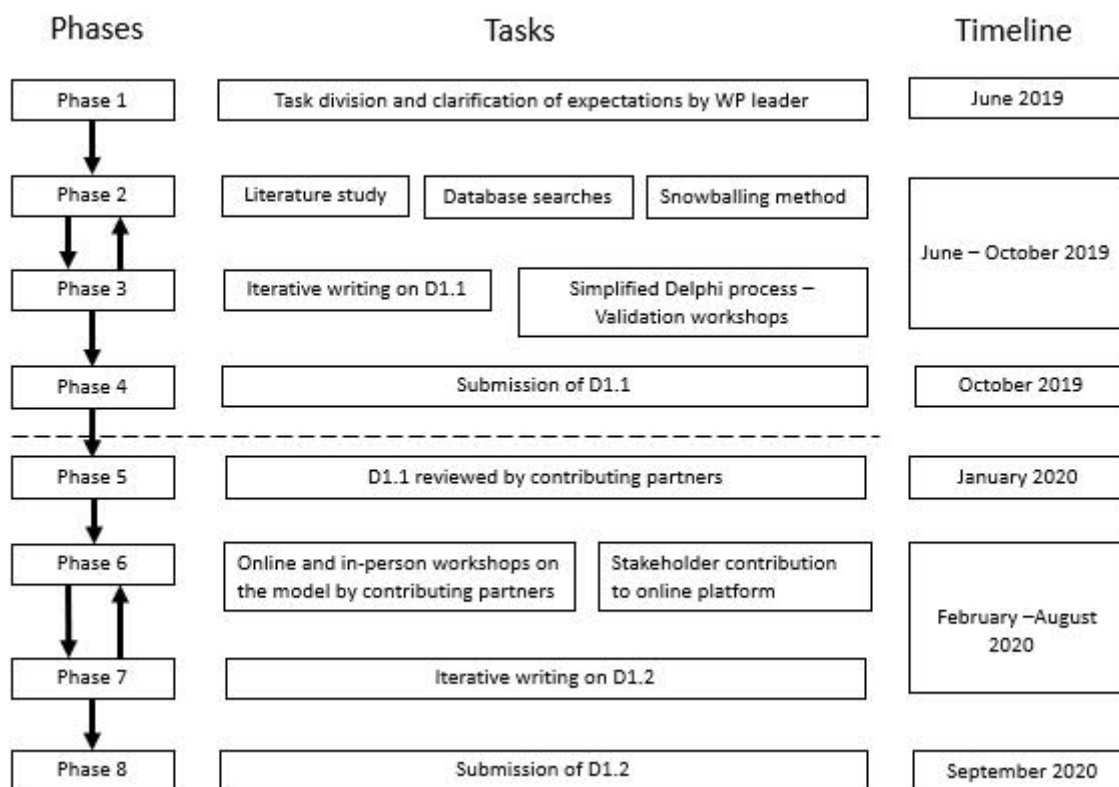


Figure 1 Research design showing the connection between D1.1 and D1.2

### 2.2. Scoping study

Scoping studies combine elements from both integrative and interpretive reviews, formal database searches as well as the snowballing method. Integrative reviews consist of the combination of large sets of data and meta-analysis and involve induction and interpretation to form a synthesis of



theoretical contributions. In contrast, the goal of the interpretive review is the development of concepts and theory (Dixon-Woods et al., 2005). Scoping studies, while often considered as a way of attaining a preliminary overview of a scientific field to verify whether a systematic review should be performed, can also be a research strategy in its own right (Arksey and O'Malley, 2005), as is the case of D1.2.

In addition to the scholarship on the key concepts, with special attention on publications concerning crisis and disaster risk management and disaster risk reduction, grey literature, such as EU and UN reports, was found by using the snowballing method of literature search (Jalali and Wohlin, 2012). This method is used when the researcher starts out with one central article or book and further pursue references after references using inclusion criteria (Greenhalgh and Peacock, 2005). The strength of this method is obvious when pursuing knowledge in a field with strong ties to other literature producing bodies, such as the government or private sector, or where there is little peer-reviewed literature to be found in the data bases.

The purpose of this scoping study was to identify and analyse theoretical and empirical studies focusing on the relationship between vulnerability, social capital, and resilience within different phases (before, during or after) of man-made or natural crises and disasters. The results of the review are recorded according to the guidelines of the Preferred Reporting Items for Systematic reviews and Meta-Analyses (Moher et al., 2009). Literature concerning the core terms of vulnerability, social capital, resilience and risk perception<sup>1</sup> and risk awareness were identified through several stages of screening using the snowball approach and regular database searches.

The analytical approach to the acquired literature is based on the iterative standard approach of Miles et al. (2014), within which the key concepts of BuildERS have guided our reading and understanding during the iterative writing.

### 2.3. Simplified-Delphi method

Between the phases of iterative writing, the WP leader organised two rounds of validation workshops on the model's development to receive feedback on the draft model and make progress towards its final version. An on-line validation workshop was run via the Howspace platform within which stakeholders from inside and outside the BuildERS' consortium were asked specific questions related to the concepts and the model. The two rounds of workshops were organised as follows:

First round of validation workshops in phase 3 of the research design:

- Review round and on-line workshop with consortium's stakeholders and Advisory Board, October 2019.
- Review round with contributors and internal reviewers for D1.1, October 2019.

Second round of validation workshops in phase 6 of the research design:

- In-person validation workshop during BuildERS' General Assembly in Budapest, February 2020.
- Howspace on-line platform workshop, March 2020.

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<sup>1</sup> We added risk perception as an important concept. For further explanation of the reasons, please see the part about risk awareness. 3.3.



- On-line workshop to review the model with BuildERS' academic contributors and stakeholders, May 2020.
- Review round with contributors and internal reviewers, May 2020.
- First on-line scientific colloquium, June 2020.
- On-line workshop to review the model with BuildERS' stakeholders, June 2020.

## 2.4. Theoretical and methodological challenges

The analytical approach to the literature acquired in the scoping study is based on the iterative standard approach of Miles et al. (2014), using close reading keeping in mind the BuildERS concepts social capital, vulnerability, resilience, risk perception and risk awareness. Our ongoing iterative discussion of these key terms could indicate a certain bias in our reading of the literature. This bias could possibly be due to our choice of search terms and the composition of the consortium's various research traditions and different disciplines. In addition, the second validation workshop that took place in March 2020 was supposed to be more inclusive and invitations to join the Howspace platform were sent to up to 20 stakeholders from each country of the BuildERS consortium. However, the Howspace platform was run during the Covid-19 outbreak and the feedback received was quantitatively limited (10 feedbacks) due to the involvement of potential participants in crisis and emergency management activities.

## 3. BuildERS' building blocks

In this Section, we present BuildERS' key concepts in the following order: vulnerability, social capital, risk awareness, together with risk perception, and resilience. For each concept we conducted a literature review and here we offer a) a general introduction drawing from several disciplines studying the concept, b) how the concept is understood and applied within disaster risk and crisis management, as well as disaster risk reduction studies, c) our reflections about the concept within BuildERS.

The context within which BuildERS ponders these concepts is the crisis management cycle (also called disaster management or emergency management cycle). The crisis management cycle is a process to cope with risk, crises and disasters and mitigate their consequences and consists of the following phases, often overlapping: prevention, mitigation, preparedness, response and recovery.

- Mitigation and prevention: actions taken to prevent the cause, impact, and consequences of disasters
- Preparedness: actions taken to prepare for the management of events that could not be prevented
- Response: the set of activities put in place when the crises or the disaster occur to save lives, reduce impacts and consequences.
- Recovery and learning: the set of activities aimed at restoring, reconstructing and improving the livelihoods of affected populations, communities and groups by implementing disaster risk reduction measures and by learning from the event.

These phases are, in the following model, included in the three basic crisis phases, with prevention and preparedness in the pre-crisis phase, response in the acute crisis phase and recovery and learning in the post-crisis phase.



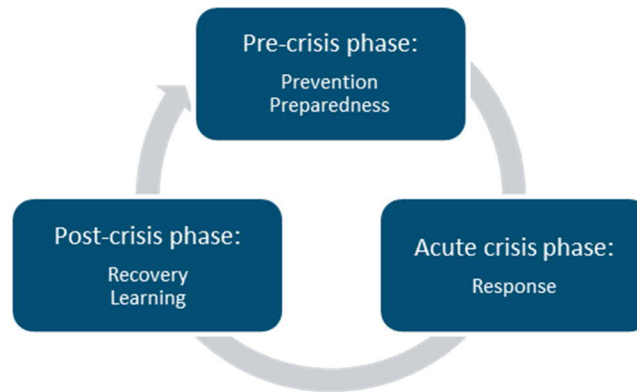


Figure 2 Crisis phases cycle (Kruke, 2012)

## 3.1. Vulnerability

### 3.1.1. Theories and perspectives on vulnerability

The scholarship offers several definitions of the concept of vulnerability according to the disciplines we refer to. The physiological perspective considers the physical state of an individual and whether his/her physical characteristics suffice to cope with negative externalities (Hollander and Wilken, 2015). The cognitive perspective broadly considers vulnerability as the potential for harm and loss of life. Here, vulnerability is studied in terms of individual potential for or sensitivity to harm and of social vulnerability, the susceptibility of social groups to potential losses (Cutter, 1996). The psychological and behavioural perspective considers certain cognitive features that make an individual more susceptible to stress (Sinclair and Wallston, 1999) and thus vulnerable. The sociological perspective tends to put vulnerability in the opposite side of the continuous spectrum where resilience (or invulnerability) lies on the other extreme (see Ntontis, 2019). Here, vulnerability is considered multidimensional, since it can be described as a weakening process accompanied by the lack of resources in (a) one or more life domains (i.e. place of living, work, family, health, migration etc.), (b) levels (i.e. individual, group, community), and (c) time (i.e. long-term process) (Spini et al., 2017). The lack of resources puts individuals at risk of experiencing negative consequences related to (1) the source of stress, (2) an inability to cope effectively with critical events as well as (3) an inability to recover from stress or to take advantage of opportunities by a given deadline (Widemer and Spini, 2017; Spini et al., 2017). Individuals generally do not live in a social vacuum and they usually have networks of family, group, or community. Thus, the individual's vulnerability is influenced by the socio-economic and emotional linkages with relational networks (Spini et al., 2017). Within a group, two phenomena affect individuals coping with stress: through relationships they get support and recognition, and the feeling of belonging to a group has a positive effect on self-esteem and coping efficiency (Spini et al., 2017).

These perspectives show that vulnerability is influenced by interdependent trajectories, as well as by physiological and psychological states, and by the socio-economic structures in which these trajectories are embedded. Interdependent trajectories refer to residence, family, employment, physical and mental health, for instance, and how the different life domains relate to each other,





whether they are interdependent and complementary (resource-supportive domains), adversary (resource-competing domain) or compensative (resource-substitutive) (Spini et al., 2017). In addition, interdependence means that the occurrence of critical events may be specific to one domain of life, but with spillover effects from one domain to another, which produce a negative or positive chain of outcomes on other/several life domains. For example, losing a job can lead to income disruption and/or depression. A weakening of trade unions can deteriorate or destroy a person's position in the labour market (ibidem) thus negatively affecting this person's economic status and/or mental health. As spillovers might spread across various life domains, they are central for the understanding of vulnerability developments (ibidem). Spini et al. (2017) emphasize that events and transitions do not have to be even critical or unexpected to produce spillover effects.

In broad terms, we can distinguish between (a) social, (b) systemic and (c) infrastructural vulnerabilities (NRC, 2006). (a) Social or societal or socio-economic vulnerability, which is the focus of BuildERS, can be understood as a set of intersectional factors that produce socially differentiated negative impacts (Bolin and Kurtz, 2018), since all members of a society have sources of resilience and vulnerability that ultimately serve to pre-figure their exposure to hazards and their ability to prepare or cope with their impacts (Hewitt, 2013). Furthermore, the notion of intersectionality connotes the existence of multiple and overlapping vulnerabilities, meaning that an individual may be rendered vulnerable based on a number of coinciding characteristics, such as simultaneously being elderly, a migrant and disabled.<sup>2</sup> (b) Systemic and (c) infrastructural vulnerability refers to organizational or institutional systems as well as societies' critical infrastructures and essential services (Pescaroli and Alexander, 2016), which can be insufficiently equipped to withstand a negative event.

Among the three types of vulnerability a mutual relationship can be established: under stress, a vulnerable individual, a group or a population can cope better if the system in which they are is sufficiently resilient (Birkmann et al., 2013). Systemic weaknesses such as the lack of infrastructural resilience can cause social and individual vulnerabilities by disrupting the supply of food or drinkable water and/or hospital services.

### 3.1.2. Vulnerability in disaster and crisis management

The concept of vulnerability is used in disaster studies and disaster risk management since the 1970s. In its most general meaning, disaster studies describe vulnerability as being prone or susceptible to damage or injury (Wisner et al., 2004: 11). Vulnerability refers to an understanding of disasters as not just being the result of an extreme event, but of an extreme event interacting with a vulnerable society (Wisner et al., 2004: 45, 55-56). In this regard, vulnerability describes the social side of a disaster (Hilhorst and Bankoff, 2004: 1–2; McEntire, 2005: 213). Thereby, the reduction of vulnerability has become a major issue in disaster management and disaster risk reduction.

However, during the 1970s, vulnerability was mainly used in two intertwined ways in the context of crises or disasters. On the one hand, vulnerability referred to places that were more prone to extreme events (geographical and place-based vulnerability). Tierney calls this “the hazardousness of different geographic places” (Tierney, 2019: 121). On the other hand, vulnerability was merely a concept to describe and measure the level of resistance of buildings and/or infrastructures against physical

<sup>2</sup> For more details about intersectionality see D1.3 and D1.6.



forces (ground motion, wind and water) as well as of density of settlements (infrastructural vulnerability) (Tierney, 2019: 124; UN-GA, 1968: para. 2; UNISDR, 2004: 41).

This changed subsequently along the further development of the concept (Birkmann, 2005; Felgentreff et al., 2012) since the 1990s, when the social aspects of geographical, place-based and infrastructural vulnerabilities became more discussed (Hilhorst and Bankoff, 2004: 1–2). The linkage of built-environment, environment and socio-economic factors can, for instance, be found in the Yokohama Strategy (UN-DHA, 1994: para. 3) and later in the 2001 UNISDR publication *Countering Disasters, Targeting Vulnerability*. Both documents take up an understanding of vulnerability as resulting from human action or social structures and therefore as dependent on “the condition of human settlements and their infrastructure, the way in which public policy and administration are engaged in disaster management, the level of information and education available about hazards and how to deal with them, among other aspects” (UNISDR, 2001: 2). In this vein, geographical vulnerability, place-based vulnerability, and infrastructural vulnerability are further distinguished from social or societal vulnerability (McEntire, 2005: 212–213): “In other words, vulnerability is much more than the likelihood of buildings collapsing and infrastructure being damaged. The concept of social vulnerability includes various themes, such as social inequalities regarding income, age or gender, as well as characteristics of communities and the built environment, such as level of urbanisation, growth rates, economic vitality, and so on” (Cutter et al., 2003 in Birkmann, 2005: 3). The social vulnerability perspective of disaster has been primarily developed by researchers from the field of sociology (see Cutter et al., 2003; Peacock and Ragsdale 1997; Philips and Morrow, 2007), and provides a useful theoretical approach for examining the effects of crisis or disaster on populations with disabilities, for instance.

Finally, the 2015 Sendai Framework for Disaster Risk Reduction has shifted the discourse on vulnerability even further. Here, vulnerability is an attribution of situations that render individuals vulnerable (UN, 2015: para. 19). This takes up an approach started by researchers like Blaikie, Cannon, Davis and Wisner in the early 1990s (Cannon, 1994; Blaikie et al. 1994) and can be found in a publication of UN-ECOSOC of 1998<sup>3</sup> (UN-ECOSOC, 1998: para. 65). In its most prominent versions, it can be found in the work by Wisner et al. (2004), who consider social vulnerability as a situational condition rather than an ontological and stable characteristic of an individual, a societal group or a whole society. More generally speaking, social vulnerability is “a condition that can be found at a particular point in time and is the consequence of historical and ongoing societal forces that create a disproportionate potential of loss, and also for experiencing poorer outcomes as a result of loss” (Tierney, 2019: 125).

Crises and disasters’ impacts are not suffered equally between all members and groups of society (Boyce, 2000). The socially differentiated impacts of natural and man-made crises - such as riots, delinquency and terrorism – imply that their adverse impacts can be reduced by tackling individual and societal vulnerabilities. As Wisner et al. point out, “to understand disasters we must not only know about the types of hazards that might affect people, but also the different levels of vulnerability of different groups of people. This vulnerability is determined by social systems and power, not by natural forces. It needs to be understood in the context of political and economic systems that operate on national and even international scales [...]: it is these which decide how groups of people vary in

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<sup>3</sup> Here, the vulnerability is defined as a human condition of every person that becomes significant depending on the specific situation.



relation to health, income, building safety, location of work and home, and so on” (Wisner et al., 2004: 6–7).

The figure below illustrates the argument put forward by Wisner et al. in the quotation above. We do not have to focus only on the hazards that triggers the crisis or disaster (in the figure mainly natural hazards in box 4), but also on how these intertwine with social processes.

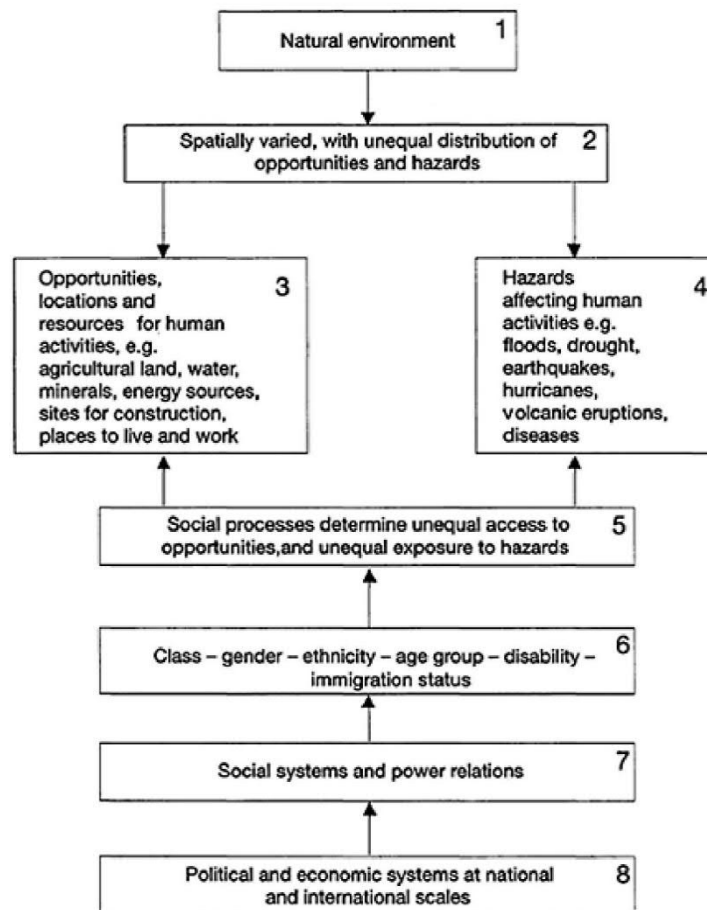


Figure 3 The social causation of disasters. Source: Wisner et al., 2004:8

Social vulnerabilities can take on different forms depending on context and also operate at different time-scales (Wisner et al., 2004). Long-term structural vulnerabilities stemming from cultural practices, ideologies, ethnic composition and historical factors are both difficult to deal with and challenging to accurately represent in a research context. More medium-term vulnerability factors, including regime type, social policies, spending on disaster risk reduction (DRR), not only serve to render certain populations more vulnerable, but also produces more long-term vulnerabilities over time. Short-term vulnerabilities in turn, influenced by preparedness measures undertaken, risk perception of the population, risk education as well as information availability, among other factors, are easier to study and have a direct effect on post-disaster outcomes. However, major factors such as who lives where, access to information and political will to tackle risk drivers can only be understood by also considering a longer time horizon as part of the analysis.



### 3.1.3. The subject(s) of vulnerability

As mentioned above, vulnerability was first an attribute given to geographical places that were especially prone to extreme (natural) events, for instance earthquake zones, coastal areas and river zones or volcanic areas. Here, vulnerability was associated with exposure: "Where the type of volcanic activity is capable of causing total devastation, the vulnerability is 100 per cent and the risk is directly proportional to the hazard" (UN-DRO, 1980: 24). In addition, vulnerability was associated with density of settlements, built-infrastructures and building quality (Birkmann, 2008).

Later, as more attention was given to the social dimension of vulnerability, individuals, social groups and communities were studied in relation to vulnerability (Anonymous, 2006: 348; McEntire, 2005: 212; Tierney, 2019: 125). While crises and disasters are usually perceived as random events, the social vulnerability perspective argues that some groups are placed disproportionately at risk to crises and disaster due to a combination of societal, economic, and political factors (Cutter et al., 2003; O’Keefe et al., 1976; Wisner et al., 2004)<sup>4</sup>. Furthermore, it argues that societies collectively determine who lives in disaster-prone areas and who will subsequently have limited defences against crises and disasters (Hewitt, 2013). From this perspective, crises and disasters not only affect some groups differentially, but expose pre-existing inequalities that lead to disproportionate damage, loss of property, or even death (Wisner et al., 2004). Women, children, immigrants, minorities, the poor, as well as people with disabilities have been identified as particularly vulnerable to the impacts of crises or disaster (Cutter et al., 2003). For instance, Stough and Mayhorn point out that “[...], the affluent have more economic and social capital upon which to draw when reconstructing their homes, while socially vulnerable populations tend to struggle post-disaster and take longer to recover. The social vulnerability paradigm thus serves as an appropriate theoretical lens through which to interpret the joint experiences of individuals with disabilities and individuals who are aging. It also allows for the concept of “layering” of vulnerabilities these two populations experience economically, socially, and politically” (Stough and Mayhorn, 2013: 385).

Finally, according to Wisner et al. (2004), not individuals, but situations are to be associated with vulnerability. This refers to situations rendering individuals vulnerable. For instance, an individual who cannot swim might not be especially vulnerable in a non-water related scenario, but might become highly vulnerable in case of a flooding or sea related one. Wisner et al. (2004: 14-15) suggest moving away from the attribution of vulnerability to any entity other than individuals or groups in order to ensure accuracy of the concept: **“People, as should be apparent already, are vulnerable and live in or work under unsafe conditions (‘unsafe’ can refer to locations of work or habitation, wherever people spend their daily lives). [...] we avoid using the word vulnerable in regard to livelihoods, buildings, settlement locations or infrastructure, and instead use terms such as ‘fragile’, ‘unsafe’, ‘hazardous’ or their synonyms. [...] a building should be regarded as unsafe, rather than vulnerable; a settlement’s location is hazardous, not vulnerable. In this way, we retain the term vulnerability for people only. [...] If ‘vulnerability’ becomes a catch-all term for any aspect of conditions related to disasters, then it will lose its analytical capacity. Moreover, it will lose the focus about which we are very explicit—that it is the vulnerability of people that is crucial to understanding disasters and disaster preparedness. It is, of course, absolutely right to be concerned about the condition of buildings, the places where people have to live, crop yields and variability and so on. But**

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<sup>4</sup> Societal, economic and political factors were included into the survey instruments (T3.2) to assess how the target group of WP3, homeless people, coped with natural and man-made hazards, risks and crises.



if policy is directed at these alone, it is in danger of being compartmentalized (e.g. into issues of building codes, or land-use planning, or production-oriented agricultural programs)” (Wisner et al., 2004: 50, emphasis added).

The way in which vulnerability is attributed also refers (not necessarily, but most likely) to a specific way of perceiving vulnerability. Taking up a physical or built-environment approach on vulnerability to describe social groups will most likely result in the neglect of societal processes that render deviance from a societal norm to vulnerability.

### 3.1.4. Primary and secondary factors of vulnerability in crisis and disaster contexts

The scholarship about crises and disasters we analysed in our literature review mentions a multitude of factors that influence social vulnerability, as the figure 3 by Wisner et al. shows. In this regard, Birkmann (2005) provided a figure, which illustrates this multitude and how these are distributed.

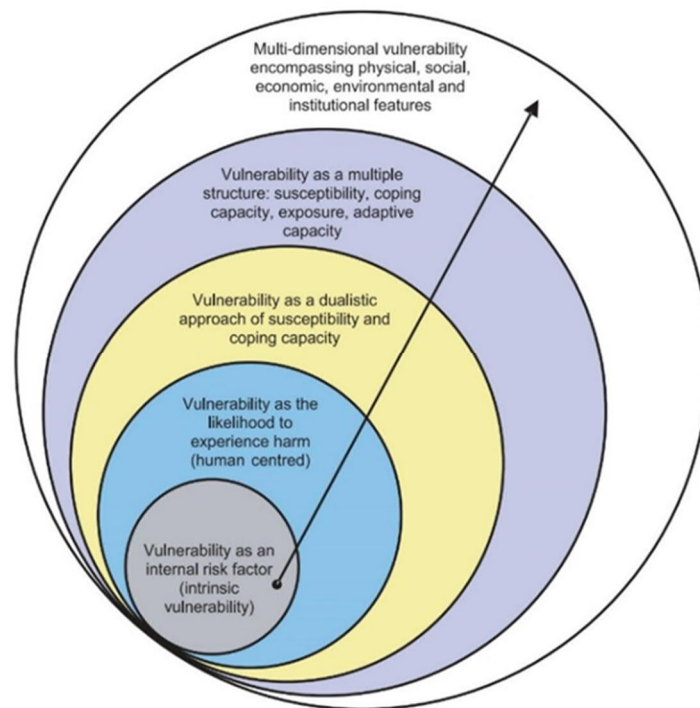


Figure 4 Key spheres of the concept of vulnerability. Source: Birkmann, 2005: 4

Due to this multitude, we propose a division of factors in two broad groups: (a) primary factors of vulnerability, which influence directly vulnerability and (b) secondary factors, which, to some extent, influence primary factors. This differentiation can be blurred and fuzzy on the ground, but, at the same time, allows for a better description of social diversities. Indeed, policies aimed at addressing vulnerability need to consider differential impacts and outcomes of crises and disasters. In this regard, primary and secondary factors can help policies to lessen vulnerability.

