

# BOTTOM-UP RESILIENCE

How civic bottom-up initiatives  
contribute to community resilience



**RISK\_DIALOGUE**

CREATING A BETTER FUTURE. TOGETHER.

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# Imprint

## STUDY WRITTEN BY

Risk Dialogue Foundation  
Zweierstrasse 25  
CH-8004 Zurich

Tel. +41 58 255 25 70  
info@risiko-dialog.ch

## RISK\_DIALOGUE

CREATING A BETTER FUTURE. TOGETHER.

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Foundation

## AUTHORS

Kimon A. Arvanitis, Matthias Holenstein and Lucien Schriber from Risk Dialogue Foundation

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**Establishing a resilience culture requires the fostering of specific capabilities in society. To this end, strong cooperations are needed to cope with future crises.**

**Matthias Holenstein**  
Director Risk Dialogue Foundation



**Understanding community resilience is important to us to better support our partners and understand their impact.**

**Stefan Huber Fux**  
Director Swiss Re Foundation



**Civic engagement makes a diverse and valuable contribution to shaping our society more resilient to current and future social and ecological crises.**

**Dr. Stephanie Moser**  
Head of the Impact Area Just Economies and Human Well-being  
Centre for Development and Environment CDE, University of Bern



**If we let bottom-up action complement top-down approaches, the general public becomes a crucial part of the solution in crisis management.**

**Dr. Stefan Brem**  
Chief Risk Officer  
Federal Office for Civil Protection FOCP

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# Executive summary

Crises are part of our reality and, as a society, we need to learn how to not only cope with them but attempt to emerge even stronger after a crisis. Prominent examples from a European perspective are the financial crisis erupting in 2008, the impact of forced migration on European political systems (especially after 2015), the Covid-19 pandemic, different natural catastrophes, and most recently the war in Ukraine. In addition to relevant approaches such as crisis management, *resilience* is a promising concept to deal with crises. Resilience is the capability to resist and potentially thrive in a period of pressure, disturbance or change with solutions, actions, or development that are sustainable. In our understanding, an integrative perspective is essential when building resilience. This means that all actors in society must be involved to some extent. In this report, we focus on social resilience, specifically on the resilience of communities as well as on actors from society which respond spontaneously and in a self-organized manner to a crisis.

**We focus on bottom-up initiatives emerging due to crises** such as the Covid-19 pandemic in Switzerland, Germany and Austria. The lockdowns due to the pandemic in early 2020 