(a) Primary factors of vulnerability could be considered as the overall aggregated categories or values that, solely or combined, describe the degree of vulnerability of an entity or system (being an individual, a group, or a community). These factors are, in turn, influenced by (b) secondary factors, such as personal characteristics and particular situations.

We offer here some examples on how factors described and analysed in the scholarship we reviewed can be placed in (a) and (b).

## (a) Primary factors:

### Sensitivity

**IPCC 2001:** The degree a system is (direct or indirectly) affected, either adversely or beneficially, by climate-related stimuli (cf. Gallopín, 2006: 295). “The central idea of the often-cited IPCC definition is that vulnerability is the degree to which a system is susceptible to and is unable to cope with adverse effects (of climate change)” (Adger, 2006: 269).

**Adger 2006:** “Sensitivity is the degree to which a system is modified or affected by perturbations” (Adger, 2006: 270).

### Exposure

**Adger 2006:** “Exposure is the nature and degree to which a system experiences environmental or socio-political stress. The characteristics of these stresses include their magnitude, frequency, duration and areal extent of the hazard” (Burton et al., 1993, cf. Adger, 2006: 270).

**Gallopín 2006:** The “[...] degree to which the system is modified or affected by an internal or external disturbance or set of disturbances” (Gallopín, 2006: 295).

Smit and Wandel (2006: 286) posit that exposure and sensitivity cannot be separated, since “the interaction of environmental and social forces determines exposures and sensitivities”.

### Coping, Adaptive Capacities or Response Capacities

**Adger 2006:** “Adaptive capacity is the ability of a system to evolve in order to accommodate environmental hazards or policy change and to expand the range of variability with which it can cope” (Adger, 2006: 270).

**Gallopín 2006:** “In general, capacity of response is the system’s ability to adjust to a disturbance, moderate potential damage, take advantage of opportunities, and cope with the consequences of a transformation that occurs. Capacity of response is clearly an attribute of the system that exists prior to the perturbation” (Gallopín, 2006: 296).

**Smit and Wandel, 2006.** “Adaptive capacity is context-specific and varies from country to country, from community to community, among social groups and individuals, and over time. It varies not only in terms of its value but also according to its nature. The scales of adaptive capacity are not independent or separate [...]” Smit and Wandel, 2006: 287).

**Vogel and O’Brien:** Both coping and adapting refer to the internal side of vulnerability, but differ in temporal scale and scope. While coping is short-term, adaption in a long-term attribute that of involves structural change (Vogel and O’Brien, 2004: 5).

Smit and Wandel (2006) combine coping and adaptive capacities under the concept of response capacities, due to diverging scientific views.

### Anticipation, Resistance and Recovery Capacities



**Wisner et al. 2004:** “By vulnerability we mean the characteristics of a person or group and their situation that influence their capacity to anticipate, cope with, resist and recover from the impact of a natural hazard (an extreme natural event or process). It involves a combination of factors that determine the degree to which someone’s life, livelihood, property and other assets are put at risk by a discrete and identifiable event (or series or ‘cascade’ of such events) in nature and in society” (Wisner et al., 2004: 11).

**(b) Secondary factors:**

Secondary factors are as diverse as people are, starting from gender, sex, race, ethnicity, culture, disabilities, income, education, religious belief to further include spoken languages, insurances, money deposits, availability of social contacts or availability of information via Internet (see for instance Cutter et al., 2003: 245–249; Tierney, 2019: 121, 128-136; Wisner et al., 2004: 11). Additionally, temporary conditions such as illness or family struggles should be considered as important secondary factors (Felgentreff et al., 2012: 41-42; Mechanic and Tanner, 2007: 1225).

Secondary factors and their interaction influence primary factors. This renders vulnerability within societies very complex and the intersectionality approach<sup>5</sup> can be helpful in this regard, as Fothergill and Peek point out: “Age alone does not make a child vulnerable to disaster. Instead, age interacts with many other factors that may render children particularly at risk. Moreover, vulnerability factors tend to build over time and cluster together, resulting in what we refer to as cumulative vulnerability ... a racial minority child with a physical disability who lives in an impoverished household in a hazard-prone area will experience multiple, intersecting forms of social, environmental, physical, and economic vulnerability to a disaster ... it is not solely age or race of ability status or poverty or hazards’ exposure, but how these risk factors **accumulate** in a child’s life” (Fothergill and Peek 2015: 23, cf. Tierney, 2019: 146). Another example is an individual who can be in a challenging physical or mental condition, but due to his/her financial situation care givers are available 24/7, the building is equipped with an emergency power generator and a good insurance is in place (Christmann et al., 2011: 16). As Mechanic and Tanner put it: “Vulnerability involves several interrelated dimensions: individual capacities and actions; the availability or lack of intimate and instrumental support; and neighborhood and community resources that may facilitate or hinder personal coping and interpersonal relationships” (Mechanic and Tanner, 2007: 1222). One last example here is poverty, since the voices of poor people are marginalised in political discourses, their needs are side-lined (Fielding and Burningham, 2007: 380–392; Tierney, 2019: 136–143).

While Birkmann’s figure displaces factors of vulnerability at conceptual level, there are several models in the scholarship that show how these factors influence vulnerability when vulnerability meets a hazard. We propose two models due to their relevance for BuildERS’ work.

The first model is the Pressure-and-Release-Model (PAR-Model) by Wisner et al. 2004. Its starting point is the following: “A disaster is the intersection of two opposing forces: those processes generating vulnerability on one side, and the natural hazard event (or sometimes a slowly unfolding natural process) on the other. The image resembles a nutcracker, with increasing pressure on people arising from either side - from their vulnerability and from the impact (and severity) of the hazard for

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<sup>5</sup> D1.3 and D1.6 have explored intersectionality and vulnerability.



those people. The ‘release’ idea is incorporated to conceptualise the reduction of disaster: to relieve the pressure, vulnerability has to be reduced” (Wisner et al., 2004: 46).

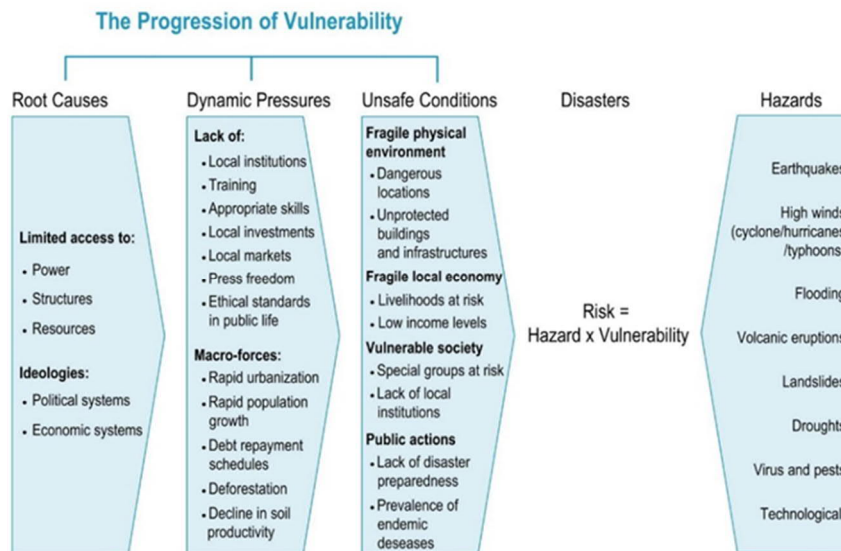


Figure 5 Analysing vulnerability (Blaikie et al. 2004, cf. UNISDR, 2004: 71)

The model describes vulnerabilities along so called root causes, “which reflect the exercise and distribution of power in society”, and lead to dynamic pressures that are “processes and activities that ‘translate’ the effect of root causes both temporally and spatially into unsafe conditions”. These risk behaviours, which in turn create physical, economical, social, and institutional structures that in combination with the consequences of extreme events endanger societies and create unsafe conditions (Wisner et al., 2004: 48–50).

The second model is the Access Model, which “focuses on the precise detail of what happens at the pressure point between the natural event and longer-term social processes” (Wisner et al., 2004: 79). In this vein, it is a more dynamic model that tackles “the amount of ‘access’ that people have to the capabilities, assets and livelihood opportunities that will enable them (or not) to reduce their vulnerability and avoid disaster” (Wisner et al., 2004: 79-80).



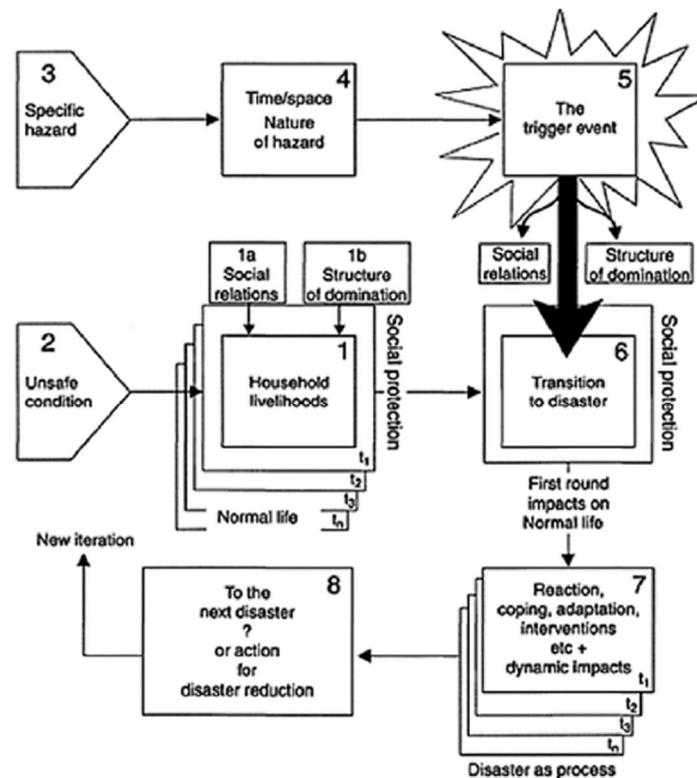


Figure 6 The Access model in outline. Source: Wisner et al., 2004: 81.

### 3.1.5. Vulnerability between essentialism and existentialism

In the previous part, we have touched upon some ways to define social vulnerability in the context of crises and disasters. In this section, we focus on whether being vulnerable is a static (essentialism) or a dynamic status (existentialism) (Adger, 2006: 270)<sup>6</sup> as a variety of studies declaring some social groups to be ontologically more vulnerable than others (Begg, 2018; Box et al., 2016; Parthasarathy, 2018; UNISDR, 2013).

**Essentialist or static understanding:** A strong tendency found in the vulnerability discourse is to grasp vulnerability as a characteristic attribute of certain societal groups due to some of their conditions (Tierney, 2019: 127); these persons are seen as ontologically susceptible. This essential understanding is, to some extent, plausible, as vulnerable groups are very similar all over the world and throughout a diversity of extreme events and disasters. Especially for those living in poverty, this description holds true and allows to develop group specific measures to be taken and to prepare on a more general level (Tierney, 2019: 127). In addition, “If the vulnerability of different target systems could be characterized on the basis of their sensitivity and capacity of response, their exposure to a

<sup>6</sup> Essentialist or static understanding: Vulnerability is a part of the essence of an entity. An entity would be ontologically vulnerable and could not lose the status. Existentialist or dynamic understanding: Vulnerability is dependent on the actions that are taken. An entity might be vulnerability due to the specific context, but can lose this status.

particular perturbation could be independently determined, and the harm or outcome of the resulting transformation of the system could be estimated from the composition of the two factors. Using a climate change example, only one map of vulnerability would be needed, that could be overlaid with different maps of exposure resulting from diverse models or scenarios” (Gallopín, 2006: 297)<sup>7</sup>.

**Existentialist or dynamic understanding:** In contrast to the essentialist understanding of vulnerability, there is an existentialist point of view that takes a situational approach (see UN, 2015; Wisner et al., 2004). In this reading, vulnerability is a situational and relative, thus dynamic, phenomenon (Hilhorst and Bankoff, 2004: 2–3). In this understanding vulnerability is dependent on the *actual* exposure, rather than a general characteristic. Vulnerability is the result of an interplay between external circumstances and personal conditions. This view refers to the diversity between and within social groups. This position seems to be more appropriate for heterogeneous groups like elderly people, persons with disabilities, people that are part of a minority, as their condition is embedded in a social context, which discriminates or disadvantages these persons. Here, the degree of vulnerability in a situation depends not on a one dimensional attribution (e.g. to a demographic group), but is the result of a complex relationship between different factors, like social class, race, gender and age (Tierney, 2019) to name just a few. As Tierney points out, “[...] social vulnerability has temporal, spatial, and situational dimensions. It exists at particular points in time and in particular locations; while disaster vulnerability is shaped by historical trends, conditions can also evolve and vary in ways that make individuals and groups more or less vulnerable, both in terms of impacts and in terms of outcomes” (Tierney, 2019: 125).

Drawing from intersectionality, the existential perspective emphasises the social dimension of vulnerability and the dependency of vulnerability on the social structures people live in (Krüger, 2019). If we, indeed, do not acknowledge this, the result “would be to ignore the often immense differences that exist within such groups and also the point that [...] people are not born vulnerable, they are made vulnerable. [...] Second, [...] different axes of inequality combine and interact to form systems of oppression – systems that relate directly to differential levels of social vulnerability, both in normal times and in the context of disaster. Intersectionality calls attention to the need to avoid statements like ‘women are vulnerable’ in favour of a more nuanced view [...]” (Tierney, 2019: 127–128).

The words by Vogel and O’Brien summarise well these approaches: “First, vulnerability is inherently a **differential concept** because risks or changes and abilities to cope vary across physical space and among and within social groups. Although a region may not be considered vulnerable to environmental change, there are likely to be households or groups within that region that are indeed vulnerable. Second, vulnerability is **scale-dependent** on the unit of analysis, from ‘individual’ or ‘household’ to ‘class’, ‘region’, or ‘system’. Third, vulnerability is **dynamic**, in that the characteristics that shape vulnerability change over time, in response to changing biophysical and socio-economic conditions” (Vogel and O’Brien, 2004: 4 emphasis in original).

Based on this, three intertwined challenges have to be outlined. 1) As the existentialist perspective emphasises that there is no necessary link between a specific condition of being vulnerable, some conditions might be very likely to cause vulnerability. 2) Existentialist or dynamic understandings of vulnerability often refer to a very strong dependency on the situation, which renders targeted disaster

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<sup>7</sup> Task 3.1, Locating the areas and vulnerable populations under significant (relative to the country) risks, followed Gallopín’s advice and will provide maps of vulnerability as D3.4.



relief actions increasingly difficult, as pre-determined categories would not be suitable (Gabel, 2019). Since existential vulnerability rightly points to vulnerability as the result of societal (power) relations, it is highly useful to analyse those factors that cause injustices and discriminations and finally prevent people from being emancipated (in the sense of being freed from personal hardship). 3) The insight that vulnerability is an intersectional phenomenon makes it hard for practitioners to anticipate who might need help most urgently in a given situation. In this vein, planning becomes very challenging.

### 3.1.6. Measuring vulnerability

During our literature review, we looked for approaches to measure vulnerability, since the measurement of vulnerability will be an important task to be carried in WP3 and WP4. These approaches are equally diverse as the multitude of definitions of vulnerability (Cutter et al., 2003: 245; Tierney, 2019: 162). We present here some examples, without claiming to be exhaustive, given the sheer number of possible operationalisations of vulnerability.<sup>8</sup>

The *Hazard-of-Place-Modell*, as much as the *Social-Vulnerability Index (SoVI)*, is a "multidimensional concept that [...] helps] to identify those characteristics and experiences of communities (and individuals) that enable them to respond to and recover from environmental hazards" (Cutter et al., 2003: 257). Independent variables are put together in order to quantify and explain social vulnerability, such as personal wealth, age, density of the built-environment, presence of single-sector economy, forms and amounts of housing stock and tenancy, race (African), ethnicity (African), ethnicity (Hispanic), race (Asian), occupation and infrastructure dependency (Cutter et al., 2003: 252).

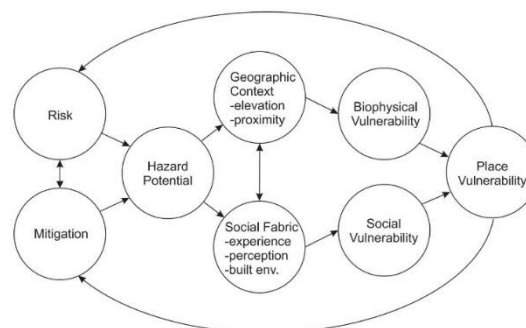


Figure 7 The Hazards-of-Place Model of Vulnerability (modified from Cutter, 1996, cf. Cutter et al., 2003: 244)

The *Global Natural Disaster Risk Hotspots* focusses on the risk of disaster-related deaths and "the risk of economic losses, each one calculated as a function of population exposed and gross domestic product" (Tierney, 2019: 163).

<sup>8</sup> Other approaches that not described here are the Bogardi–Birkmann–Cardona-Model (BBC-Model) by Birkmann; the Human-Environment-System by Turner et al.; the Disaster Risk Index of UNEP and the UNISDR (<https://preview.grid.unep.ch/index.php?preview=home&lang=eng>).

Smit and Wandel propose an opposite approach, the participatory **vulnerability assessment** that moves away from solely analysis of socio-economic factors to an actual involvement of stakeholders: "Participatory vulnerability assessments allow for the recognition of multiple stimuli beyond those related to climate, to include political, cultural, economic, institutional and technological forces. Furthermore, the methodologies recognize the interaction of various exposures, sensitivities and adaptive capacities over time. What is vulnerable in one period is not necessarily vulnerable (or vulnerable in the same way) in the next, and some exposures and sensitivities (e.g. those recognized as "creeping hazards" by Wisner et al., 2004) develop slowly over time. Finally, the approach recognizes that sources of exposures, sensitivities and adaptive capacities function across scales, from the individual to the national [...]“ (Smit and Wandel, 2006: 288).<sup>9</sup>

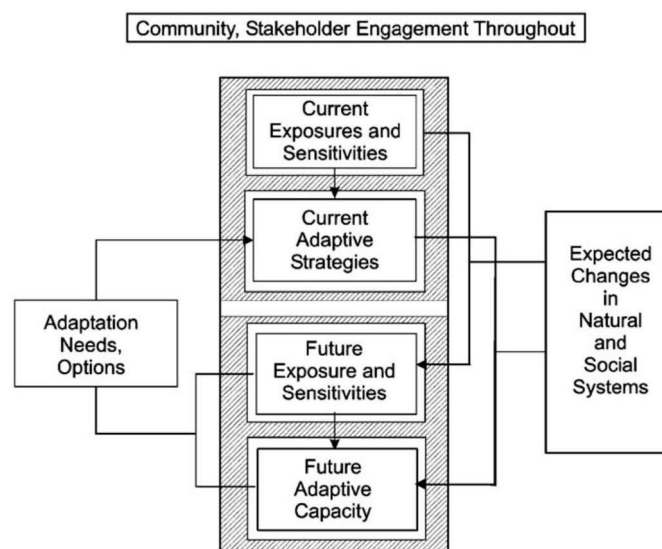


Figure 8 Conceptual framework for vulnerability assessment and mainstreaming (cf. Smit and Wandel, 2006: 288)

### 3.1.7. The ethical dimension of vulnerability

The topic of vulnerability raises a variety of ethical questions. Academic definitions of vulnerability as well as the extent to which individuals are vulnerable in particular situations relate to questions of discrimination, normalisation, autonomy, responsibility, justice, privacy, acknowledgement and participation. While all these aspects deserve our attention in assessing vulnerability from an ethical standpoint, we group all these aspects around three core categories: (a) responsibility, (b) justice and (c) privacy. These three categories are the subject to the following reflections.

#### (a) Vulnerability and Responsibility

First, we argue that vulnerability is linked to responsibility. If there is a social side of crises and disasters, which can be understood as all the structures, norms and environments that are (re-)produced through social action, it is us, the members of society, who can influence them.

<sup>9</sup> A similar approach is mentioned by Sparf (2016) regarding the involvement of persons with disabilities and their everyday situations.

Furthermore, if these structures negatively influence the consequences or the outcome of an extreme event for some members of society, we might even have the responsibility to change them. An insight, for example, can be found in the Yokohama Strategy from 1994: “Natural disasters continue to strike and increase in magnitude, complexity, frequency and economic impact. Whilst the natural phenomena causing disasters are in most cases beyond human control, vulnerability is generally a result of human activity” (UN, 1994: para. I.A.1).

The degree of this responsibility thereby very much depends on how vulnerability is defined, but also to which degree certain factors can be influenced respectively and to which degree we define certain factors to be changeable. For instance, in almost every conception of vulnerability, persons with disabilities are described as vulnerable (Sparf, 2016; Stough and Mayhorn, 2013: 384; ULSS20 Verona, 2007). Taking this example of persons with disabilities, the societal dimension of crises and disasters and the idea of responsibility would mean that we have to identify the factors, which render persons with disabilities vulnerable.

In this regard, in our research we distinguish four different levels of responsibility questions or issues: First, that persons with disabilities are vulnerable could be due to a lack of appropriate crisis or disaster management measures, which need then to be adjusted to their needs. On this level, the questions would be: who is responsible to adjust measures and to what extent?

Second, reducing vulnerability could also mean to question the concept of disability itself. For instance, the social model of disability differentiates two dimensions: (1) the impairment, which is the physical, mental or emotional condition of a person and (2) the disability, which is a potential consequence of how society deals with this condition (Johnstone, 2006). A wheelchair user might not be able to walk, but if there are suitable access ways (e.g. ramps), this person would not be disabled. Acknowledging these disabilities as being the reason why persons with disabilities are vulnerable in disaster situations might therefore refer to a responsibility to prevent the creation of disabilities out of impairments in the first place (Tierney, 2019: 152–156). To be vulnerable would then mean to have an impairment, which is not socially treated in an appropriate way and – in the words of Johnstone – not to blame persons with disabilities (Johnstone, 2006: 108–116). This, in turn also refers to questions of social power: “There is often a reluctance to deal with such factors because it is politically expedient (i.e. less difficult for those in power) to address the technical factors that deal with natural hazards. Changing social and economic factors usually means altering the way that power operates in a society” (Wisner et al., 2004: 7).

Third, reducing vulnerability can also refer to the general responsibility to actively questioning social structures and scrutinise the situations in which people are vulnerable. Or in Cannon’s words: “To see disasters as being natural is about as useful as a doctor signing a death certificate with the explanation of, natural causes. It gives no indication as to whether the person’s life might have been extended by a different social system which allocated resources differently, provided a health care system enabling early diagnosis and treatment of many ‘natural’ causes of death, regulated risks in a different way or enabled access to scientific knowledge of factors such as diet and toxins” (Cannon, 1994: 17–18). Christmann et al. (2011) support this point by arguing that vulnerabilities are socially constructed, since they are defined by societies. Therefore, all aspects of vulnerability (the subject of vulnerability, its relation to other objects as well as the level to which vulnerability is ascribed) are not naturally given, but socially imposed (Christmann et al., 2011: 25). Consequentially, vulnerabilities are selective and dependent on those who are able to define them. Accordingly, a subject is vulnerable due to the shared belief that it is vulnerable not because of objectified criteria (Christmann et al., 2011: 5). For example, that the loss of internet access might be envisioned a vulnerability characteristic is due to an existing belief that internet access is a core part of human existence.



Fourth, responsibility might be attributed with regard to the measures that are taken in order to ensure security, as these measures can produce new unwanted vulnerabilities. “The technical interventions which are supposed to reduce hazard intensity or prepare people for them are themselves not socially neutral, and they must not be taken in isolation from the factors that create vulnerability, and should only be implemented with full awareness of their impact on different sections to the people” (Cannon, 1994: 14).

### *(b) Vulnerability and Justice*

Especially the connection between the everyday and the exception is an important aspect which mainly can be found in the social vulnerability discourse. This mutual interdependency becomes evident when asking for the possibilities of people to inscribe their interests into security action (Hansen, 2000) and for the state’s active acknowledgement of societal diversity, hence varying needs (Vondermaßen, 2019). David Alexander demonstrates, for instance, the lack of inclusivity in disaster management and the resulting vulnerability of people with disabilities (Alexander, 2015). Furthermore, Kathleen Tierney (2019) shows how disaster relief measures designed for helping house owners exclude people who need to rent flats or houses, hence mostly socially underprivileged groups of population. Since crises and disasters amplify discrimination that already exist in daily life, these exclusionary mechanisms cumulate in their effects due to the intersectionality of different, but interrelated pattern of discrimination.<sup>10</sup> While more inclusive disaster relief means are certainly one way to mitigate vulnerability, disasters are complex phenomena, inducing a multitude of unanticipated cascade effects (Chandler, 2014), both in terms of threats as well as in terms of coping strategies (such as resilience and resistance). In this way, the justice dimension of vulnerability is also linked to the idea of a good life.

### *(c) Vulnerability and Privacy*

Especially the measures that are taken in order to reduce vulnerability are linked to the value of privacy. For instance, in order to reduce vulnerability in recent times, the call for more (disaggregated) data on specific social groups is getting more and more attention. The hope is that if more data is available, measures can be easily adjusted. “Proper collection, analysis and use of sex and age disaggregated data, or SADD, allows operational agencies to deliver assistance more effectively and efficiently than without SADD. [...] The net outcome is both more lives saved and a reinforcement of basic human rights in a situation where rights are often brushed aside” (Mazurana et al., 2013: 1).

This argument neglects at least two important ethical issues: (1) To be identified as vulnerable is not only helpful, but might be a stigma, (2) to create a registry of those who are vulnerable is problematic for multiple reasons. The first issue concerns the idea of identifying specific groups (Christie et al., 2016: 253; Paudel et al., 2016), as there is a price for doing this, which should not be underestimated. For instance, illegal immigrants are not interested in being identified as a vulnerable group that needs help, as it increases their risk of being expelled of the country. Another example from disability studies is presented by Sparf (2016): “The price of having the home adapted is having it labelled as a disability home, emphasizing one’s disability and vulnerability. Therefore, keeping the home unadjusted can serve as an empowering strategy to avoid showing vulnerability” (Sparf, 2016: 7).

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<sup>10</sup> The challenges raised by Alexander and Tierney are explored in WP4, in particular in the German case on floods.



The second issue concerns the idea of registries for the most vulnerable being highly problematic not only because it builds on the ideas that vulnerable groups can be pre-defined, or that a list of the most vulnerable encompasses a high risk for misuse<sup>11</sup>, but also because “Registries have been viewed as an easy and logical answer for addressing what are perceived as ‘special needs’ for a small segment of the population. The reality is that registries bring into play a complex relationship between the civil rights and the registrant and the responsibilities of jurisdictions and civil authorities; between symbolic planning and real, actionable planning. Registries are anything but simple” (Kailes, 2015: 100).

In this vein, it can only be emphasised what is already mentioned in the Grant Agreement: “Vulnerability conditions cannot overrule data protection” (BuildERS, 2019a:124). Furthermore “Additional efforts might be necessary [...] in order to ensure that especially vulnerable persons are not put under problematic pressure. Vulnerability should not be taken as an advantage for limited rights” (BuildERS, 2019a:126).

### 3.1.8. Conclusions on vulnerability for BuildERS work

#### 3.1.8.1. Vulnerability in the theoretical work of BuildERS

Our literature review and the work done, in particular, in D1.3 have uncovered that there are two perspectives of vulnerability in current discussions: the idea of vulnerable groups (e.g. persons with mental and/or physical disabilities, the poor, the elderly etc.), which can be defined and studied accordingly, and the perspective of vulnerability as a highly dynamic characteristic, that potentially changes over time due to the specific situations and intersectionality and, therefore, can apply to every individual. These two approaches seem in tension with each other and this tension can be found in BuildERS itself since the project aims at developing strategies, recommendations and measures to improve the situation of the most vulnerable in crises and disasters. The following part outlines how BuildERS deals with this issue.

Within the vulnerability discourse and use of the concept, defining and speaking of vulnerable groups is widespread, especially among practitioners. There is a prevalent interpretation of vulnerable groups as static, putting forward the argument of vulnerability as an ontological characteristic of few groups within society. Furthermore, research also identifies poor, homeless, racial and ethnic minorities, children, non-native speakers as vulnerable groups (see Turner et al., 2010: 160). However, the International Federation of Red Cross and Red Crescent Societies (IFRC) points out that vulnerable groups, such as the elderly or persons with disabilities, are often left out of disaster management planning (IFRC, 2018: 107). According to this perspective, there are some characteristics among members of society, which lead to facing higher risks and to suffer from a greater loss of live or property than the rest of society in crisis or disaster situations. These characteristics are understood to be at a high prevalence within certain social groups, such as those mentioned above. Therefore, as for instance several persons with disabilities have difficulties to evacuate (for different reasons),

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<sup>11</sup> This aspect is important as a similar aim is formulated in the Grant Agreement: “Locating the areas and vulnerable populations under significant (relative to the country) risks” (BuildERS, 2019:39) and create spatial-temporal human dynamics maps (BuildERS, 2019:34).



the social group of persons with disabilities (according to this socio-political category) is considered vulnerable to crisis and disasters. These findings are also confirmed in D1.3 (see the surveys we took into account and the sample of countries in D1.3, where these groups are very similar despite of the country of reference).

BuildERS argues that the narrative of vulnerable groups which are equated to socio-political categories generates problematic tendencies (Gabel, 2019). First of all, this narrative tends to neglect the heterogeneity of social groups, which in the case of persons with disabilities is the variety of different impairments that lead to very different needs and affectedness by crisis and disasters. Second, based on what was written earlier on temporality and situational dependency, the common way of speaking of vulnerable groups limits vulnerability to certain individuals and ignores the fact that, not only everyone can become vulnerable depending on the individual situation, but also members of the mentioned groups can be more or less vulnerable due to the specific situation. For instance, having a sudden health condition or an accident can render everyone vulnerable, while having the right devices or medication allows for acting in an appropriate way. Both tendencies risk that certain groups are seen as ontologically vulnerable: vulnerability is considered a core condition of being vulnerable, that cannot be changed. This statement is not only problematic for those affected, but also for disaster management as it pre-limits efforts to reduce vulnerability. Finally, to speak of vulnerability referring to some socio-political groups risks to overlook their capacities and capabilities, framing them as helpless and with no agency.

Against this backdrop, the upper mentioned tension does not exist between studying vulnerable groups and the idea of an intersectional, situation-dependent vulnerability as such, but between interpreting vulnerable groups as static or dynamic as well as pre-defining these groups. The BuildERS project does not reject to discuss and study vulnerable groups, but understands this as the description of all individuals being vulnerable at a certain point in time; not necessarily beyond that point. Or, in other words, people in situations that render them vulnerable are considered vulnerable groups since they are in different situations, which render them vulnerable. This leads to the formulation of the BuildERS approach, that aims to find out more about those situations that render individuals vulnerable. In this regard, BuildERS starts from the currently widely used definition of vulnerable groups (e.g. persons with mental and/or physical disabilities, the poor, the elderly etc.), and takes a look at the diversity within them in order to find out which situations there are, that make individuals vulnerable. This is, for instance, a core point of WP3, where homeless people from different countries in Europe are questioned about their living conditions in order to find out if it is homelessness and/or other situations, which lead to people being set into vulnerable situations. In this vein, one perspective (static vs dynamic) cannot exclude the other. The two perspectives actually interact, since, on the one side, speaking of vulnerable groups tells us something about whether entities are vulnerable. On the other side, speaking of vulnerable situations and approaching vulnerability through intersectionality allows us to question why entities are vulnerable. Therefore, both perspectives are important within BuildERS.

Following this understanding, it also becomes clear, that lists of vulnerable groups in crises or disasters, which inspired BuildERS, need to be scrutinized within the project, also with regard to whether there are more groups or other persons who might even be more vulnerable in some crises or disaster situations, but have not yet been discovered. This is especially important due to the fact that vulnerability research often builds on other databases such as census data, which offer a statistical picture of the society, but necessarily neglect individual living situations. In this vein, BuildERS will take into account the limitations of these data, which follow from aggregation and





homogenisation's processes. In addition, BuildERS is going to reflect on the limits and biases of current research. Understanding vulnerability as intersectional does not only mean for individual conditions to worsen, but also to reduce vulnerability. For instance, being disabled and white is likely to be a different situation than being disabled and coloured. Similarly, considering an individual with physical and/or mental disabilities just a member of a vulnerable group that includes all the individuals with those characteristics neglects a variety of diversities within this same group: a variety of living situations that might be linked to a variety of different degrees of vulnerability, for example. For instance, persons with disabilities are vulnerable depending on their condition, the event and social structures they are living in. This means not to make hastily causations from, for instance, being a person with disability to being vulnerable, but to take the specific context into account. Therefore, BuildERS is going to reflect on the heterogeneity of groups and the dependency on situations and time. Even if reports outline the higher vulnerability of certain social groups, we have to scrutinize the interplays and intersections as well as the specific socio-structural conditions that render a person and member of a specific social group vulnerable. In this vein, research has a high ethical responsibility to point out the root causes of vulnerability, such as factors that cause injustices, discriminations, unbalanced power relationships and stigmatization, to improve societal resilience. By unveiling these factors, it is possible to promote policies and design measures, which are appropriate to the living situations of vulnerable individuals and their real needs. Furthermore, it allows to scrutinize existing stereotypes and has the potential to make the abilities of persons visible for the benefit of the whole of society.

### 3.1.8.2. Vulnerability in the empirical work of BuildERS

This BuildERS approach has implications not only from a theoretical standpoint, but also in the empirical work of BuildERS, when the project looks at what happens on the ground in WP3 and WP4. Those who are considered the most vulnerable as they are in need of social welfare assistance (e.g. rough sleepers, persons with substance use disorder, marginalised minorities, refugees) will be at the centre of the research activities in WP3. By interviewing considerable similar clients of one service provider in different national settings, the Salvation Army (SAL) will help to better understand the specific conditions and situations in which these highly diverse persons live and which abilities to cope they possess. In this regard, BuildERS takes up existing research findings, which support these people as being most vulnerable, as a reason for further research on the accuracy of this attribution. Accordingly, BuildERS aims for a more complex picture that does not lead to general measures to reduce vulnerability of those most in need of social welfare, but to specific measures, policies and intervention strategies adjusted to the exact living conditions, which render these people vulnerable. Similar approaches are taken for the case studies of WP4.

Within this empirical work, BuildERS also reflects on the very basis it builds on. This means that conditions, which are likely to put persons in situations where they are vulnerable, will also be taken as a starting point for scrutinizing the living conditions of those considered 'not vulnerable'. Although in doing so BuildERS itself will define vulnerable groups or the most vulnerable, these groups will be defined much more depending on situations and temporalities, in addition to specific factors. For instance, tourists<sup>12</sup>, similarly to hearing-impaired people, might not understand a specific language. In this vein, any individual should not be considered neither as a passive object nor solely as a victim. On the contrary, the same individual is a bearer of capacities that might be activated, if specific

<sup>12</sup> Which is also not one homogenous group, they might be impaired, native, rich, etc..



hindering factors are removed (IFRC, 2004). Here, the connection between needs and vulnerability requires some attention, since a distinction can be done between vulnerability due to needs, which are not fulfilled (Kailes and Enders, 2007). For instance, in a crisis, a person that lacks information because of a hearing impairment and the lack of alternative information channels might become vulnerable. He/she does have the same basic need to receive information on the situation, for example, where to evacuate. In order to emphasise the similarity of persons and to counter an artificial distinction between the needs in society, it might be better to speak of a lack of functions to act independently. Sparf gives two nice examples here: “A snowstorm, or any risk situation with contextual inertia, does not lead to a radical change from the normal state for immobilized people. Immobilized people might actually be better off than non-disabled people in such situations” (2016: 7-8) In contrast, “instrumental aids such as crutches and wheelchairs are normally useful. In some situations, though, they may cause vulnerability“ (2016: 5).

By combining both the understanding of vulnerable groups and vulnerability as a characteristic of certain situations, BuildERS will answer two questions:

- 1) Who is vulnerable?**
- 2) Why are individuals vulnerable? Which situation should be changed?**

To answer these two questions, both quantitative and qualitative approaches will be applied in WP3 and WP4: “Quantitative approaches based on global data are useful for measuring vulnerability with regard to experienced losses-such as mortality and economic loss (e.g. DRI, Hotspots) - but they are limited when it comes to measuring context dependent and spatially specific characteristics” (Birkmann, 2005: 6). We have experienced this when we collected data for D1.3. Quantitative approaches need to be supplemented by qualitative approaches and self-assessment-oriented measurements. Wisner et al. (2004), for instance, outline the limitations of the taxonomic approach to assess vulnerability, and show that self-assessment to measure coping capacity and vulnerability is both participatory and provides proactive information. WP3 will, indeed, provide information via a participatory approach thanks to the survey, while the cases in WP4 will apply both approaches. At the same time, qualitative approaches might not be as continuous, but on a one-off basis (Birkmann, 2005: 6). Against this backdrop Birkmann suggests that: “Research is needed into balancing qualitative and quantitative methods of measuring vulnerability and coping capacity. As Wisner says, it will be important that quantitative and qualitative, as well as reflective and action-oriented methodologies, are transferred into continuous monitoring and correction measures. [...] Quantitative and qualitative ways of measuring vulnerability are a precondition of the effective and systematic integration of vulnerability and risk reduction into day-to-day decision-making processes. Politicians, the media and the public often focus on the disaster itself, the initial relief actions and perhaps on the first days and weeks of reconstruction. [...] measuring vulnerability must be understood as a continuous and long-term task (monitoring) in order to identify potential areas for priority proactive policy interventions” (Birkmann, 2005: 7). Tierney adds: “What is needed is more well-designed, systematically conducted multivariate, comparative studies on disasters vulnerability that should be capable of teasing out the relative contributions of the various factors that can influence social vulnerability” (Tierney, 2019: 166). This is, indeed, what BuildERS aims to achieve in WP3 and WP4, as well as in WP6.



## 3.2. Social capital

### 3.2.1. Theories and perspectives on social capital

Another BuildERS' key concept is social capital. We argue that social capital is often used, but poorly defined. Therefore, we will track its origin and use in order to give the opportunity to WP3 and WP4 operationalise it more effectively.

As set out by Berg (2017), social capital is a theoretical concept that has been popularised by scholars such as Coleman (1988), Putnam (1993), Bourdieu (1997), and, later, Lin (2001). The renowned social theorist Pierre Bourdieu explained social capital as one of four types of capital, alongside with economic, cultural and symbolic capital. He defined social capital as "the aggregate of the actual or potential resources which are linked to a durable network of more or less institutionalised relationships of mutual acquaintance or recognition" (Bourdieu, 1997:51). The volume of social capital is, according to Bourdieu, mainly determined by the amount of other forms of capital an individual possesses. Therefore, social capital is always unequally distributed in the social space: inequalities and hierarchies do not guarantee the access to social capital to everybody in the same way (ibid). Accordingly, he suggested that social capital is dependent on economic capital, "since wealth played a key role in societal achievement and reputation" (Aldrich, 2012:28). Coleman established strong parallels between social capital and the other forms of capital. He explained social capital as "defined by its function [...] a variety of different entities, with two elements in common: they all consist of some aspect of social structures and they facilitate certain actions of actors [...] within the structure" (Coleman, 1988:98). Coleman outlined the different aspects of social capital as obligations and expectations, information and social norms - including sanctions (Coleman, 1988:95). His conceptualisation of social capital, though, has been regarded as highly individualistic and rational (Albrecht, 2017:20).

Despite its growing popularity as a concept, it is widely debated how to measure and interpret social capital correctly (Johnston and Percy-Smith, 2003:327). Conceptual and measurement challenges have induced the concept to dubious interpretations, less empirical use, and an "underestimation of its value" (Bhandari and Yasunobu, 2009:480). Aldrich argues that research on social capital has struggled to determine whether the concept constitutes "the data about, reputations of, and information flowing between members of a groups or if it is the network of relationships and connections" (Aldrich, 2012:29). He suggests that some scholars focus on social capital as the wires "through which information and resources run", while others highlight social capital as the electricity "running through those wires, that is, the information and resources that are passed back and forth" (Aldrich, 2012:29-30). Putnam belongs to the first category with his definition of social capital as the "trust, norms, and networks that can improve the efficiency of society by facilitating coordinated actions" (Putnam, 1993:167). His definition entails three facets of social capital: (a) horizontal networks of (b) interpersonal communication and norms of reciprocity that together foster (c) social trust (Putnam, 1993:171,173). Putnam further argues that, similar to trust, norms and networks, social capital is a public good and "not the private property of any of the persons who benefit from it" (Putnam, 1993:170). Putnam's approach, and other scholars defining social capital as the wires, has been used in various case studies on disasters (Albrecht, 2017:21), as we will present later in this part.

#### 3.2.1.1. Definitions of social capital



Despite of the variety of definitions of social capital, some common denominators are clear. One is the emphasis on social relations generating productive assets, i.e. accessible resources (Bhandari and Yasunobu, 2009:487). In the context of disaster resilience, social capital reflects an informal safety net that assists people accessing resources during and after a disaster (Masterson et. al, 2014: 36). It has been identified as an imperative factor for mental health during the recovery phase. In addition, high levels of social capital have been proven to positively contribute to “coping efforts and collective efficacy”, since an individual with strong social capital needs less resources in recovering from severe events (Albrecht, 2017:21).

The importance and impact of being a part of social groups is a key sociological theme that has been examined in a range of different contexts, since even Emile Durkheim in 1897 provided an empirical study indicating that the rate of suicide in a community is closely related to the level of social integration, and that different types of suicide are related to different types of social integration and cohesiveness. Lacking or low social integration between individuals was described as ‘anomie’, a situation which was related to higher incidences of suicide.

Social capital has been defined as the groups, networks, norms, and trust that people have available to them for productive purposes (World Bank, 2004: 3). Moreover, definitions of social capital often refer to several different aspects or dimensions of social capital. A first distinction is between structural and cognitive social capital. Structural social capital refers to the types of groups and networks that people can utilize, and the nature and extent of their contributions to other members of those groups and networks. Cognitive social capital refers to peoples’ subjective perceptions of the trustworthiness of other people and trust in the key institutions in society, and norms of cooperation and reciprocity influencing the capabilities of people to work together to solve problems (World Bank, 2004).

Additionally, definitions of social capital also refer to different analytical units and relationships: 1) Bonding capital/networks (family, closest friends), 2) Bridging capital/networks (neighbours, local community) and 3) linking capital/networks (relationship to authorities and institutions) (MacGillivray, 2018).

The World Bank’s (2004) operationalisation of social capital focuses on six aspects:

- 1) Groups and networks: participation in various types of social organizations and informal networks, and the range of contributions that one gives and receives from them.
- 2) Trust and solidarity: trust towards neighbours, key service providers, and strangers.
- 3) Collective action and cooperation: whether and how people have worked with others in their community on joint projects and/or in response to a crisis.
- 4) Sources of information and modes of communication: access to information is recognized as central to peoples’ well-being.
- 5) Social cohesion, norms and reciprocity: the nature and extent of differences in the community (e.g. between various groups), the mechanisms by which they are managed, and which groups are excluded from key public service.
- 6) Empowerment and political action: members’ sense of happiness, personal efficacy, and capacity to influence both local events and broader political outcomes.



### 3.2.1.2. Network views of social capital

In contrast to Putnam's conceptualisation of social capital, Lin (2001) suggests that social capital is the electricity running through the wires of social networks (Aldrich, 2012:30). He defines it as "resources embedded in social networks accessed and used by actors for action" (Lin, 2001:25). Lin argues that the value of social capital lies in the access to resources through one's "direct and indirect ties", not in the actual structure or network (Falk, 2015:30; Lin, 2001:19). Similar to previous research conducted by Granovetter (1973), Lin advocates open networks and suggests that 'bridges' within social networks facilitate flows of information and influence (Albrecht, 2017:21). Granovetter highlighted that sporadic and often informal connections would link different groups of individuals (Aldrich, 2012:27). Close ties commonly hold the same type of information, new information and resources are provided by individuals outside their close network (ibid). Network views of social capital - such as the work of Granovetter (1973) and Lin (2001) - concentrate on the horizontal and vertical aspects of social networks (Aldrich, 2012:31).

Lin offers four explanations as to why embedded resources in one's social networks can enhance the outcomes of actions. First, the flow of information is facilitated (Lin, 2001:20). Direct and indirect ties within a social network can provide an individual with information regarding opportunities otherwise not accessible - and likewise "it could provide an organisation or a community about the availability of an otherwise unrecognised individual" (ibid). Second, ties within a social network may wield influence on agents playing a vital role in decision-making involving the individual. Third, "social ties, and their acknowledged relationships to the individual, may be conceived by the organisation or its agents as certifications of the individual's social credentials" (ibid). Ultimately, relationships strengthen identity and recognition. To be assured of and recognised as an individual and member of a social network provides not only emotional support, but also "public acknowledgement of one's claim to certain resources" (ibid). Although Lin's conceptualisation of social capital stems from the field of economics, it has been used in prior research on disasters, for example by Aldrich (Albrecht, 2017:21).

To avoid an overly broad conceptualisation, social capital is usually traced in three dimensions - *bonding*, *bridging* and *linking* social capital (Falk, 2015:29). *Bonding* social capital refers to relations between individuals who are similar to each other and emotionally close, such as friends or family. Strong bonding social capital proves useful in providing social support and assistance, especially during and after a disaster (Aldrich and Meyer, 2014: 259). *Bridging* social capital allows for 'linkage to external assets', connecting individuals across various ethnic and racial groups, bringing together different communities (Aldrich, 2011:83). *Linking* social capital connects regular citizens with those that hold positions of authority and power - those who often can distribute scarce resources (Aldrich, 2011: 84). Aldrich's research on social capital and disaster recovery builds on Lin's network view of social capital that envisions it "as the resources available through bonding, bridging, and linking social networks along with the norms and information transmitted through those connections" (Aldrich, 2012: 33).

Related to disasters, scholars of social capital usually differentiate between two forms of networks' connections – horizontal and vertical. *Bonding* and *bridging* social capital refer to horizontal ties, whereas *linking* social capital refers to vertical ties (Ferlander, 2007:119). In disaster recovery, horizontal ties are commonly imperative for immediate support, while vertical ties provide longer-term support (Falk, 2015:29). In addition to immediate aid and recovery support, strong horizontal networks enable individuals to receive alerts, undertake precautionary measures and find shelter and supplies



(Aldrich and Meyer, 2014:259). Vulnerable groups may have deep reservoirs of bonding capital, i.e. horizontal ties, allowing them to 'get by', while lacking linking social capital, i.e. vertical ties - preventing them to 'get ahead' (Woolcock and Narayan, 2000: 227).

Lin points out that social capital is disparately allocated across social groups (Lin, 2000:787). Considerable differences are found "in the social networks and embedded resources between females and males", with men having weaker horizontal ties, but stronger vertical ties, while the opposite applies to women (ibid). Men have larger networks, are connected to larger associations and retain the benefits in associations with other men commonly holding higher positions in hierarchical structures. In contrast, women are affiliated with smaller and more disadvantaged networks, mostly consisting of ties to other women holding lower hierarchical positions (Lin, 2000:788). This enforces closed networks and the "reproduction of resource disadvantages among females" (ibid). In the context of a disaster, recovery initiatives can strengthen "the voice" of civil society, but some voices may be silenced" (Bradshaw, 2013:183). The latter particularly applies to women's voices, and women may instead participate in "women only" spaces (ibid). Bradshaw highlights that "without care, the disaster for women may be as much the post-disaster interventions as the event itself" (2013:184).

Aldrich describes different external mechanisms for increasing social capital and strengthening existing civil society, referring to various case studies (Aldrich, 2012:160). These efforts include targeted programmes promoting management and leadership development which have been proven to strengthen both local trust and civic participation, as well as policies providing incentives for community participation (ibid). Moreover, recovery programmes focusing on bringing different people together to build new houses have shown to enhance social capital and deepen trust. Encouraging participation in community services has also proven effective in shortening the psychological recovery after a disaster. Another mechanism for increasing social capital among vulnerable groups is to build or rebuild local institutions, such as community development centres, which provide local citizens with new sources of information as well as ties to each other and to external agencies (Aldrich, 2012:160). Scholars have highlighted the benefit of these centres holding weekly, monthly or annual events in deepening trust and social networks among the citizens (Aldrich, 2012:161).

The mechanisms of a network-based theory of social capital offer strong insights within a post-disaster context. Previous research has asserted that a focus on social networks is relevant for social capital and disasters and should be examined further (Albrecht, 2017: 86). In his conceptualisation of social capital, Lin argues that the value of social capital within the context of disaster recovery lies in the resources embedded within one's social networks that can be accessed through ties in the networks (Lin, 2001:25). Lin and Aldrich state that social capital does not function as a public good since it is differentially distributed across social groups (Aldrich, 2012:14).

Disasters stimulate spontaneous responses by self-organization of individuals and voluntary groups from within and outside disaster-affected communities, as individuals and groups typically become more unified, cohesive and altruistic in such events (Twigg and Mosel, 2017). Their volunteering is



entirely spontaneous<sup>13</sup>, unlike formal or organized<sup>14</sup> volunteers who are recruited, trained, and instructed by government and non-governmental organisations. Empathy for friends and neighbours, community attachment and occasional perceptions that official responders are not sufficiently effective are important motivators for spontaneous volunteers in local situations (Harris et al., 2017). Twigg and Mosel (2017) emphasise shared values and a culture of responsibility to one's community and society, alongside previous experience of disaster events or awareness of risks.

However, many of these 'intra-community' differences can of course apply to any group of residents. For instance, while ethnic, linguistic, religious, or class ties might very often be strong indicators of community in European cities, the extent to which members of these groups agree amongst themselves on the best approach to preparedness, rescue, rebuilding, and future resilience is an open question. Communities very often differ in their access to power holders in politics or business – and in many cases government's actions on risk reduction are not spread evenly according to, for example, risk of flood or earthquake damage in each location. Rather, timely delivery of services and infrastructure can depend as much on a group's ability to lobby for its own interests as it can the actual cost of project implementation

Authors have often used the term social capital to explain the bonds that community members have in common. Following research in both Italy and the United States, Putnam (1993) viewed the quality of community as lying within social networks. 'Weak ties' - as opposed to the blood ties of family - described the practices of trust and understanding that were built around the social networks of church, work, and neighborhood activity. The stronger these 'weak' ties were, the more community members relied on each other for support, planning, and organisation in difficult situations such as crises and disaster. Yet, these community ties should not be seen as straightforward, or as things that outside initiatives can build and produce automatically. While community is certainly about shared interests and values, it is also about place – that is, the experience of living together in a proximate area. Looking specifically at marginalised, working class districts, Bourdieu called this the 'site effect': people might have origins in very different cultural or ethnic backgrounds, but come together as a community by nature of dealing with the same local issues and sharing the same local memories. People were brought together by issues such as their employment, housing situations, political or social campaigns, or a trauma, tragedy or disaster. Social and cultural capital could act as constraining forces for community development as much as enabling ones. Therefore, 'essentialising' a particular community (say, Roma people, slum dwellers) as 'problematic', 'needy' or 'wanting' causes problems as it fails to deal with the issues that pulled the community together in the first place. In a more recent essay, Marres (2005) declared that issues spark a public into being: communities are not 'pre-given' things, but they are formed, developed, and then changed according to the issues (in this case, disasters) that unite them in a common goal.

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<sup>13</sup> Also referred to as "convergent," "walk-in," or "unaffiliated" volunteers (Harris et al., 2017), is an impulsive and unplanned type of volunteering (Simsa et al., 2019). They rarely have specialized training for responding to the event and they may, or may not, have relevant expertise (Drabek and McEntire, 2003). The main activities in which emergent groups and spontaneous volunteers are involved in disasters seem to be search and rescue (SAR); collecting, transporting and distributing relief supplies and clothing; and providing food and drink to victims and emergency workers (Twigg and Mosel, 2017). Shaskolsky (1965) differentiates four subgroups: those who (a) help a regular disaster organization; (b) formally create an ad hoc organization for dealing with the circumstances of the specific disaster; (c) use their pre-existing non disaster organization for disaster work; or (d) carry out disaster-related tasks within a loose, informal network.

<sup>14</sup> Spontaneous disaster response can also lead to longer-term involvement in more organized volunteering (Whittaker et al., 2015), complementing spontaneous, emergent activity but does not replacing it (Twigg and Mosel, 2017).



### 3.2.1.3. Framings of social capital

During the literature review, several different outcomes were examined in studies on social capital, such as mortality, depression and posttraumatic stress disorder (PTSD), food security, livelihood security, adaptation, help and social support, preparedness, and coping. We found out some interesting ways to frame social capital by the scholarship:

1. In several of the reviewed studies in the scoping study, social capital is treated as an independent variable influencing outcome measures. Ali et al. (2012) assess PTSD prevalence among earthquake survivors after the 2005 Pakistan earthquake, which killed 87 000 people, and find that a high social capital and religious inclination seem to protect against PTSD. Hall et al. (2014) study the relationship between cognitive social capital among war-affected youth in low- and middle-income countries and mental health among children in Burundi. They measure cognitive social capital as the extent to which children believed their community was trustworthy and cohesive, and find that high levels of cognitive social capital was related to a declining trajectory of children's mental health problems.
2. In other studies, social capital is treated as an intermediate variable, for example between built environment in cities and resilience. Carpenter (2015) studies, for instance, how characteristics of the built environment influencing social networks contributed to greater resilience to the 2005 Hurricane Katrina along the Mississippi Gulf Coast.
3. In other studies, social capital is treated as a dependent variable. As such it is influenced by other variables. This applies to studies examining the impact of disasters on social capital: Wickes et al. (2017), for instance, assess the stability of neighbourhood level collective efficacy and social capital before and after a disaster.

### 3.2.1.4. Objects of study on social capital

The most common object of study in the reviewed publications is communities or neighbourhoods, followed by families or households. These two analytical units correspond to the concepts of bridging social capital and bonding social capital. Generally, the studies we analysed consider bonding social capital as the most important for resilience in the long run. Some studies also mention linking social capital.

When it comes to the dimensions of social capital, or the mechanisms through which they influence outcomes, the most important type of social capital that is studied is the structural type of social capital, such as the different types of support that diverse types of group membership can provide before, during and after disasters. However, cognitive social capital is included in the studies focusing on PTSD.

## 3.2.2. Social capital in crisis and disaster management

A common disaster management cycle put forward by the US Federal Emergency Management Agency (FEMA, 2016) shows four different phases and conceives crises and disasters as recurring events:





- Mitigation: actions to prevent or reduce the cause, impact, and consequences of disasters
- Preparedness: planning, equipping and training for events that could not be prevented or mitigated
- Response: responding to the effects of the disaster
- Recovery: restoration efforts

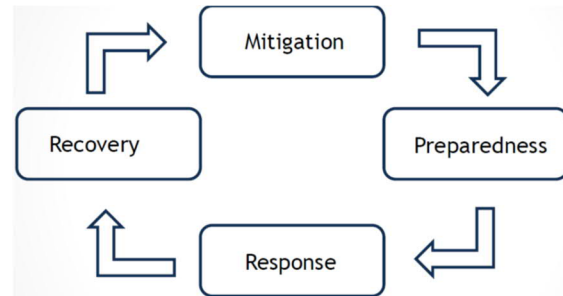


Figure 9 An example of the disaster or crisis management cycle

Wood et al. (2013:161) describe the role social capital plays in each phase of the disaster management cycle. In each phase social capital is important in the diffusion of information, the fostering of civil engagement and collective trust, and the proliferation of social networks and organisational involvement. However, social capital manifests in different ways in each of the phases.

- Information flows through social networks during the **response** contains resource mobilisation (political, institutional, and economic). During the **recovery**, information concerned with the allocation of resources, recovery management, and type and availability of support infrastructure diffuses through social networks. During the **prevention and mitigation**, information passing through social networks contains hazard awareness, risk perception and mitigation strategies. During the **preparation**, information passing through social networks contains early warnings and evacuation protocols.
- The role of social capital in fostering civil engagement and collective trust in the **response** is focused on individual and collective mobilization of community resources; in the **recovery** is focused on recovery management and resource allocation; in the **prevention and mitigation**, the emphasis is on promoting prevention and mitigation strategies as a component of community organisations; in **the preparation**, the emphasis is on trusted local leadership and knowledge.
- The role of social capital in proliferation of social networks and organisational involvement in the response is focused on resource availability and support networks; in the recovery it is focused on physical and emotional support, community spirit; in the prevention and mitigation it is focused on community disaster risk reduction; in the preparation it is focused on community's response and recovery planning.

Few studies examine the role of social capital in crisis and disasters, focusing, for instance, on how people cope with imminent physical threats or how they escape from dangers. Through our literature review, we found out that the scholarship on crisis and disasters has a stronger focus on the period after a crisis or disaster, probably due to the character of the social capital concept: its linking, bonding, and bridging aspects are more prominent after a crisis or disaster than during. Indeed, most

research has focused on the recovery stage of disaster management (see Meyer, 2018; Twigg and Mosel, 2017). On the other hand, social capital is also of vital importance during a crisis or disaster. First, the linking aspect is important, for example, when it comes to how information from authorities is interpreted. The bridging aspect is important when it comes to the extent to which people provide assistance to other people in their community during a crisis or disaster or spread information. The bonding aspect is also central during disasters, as strong ingroups may provide their members with assistance.

We are aware that it is challenging to draw an objective line between a pre-crisis, an acute and a post crisis phases. Especially between during and after a disaster, the passage depends on the experience and perspective of different actors. For instance, while crisis managers declare the end of a crisis to start with the official recovery, the people impacted by the crisis can still experience it. However, this division has helped during the scoping study for the literature review. Here, we offer the role of social capital in the three phases, by providing some examples taken from studies on crises and disasters.

*Before a crisis.* Analysing the levels of household preparedness in New York during Superstorm Sandy on 25 October 2012, Martins et al. (2019) find out that the levels of household preparedness in the city at the time of the storm were modest, but that social capital was an enabler of preparedness. They also conclude that single mother households, low-income households, and households with seniors were less likely to be proactive with respect to preparedness efforts. The linkages between social capital and disadvantaged situations are clear here. Działek et al. (2016) conclude that human and social capital were the most important factors to predict households' preparedness to floods in Southern Poland in May 2010. However, they point out that preparedness behaviour of communities at risk is influenced by context-specific social and economic factors that cannot be generalized. Lo et al. (2015) study how social capital contributes to anticipatory adaptation to environmental change in a flood-prone port city in China. They conclude that the intention to make preparation increases with the levels of social expectation, social relationship, and institutional trust. Surprisingly, they find out that perceived risk and damage experience have no significant impacts. The authors, therefore, conclude that it is more important to build social capital and trust to enhance community resilience than to increase risk awareness.

*During a crisis.* Linnekamp et al. (2011) examine households' perceptions of flooding as part of climate change in two low elevation coastal zone cities (Paramaribo and Georgetown) in the Caribbean. They find out that households' exposure to floods is higher for lower-income groups. At the same time, households in lower-income areas are involved in more preventive measures than higher-income households. They also uncover that social capital leads to mutual help among neighbours during floods. These types of efforts are, however, not sufficiently acknowledged by local government.

*After a crisis.* Kerr (2018) shows that social capital, and in particular bridging social capital, is a strong predictor of a community's post disaster recovery. Moreno et al. (2019) study the role of community resilience during the emergency response after the 2010 Chile earthquake and tsunami. In the absence of external aid, they conclude that community resilience played an important role during the response period. The study of Moreno et al. (2019) stresses that communities not merely are passive victims of disasters, but rather active agents. The entire community survived through the first days after the 2010 tsunami in Chile. This is attributed to six key factors: 1) sense of community, 2) local knowledge, 3) social capital, 4) organisation, 5) cooperation, and 6) trust. Also recognizing the inherent potential of local community response to disasters, Kenney et al. (2014) study the 2010 earthquake in the Canterbury region of New Zealand, focusing on the local Māori recovery initiatives,



which were collaborative, effective and shaped by cultural values, including the principle ‘aroha nui ki te tangata’ (extend love to all). They argue that the Māori response to earthquakes comprises an example of best practice, and that the potential in such local initiative to a greater extent should be acknowledged by policy makers. Islam and Walkerden (2014) study how bonding and bridging networks contribute to disaster resilience and recovery on the Bangladeshi coast. Their study indicates that affected communities drew heavily on their bonding and bridging relationships to face the immediate crisis. They found that support through bonding and bridging networks, displayed in sharing food, providing comfort, mutual works, etc., was very important in the first period after the disaster. On the contrary, bridging networks eventually broke down due to resource scarcity, while the importance of bonding networks persisted. The bonding networks helped the recovery process by reducing food intake, helping with alternative income etc.. Finally, they conclude that linking social networks are required for longer time support.

### 3.2.2.1. Social capital’s role in enhancing disaster resilience

As crises and disasters demand communities to perform collective action, social linkages, relational trust, and internal and external relationships are important in the overall disaster management process (Wood et al., 2013). According to Kendra et al. (2018), social capital in the form of presence of relationships, facilitates emergent or spontaneous disaster activities, but also enhances the prospect of finding resources, bolsters learning, and enables trust across disaster management organizations and sectors. This contributes to an enhancement of the disaster resilience within the community. Pre-existing social relationships and organization (particularly family, neighbourhood and workplace) can influence how emergent groups are created and organized. They may also influence what types of activities are undertaken and how they are carried out (Twigg and Mosel, 2017). More specifically, the community’s capacity to respond is influenced by breadth and depth of personal networks and relationships (Harris et al., 2017). The overall recovery of a community is usually supported by strong bonding, bridging and linkage relationships (Wood et al., 2013). Social capital, including social networks, provide motivation and encouragement to take part in preventative action (Dynes, 2006) and increase preparedness (Wood et al. 2013). According to Aida et al. (2013), social capital allows communities to be more resilient at each stage of a disaster.

#### *Self-organising next to official responses to crises or disasters<sup>15</sup>*

Individuals often engage in collective action based on a local consensus about what needs are not being met by formal governmental and non-profit agencies that constitute the “official” response to a disaster (Stallings and Quarantelli, 1985). Communities understand their own contexts and realities the best. Therefore, the effectiveness of “official” responders depends on the local knowledge and capacities, which community organizations can contribute with (Harris et al., 2017). Moreover, using online platforms and mapping, crowdsourcing data, microblogging, wikis and social media, “digital” spontaneous volunteers can contribute to disaster response by providing vital information to the “official” responders (Kankanamge et al., 2019; Twigg and Mosel, 2017). For example, volunteer crowdsourcing shares real-time, time critical and location specific information whenever a disaster occurs, assisting the emergency managers to take necessary actions to reduce the disaster risk, increase the real-time awareness and predict the direction in which the disaster is spreading (Kankanamge et al., 2019).

<sup>15</sup> In WP2, we explored the role of informal volunteers in D2.3.



However, spontaneous volunteers might not always be welcomed by disaster managers - a phenomenon called “involvement/exclusion paradox of spontaneous volunteering” (Harris et al., 2017). In most countries, disasters are dealt by networks of “official” responders characterized by standard operating procedures, centralized authority, reluctance to trust information from outside the network, drivers to minimize risk, and reluctance to collaborate with unknown people or organizations (Vigoda, 2002). Thus, reactions by “official” responders to spontaneous volunteers tend to be cautious, as they are seen as outsiders, whose qualifications, skills, background, and capacity are unknown and whose credentials cannot be reliably verified (Drabek and McEntire, 2003; Harris et al., 2017). They potentially might become an obstacle to efficient emergency management. Indeed, spontaneous volunteering can imply significant coordination, integration, communication, logistical, and health and safety challenges or risks for the volunteers, the clients, or the disaster managing organizations (Simsa et al., 2019; Twigg and Mosel, 2017). Harris et al. (2017) have highlighted the following main challenges for managers during natural disasters: communicating with spontaneous volunteers, maintaining links with spontaneous volunteers, prioritizing the tasks of spontaneous volunteers, incorporating spontaneous volunteers, keeping spontaneous volunteers motivated during standby, and finally the risks that spontaneous volunteers can meet as well as the costs for insurance, equipment, and reputational risk. Overall, the drive to manage risk is a key reason why “official” responders may be reluctant to allow spontaneous volunteers’ involvement (Harris et al., 2017). As a consequence, ordinary citizens and emergent groups are often underutilized or even rejected during emergencies. Moreover, emergency planners rarely take emergent groups and spontaneous volunteering into account in their contingency plans (Twigg and Mosel, 2017).

### **3.2.2.2. Suggested strategies of engaging volunteer groups and building social capital for disaster preparedness and response**

Disaster research increasingly shows that command-and-control models have their flows and suggests “loosening rather than tightening up the command structure” (Quarantelli 1988: 381; Whittaker et al., 2015). Managers deterring people from spontaneous helping (even if justified as concern about hazards) might ultimately cause negative effects (Harris et al., 2017), since social capital, especially the early incorporation of local networks in formal response mechanisms, might improve disaster response (Reimer et al., 2013). Several scholars (Baker and Refsgaard, 2007; Jaeger et al., 2007; Munasinghe, 2007) even argue that social capital is central for effective emergency formal and informal responses. Thus, involvement of spontaneous volunteers into disaster management and planning is important. However, it is crucial to find the right balance between self-organization of individuals and communities, and their coordination (Simsa et al., 2019). For example, a few persons working in shifts, assessing and ensuring stable processes, passing on information, acting as coordinators for spontaneous volunteers, and other means of guidance could increase the efficiency of spontaneous volunteer’s work (Simsa et al., 2019). Also, it is important that processes should focus on specific tasks (Simsa et al., 2019). Neubauer et al. (2013) have proposed new concept for volunteer management – “crowd tasking” - composed of structures, processes and tools with the goals to (1) build up and maintain an informal community of pre-defined and informal volunteers, (2) mobilize them when needed, (3) control their activity and (4) collect data generated by the mobilized volunteers for enhancing situation awareness of the disaster relief effort as a whole. Now, several existing IT tools allow to register volunteers to be able to task them when needed. For example, PulsePoint or Staying Alive are two mobile applications aiming to alert the closest CPR-



trained citizens and localize the closest Automated External Defibrillator in case of cardiac arrest emergencies (Batard et al., 2019). Such new media tools also help to enhance spontaneous volunteers' involvement and engagement.

### 3.2.2.3. Policy measures to enhance civic involvement and disaster preparedness

Although social networks and social cohesion are, in general, underutilized in disaster planning and management, NGOs and government agencies have adopted a number of policies and programmes to increase reservoirs of trust, deepen networks (Aldrich and Meyer, 2014) and enhance civic involvement. Some of these interventions include time banking systems or community currency programmes providing incentives or rewards for those who volunteer; focus group meetings and social events, including general social activities such as parades, fairs, and block parties along with moderator-led discussions of different topics, redesign of physical and architectural structures to maximize social interactions (Aldrich and Meyer, 2014). Coffee shops, bookstores, bars, hair salons, public squares, and libraries serve as the places for social capital to be generated and regenerated. The various methods use existing networks and community activities as spaces for incorporating disaster issues and resilience actions. For example, in Seattle, Emergency Managers and the Department of Neighbourhoods joined to create Community Emergency Hubs in the existing community gardens as organizing spaces to provide disaster information, food and water, and preparedness training to the local community (Aldrich and Meyer, 2014). However, community projects, regardless of their focus, which strengthen neighbourhood relationships, are an effective way to improve community resilience (Wood et al., 2013). Also whole new networks and activities are created focussing specifically on disaster issues. For example, the Neighbourhood Empowerment Network in San Francisco brings neighbours and stakeholders together to develop plans and actions for disaster preparedness and response (see <http://www.empowersf.org>). According to Mimaki et al. (2009), having a community organization focused on disaster within a neighbourhood was correlated with increased citizen preparedness and participation in disaster-related activities.

These examples from USA show the importance of collaboration between spontaneous volunteers and professional responders. According to Kaltenbrunner and Renzl (2019), emergent collaboration between non-profit organizations (NPOs) as formal disaster relief organizations and emerging volunteers based on social capital represents an appropriate approach to enhance their disaster relief performance. Collaborative efforts can be regarded as distinctively highly socially driven. Social capital components like 'avoidance of misunderstanding' and 'interaction frequency' enhance the collaborative efforts between NPOs and emergent volunteers (Kaltenbrunner and Renzl, 2019). According to Kaltenbrunner and Renzl (2019), in addition to standardized training procedures, NPOs should implement trainings that focus on learning (a) how to quickly recognize emergent volunteers' capacity and (b) when to 'use' volunteers and for which purposes/tasks. Emergent collaboration could be integrated into disaster exercises and in order to improve connectedness with volunteers, additional liaison officers could be installed (Kaltenbrunner and Renzl, 2019).

Collaboration between spontaneous volunteers and local residents/disaster victims can be problematic when local residents perceive spontaneous volunteers as "outsiders" (Haraoka et al., 2012). A tendency towards more collaborative activities between non-professional disaster volunteers and disaster victims occur the higher the social capital is (Haraoka et al., 2012). Therefore, social capital should be built for residents to collaborate with volunteers. According to Haraoka et al. (2012),



high social capital may be created by facilitating interactions between residents and by regular participation of the majority of residents in neighbourhood association events and festivals that are cooperative activities, disaster drills and education, and organized activities.

### 3.2.2.4. The “dark side” of social capital

In general, the studies on social capital connected to crises and disasters give a positive account of social capital. However, social capital can be a double-edged sword, helping in-groups recover more effectively, for instance, but at the same time slowing or halting rebuilding for those with fewer social resources. Strong bonding social capital can reinforce existing systems of discrimination and justify programmes that provide benefits locally, but without helping those at the margins of society (Aldrich, 2012). Indeed, discrimination and inequality make access to and generating of social capital more difficult. Therefore, discrimination and inequality have to be addressed in the context of social capital. This is an important perspective for communities to consider their actions and programmes that build bridges across groups in communities and up to authorities (Aldrich and Sawada, 2015).

In a study of the role social networks play in individuals’ responses to heat waves, Wolf et al. (2010) suggest, for instance, that strong bonding networks could potentially worsen rather than reduce the vulnerability of elderly people to the effects of heat waves. Most of the old people that they interviewed generally asserted that heat waves did not pose a significant risk to them personally, and most said that they would be able to cope with hot weather. The authors conclude that bonding networks strengthen these narratives rather than challenging them and thus contribute to vulnerability. In accordance with these insights, MacGillivray (2018) refers to the “dark side” of social capital to describe bonding capital that is cemented by ethnic hostility, patronage networks (and also “unresponsive” linking capital). In his review of the research, Kerr (2018) also notes the possibly negative outcomes of bonding social capital in disasters, as it often excludes community outsiders, such as religious and ethnic minorities and other vulnerable groups, thereby reinforcing their vulnerability and leaving them even worse off.

### 3.2.3. Social capital in the theoretical framework of BuildERS

The studies included in our literature review offer, in general, a positive view about social capital as a key enabler of resilience in crises and disasters. However, recalling Bourdieu’s approach to social capital, there is a strong linkage between social capital, other types of capital and disadvantaged positions and hierarchies in the social spaces. There are studies, which underline that the outcome of different dimensions of social capital is highly contextual, and outcomes vary, depending on the situation in question and the interaction between specific aspects of social capital with other important socio-economic factors.

In addition, few studies focus on informal volunteers’ involvement in crises or disaster. However, this knowledge is critical to better understand how to integrate bottom-up, networked forms of crisis management with top-down, institutionalised efforts. In WP2, we address particularly this issue by exploring the engagement of informal volunteers, including social support networks, within crisis management systems in various countries. In addition, we seek to define how national crisis management systems find the balance between purposeful engagement of informal volunteers and institutionalised efforts.



Furthermore, the literature review shows that there are few studies about the social capital of vulnerable groups in Europe, and how they cope with disasters. It seems an under researched issue. In this vein, BuildERS can greatly contribute to fill this gap. One reason can be that some of the vulnerable groups we spotted out in D1.3 as included in official data, such as migrants or homeless, often are difficult to reach. In that deliverable, we define vulnerable groups as those regrouping individuals currently in vulnerable living situations or conditions, such as children, elderly, persons with disabilities and homeless people. According to what we presented earlier in the Section about vulnerability, these current stages should not be taken as a static characteristic of these groups. The BuildERS project aims to scrutinise these vulnerabilities (survey in WP3) and offer recommendation on how to decrease them (WP5). Another reason is the scholarship, in general, studies social capital within communities, neighbourhoods, families or households, which have become the main units of analysis.

### 3.3. Risk awareness

After mapping both the scientific production and a sample of international and national public documents dealing with disaster risk reduction (mainly from international organisations and from the consortium's countries respectively), we concluded that there is no formal definition for risk awareness. As this part will show, risk awareness is used as 1) synonym of risk perception; 2) component of risk perception together with risk preparation and worry, for instance; 3) a (slightly) different concept with strong links to risk communication.

To highlight this issue, we conducted a literature review on risk perception to find out to what extent risk awareness can actually continue to be used in guises 1) and 2) or whether we can offer a distinctive definition of this concept as in 3), since risk awareness has become very important for policy makers and risk and disasters managers.

#### 3.3.1. Theories and perspectives on risk perception

Sixty years of research about risk perception have produced an impressive and varied bulk of literature on this subject, mainly characterised by the constant scientific interest to study the ways individuals understand risks (Starr, 1969; Slovic, 1987). Several approaches investigate risk perception (Van Wassenhove et al., 2012), but they are all inspired by three main perspectives: psychology (e.g. Fischhoff et al., 1993; Slovic 1987, 2000), anthropology (e.g. Douglas and Wildavsky, 1982; Douglas, 1985; Thompson et al., 1990) and sociology (e.g. Short, 1984; Renn and Rohrmann, 2000; Renn, 2008; Beck, 2009). These three perspectives have commonalities and differences in the way they describe risk perception. Commonalities regard risk as a mental construction or model, which is subjective, intuitive and contextual, and has been built through interactions and experiences. Differences concern the extent to which this mental model develops individually (psychological perspective) or at group level (anthropological and sociological perspective) and how risk is considered.

These three perspectives also imply that different aspects should be prioritised if any change in risk perception needs to be accomplished. The psychological perspective suggests that cognitive and affective aspects of a risk or a hazard need to be considered. The anthropological and sociological perspectives assume that risk perception passes through a social influence process and therefore the main factor to be focused upon in order to accomplish any change are the means of social influence



(friends, family, and significant others). Here, risk is culturally constructed. Therefore, to change risk perception, one has necessarily to go through a sort of *cultural revolution*, and in any case, societal groups and not individuals should be targeted for change.

The table below summarises the three perspectives on risk perception.

Perspectives	Risk perception	Focus	Results
Psychology	Risk perception is an intuitive risk judgment on which citizens rely upon in taking decision about risks (Slovic, 1987)	Cognitive and affective factors underlying individual risk perception	<p>Lay-people's judgments of risk are related to hazard characteristics (e.g., catastrophic potential, threat to future generations) and, as a result, tend to differ from experts' judgements (Slovic, 1987)</p> <p>Risk intuitive judgments are based on an "affect heuristic", i.e., a mental process, which derives judgements of risk from an overall affective evaluation (Finucane et al., 2000)</p>
Anthropology	Risk perception is the result of social and cultural factors shaping individual risk cognition (Douglas and Wildavsky, 1982)	Cultural factors that predict citizens' risk perception and risk acceptance	People, acting within social groups, downplay certain risks and emphasize others as a means of maintaining and controlling the group (Douglas and Wildavsky, 1982)
Sociology	<p>Complex combination of innate biases and experience, i.e. cultural-, socio-political- and emotional factors (Rohrmann and Renn, 2000)</p> <p>More on group level: risk perception involves a process rather than a series of discreet activities (Mileti and Sorensen, 1990; Lindell and Perry, 1992)</p>	Social factors that predict citizens' risk perception and risk acceptance (Short, 1984; Luhmann, 1986,)	<p>Individuals' reaction to risks is mediated by social influences conveyed by friends, family, and fellow workers.</p> <p>Risk perceptions are posterior rationalizations of one's own behaviour, influenced by the social context (Short, 1984)</p>





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*Table 1 Three perspectives about risk perception*

The psychometric approach has dominated the psychological perspective since the 1980s (Rodríguez et al., 2018; Sjöberg et al., 2004; Slovic, 1987). This approach uses different techniques to quantify people’s risk perceptions, in order to gain insight into individual mental processes that can predict beliefs and behaviours regarding actual hazards. The result of these insights revealed that all social, cultural and psychological aspects could be summarised and quantified into a model that can predict how individuals respond to actual hazards. One of the main conclusions of this approach is that risk is subjective, and it “does not exist ‘out there’, independent of our minds and cultures, waiting to be measured” (Kunreuther and Slovic, 1996: 119). In addition, this approach posits that experts and non-experts (often called lay-people) perceive risk in a different way: lay-people base their evaluations on an array of risk factors and risk characteristics (e.g. risk for future generations, knowledge, etc.), whereas experts tend to use statistical annual fatalities to judge whether an activity poses a risk or not (Fischhoff et al., 1979). This distinction in the core nature of the risk construct is the origin of much of the divide between experts and lay-people in accepting and regulating hazards and is the ultimate cause of mis-communications between politicians and citizens. Experts and lay-people often perceive risks differently: experts develop their premises on elements such as probability, statistics, and scientific and technological knowledge, while lay-people base their judgement on other elements, such as previous experiences and beliefs (Baron et al., 2000). Renn and Benighaus (2006) prefer to use the term risk assessment rather than risk perception when referring to experts.

At the beginning, the psychometric paradigm asked people to define each hazard based on a series of characteristics, for example, voluntariness, catastrophic potential, controllability, which were supposed to influence the perception of risk. In doing so, cognitive maps and personality profiles were created for each risk (Starr, 1969; Lowrance, 1976). Cognitive maps represent each hazard in a two-dimensional space derived from the analysis of the factors that group together those characteristics that are related to each other. The factors in this space reflect the degree to which the risk from a particular hazard is known (factor 1) and the degree to which the risk evokes a feeling of terror (factor 2). People’s perceptions are closely related to the position of a hazard within the space created by these two factors.

However, while the psychometric approach research saw the perception of risk as a form of conscious and analytical mental process, deliberately implemented by the individual to decide whether or not to worry about a certain danger (e.g., it is uncontrollable therefore it is risky, it is unknown therefore it is risky), with the passage of time, and with the accumulation of experimental data, Slovic and his collaborators recognized how much the perception of risk actually depends on intuitive and experiential thought processes, guided by emotional and affective factors. In this new conception of risk perception (see Finucane et al., 2000; Slovic et al., 2007), risk perception generates from a general affective assessment, from which the risk and benefit judgments both derive. In other words, it is not so much the cognitive components that determine the perception of risk, but rather the emotional and experiential components (see Slovic and Peters, 2006). As well, the questions measuring the affective component of risk (e.g., "How worried you are about X", "If you think about X how scared are you") are the best predictors of protection and prevention behaviours (Ferrer et al., 2018). This superiority of the affective, emotional, intuitive component in determining individual risk



perception is nowadays well known and well accepted and is a benchmark of this literature (see Keller et al., 2012).

According to Sjöberg (2001), the psychometric approach is mostly instrumental to decision-making to avoid that rational experts' judgement is undermined by non-experts' fears and beliefs. Indeed, the conflict between expert and non-experts' risk perception is at the basis of the social dilemmas of risk management (Sjöberg, 1999). Furthermore, the psychometric approach considers media as having a strong impact on risk perception (Wåhlberg and Sjöberg, 2000).

Both the anthropological and sociological perspectives have been very much influenced by a) the cultural theory of risk (Douglas and Wildavsky, 1982; Thompson et al., 1990), b) Ulrich Beck's theory of reflexive modernization and the risk society (Beck, 2009), and c) Niklas Luhmann's system theory (1993).

- a) The cultural theory has contributed to the developed of four main prototypes of people's risk perception: fatalists, egalitarians, hierarchists and individualists. According to Dake (1991), 'worldviews' are general attitudes that people have towards the world and its social organisation. These 'worldviews' can become real 'dispositions' that guide behaviour and choices. In fact, they have proven to serve to guide people's choices in complex situations, such as those related to climate change (Kahan et al., 2012; Drummond and Fischhoff, 2017). They, therefore, also guide risk perceptions. For example, people who have an 'egalitarian' preference, that is, who would like wealth and power to be distributed equally in society, perceive a higher risk for a wide range of hazards (see Peters and Slovic, 1996 and their study on nuclear energy). People who prefer a 'hierarchical' social order, in which experts and authorities are in control of the situation, have lower perceptions of risk (Peters and Slovic, 1996). According to these authors, both 'worldviews' and those affective evaluations function as 'dispositions' guide and help people evaluate and respond to risks. Noteworthy, experts' judgment, as well as that of lay-people, are influenced by worldviews (Kunreuther and Slovic, 1996; Slovic, 1999; Savadori et al., 2004).
- b) Beck (2009) claims that one of the consequences of modernisation is the social production of wealth, which is systematically accompanied by the social production of risks. However, in the long run, the social production of risk has overtaken the production of wealth. Beck is famous for having described our society in terms of risk society, resulting in people being constantly anxious about risks.
- c) Luhmann suggests any danger, any misfortune and ultimately the future itself is portrayed as a risk, since our society has become obsessed with risk. He also underlines that exaggerated risk consciousness and accompanying irrationalities may cause greater danger to the society than the risk itself. Luhmann states that risk perception is the result of a process of social communication (Luhmann, 1986). Psychological, social, cultural and political factors all interact to amplify risk and produce ripple effects described by Kaspersen et al. (1988). In this context, the various factors contribute to determine the signal value of an accident, after it has occurred. The signal value indicates the probability that future accidents will occur. It, therefore, determines the perceived seriousness of that incident, the media coverage, the costs perceived in the long term, the impact of the protests against the industry or agency that produced it etc.

How individuals, communities, groups, institutions, and societies define and understand risk depends on a wide range of factors, both personal and situational. For instance: (1) Interpretation of danger, understanding and knowledge of the cause (e.g. Bostrom et al., 1994; Lorenzoni and Pidgeon, 2006);



(2) proximity, exposure, direct personal threat, personal experiences with notable recent serious consequences (e.g. Goltz et al., 1992; Whitmarsh, 2008; O'Connor et al., 1999; Weber, 2006; Spence et al., 2011); (3) People's priorities (e.g. Lorenzoni and Pidgeon, 2006); (4) Experimental factors (e.g. Leiserowitz, 2006); (5) Environmental values (e.g. O'Connor et al., 1999). In other words, experiences, background, beliefs, attitudes, judgments and feelings influence risk perception, as much as factors such as how an individual understands the risk through information received from mediated sources, as, for instance, family, friends, school education, TV, or social media. In addition, different risk perceptions might be rooted in the level of knowledge acquisition, for example between the scientific community and the laity (Renn, 2001; Sjöberg, 2001; Aven et al., 2004). A good example, here, is the increasingly polarised public debate about climate change consequences, where we often witness both alarmist calls with apocalyptic repercussions, or a lack of reflection on how human activities impact and are impacted by climate change. Risk perception is influenced by the level of exposure to floods, storms, heat waves, which can influence perceptions of risks and threats related to climate change (Reser et al., 2014). All this means that people do not necessarily share the same perceptions of risk and their underlying causes and consequences since who we are strongly influences our risk perception. Individuals' social background, including being part of a minority or a vulnerable group, is an important predictor of how we perceive a risk. For instance, socio-economically deprived groups suffer worse effects due to increased exposure and increased vulnerability to the effects of the exposure. Another example is the so called "white-male effect" in risk perception, that is the tendency for white-males to have lower perceptions than other non-white groups, such as white females or black females and males. The reason for this different risk perception has been indicated in a different social-status position and trust in authority (Slovic, 1999). White-males are the dominant social group and they can determine risk regulations and have control over the issue, whereas, the other less-dominant groups tend to suffer decisions taken by others. "Perhaps women and non-white men see the world as more dangerous because in many ways they are more vulnerable, because they benefit less from many of its technologies and institutions, and because they have less power and control over what happens in their communities and their lives" (Slovic, 2000: 402). Inter-group differences in risk perceptions are attributed to the notion that societal institutions, infrastructures, and information not only shape the opportunities available for individuals to deal with risks, but also create the societal and individual fears/meanings in a co-evolutionary process. Some scholars argue that individuals can overcome what is seen to be the lack of control over and incomprehensiveness of a risk issue by following how the trusted people around them explain, or react to, risk issues (Cvetkovich et al., 2002). Trust in institutional performance reflects people's confidence in both the expertise and actions of agencies and institutions that control risk (see Cvetkovich and Löffstedt, 1999; Renn and Rohrmann, 2000).

Most people possess a common sense and are able to recognise risks. However, a biased perception of risk might influence survival responses in the everyday world, and especially survival responses in crises or disasters. To support the development of rational and reasonable risk perception among individuals might be the key to motivate risk reduction behaviour, for instance, information campaigns, and participatory actions.

### **3.3.2. Risk perception in disaster risk management and crisis management**

Risk perception plays an important role in disaster risk management and crisis management. Poor and biased risk perceptions (too high or too low) may be both the cause of under- or over-reactions when a crisis unfolds, determining delayed responses or panic and irrational behaviours, and, in



general, inappropriate or even harmful behaviour. As an example, consider the wide spread tendency to rebuild on the same sites were a flood has occurred in the past, or build houses without seismic structures in earthquake prone areas (Meyer and Kunreuther, 2017), or avoid traveling by plane after a terrorist attack, thus increasing the number of fatal car accidents (Gigerenzer, 2004). Risk perception influences preparedness, since an unbiased risk perception equips people and institutions to be prepared, to respond and to recover from different types of crises and disasters (Grothmann and Reusswig, 2006; Bradford et al., 2012; Scolobig et al., 2012; Bubeck et al., 2013; Hernández-Moreno and Alcántara-Ayala, 2016). At the same time, preparedness affects the way risk is perceived: if we are prepared, the risk is perceived as not so harmful or damaging (Calvello et al., 2015). However, the DRIVER project argues that this correlation is not as linear as one may think: the factors influencing both risk perception and preparedness make the picture more complicated and they need to be explored and understood before concluding that a 'high' risk perception leads to preparedness (DRIVER, 2017). Another component added by the DRIVER project is resilience. The project posits that the relationship between risk perception, preparedness and resilience is still unclear but exists at least to some extent and has been conceptualized by different approaches (DRIVER, 2017). Marshall and Marshall (2007: np) argued that “perception of risk should be included in future conceptual models of resilience, at least those applying to social systems subject to external change events”. They studied how ranchers in Australia and the USA have developed a biased risk perception on how to adapt to climate change. Their misperception made them less resilient to more extreme climate events. Schwarz et al. (2011: 1138) underlined that risk perception, among other factors “determine, at the individual and societal level, whether and how adaptation takes place”. Risk perception influences, as well, risk management and therefore determines whether risk management is successful in reducing vulnerability.

As mentioned in the section above, risk perception is influenced by several factors. The ENANCHE project, which studied how to enhance multi-sector partnerships (MSPs) to manage catastrophic natural disasters in Europe, provides a figure that explains very well the combination of factors, as well as the interplay between individual and collective risk perception. These factors are divided in three wide categories: cultural background, social and political factors and cognitive affective factors. Within each category, the figure introduces categories pertaining to the collective and the individual risk perception respectively. Individual risk perception influences collective risk perception and vice versa.



Factors determining risk perception (Source: Adapted from Renn and Rohrmann, 2000).

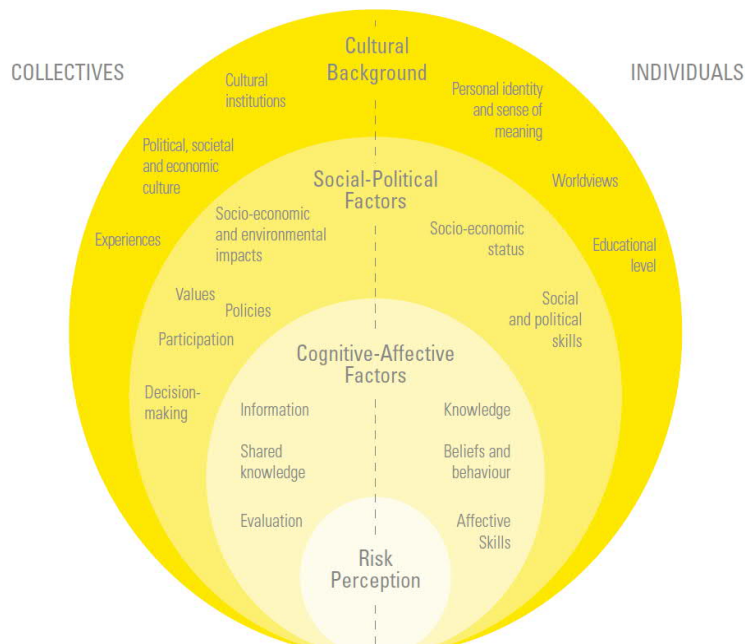


Figure 10 Factors influencing risk perception (ENANCHE, ny: 54)

Studies on risks related to natural hazards - floods, droughts, earthquakes, landslides, volcanic eruptions, and wild fires - (see, for instance, Barberi et al., 2008; Wachinger et al., 2013) conclude that factors, such as previous experience on the hazards and trust in authorities or experts are crucial in influencing risk perception. In particular, previous negative experiences of the hazards seem to have a positive impact on risk perception, in the sense that it is higher (see Grothmann and Reusswig, 2006; Ruin et al., 2007; Heitz et al., 2009; Damm et al., 2013). This conclusion is supported by studies that show that people, who do not suffer personal damage in a previous crisis or disaster, are less inclined to keep their risk perception high when a similar crisis strikes (see Halpern-Felsher et al., 2001; Scolobig et al., 2012). In addition, it can be explained assuming the availability hypothesis, which implies that any factor that makes a hazard highly memorable or imaginable – such as a recent disaster or a vivid film or lecture – can increase risk perception for that hazard by increasing the intuitive estimation of the hazard’s supposed frequency (Tversky and Kahneman, 1973). Other studies take into account individual factors, such as age, gender, and educational level and the way they impact risk perception and preparedness (see Knocke and Kolivras, 2007; Burningham et al., 2008; Jóhannesdóttir and Gísladóttir, 2010; Kellens et al., 2013; Kellens et al., 2011).

We found several definitions of risk perception provided by the scientific literature, international organisations and previous projects. We mentioned here those considered most broad and seeking to include several aspects of risk perception at the same time. For instance, Engen et al. (2016) defined risk perception as the subjective assessment of a risk and to what extent we are worried about its consequences in form of accidents, crises or disasters. Thus, risk perception concerns mainly individual mental processes of the individual at risk.

Renn (1992) and Wachinger et al. (2013) describe risk perception as a process of collecting, selecting and interpreting signals about uncertain impacts of threats and crises.



The European Environmental Agency defines risk perception as it follows: “Risk perception involves people’s beliefs, attitudes, judgements and feelings, as well as the wider social or cultural values that people adopt towards hazards and their benefits. The way in which people perceive risk is vital in the process of assessing and managing risk. Risk perception will be a major determinant in whether a risk is deemed to be “acceptable” and whether the risk management measures imposed are seen to resolve the problem” (EEA, 2020).

In general, the studies about risk perception in disaster risk management and crisis management recognise that there is a complex interplay between a wide variety of factors influencing risk perception.

### 3.3.3. Risk awareness

Wachinger et al. (2013) conducted a literature review on risk perception, mainly concerning natural hazards, and found out that some studies, independently from the research discipline (psychology, social science, natural science, or philosophy) used the term risk awareness, often together with the term risk perception, as its synonym (see Burningham et al., 2008; Kaiser and Witzki, 2004; Pagneux et al., 2011; Stanghellini and Collentine, 2008).

In other studies, both terms are considered well known and there are no definitions. In a recent study by Ridolfi et al. (2020) on flood losses, the researchers use both the term risk perception and risk awareness. Risk awareness is not defined, but one can deduce that the authors use it to describe activities promoted by the authorities to raise community’s attention around a risk. Haynes et al. (2008), in study about volcanic risk, made a distinction between risk awareness, risk perception and risk preparation and response. From the study by Scolobig et al. (2012) on flood risk awareness in the Alpine region, we can deduce that risk awareness is associated with the way people behave by assuming precautionary measures and with the knowledge about the risk. At the same time, in the study, some factors influencing risk perception, like previous experience, trust, age, education, influence risk awareness as well. Within the literature on psychological aspects of risk preparedness, the concept of risk awareness is often simply equated to the concept of worry (see Scolobig et al., 2012). For instance, people’s awareness of flood risk is equated to their feeling of worry for the risk under the assumption that higher levels of worry are associated to higher levels of preparedness. Other studies equate risk awareness to the concept of knowledge, like in Hori and Shaw (2013: 80), where awareness of local climate-related disaster risk is defined as “the extent of knowledge in practice about risks due to climate-related hazardous impacts such as intense rains, floods, and landslides that may affect communities”. Raaijmakers et al. (2008) as well state that risk awareness is knowledge or consciousness and that risk perception is characterized by the notions of risk awareness, worry, and preparedness.

Maidl et al. (2019: 6) offer an explanation of risk awareness consisting of three components: “relevance of natural hazards (including concern), (2) perceived probabilities of different hazard types in the respondents’ region, and (3) perceived threat”. However, these three components are very similar to those describing risk perception (concern, probability and threat).

In a study about risk perception and risk awareness of earthquakes in Portugal, Vicente et al. (2014) associate risk awareness with authorities’ risk and crisis communication strategies like risk awareness campaigns. Other studies investigate the importance of risk communication to increase risk



awareness (Keller et al., 2006; Haer et al., 2016; Bakker et al., 2018), being this the primary goal of risk communication.

To sum up, the scholarships often associates risk awareness with knowledge about a risk, with worry and with risk communication. Knowledge and worry have been investigated by risk perception scholars. Some of them have, indeed, assigned a broader definition to the idea of *knowing a risk*. Slovic and Peters (2006), for example, have discovered that people rely on feelings to inform judgments and make choices. These feelings have permitted humanity to evolve, telling us what is safe and what is not (Finucane et al., 2000; Slovic and Peters, 2006). Relying on feelings is a cognitive heuristic that individuals trigger each time they need a cognitive short-cut. In other words, when we have to decide if we should worry or not about a hazard, we intuitively and involuntarily consult the affective evaluation (how positive/negative, how good/bad) which is stored in our memory for that hazard. This affective value is the result of direct and indirect experience with the same hazard. If the affective attitude is positive, then risks are judged low with a consequent low risk perception. On the other side, if the affective attitude is negative, the risk is judged to be high. This process is intuitive, automatic and effortless, but relies on feelings and not on cognitive reasoning. In this sense, it is considered heuristic. As such, it is susceptible to biased risk perception (Finucane et al., 2000; Tversky and Kahneman, 1974). Following this reasoning, feeling-the-risk means that we are fully informed about a risk (Loewenstein et al., 2001). Nevertheless, measures of worry are, in some respect, measures of feelings. Worry increases emotional reactions, but it does not offer any indication about how to behave or react (so called perceived self-efficacy; see Bandura, 1993). Thus, risk awareness, limited to knowledge or worry, must be accompanied by recommendations about what to do to drive behaviour. Providing a copying strategy or a civil protection plan to follow in case of a crisis or a disaster is what many of the emergency organisations are nowadays trying to accomplish. In this vein, risk communication is an important element for risk awareness.

In looking for definitions of risk awareness, which include both knowledge and communication, we looked into the UN's disaster risk reduction (DRR) website (<https://www.undrr.org/>). The UN often uses the term awareness declined in the following forms: risk awareness, public awareness, hazards' awareness or awareness raising, often through campaigns and global initiatives. Most of the time, awareness is used in the UN's disaster risk reduction policies and initiatives. In particular, public awareness is defined as "The extent of common knowledge about disaster risks, the factors that lead to disasters and the actions that can be taken individually and collectively to reduce exposure and vulnerability to hazards" (UNISDR, 2009: 22-23). The UN points out that "Public awareness is a key factor in effective disaster risk reduction. Its development is pursued, for example, through the development and dissemination of information through media and educational channels, the establishment of information centres, networks, and community or participation actions, and advocacy by senior public officials and community leaders" (ibid.).

Risk awareness has been also studied in its relationship with preparedness, but with not so straightforward results (see Cave et al., 2009; Pligt, 1998; Scolobig et al., 2012). While Miceli et al. (2008) and Grothmann and Reusswig (2006) posit a direct relationship, Siegrist and Gutscher (2008), Steinführer et al. (2009), Scolobig et al. (2012) argue against it. In particular Scolobig et al. (2012: 20) argue that "There is no statistically significant relationship between risk awareness and preparedness". Thus, knowledge about the level of risk awareness of a certain individual or group is not sufficient to predict the actions they will actually take (or do not take) to prevent, or limit the impact of negative occurrences. Residents' are very worried but still do not adequately prepare for the disaster". Despite of their risk awareness, people tend to delegate the responsibility for their protection



to the agencies in charge, with a lack of personal involvement (so called social loafing; Latané et al., 1979). It has been largely demonstrated that when responsibility to act (power - agency) is given to another individual or organisation, people make a step back and wait and see (e.g., Murata et al., 2015). People's fears do not translate into self-protective action but, rather, they increase the political request for external interventions to make the environment safer.

In this vein, communication campaigns aimed at increasing sense of responsibility and agency should increase, in theory, the link between risk awareness and protective behaviour. Some scholars use the expression *cognitive misers* (so called bounded rationality; Simon, 2006; Tversky and Kahneman, 1974). People are aware of the risk and they think that safety is a high priority. However, when protective actions are needed, they postpone this decision due to a series of cognitive biases (Meyer and Kunreuther, 2017). One bias is the so-called status-quo bias, which causes individuals to stay in the state they are rather than taking action (Samuelson and Zeckhauser, 1988). Another is the so called present-bias, which is the tendency to prioritise immediate smaller rewards over greater future rewards - a tendency also known as time preference (Frederick et al., 2002). Investing in protective action involves immediate, high and tangible costs in front of uncertain future benefits. Other biases, such as the availability bias (Tversky and Kahneman, 1973), reduce the perceived likelihood that a natural disaster will occur. Since most people never experience a natural disaster, examples of such an event emerge in people's minds with difficulty, and for this reason, the likelihood of such an event is judged to be low. A solution to this problem is proposed by research on nudging (Thaler and Sunstein, 2008), applying behavioural economics to produce behavioural change. Preparedness activities include devising disaster plans, gathering emergency supplies, training response teams, and educating people about a potential disaster (Mileti, 1999). An effort should be made to make the preparedness option as the easiest option.

### 3.3.4. Risk awareness in the theoretical framework of BuildERS

How crisis managers and, in general, authorities communicate about risks is not just a question of informing the population about a risk. The communicative behaviour of individuals and groups is, as well, important. How people interact with authorities and with each other, to what extent they seek information, send, receive and interpret messages, use communication devices and (social) media channels, and react upon warnings or other relevant information influence risk awareness. As we have demonstrated in D1.4, to understand vulnerability and resilience more fully, we have to take into consideration the interaction of three types of communication-related factors: individual (e.g., various impairments, limited language skills), social-structural (e.g., inadequate official preparedness measures), and situational (e.g. breakdown of communication channels). In D1.4 we have highlighted, as well, how the increasing use of social media has posed a challenge: thanks to social media, individuals, groups, organisations, and states may more easily send or share messages, which may increase vulnerability of others by confusing or misleading them, for instance. We live an age of *information disorder*, a sort of global information pollution that includes unprecedentedly fast, cheap, and widespread creation, dissemination, amplification, and consumption of various forms of false and/or harmful information (Wardle and Derakhshan, 2017). In this context, misinformation and disinformation may increase risks and vulnerabilities and complicate the work of crisis managers and authorities. On the other side, the way authorities communicate and which means they use to communicate about risks to people need to consider that audience is not homogeneous.





In Task 2.3, we seek to clarify how state actors try to promote risk awareness and share crisis information in these relatively new information pollution circumstances. We gather quantitative and qualitative data about how preparedness and risk awareness information are being shared in social media. Furthermore, we focus on government social media campaigns and how they are received and spread by the audience and whether there were challenges in risk awareness raising through such campaign. In Task 2.4, we focus on the challenges of responses to false information in particular institutional contexts. We clarify the various meanings and uses of the notion of false information, as well as rules and practices in handling various forms of false information.

### 3.4. Resilience

*What is resilience?* On Google Scholar there is a list of about 1 840 000 results answering this question. We can consider this number as an indication of the popularity and diffusion of the term. The scholarship has widely studied resilience and has recognised the complexities of defining what appears to be a relatively simple concept. As Dunn Cavelty et al. (2015: 3,4) sharply point out, “Resilience is mysterious: she can be in many places at the same time, takes on various forms, slips into different subject-bodies, and eludes clearly-defined dimensions of time – some say she is only ever emergent in essence. She is a typical postmodern heroine, existing in different universes, with various stories of origin – her multiple personalities imbue different characteristics, normative concepts, and ways of interacting with subjects”.

The English term resilience derives from *resilire*, a Latin verb which means to bounce back, jump back (Alexander, 2013). In psychology, the idea ranges from issues of child development and personality adaptation to trauma and risk exposure, while some of the ecology literature of the 1970s draws on models from mathematics and engineering where resilience stands for the ability of the material to reverse from deformation. Especially in the last two decades, resilience has become a recurrent political concept, since it has spread rapidly through several policy areas, such as critical infrastructure protection (Aradau, 2010), humanitarian relief and development policy (ECHO, 2020), disaster relief (ECHO, 2020a), climate change adaptation (UNDP, 2020), state building (Chandler, 2013), and terrorism (Jore, 2020). Several 7FP and H2020 projects have sought to analyse the concept and to advance research as for the applicability of resilience.<sup>16</sup> Indeed, when it comes to implementation, the differences in perspective are amplified and this is a major challenge, since resilience carries a boundary-crossing potential both in theory and in practice (Rhinard and Sundelius, 2010). This part seeks to offer an overview of resilience, from a theoretical and practical perspective, with no pretence to be exhaustive, but to mainly serve the purposes of T1.1 and the BuildERS project in general.

#### 3.4.1. Theories and perspectives on resilience

Conceptually resilience means not only different things according to different disciplines, but also in the respective disciplines there are different understandings of resilience. Bourbeau (2018) carves this out, while Joseph (2018) even argues that resilience is too vague to be a concept. Kaufmann (2012) and Tierney (2019) call resilience a boundary object. Thus, within the scientific debate, there

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<sup>16</sup> Some examples from H2020: Smart Mature Resilience, DARWIN, Improver, Resiliens, Resolute. From the 7FP: emBRACE, ENHANCE.



is little consensus as to the nature and substance of resilience, since analyses of the concept of resilience cut across several disciplines as engineering sciences, ecology, organizational studies, sociology, political science, international relations, security studies, geography, human development and psychology, to mention a few. Consequently, there is not a single concept of resilience, but a plurality of concepts that exist in parallel (see Manyena, 2006). At the same time, resilience is not a static concept. Resilience is dependent on time, as well as culture and how individuals, communities, societies, infrastructures, and institutions respond to a stressor or shock, whether this is a natural disaster, a conflict, a trauma, an epidemic or a terrorist attack.

De Bruijne et al. (2010) made an attempt for a typology of resilience concepts along the three perspectives: engineering resilience, ecosystem resilience and socio-ecological resilience. While this typology is very useful to categorize the resilience concepts in use, it is important to keep in mind that these concepts have no teleological order and, furthermore, that these types are far from being clear-cut. In the reality of resilience-based policies, we commonly are confronted with a mixture of various conceptual approaches.

Resilience concept	Characteristics	Focus	Context
Engineering resilience	Return time, efficiency	Recovery, constancy	Vicinity of a stable equilibrium
Ecological/ecosystem resilience	Ability to buffer capacity, withstand shock, maintain function	Persistence, robustness	Multiple equilibria, stability landscapes
Socio-ecological resilience	Interplay disturbance and reorganization, sustaining and developing	Adaptive ability, transformability, learning, innovation	Integrated system feedback, cross-scale dynamic interactions

*Table 2 Three typologies of the resilience concept (de Bruijne et al., 2010:19)*

In engineering, resilience refers to the return to a state of one single equilibrium following a disturbance of a system (Hollnagel et al., 2006). This was the main understanding of resilience until the 1970s, when Holling introduced the term ecological resilience. Ecological resilience looks at the amount of disturbance absorbed by a system before it changes its state and emphasises how instabilities can change a system, rather than returning to one single equilibrium, as in engineering resilience. Holling argues that, when faced with unexpected external shocks, the constancy of a system is less important than the ability of its essential relationships to withstand these shocks, persist and change (1973). In contrast to an approach promoting stability as a return to one single equilibrium, Holling's approach to resilience emphasises change and heterogeneity (Holling, 1973; see also Walker and Salts, 2006). As this ecology literature blends with sociology in order to examine socio-ecological systems, emphasis is placed on continuous change and disturbance. For Folke (2006: 259), the core issue is no longer one of robustness or capacity to absorb disturbance, but to examine dynamic adaptive interplay. Kaufmann (2013), as well, considers resilience as a continuous process of adaption.

Several prominent scholars have attempted to analyse resilience, within their own discipline or using different disciplines in a multidisciplinary fashion, like Bourbeau, who offers a useful definition: "the



process of patterned adjustments adopted in the face of endogenous or exogenous shocks, to maintain, to marginally modify, or to transform a referent object” (2018: 13-14).

Within security studies, scholars argue for the importance of considering resilience as a boundary object (Brand and Jax, 2007; Kaufmann, 2012; Tierney, 2019). This leaves resilience more like a general approach or attitude rather than a concept, as Joseph argues (2018). Joseph, as well as Lentzos and Rose (2009), are influenced by a Foucauldian framework, since they relate resilience to liberal or neo liberal forms of governance, with emphasis on awareness, learning and adaptation (Walker and Cooper, 2011; Zebrowski, 2013; Neocleous, 2013; Joseph, 2013; Evans and Reid, 2014; Joseph, 2016). Chandler (2014) argues that resilience is in fact indicative of a post-liberal paradigm because of its focus on adaptation to our social situation rather than trying to change it. Chandler actually offers a positive definition: resilience is “the capacity to positively or successfully adapt to external problems or threats” (Chandler, 2012: 218).

The Foucauldian criticism of resilience emphasises the need to see it in relation to ways of governing through risk. Aradau and van Munster’s work (2011) is notable in seeing governance working through the notion of the unknown, while O’Malley (2010) writes about governing through uncertainty. Other approaches to resilience also link it in with approaches to risk and policies – and politics – of riskification, defined by Corry as “the speech act of constructing something politically in terms of risks” (Corry, 2012: 238). Most notable is Wildavsky’s (1988) pioneering work that draws on the ecology theorists, but argues for a more risk-oriented and market-oriented approach to resilience and anticipation. He defines anticipation as “to predict and prevent potential dangers before damage is done”, and resilience as “the capacity to cope with unanticipated dangers after they have become manifest, learning to bounce back” (1988: 77). This recognises the significant costs involved in trying to prevent all possible risks, not only in terms of prohibitive expenditure, but also undermining enterprising activity.

Also, Renn, in his work on risk governance, links resilience to the uncertainty of risk. For him, “resilience is a protective strategy against unknown or highly uncertain hazards” (Renn, 2008:179). Consequently, he argues for a focus on the strengthening of systems and on pre-emptive measures. Resilience, however, is just one particular point – responsible for dealing with the unknown and unpredictable risks – in Renn’s argument for a new approach to risk governance going beyond ‘generic’ categories of risk assessment, risk management and risk communication (Aven and Renn, 2010: 53). What Renn conceptualises as risk governance approach very much resembles resilience-based-policies – particularly his two innovations: “the inclusion of the societal context” and the “new categorization of risk-related knowledge” (Renn, 2008). This means that resilience not only depends on current threats and management practices, but is part of a historical grown fabric in which the system as a whole and the system’s elements learn and evolve. Holdschlag and Ratter (2013) describe the panarchy of socio-ecological systems as a resilience cycle of a system which is multi-scalar, historic, and reflects the learning processes of socio-ecological systems by creating the possibility (but not the necessity) of building or growing resilience after a crisis. According to Gunderson and Holling (2001: 21) “Panarchy is the structure in which systems, including those of nature (e.g., forests) and of humans (e.g., capitalism), as well as combined human-natural systems (e.g., institutions that govern natural resource use such as the Forest Service), are interlinked in continual adaptive cycles of growth, accumulation, restructuring, and renewal”. This panarchy underlies systems’ resilience, focusing on how systems respond to known and unknown threats. A research strand at the Centre for Security Studies in Zurich has further devolved the interrelation of resilience and risk through definition of resilience as a “process of preparing and responding to the eventual actualization of the multiple and increasingly diverse risks” (Brunner and Giroux, 2009: 6).



These approaches are worth pursuing because the link between resilience and risk reveals its significance in relation to new forms of governance. For instance, the devolvement of responsibility, as central point of criticism (Chandler and Reid, 2016; Kaufmann, 2013), from governments to citizens is something that needs to be considered as it touches directly upon issues of social capital, which can then re-enforce this claim. Resilience requires resources, be them in the form of social capital, economic capital or bodily/mental abilities. Thus, resilience cannot be simply demanded, but needs to be enabled and fostered (Krüger, 2019). Moreover, the resilience discourse focusses on the individual and local communities (Kaufmann, 2013) and variously side-lines the role of the state. While this is in many cases problematic, it allows to scrutinise the selection bias of the state. This bias is the result of the unequal capacity of societal groups or individuals to inscribe their interests into state action. As a consequence, those who are less able to do so are prone to marginalisation or even exclusion. However, centralised decision structures always run the risk of neglecting interests for various reasons. João Nunes (2016: 546) lists four and argues that reasons for neglect are either invisibility, apathy, inaction or incompetence. The resilience discourse with its focus on abilities and capacities has the potential to subvert this strategic selection bias that either consciously or unconsciously discriminates against the margins. It urges us to ask questions about what can be requested from whom and what is necessary to live up to the formulated demands. In this understanding, resilience exceeds the limit of disaster or security politics and needs to be thought from the perspective of social and diversity politics. Such a form of resilience is based on redundancy and capacity and thus at odds with neoliberal imaginaries of pure efficiency (Krüger, 2019a).

As mentioned above, even if it has entered the political discourse very recently, resilience is nowadays pursued in a wide range of policy areas, from narrow technical applications such as in cyber security and critical infrastructure protection to wide policy areas such as disaster risk reduction. Indeed, resilience has become a key concept in the constant effort to secure societies against crises and disasters. The implementation of resilience is, in general, accompanied by two particular challenges: (1) as described in 3.4.1, there is not a clear and univocal theoretical understanding of resilience. However, this is usually accompanied by the pressure to operationalise resilience as quickly as possible, as it is characteristic in security-related policy areas; (2) strongly related with (1), there never was – nor is – a single resilience approach. Instead, there are several resilience approaches in policy areas, varying from natural disaster policies and anti-terrorism to state-building.

Holling and Folke's arguments on socio-ecological resilience can be applied to reactions and strategies at the level of individuals, communities, organizations and societies, to make them resilient or more resilient to current and future risks and threats such as pandemics, economic shocks, and terrorism. In particular, applying resilience to societies means placing emphasis on such things as complexity, self-organisation, functional diversity and nonlinear ways of behaving (Gunderson et al., 2002: 530). The adaptive capacity of societies depends on the nature of their institutions and their ability to absorb external shocks (Berkes et al., 2003), as well as on each individual and community ability to bounce back. Berkes et al. underline that crises can actually play a constructive role in crisis and risk management because they may force to consider issues of learning, adapting and renewal (ibid.: 20). For example, the British think tank Demos argues that resilience should be seen not only as the ability of a society to bounce back, but as a process of learning and adaptation (Edwards, 2009: 11), while the World Resources Institute emphasises the ability of individuals to “adapt to changing conditions through learning, planning, or reorganization” (WRI, 2008: 27) and it even suggests that resilience should be understood as the capacity to thrive in the face of challenge (WRI, 2008: ix).



The rapid changes and mutual dependencies between critical societal functions have created new and shifting vulnerabilities. Furthermore, they generate new and unknown risks that represent new challenges for experts, academics and authorities (Beck, 2009) in making societies more resilient. Nowadays, societies are exposed to complex technological failures, dependencies on information and communication technology, rapid changeovers and readjustments in public and private industries, climate change consequences, warfare, and state failures. Thus, societies need to be prepared for disasters, conflicts and crises of different character, which is the overall goal of resilience building. However, resilience building needs to be targeted towards the different types of shocks and traumas and, in order to develop effective interventions, resilience building needs to consider that individuals are usually embedded in families, families in organisations and communities, and communities in societies and cultures. Interventions targeted in one of these levels may influence the other levels. Individual resilience is interdependent on many other layers of societal systems and how they are operating.

In some situations, the most effective strategy to enhance resilience at a specific level may involve intervening in a different level. Southwick et al. (2014) argue that resilience building needs to consider the adaption of these interconnected systems and that individuals carry a great potential to adapt in crises and difficulties when given the basic social and material resources to do so. They claim that the most important way to foster resilience is to promote supportive family and community environments allowing the individual's natural protective system to develop and operate effectively. This is particularly true when crises affect vulnerable groups. Schoon and Bynner (2003) argue that emphasis on resilience might reduce the impact of risks factors that provide targets for policy in the sense that they can help to identify groups at risk and ensure that appropriate protective mechanisms are in place. They also indicate that positive adaption does not reside within an individual, but in the interactions between the individual and his/her environment. In instances where vulnerable groups and risks are present, resilience should not only focus on deficits, but also on areas of strength such as hopes and aspirations. A resilience perspective effort should try to harness notable strengths of vulnerable groups to drive a significant momentum for positive change (Schoon and Bynner, 2003).

In their study on vulnerable groups, Luthar and Chicchetti (2000: np) consider resilience as “a dynamic process wherein individuals display positive adaptation despite experiences of significant adversity or trauma”. They emphasise the two-dimensional construct of resilience, positive adaption and adversity. Positive adaption is defined as behaviourally manifested social competence or success in achieving the appropriate developmental tasks at different stages in life. Adversity refers to negative life circumstances and adjustment challenges that make individuals more vulnerable than others in a society. Luthar and Chicchetti (2000) claim that research on resilience should identify vulnerability factors and protective factors. Vulnerability factors consist of those elements worsening the risk situation, for instance poverty or exposure to violence. Protective factors include elements that modify the effects of risks in a positive direction, for instance a strong family network. Once these factors are identified, the processes underlying their effects need to be explored to make vulnerable groups in the condition to increase their resilience against risks and traumas (Luthar and Chicchetti, 2000).

### **3.4.2. Resilience in disaster risk management and crisis management**



The concept of resilience has made its way into international and national crisis management policies since the 1990s with the Yokohama Strategy (UN, 1994). Since then, resilience and resilience building have become key priorities for several international organisations and NGOs working in the field of disaster risk reduction. The global endorsement of the Hyogo Framework for Action in the follow-up of the World Conference on Disaster Reduction in 2005 (UN, 2005) and of the Sendai Framework for Disaster Risk Reduction in 2015 promote resilience as a political choice for disaster risk reduction (UN, 2015). The UN define resilience as it follows: “The ability of a system, community or society exposed to hazards to resist, absorb, accommodate to and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions” (UNISDR, 2009: 24). For the UN resilience is the ability to “resile from” or “spring back from” a shock. The resilience of a community in respect to potential hazard events is determined by the degree to which the community has the necessary resources and is capable of organizing itself both prior to and during times of need” (ibid.). Thus, the UN considers resilience an ability related to the availability of resources and the organisation of a community, especially in the preparedness phase (prior to). Preparedness is considered as an integral part of resilience. As such, resilience is not just the immediate ability to respond to a shock, but rather a process of adaptation before, during and after a crisis. This view is shared by two other international organisations, which consider resilience as an ability as well as a process. The International Federation of Red Cross and Red Crescent Societies (IFRC) has a definition quite similar to the UN’s: “the ability of individuals, communities, organizations or countries exposed to disasters, crises and underlying vulnerabilities to anticipate, prepare for, reduce the impact of, cope with and recover from the effects of shocks and stresses without compromising their long-term prospects” (IFRC, 2014: 6). Here, this ability is undergoing a process of adaptation before, during and after a crisis or a disaster. The EU, as well, has elaborated its own definition of resilience as “the ability of an individual, a community or a country to cope, adapt and recover quickly from the impact of a disaster, violence or conflict. Resilience covers all stages of a disaster, from prevention (when possible) to adaptation (when necessary), and includes positive transformation that strengthens the ability of current and future generations to meet their needs and withstand crises” (ECHO, 2020). The EU definition seems the most encompassing and it spells out that resilience should be included in the phases of disaster and crisis management. The EU promotes resilience building both internally in its relationship with its member states and externally, although it is not always easy to draw a clear line between these two areas (Joseph, 2018a). Internally, the EU is, in general, quite active in promoting disaster risk management among its member states and associate countries (Morsut, 2019) and has established the European Union Civil Protection Mechanism, where the so called Mechanism’s participating states (all the member states and some non-members) pull together their national resources and capacities to assist a country that requires help due to a crisis or a disaster (Morsut and Kruke, 2017). Thus, besides prevention, preparedness, response and recovery efforts, the EU initiatives also focus on integrated risk management capacities among the member countries. Under the heading of developing ‘national resilience capacities’, the EU supports complex governance efforts, linking national governments with local governments and civil society. Externally, the EU has taken initiatives such as SHARE (Supporting the Horn of Africa’s Resilience) and AGIR-Sahel (Global Alliance for Resilience Initiative) for supporting regional resilience in disaster risk reduction. Within the EU, resilience in Disaster Risk Reduction (DRR) acts as the main bridge of linking relief and development policies, building upon the Linking Relief, Rehabilitation and Development (LRRD) approach and drawing it further (Pospisil, 2018). This is also one of the priorities of the EU Action Plan for Resilience in Crisis Prone Countries (EC, 2013). The EU is seeking a role, but strategic ambiguity, institutional complexity and modest funding seem to jeopardise these efforts (Boin et al., 2013).



Several 7FP and H2020 project have studied resilience, which is one of the main topics within the H2020 Work Programme Secure Societies. Most of these projects have advanced research in the field of disaster management and disaster risk reduction. Among them, one of the most useful attempts for BuildERS' purposes to offer an overview of the many definitions, conceptualizations and operationalisations of resilience is the H2020 DARWIN project and one of its deliverables, *Consolidation of resilience concepts and practices for crisis management* (DARWIN, 2015). In this report, the systematic literature survey (more than 500 articles selected in the period 1998 - 2015) allowed to identify around 300 definitions of resilience. These definitions were analysed following six categories (DARWIN, 2015: 26):

- 1) domain (what is the professional discipline?): community, ecology, infrastructure, engineering, organizational and so on.
- 2) the resilient entity (which system/entity is described as resilient; what is resilient?): system, community, individual, society, organization.
- 3) the ontology of resilience (what type of property is resilient/in what way is it resilient?): the most recurrent terms are ability, capacity, property and capability, while process is not so diffused in the literature analysed
- 4) actions aimed to achieve resilience (what measures are taken to achieve the resilience?): prevention, absorption, adaptability, sustained adaptability and bouncing back.
- 5) type of event (what type of event does the system aim to be resilient against?): change, disaster, disturbance, disruptions, adversity, stress, shock, crisis, uncertainty.
- 6) phases of resilience (when is the system resilient?): before, during and after the event.

To some extent, these six categories have been covered also in our literature review, since we have looked at which disciplines study resilience, which entities are considered resilience, while the properties have been briefly presented as well. As for actions, the whole BuildERS project aims at finding solutions and measures to achieve resilience for societies, while its context is crisis and disaster management.

DARWIN elaborated further these six categories into a classification of resilience according to the following areas:

- a) Resilience concepts. Eight categories of resilience concepts were identified: A. Link between community resilience and other efforts, such as organisational resilience; B. Continuity and persistence of critical services and functions; C. Attention to vulnerable groups; D. Generic characteristics of resilience concept; E. Special characteristics of community resilience; F. Sensitivity to social and cultural foundations; G. Resilience in context of compliance, planned protection and risk management; H. Resilience of critical infrastructure.
- b) Methods and strategies to assess resilience. Mainly models to measure and evaluate resilience
- c) Tools proposed for resilience. Mainly communication tools, information sharing, trainings, decision support, warning systems, expert systems and sharing of information.

From the DARWIN report, we can draw some useful reflections for BuildERS. First, the report confirms that resilience is a complex concept. Second, it shows that the literature mainly describes resilience as mainly an ability and a capacity. It is, indeed, after 2015 that the literature approaches resilience in terms of process (see Bourbeau, 2018). Ability and capacity clearly display the aim of enhancing and sustaining resilience over time, through capacity-building. Capacity building, is, in turn, important for social capital. Aldrich points out the role of social capital especially in the recovery phase from a crisis or a disaster, when social ties and cohesiveness among individuals increase the chances to better cope to the consequences of the event (Aldrich, 2012; see also Tierney, 2019). Third, the report



outlines that within the resilience literature, there is a constant reference to community and societal resilience. The UN mainly uses community resilience, while societal resilience is used more by the EU and by BuildERS as well. The H2020 IMPROVER project made an attempt to clear out the difference between community and societal resilience, since it claimed that in resilience literature the terms community and societal are used as synonyms. Although there is a lot overlapping, the two terms can be defined as it follows: community resilience is founded on cultural, social and civic aspects, where the community is a defined entity in terms of geographic boundaries and shared culture (IMPROVER, 2016). Societal resilience has a more encompassing meaning by including actions and relations on every level of society (individual, organizational and societal level), where coping, adaptive and transformative capacities are essential to increase resilience (IMPROVER, 2020). Fourth, most of the literature identified in the DARWIN report emphasizes the need of resilience in preparedness and in response, while BuildERS considers resilience an important component in the whole crisis management cycle and will promote it accordingly. Resilience should always be an integrated effort within the disaster and crisis management cycle (Kruke and Morsut, 2015): within prevention and preparedness, potential risks are identified and actions to reduce their impacts must be taken before the crisis or the disaster unfolds. The response to the crisis or the disaster must be swift and effective to combat the disaster, to assist those affected by it and to make the area safe. The recovery should be not only material, but a learning opportunity by assessing the level of resilience and by introducing eventual changes for a more resilient society.

In this vein, the UNISDR's definition of resilience as "The ability of a system, community or society exposed to hazards to resist, absorb, accommodate to and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions" (UNISDR, 2009: 24) seems to focus only on the recovery phase. In addition, it implicates a sort of returning to a status quo (preservation and restoration). However, the important learning aspects of recovery and the enhancement of new capacities must be included in both the prevention and preparedness activities of local communities, infrastructure providers, emergency rescue organizations, national and international response organizations, etc.. Only by a successful implementation of the learning aspects we will reach a more resilient stage in our prevention and preparedness actions. Resilience in this respect is manifested in both more robust prevention and preparedness, together with increased risk awareness on weak signals indicating that we are moving towards a new crisis situation (Weick et al., 1999; Weick, 2001; Weick and Sutcliffe, 2001). The EU definition of resilience as "the ability of an individual, a community or a country to cope, adapt and recover quickly from the impact of a disaster, violence or conflict. Resilience covers all stages of a disaster, from prevention (when possible) to adaptation (when necessary), and includes positive transformation that strengthens the ability of current and future generations to meet their needs and withstand crises" (ECHO, 2020) is more encompassing in this sense. It puts more emphasis on all stages of a disaster and underlines the learning aspects in terms of positive transformations.

In the crisis and disaster management research field, the conceptualisation of resilience is still scant (for the best available overview yet see Combaz, 2014). Resilience assessment, implementation and management are, as a consequence, areas which are mainly dealt with in a trial-and-error-approach at present, since most of the empirical studies lack sound conceptual approaches to resilience. One of the main challenges in conceptualizing resilience within crisis management is the crisis management is strongly related to issues of governance. This is mainly based on the insight that practices of crisis management face severe limitations in the context of unpredictable crises (see Boin and McConnell, 2007); hence, they have to be complemented (if not replaced) by resilience-based approaches.





Ostrom and Janssen (2004) have provided critical foundational research on that issue. They interpret the governance of resilience along the even broader problem of the governance of global common goods. Hence, the governance of resilience is interpreted as an adaptive process on multiple scales, which connects the stakeholders on various levels. To make such a connection a sustainable and profitable enterprise for all stakeholders involved, however, the crucial question of the subject (resilience of what, to what, and for whom?; see Lebel et al., 2006) has to be addressed.

The area where resilience-thinking has gone furthest is in the rejection of modernist or liberal approaches to governance. For liberal universalist approaches, policy-making is constructed in ‘top-down’ ways, determined by the ‘known knowns’ of established knowledge and generalizable assumptions of cause-and-effect. In these ways risk assessments can be undertaken and probabilities used for disaster/risk prediction and insurance purposes. This approach could be understood in terms of resilience as *prevention*.<sup>17</sup> For neoliberal approaches, the problematic of governance always lies at the level of the ‘known unknowns’ - knowledge gaps that require deeper or more sociological understandings of determinate relational causality - the path dependencies and cultural or inter-subjective transmissions of values and understanding (Chandler, 2014). This approach could be understood as resilience as the *capacity to bounce back or return to normality* (DfID, 2011:6; Zolli and Healy, 2013). Resilience is also understood as *transformative* when it is realised that government’s responses to problems in reactive ways are less effective than enabling societies to be able to govern themselves more responsively. For transformative understandings, community empowerment and individuals’ responsibility of their own protection (Grove, 2014; Kaufmann, 2013; Malcolm, 2013) are at the centre of resilience. A good example of this is the understanding of natural disasters, while disasters were traditionally perceived as sudden and short lived events, there is now a tendency to look upon disasters as continuous processes of gradual deterioration and growing vulnerability (Perlo Cohen, 2000).

### 3.4.3. Resilience in the theoretical framework of BuildERS

Resilience represents a plurality of concepts and of approaches, which can be divided by countries and institutions as well as by policy areas. While these pluralities make the engagement with resilience on a theoretical level so meaningful and interesting, they at the same time are a serious challenge to an operationalisation of resilience in crisis and disaster management that can make a difference on the ground.

At the same time, the political character of resilience is hardly ever discussed. The *politics of resilience*, however, are a crucial factor for any approach of resilience implementation. It has become increasingly important to discuss whether we want a social-democratic resilient society, where the state deals with crisis or disasters on behalf of the individual and aims at getting ever better prepared or whether we want a more neoliberal resilient society, where the state just enables and facilitates individuals’ ability to deal with their own risks. This is a matter of great importance in the field of crisis management, where the state is expected to overpower individual capabilities. In addition, this discussion become crucial when the state or an organisation aims at helping vulnerable groups. We argue that there is the need to discuss more and better whether the best way to govern society is through a greater awareness of our own behaviour as seen through the lenses of responsibility, preparedness and adaptability rather than more traditional notions of state protection. This issue

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<sup>17</sup> Some authors like Evans and Reid (2013) deny that the approach of resilience as prevention. They argue instead that resilience means to abandon prevention and mitigation for the sake of adaptation.



should be at the heart of European debates about resilience, as well as how the EU understands its own approach.

## 4. Towards BuildERS model

In this Section, we present the following: in 4.1, an upgraded understanding (taking into account the definitions we provided in D1.1) of vulnerability, resilience, social capital, and risk awareness, based on the findings from the previous Sections and the simplified Delphi process; in 4.2 the process behind the last model.

The review of literature and the simplified Delphi process offered a deeper understanding of the concepts in use and helped us to formulate these statements, which will be verified in the following work of BuildERS.

### *Vulnerability:*

- a) There are two narratives of vulnerability, one defines groups as ontologically vulnerable and, in this vein, fundamentally different from other groups in a society, while the other understands vulnerability as highly dynamic concept that can apply to every person.
  - While there seems to be a tension between the two narratives, both can be combined, the first representing the “Who?”, the latter the “Why?” question on vulnerability
  - We need to answer both these questions and understand their interactions to establish a comprehensive understanding of vulnerability and vulnerable groups and, therefore, to develop measures that are appropriate to reduce specific vulnerable situations, rather than homogenized groups’ vulnerabilities
- b) The dynamic understanding of vulnerability argues for vulnerability as arising through the interaction of several different factors and as socially constructed.
  - Being a social construction, to lessen vulnerability there is the need to investigate its root causes, such as factors that cause injustices, discriminations and stigmatization
- c) The dynamic understanding of vulnerability opens up for more complex analyses of vulnerability.
  - A more systemic use of the intersectionality perspective in research uncovers multiple and overlapping vulnerabilities and provides a more precise picture of the phenomenon
- d) To study vulnerable groups represents a punctual observation, since they give us the picture on how things are
  - To take into account vulnerable groups is not a claim on their general condition or status, but the research basis for BuildERS

### *Social capital:*

- a) It is socially constructed and often given a positive account
  - Being a social construction, we need to look also for negative spill overs (the dark side of social capital) which cause injustices, discriminations and stigmatization
  - The dark side of social capital needs to be scrutinized to consider how authorities can build bridges across groups and up to authorities



- b) It is mostly studied when a crisis or disaster unfolds and during the recovery phase
  - Being a social construction, we need to know, as well, how social capital is before a crisis, since it influences the behaviour during and after a crisis
  - The role of bonding, bridging and linking social capital needs in-depth scrutiny among the people in the most vulnerable situations
- c) Its main units of analysis are communities, neighbourhoods, families or households
  - Vulnerable groups' social capital seems neglected by the scholarship
  - Informal volunteers and social support networks need to be studied to better understanding how integrate bottom-up, networked forms of crisis management with top-down, institutionalised efforts

### *Risk awareness:*

- a) It is not the same as risk perception and is often studied together with knowledge, risk preparation and worry
  - There is no formal definition for risk awareness, so a definition is needed to be explored empirically
  - There is the need to investigate risk awareness as social phenomenon and to distinguish it from risk perception, which is more based on individual judgement
- b) There is a correlation between social capital and risk awareness
  - Social capital influences risk awareness, while the opposite relation is more difficult to unveil
- c) Strong correlations between risk awareness and risk communication
  - Risk communication has often been studied as one directional information flow (from authorities to citizens) that can affect risk awareness, but the use of social media has changed the way societies communicate
  - Issues of reliability, trustworthiness and credibility concerning risk communication impact risk awareness, especially when information travels fast through social media
  - Need to consider triggers of communication-related vulnerability to crises and disasters, such individual (e.g., various impairments, limited language skills), social-structural (e.g., inadequate official preparedness measures), and situational (e.g. breakdown of communication channels)

### *Resilience:*

- a) It is a very popular concept and approach with several definitions (ability, quality, process etc.), which make its operationalisation on the ground challenging
  - By defining it as a proactive and/or reactive dynamic process of adaptation and change, we aim to make its operationalisation more feasible
- b) It is often studied as the antonym for vulnerability
  - By considering vulnerability through a dynamic perspective and resilience as a process, we promote vulnerability and resilience as not mutually exclusive



c) The politics of resilience

- We need to balance neoliberal tendencies, which are emerging at national and European level, which shift the burden of becoming resilient and less vulnerable on the individual

## 4.1. BuildERS' definitions and relationships

*(Social) vulnerability:*

Dynamic characteristic of entities (individuals, groups, society) of being susceptible to harm or loss, which manifests as situational inability (or degree of situational weakness) to access adequate resources and means of protection to anticipate, cope with, recover and learn from the impact of natural or man-made hazards.

*Social capital:*

Networks, norms, values and trust that entities (individuals, groups, society) have available and which may offer resources for mutual advantage and support and for facilitating coordination and cooperation in case of crisis and disasters.

*Risk awareness:*<sup>18</sup>

Collective (groups and communities) acknowledgment about a risk and potential risk preventing and mitigating actions, fostered by risk communication.

*Resilience:*

Processes of proactive and/or reactive patterned adjustment and adaptation and change enacted in everyday life, but, in particular, in the face of risks, crises and disasters.

Vulnerability is dependent on social structures and power relations in their interaction with personal conditions and specific situations in complex trajectories. In this vein, increasing social capital is one way of tackling existing injustices. However, this runs the risk of exacerbating the vulnerability of those whose needs and constraints are not taken into account when designing means for enhancing social capital. In our literature review we proposed some primary and secondary factors that help to assess vulnerability, but it is the intersectionality approach that reminds us of acknowledging the variety of dimensions determining a person's vulnerability. In addition, social capital, as well as vulnerability, are highly complex concepts with a lot of factors that influence them, which raises a variety of challenges for any operationalisation. In order to ensure that reductions of complexity still show intersections and interdependencies without becoming one dimensional and deterministic, these reductions have to be reflected and the relevance and way in which a factor becomes important should be discussed and outlined.

The increase in social capital and the proclaimed 'decrease' in vulnerability should not unduly responsabilise those who live under precarious situations. The emphasis on social capital runs the risk of reinforcing neoliberal tendencies that shift the burden of becoming resilient and limiting vulnerability

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<sup>18</sup> We follow Slovic's tradition by considering risk perception at individual and intuitive judgment level, while risk awareness is shaped at group level.



to the individual by commodifying one's personal relationships and declaring the individual responsible for enhancing networks (not for a social, but for a security sake). In this context, social capital must not be confused with social cohesion, but needs to be grasped – according to Bourdieu – as one form of personal capital that causes a societal stratification and, finally, power hierarchies. Since forms of capital are interdependent, one persons' social capital can therefore be considered to have more worth. Doing research on the role of social capital for reducing vulnerability and strengthening resilience must therefore not foreclose the importance of other forms of capital (i.e. cultural and economic).

One of the components of social capital is trust. BuildERS posits that vulnerable groups often lack trust in networks, in institutions and social media (BuildERS, 2019: 2, 25, 34). D1.4 confirms this argument, which will be further investigated in WP3. If vulnerable groups lack trust, there might also be good reasons to do so. As trust has to be built, it might be the case that trust in institutions is low because the same institutions have failed to help in the appropriate way. In this case, the lack of trust would be a necessary consequence of insufficient crisis and disaster management activities. To increase trust would therefore not be a task for those most vulnerable, but for the institutions to earn it. Additionally, the lack of trust might not be due to crises and disasters' related factors or experiences, but might come from a general feeling of insecurity.

BuildERS posits that there is a relationship between social capital and risk awareness and this relationship, in turn, influences vulnerability and resilience. Risk awareness is fostered not only by authorities, through campaigns, but also by everyday interactions in social networks, including information-seeking, sending, receiving and interpreting messages via (social) media. At the same time, information can be misleading or false and may distort risk awareness, increasing vulnerability.

## 4.2. Developing BuildERS model

The definitions above are not exhaustive and our proposed assumptions just suggest which kind of relationships we need to consider within the three phases of a crisis. For instance, social capital enables access to networks that might increase an individual's capacity to act, thus increases his/her resilience. At the same time, it affects his/her vulnerability. However, social capital and vulnerability share the same roots in societal circumstances, such as hierarchies, discrimination, and allocation of other forms of capital. Risk awareness is influenced by social capital both in positive and negative ways. Resilience is a process that goes beyond the bouncing back ability or capacity.

The intricacies of the concepts, and the various ways they may relate in the building of resilience, require a stepwise approach to model building. We developed our final model, in Section five, by first developing and exploring various components in this section. We also verified and consulted stakeholders and our advisory board on these models, to make them clearer and more practical.

In developing the models, we should first make clear that these relations are not linear: they interact and mutually constitute; (b) measurements are heavily subjective, only partly objective; and (c) relations are an exemplification of very complex social phenomena, starting from our assumption that resilience and vulnerability coexist and, especially resilience is triggered by the crisis.

We started to show these relations through three linked models elaborated in D1.1. For the sake of clarity, we propose them here.



First, we tried to visualise linkages among the main concepts by borrowing the notion of a safety model (pressure and release model or PAR) developed by Wisner et al. (2004). We loosely adapted it to our context by placing the terms vulnerability, social capital, risk awareness (and risk perception) under the aegis of resilience building. Resilience building, here, encompassed several key resilience definitions, since it covers various levels and stages where societies in their institutional and individual integration expressions, bounce back and adapt to risks and hazards. Thus, we prepared the model to connect the concepts. Then, we linked the model to the different phases of the crisis/disaster management cycle (preparedness, prevention, response, recovery) and we prepared a supporting model that shows in which phases the previous model's concepts play a crucial role. A more detailed explanation is contained in D1.1.

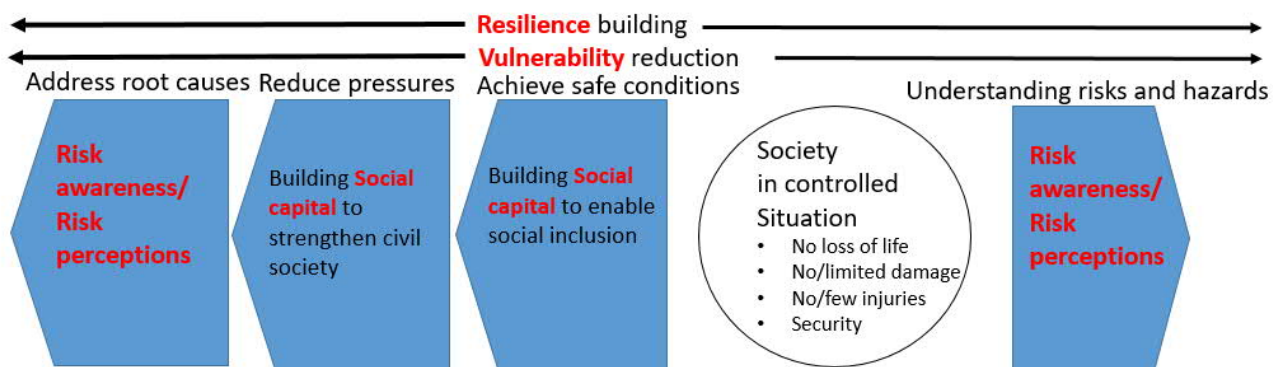


Figure 11 First version of the model adapting the PAR model with BuildERS' key concepts

Resilience building included four elements in this first model:

- 1) Meta-level. Addressing the root causes of societal vulnerabilities. Root causes relate to the vast spectrum of meta-level fundamental societal challenges that both enable and exacerbate crises and disasters. For instance, unbalanced wealth and power distribution, widespread corruption, lack of resources. They affect all societies in different degrees and provoke dynamic pressure. A way to address the root causes is to favour an equitable distribution of power, wealth and resources (blue figure).
- 2) Macro-level. Reducing dynamic pressures on society. Dynamic pressures on societies relate to the lack or poor development of institutional and societal infrastructures and of responses to ecological and social-economic macro forces, such as rapid demographic changes, immigration, antibiotic resistance, poverty, rapid urbanisation, climate change consequences, and decline in soil productivity.
- 3) Micro-level. Achieving safe conditions for society. Here, we consider the range of unsafe conditions at the local and national practical level. Such as securing unsafe buildings, addressing vulnerable groups, building local institutions, increasing disaster preparedness.
- 4) Micro- and macro-levels. Understanding risk and hazard relates to the way and the forms risks and hazards are communicated and discussed on the micro and macro levels of society.

Under these four elements (the blue figures), we identified where social capital and risk awareness play a role in resilience building. Within an adequate understanding of risks and hazards and the achievement of safe conditions, we considered society to be in a controlled situation, an ideal-state

which was characterised by the following criteria: no loss of life, limited infrastructural damage, few injuries etc. To further build resilience and reduce vulnerability, one should build social capital and work to increase risk awareness and risk perception.

This first model met internal critiques and we soon realised that it did not show which level of analysis we aimed to achieve. We kept it at society's level, without considering vulnerable groups, for instance. The most classical definition of society is provided by Giddens as "a group of people living in particular territory, are subject to a common system of political authority, and are aware of having a distinct identity from other groups around them" (Giddens, 1993:746).

We thus drafted a second model to accommodate our concepts from the first model within the crisis management cycle. Here, we visualise how the different components of the model can influence the crisis management cycle in order to achieve a controlled situation during a crisis.

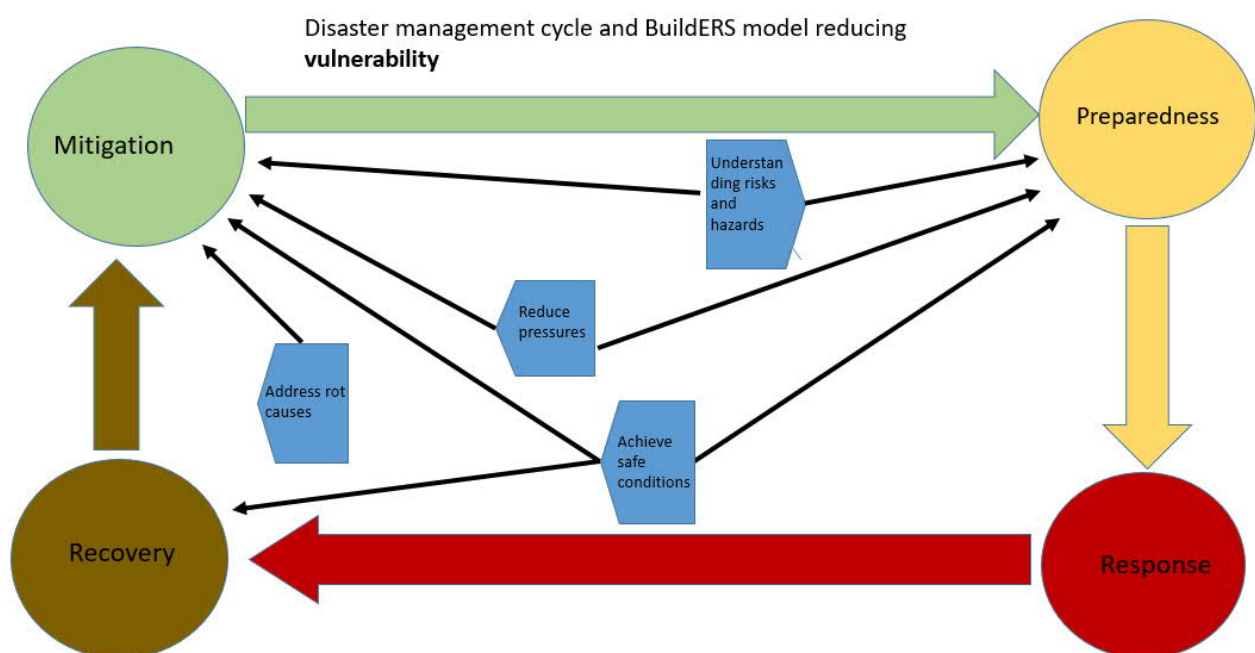


Figure 12 Second complementary model

The two models were presented to the contributors of D1.1 and then to the Advisory Board and the BuildERS stakeholders in the first validation workshop in October 2019. Criticism included: the different levels from micro to meta were considered too complicated; prevention was not included in the crisis management cycle; the risk equation ( $\text{vulnerability} = \text{exposure} \times \text{risk}$ ) was not considered; the plurality of postulated relationships between the key concepts was not represented well enough and measurements could have helped in this regard. The constructive feedback from those meetings allowed us to move to the next model version (Figure 13 below).

To provide some sort of measurement, we sought then to split concepts into elements or attributes, which could then be operationalised in the survey of WP3 or in the interviews of WP2 and in

questionnaires for the validation workshops. For instance, we defined vulnerability and its variations according to elements, such as:

- geographical (e.g. living in a risky climate)
- locational (e.g. strange place => tourists; flood-prone area, etc.)
- micro-economic (poor, homeless)
- cognitive (low/non-education, mentally impaired, biased risk perception, state of shock etc.)
- social (marginalized, excluded, homeless)
- demographic (elderly, children)
- institutional (quality of institutions, culture)
- macro-economic (GDP, income-distribution)
- access to information (technology, education)
- physical (blindness, deafness etc.)
- gender
- Etc.

These attributes (by no means exhaustive, but just examples) can be regarded as meta-, macro- or micro-level attributes. Some of them are interlinked. For example, macro-level income distribution tends to correlate with micro-economic factors. In a way, the macro context increases the risk of micro-level exposure. Also, GDP and income distribution tend to correlate with institutional quality.

The main effort was, thus, to show that the concepts are always interrelated either directly or indirectly to demonstrate via analyses in the following WPs how large the gaps between what we consider mainstream society and vulnerable groups were.

These suggestions allowed to move on to the third model.





Elements of Vulnerability		
Individual level	Group level	Governance level
<ul style="list-style-type: none"> <li>• Geographical exposure to hazards</li> <li>• Locational displacement</li> <li>• Cognitive challenges (low/non-education; mentally impaired)</li> <li>• Limited mobility</li> <li>• Social marginalization (e.g. excluded; homeless)</li> <li>• Limited access to information (technology, education)</li> <li>• etc.</li> </ul>	<ul style="list-style-type: none"> <li>• Geographical exposure to hazards</li> <li>• Economic marginalisation of groups (poor; homeless)</li> <li>• Limited community cohesion</li> <li>• Demographic (elderly, children)</li> <li>• etc.</li> </ul>	<ul style="list-style-type: none"> <li>• Low Institutional quality</li> <li>• Macro-economic disparity (GDP, income-distribution)</li> <li>• Poor political decision making</li> <li>• Civil society oppression</li> <li>• Lack of legitimacy</li> <li>• etc.</li> </ul>

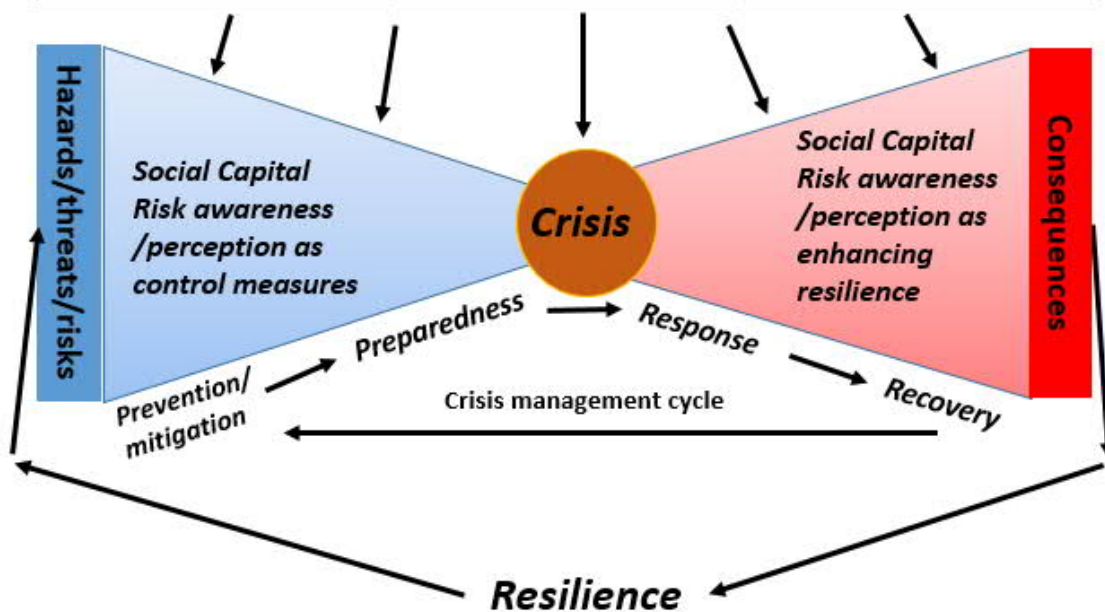


Figure 13 Third version of the model: the so-called butterfly model

This model was inspired by the bow-tie model of de Ruijter and Guldenmund (2016), which is used to visualise the mitigation techniques put in place to prevent unwanted events and to recover after them. The model aimed at showing that individuals, groups and societies 'enter' into crises with certain social capital, risk perception and risk awareness. Through the crisis, the experiences of it and its aftermath, these might increase making individuals, groups and societies more resilient when the next crisis unfolded.

This model included new elements, like the vulnerability factors, but some central problems were detected during its presentation in front of the BuildERS' General Assembly in February 2020 and the second validation workshop via Howspace: 1) the model was not clear enough in providing a picture of the causal relationships among the concepts. For example, a weak social capital could be seen as a weakening factor when a crisis or disaster stroked since the society had a scarce capacity to assure social cohesion. When this occurred individuals could start to behave in a highly selfish manner and their degree of compliance with the authorities' strategy could become a real obstacle to the

implementation of the necessary interventions. 2) The left part was considered redundant since it included obvious ex-ante relationships. It was quite straightforward that increasing social capital before the occurrence of a crisis prevented the emergence of the negative phenomena, once the crisis stroke. 3) It was too complicated and perhaps by concentrating on the right part of the figure a different model could be provided. 4) The division among vulnerability levels was unclear. 5) The connections between the two BuildERS core concepts, resilience and vulnerability, was, to some extent, not properly addressed.

Effort was made to reflect closely on point 5) of the critiques. What is impacting both resilience and vulnerability? It is usually an external shock, which can be provoked by a risk or a hazard. If not properly addressed, this shock takes the guise of a crisis or a disaster. In addition, vulnerability, as much as resilience, is dependent on the actual exposure. This figure aims at showing the interdependency between vulnerability and resilience. A degree of resilience and vulnerability is displayed in a pre-crisis phase with no exposure to hazard. Following the same line of thought, the exposure to the hazard in the acute phase, may change the relationship between resilience and vulnerability. We visualised this relationship with this figure:

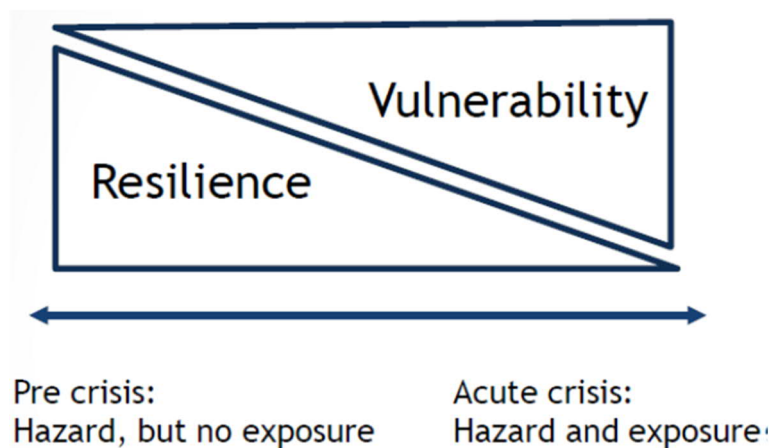


Figure 14 Exemplifying how hazard and exposure may affect vulnerability and resilience

This figure, by no means, claims that resilience and vulnerability are antonyms or the two ends of a continuum, but rather aims at showing the strong linkages between the two. They are linked together in such ways that, for instance, a group may be vulnerable to flooding because of the households located in a flood prone area, but the same group displays resilience since it has taken precautions, like insurance or living in the second floor or they have networks to assist and support them to rebuild in case of a flood.

The scholarship within Wildavsky's tradition considers resilience as reactive and is described as "the capacity to cope with unanticipated dangers after they have become manifest, learning to bounce back" (Wildavsky, 1988: 77). However, some definitions point out the proactive aspects of resilience, see, for instance:

*"Resilience is the ability to adapt to changing conditions and prepare for, withstand, and rapidly recover from disruption"* (DHS, 2010: 18).

“The ability of an individual, a community or a country to cope, adapt and recover quickly from the impact of a disaster, violence or conflict. Resilience covers all stages of a disaster, from prevention (when possible) to adaptation (when necessary), and includes positive transformation that strengthens the ability of current and future generations to meet their needs and withstand crises” (ECHO, 2020).

Proactive resilience is displayed in protection and prevention, whereas reactive resilience is our capacity in adjusting to the trigger event.

The figure above made us change the butterfly model in this new attempt:

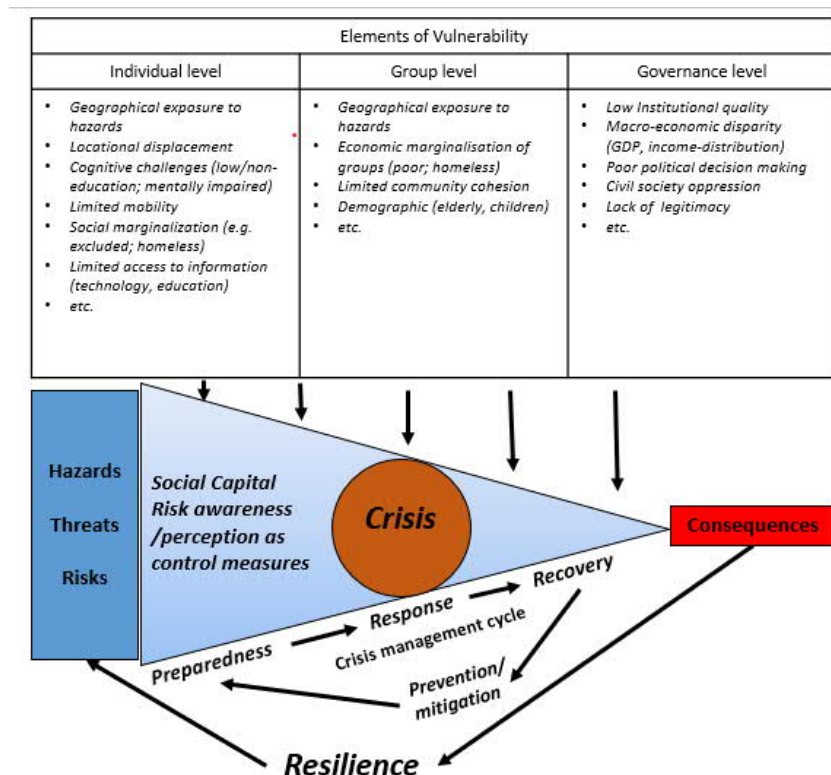


Figure 15 New “one wing” model

Figure 13 (the so-called butterfly model) was later definitely abandoned after the Howspace results in March 2020 and substituted by this new model, resulting from the discussions during the General Assembly meeting in Budapest, Howspace, and meetings in May.

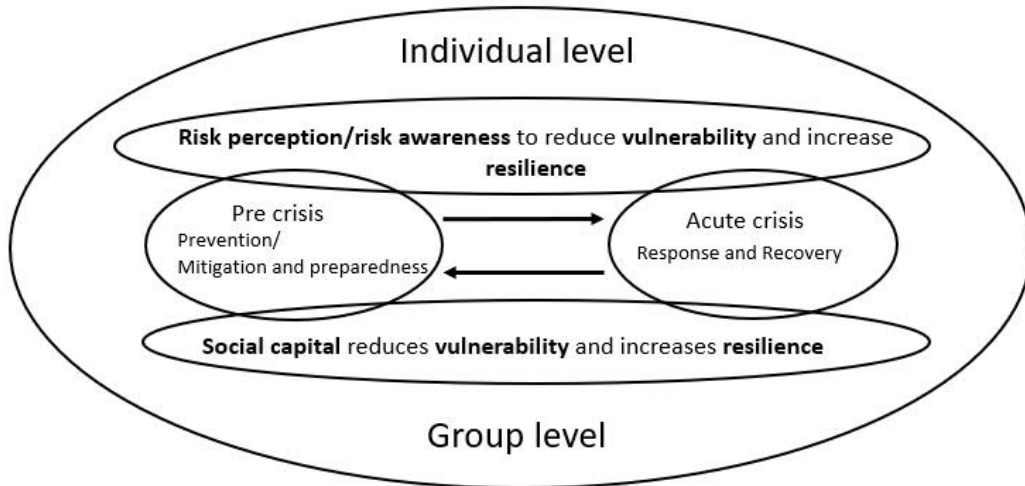


Figure 16 New draft model based on the insights from the Delphi process

## 5. Final BuildERS model

Following consultation of our advisory board, stakeholders and a meeting with external reviewers, the insights and debates discussed above were narrowed down to a model to drive BuildERS research. The model follows the strongest insights and practically relevant aspects of previous research, along with BuildERS goals. The model looks as follows:

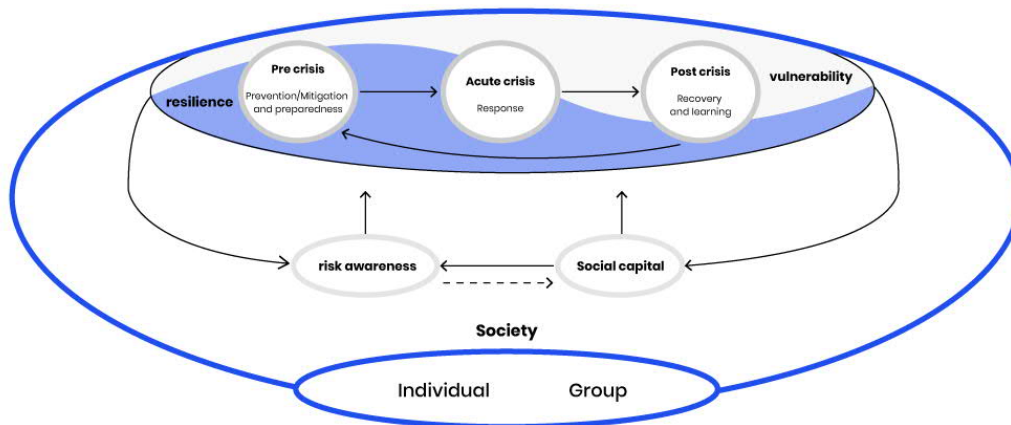


Figure 17 Final version of the BuildERS model

The oval at the bottom of the model includes individuals and groups explored by BuildERS in a given society in WP3 and WP4. Individuals tend to be aggregated in groups (see D1.3), which are/become vulnerable by cultural and social conditions.

Vulnerability and resilience are intertwined and, as such, represented in a sort of yin and yang dyad. Resilience and vulnerability manifest in the pre/acute/post crisis phases according to a mutual interdependency. Risk awareness and social capital are placed in the outer circle. The relation of resilience and vulnerability with social capital and risk awareness is exemplified by the arrows, while there is a stronger relation between social capital and risk awareness, than vice versa, as the scholarship has pointed out.

The process of adaptation and adjustment, typical of resilience, can take also a negative step by contributing to vulnerability, if, for instance, forms of social capital (organised or informal networks, levels of trust, etc.) are not known, or are not supported or strengthened by authorities through proper policy measures. If there are individuals or groups that are not able to count on resources through their social networks, relying on these same networks for resilience may increase vulnerabilities.

We are likely to make use of our social capital to various degrees in the pre-crisis phase and in the acute and recovery phases, and our social capital may be more important to us when important values or particular ties are at stake in the acute crisis phase. Social capital may improve the efficiency of society by facilitating coordinated actions (Putnam, 1993), may be a form of informal security net that assists people accessing resources during and after a crisis or a disaster (Masterson et. al, 2014), and be a crucial asset in the recovery phase following severe events (Albrecht, 2018). Local networks, relying on trustworthy family or neighbours' ties, can contribute to manage risks by sharing knowledge and information about a risk. Thus, social capital may also provide groups and individuals with sources of information and communication, a crucial asset in particularly the acute crisis phase, but also in pre- and post-crisis phases. Thus, risk awareness may be the result of social factors deriving from being part (or not) of a network. In this way, social capital may influence the degree to which we are vulnerable or resilient in both the three phases. However, poor or weak social capital (the dark side of social capital) in a given situation may have opposite effects.

The same figure can be elaborated in a three-layer representation to better show the levels of analysis.



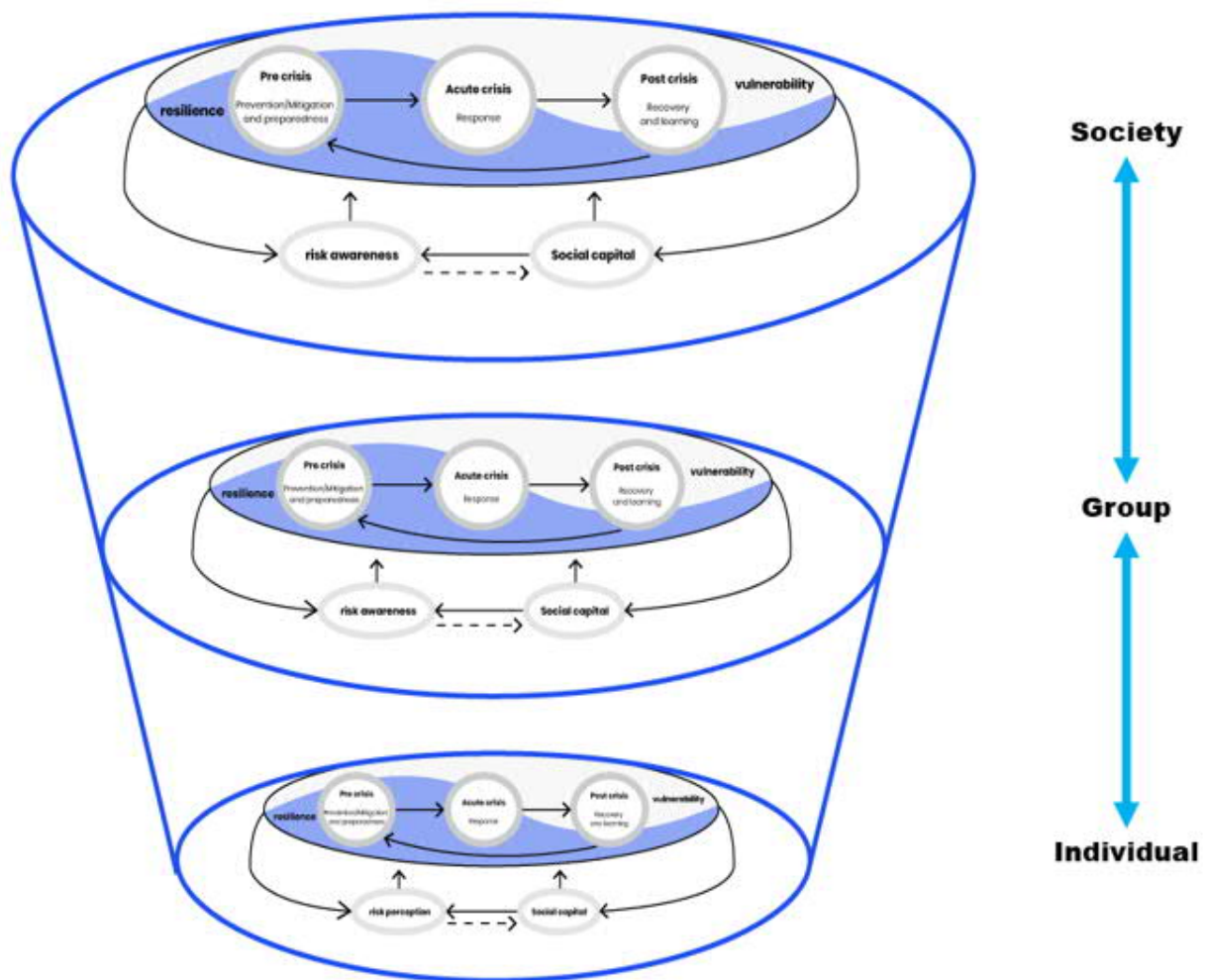


Figure 18 Multi-layer BuildERS model

## 5.1. Questions for the following WPs

Our model is a theoretical construction and its assumptions need to be rigorously tested and amended whenever it is necessary. To concretise matters and allow for empirical investigation, WP3 and WP 4 will investigate the proposed connections of the central concepts, and thereafter of the resilience-vulnerability nexus in the changing contexts of pre-, acute- and post- crises phases. Since current research has no agreed-upon connections in this regard, as substantiated in the theoretical parts in this deliverable, exploration is necessary rather than strict hypothesis testing.

Examples of exploration of these connections, which should offer reliable material to answer the overarching question why various factors make up vulnerability in specific contexts of crises and disasters.

1. How does social capital affect risk awareness? Do size and/or number and/or the type of the networks and groups an individual has access affect in a meaningful way the acknowledgement of risks and/or the potential behaviour to act to reduce or eliminate risks?
2. How does risk awareness affect vulnerability and resilience? Does risk awareness increase or decrease vulnerability in a pre-crisis phase? Does this change in an acute crisis context?
3. How does social capital affect the nexus resilience-vulnerability? How size and/or number and/or the type of the networks and groups an individual has access affect ways of coping with crises or disasters?
4. Looking more broadly, if resilience is the end goal, what degrees of improvement of social capital, vulnerability, and risk awareness are required to achieve a resilient group?

## 6. Conclusions

This Section summarises this report and sets out key elements for other WPs. This deliverable (D1.2) and the preceding task (T1.1) outlined BuildERS' theoretical framework through a cross-domain and cross-disciplines literature review of the concepts, followed by their synthesis into a set of models, which initiated in D1.1, reviewed and validated through consultation and the iterative Delphi process. This report, D1.2, finalises that process and develops a unified theoretical approach set out in the previous sections.

### 6.1. Main findings

The report is the result of an interdisciplinary effort, which not only concerned the scholarship taken into considerations, but also the inputs from the participating partners, and the consortium in general, belonging to different scientific traditions and disciplines. BuildERS has generated an understanding of the concepts of BuildERS theoretical framework, cutting across disciplines. This was a necessary part of the process to move towards the conceptualising of our model, which enlightens the importance to reflect more systematically on the causal relationships between the concepts. This reflection is needed to better cope with the multitude of needs of different societal groups, especially the most vulnerable ones. We believe that we have achieved an important result by building a model with concepts that the scholarship seldom relates to each other in the way this report aimed at. We will test this model in the following WPs and we will apply it in our own respective research areas.

Vulnerability, resilience, awareness and social capital pertained both to individuals and groups. Thus, these two dimensions - individual and group - should always be considered by academia, policy makers and stakeholders when studying these phenomena or shaping policies or implementing them in a given context.

The interplays and interdependences of these concepts need to be translated into durable and sustainable policy actions that are beneficial for the whole society, but in particular for vulnerable groups. Aspects such as family ties, social and institutional trust, culture and religion tend to be overlooked and differences within society levelled towards the needs of who is actually most robust.



Policies and strategies at all levels of governance need to be better targeted according to which groups they are meant for.

## 6.2. Synthesis of the findings in WP1

To answer T1.5 (synthesis of findings in T1.1 – 1.4), we briefly mention some main results of the overall work conducted in WP1. These results will feed two scientific articles (D1.5).

WP1 has investigated the concepts that sustain the BuildERS' architecture and has provided four reports (D1.1. – D1.4) and three scientific publications (two as D1.5 and D1.6). The variety of knowledge and information provided allow us to draw three main conclusions for the benefit of policy makers and researchers.

1. D1.1 and D1.2 have showed that, although the production of scientific knowledge about resilience, social capital and vulnerability is robust and varied, there is always the need to explore new venues by adding concepts like social capital and risk awareness and reflecting on mutual relationships.
2. D1.3 has confirmed the findings from D1.2 that vulnerability is shaped by a complex set of elements, some of them are stable characteristics of a group or an individual, while some others are context specific. They intertwine in such ways that, especially when looking at 'typical' or 'predefined' vulnerable groups, we need to broaden our understanding of vulnerability. In this vein, D1.3 has promoted a more systematic application of the intersectionality approach to assess vulnerability as a dynamic phenomenon and to help to unveil groups that fall outside the official data.
3. D1.4 has confirmed the findings from D1.2 and D1.3 about vulnerability, with its focus on challenges related to the usage of social media and access to correct crisis information. The crisis information landscape has dramatically changed due to the use of social media and this contributes to new ways for resilience building (e.g., dialogic communication between crisis managers and affected groups; organising support networks online), but also to new types of vulnerabilities (e.g., misinformation and disinformation issues; digital divide and possible discrimination of some disadvantaged groups). The findings in D1.4, supported by the other reports from WP1, show that the actuality of the research conducted in BuildERS is undeniable in these times of the current pandemic.

BuildERS aims to contribute to the general debate about resilience and vulnerability. In addition, BuildERS will contribute on how we can better understand risk awareness in the context of resilience-vulnerability-social capital linkages, since societal changes affect risks and their management: conventional hazards are reshaped, new ones are created and increased by climate change impacts, modifying resilience to risks, transforming the channels through which accidents spread, and altering society's responses (Hansen and Nissenbaum, 2009; Comfort et al., 2010). Strictly related to this, it is equally clear for us that the interplay between factors can change from society to society. A concept like resilience or vulnerability can seldom or never be isolated from the social fabric in the societies in which they operate (Aldrich, 2012). BuildERS approach in connecting vulnerabilities, resilience, social capital, and risk awareness seeks to provide a further boost for the enhancement of resilience in Europe.

We conclude this deliverable the words by the German vulnerability researcher Jörn Birkmann, which very well summarises the research journey undertaken in the first year of the BuildERS project.





*“If our ultimate aim is to develop a disaster-resilient society, the starting-point in the process of risk reduction should be to shift our focus away from quantifying natural hazards and towards identifying, assessing and ranking various vulnerabilities (Bogardi and Birkmann, 2004). But the very concept of vulnerability is unclear, despite being recognised in various fields, such as disaster management, environmental change research and development studies. So what does vulnerability mean? And who is, and what is vulnerable - and vulnerable to what? Some approaches base vulnerability on loss of life: the number of people killed compared to the number of people exposed to natural hazards. But can we really measure our vulnerability now and in the future by analysing past events? If not, what are the alternatives?” (Birkmann, 2005: 1).*

This deliverable helps to answer Birkmann’s questions and more. We have shown that resilience and vulnerability represent two intertwined approaches of individuals and groups’ behaviour in crises and disasters, sometimes coexisting, sometimes building on each other. Our final models help to operationalise these principles and turn them into researchable tasks.

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## Appendix A

Appendix A is a concise and updated list of concepts used throughout the project. The definitions of concepts (either in the form of a quotation or of our own elaboration) are taken mainly from the disaster risk reduction (DRR), risk analysis and the crisis management literature and from international organisations, such the UN and EU, working with DRR and crisis management.

### *Accident*

“Unintended damage to people or objects that affect the functioning of the system we choose to analyse” (Perrow 1999: 64).

### *Capacity*

“The combination of all the strengths, attributes and resources available within an organization, community or society to manage and reduce disaster risks and strengthen resilience.

Annotation: Capacity may include infrastructure, institutions, human knowledge and skills, and collective attributes such as social relationships, leadership and management.

**Coping capacity** is the ability of people, organizations and systems, using available skills and resources, to manage adverse conditions, risk or disasters. The capacity to cope requires continuing awareness, resources and good management, both in normal times as well as during disasters or adverse conditions. Coping capacities contribute to the reduction of disaster risks.

**Capacity assessment** is the process by which the capacity of a group, organization or society is reviewed against desired goals, where existing capacities are identified for maintenance or strengthening and capacity gaps are identified for further action.

**Capacity development** is the process by which people, organizations and society systematically stimulate and develop their capacities over time to achieve social and economic goals. It is a concept that extends the term of capacity-building to encompass all aspects of creating and sustaining capacity growth over time. It involves learning and various types of training, but also continuous efforts to develop institutions, political awareness, financial resources, technology systems and the wider enabling environment” (UNISDR 2019a).

### *Civil protection*

Protection for people, their environment, property and cultural heritage in the event of natural or manmade crises and disasters (Morsut, 2014).

*Civil protection according to the EU* (Source: Hellenberg 2006: 5).

<i>Subjects of protection</i>	<i>of</i>	<i>Risk source</i>	<i>Risk type</i>	<i>Subjects of civil protection planning and training</i>
People Environment Critical infrastructure Property		Man-made Technological Natural Complex	Crises Emergencies Disasters Accidents	Prevention Preparedness Response Restoration

### *Civil society*



Civil society refers to both the networks of actors and groups that are non-state, formally and informally constituted, and to the networks of trust and reciprocity among citizens in a society (see Aldrich and Crook, 2008).

*Community (see society)*

*Crisis*

“Period of upheaval and collective stress, disturbing everyday patterns and threatening core values and structures of a social system in unexpected, often unconceivable, ways” (Rosenthal et al., 2001:6).

*Crisis communication*

“Crisis communication includes the collection and processing of information for crisis team decision making along with the creation and dissemination of crisis messages to people outside of the team” (Coombs and Holladay, 2010: 20).

*Crisis management*

“Crisis management is the shorthand phrase for management practices concerning non-routine phenomena and developments” (Rosenthal et al., 2001:14).

*Crisis management cycle*

It is a multiple-phase chronological process, during which an organisation deals with a crisis or a disaster. There have been developed several models, but the most widely accepted foresees four phases: prevention/mitigation, preparedness, response and recovery.

It is also referred to by other names, such as “the emergency management cycle or crisis life cycle” (Pursiainen, 2018: 4).

*Disaster*

“A serious disruption of the functioning of a community or a society at any scale due to hazardous events interacting with conditions of exposure, vulnerability and capacity, leading to one or more of the following: human, material, economic and environmental losses and impacts” (UNISDR, 2019a).

*Disaster risk management*

“Disaster risk management is the application of disaster risk reduction policies and strategies to prevent new disaster risk, reduce existing disaster risk and manage residual risk, contributing to the strengthening of resilience and reduction of disaster losses” (UNISDR, 2019a).

*Disaster Risk Reduction (DRR)*

“Disaster Risk Reduction (DRR) aims to reduce the damage caused by natural hazards like earthquakes, floods, droughts and cyclones, through an ethic of prevention” (UNISDR, 2019).

*Disinformation*

Deliberately misleading information.

*Emergency management*

“The organization and management of resources and responsibilities for addressing all aspects of emergencies, in particular preparedness, response and initial recovery steps” (UNISDR, 2009: 13).

*Exposure*

“The situation of people, infrastructure, housing, production capacities and other tangible human assets located in hazard-prone areas.

Annotation: Measures of exposure can include the number of people or types of assets in an area. These can be combined with the specific vulnerability and capacity of the exposed elements to any



particular hazard to estimate the quantitative risks associated with that hazard in the area of interest” (UNISDR, 2019a).

#### *Hazard*

“A process, phenomenon or human activity that may cause loss of life, injury or other health impacts, property damage, social and economic disruption or environmental degradation.

Annotations: Hazards may be natural, anthropogenic or socionatural in origin. **Natural hazards** are predominantly associated with natural processes and phenomena. **Anthropogenic hazards**, or human-induced hazards, are induced entirely or predominantly by human activities and choices. This term does not include the occurrence or risk of armed conflicts and other situations of social instability or tension which are subject to international humanitarian law and national legislation. Several hazards are **socionatural**, in that they are associated with a combination of natural and anthropogenic factors, including environmental degradation and climate change” (UNISDR, 2019a).

*Marginalised people (see vulnerable groups)*

#### *Misinformation*

Confusing, false or misleading information, without the intent to mislead.

#### *Protection*

The condition or state of being kept safe from injury, damage, or loss (Cambridge on line Dictionary).

#### *Public awareness*

“The extent of common knowledge about disaster risks, the factors that lead to disasters and the actions that can be taken individually and collectively to reduce exposure and vulnerability to hazards” (UNISDR, 2009: 22-23).

#### *Resilience (BuildERS definition)*

Processes of proactive and/or reactive patterned adjustment and adaptation and change enacted in everyday life, but, in particular, in the face of risks, crises and disasters.

#### *Resilience management<sup>19</sup>*

Resilience management is about institutional policies, approaches, procedures and resources aimed at enhancing organisational and societal resilience.

#### *Risk*

Risk results from the interaction of hazard(s), exposure and vulnerability.

#### *Risk assessment*

“Risk assessment (...) is part of the broader risk management process. Risk assessment in turn consist of three tasks: risk identification, risk analysis, and risk evaluation. Risk identification is the initial process of finding, recognising and recording risks. Risk analysis is about developing an understanding of the risk by developing the consequences and their probabilities for the identified risks. Risk evaluation delineates the significance of the level and type of risk” (Pursiainen, 2018:14).

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<sup>19</sup> We have learned that resilience management concerns organisations (see, for instance, the H2020 projects DARWIN, RESOLUTE, RESILENS, and SMG, focusing on different types of organisations: healthcare and aviation organisations in DARWIN, transport systems in RESOLUTE, critical infrastructures systems in RESILIENCE, cities in SMG). The DARWIN project provides this definition “Resilience management is about the resilience of professional actors involved in handling crisis, e.g., first responders, employees in crisis management organizations...” (DARWIN, 2015). However, BuildERS offers a more inclusive definition by considering resilience management as a “task” of dealing with disasters not only for organisations, but all parts of society.





*Risk awareness (BuildERS definition)*

Collective (groups and communities) acknowledgment about a risk and potential risk preventing and mitigating actions, fostered by risk communication.

*Risk communication*

“Risk communication is the process of exchanging or sharing risk-related data, information and knowledge between and among different groups such as scientists, regulators, industry, consumers or the general public” (IRGC, 2017: 27).

*Risk governance*

“Requires consideration of the legal, institutional, social and economic contexts in which a risk is evaluated, and involvement of the actors and stakeholders who represent them. Risk governance looks at the complex web of actors, rules, conventions, processes and mechanisms concerned with how relevant risk information is collected, analysed and communicated, and how management decisions are taken” (Renn, 2008: 9).

*Risk management*

“The process involved in managing risks in order to achieve objectives, by maximizing potential opportunities and minimizing potential adverse effects” (Drennan et al., 2015: 2).

*Risk perception*

Risk perception is the subjective judgment individuals make about the severity and probability of a risk, and may vary from person to person.

*Safety*

A state in which or a place where you are safe and not in danger or at risk (Cambridge on line Dictionary).

*Security*

Protection of a person, building, organization, or country against threats such as crime or attacks by foreign countries risk (Cambridge on line Dictionary).

*Segments of population*

“a delimited set, with unambiguous membership criteria, such as the population of the People’s Republic of China as identified and enumerated in its 2000 census” (Turner, 2006: 130).

*Segments of society*

“A level of organization of groups that is relatively self-contained. [..., and] may be used to indicate the wider activities of those under the authority of a particular state, for example, French society or Indian society” (Turner, 2006: 592).

*Social/societal*

Pertaining to society.

**Societal** describes something related to society that is used in a more scholarly/formal setting. **Social** refers to a context that depends on the situation.

*Social capital (BuildERS definition)*

Networks, norms, values and trust that entities (individuals, groups, society) have available and which may offer resources for mutual advantage and support and for facilitating coordination and cooperation in case of crisis and disasters.

*Society*

Society refers a group of people living in particular territory, sharing a political system of authority and with a distinctive culture.

#### *Threat*

A suggestion that something unpleasant or violent will happen, especially if a particular action or order is not followed (Cambridge on line Dictionary).

#### *Vulnerability (BuildERS definition)*

Dynamic characteristic of entities (individuals, groups, society) of being susceptible to harm or loss, which manifests as situational inability (or weakness) to access adequate resources and means of protection to anticipate, cope with, recover and learn from the impact of natural or man-made hazards.

#### *Vulnerability assessment*

Process of identifying, quantifying, and ranking vulnerabilities in a system.

#### *Vulnerable groups*

Groups of people sharing characteristics making them individually, and as group vulnerable in that they are susceptible to harm or loss, which manifests as situational inability (or weakness) to access adequate resources and means of protection to anticipate, cope with, recover and learn from the impact of natural or man-made risks



## Appendix B

### WP3 and WP4 and the theoretical framework

This appendix briefly shows how the work in WP3 and WP4 will follow the theoretical framework of WP1.

(1) Key authors and theories are presented in Section 3 from D1.2

(2) Key theoretical constructs from D1.2.

From D1.2, the most relevant parts to read are the following: Section 4 and 5, describing respectively the progress of the model since summer 2019 and the final model.

For each concept, D1.2 provides some reflections relevant for BuildERS work:

*3.1.8. Conclusions on vulnerability for BuildERS work*

*3.2.3. Social capital in the theoretical framework of BuildERS*

*3.3.4. Risk awareness in the theoretical framework of BuildERS*

*3.4.3. Resilience in the theoretical framework of BuildERS*

(2) Definitions from 4.1. BuildERS' definitions and relationships

(Social) vulnerability:

Dynamic characteristic of entities (individuals, groups, society) of being susceptible to harm or loss, which manifests as situational inability (or degree of situational weakness) to access adequate resources and means of protection to anticipate, cope with, recover and learn from the impact of natural or man-made hazards.

Social capital:

Networks, norms, values and trust that entities (individuals, groups, society) have available and which may offer resources for mutual advantage and support and for facilitating coordination and cooperation in case of crisis and disasters.

Risk awareness:

Collective (groups and communities) acknowledgment about a risk and potential risk preventing and mitigating actions, fostered by risk communication.

Resilience:

Processes of proactive and/or reactive patterned adjustment and adaptation and change enacted in everyday life, but, in particular, in the face of risks, crises and disasters.

The work in WP3 and WP4 starts from here:

(4) Key variables that underpin the theoretical construct: which are the key variables you explore according to the main concepts of the theoretical framework?

VULNERABILITY: ...



SOCIAL CAPITAL: ...  
RISK AWARENESS: ...  
RESILIENCE: ....

(5) Based on the definitions above, how have you chosen to operationalise the variables (i.e. specific questions and answer categories)? How do you see them empirically (e.g. what do they “look like” in real life)? Which parts of the crisis management cycle are in focus?

....

(6) How have you chosen to measure these variables? What methods? (e.g. interviews, surveys, etc.)?

....

(7) Specify the groups you will survey (in accordance with the theoretical framework): which groups are you studying?

....



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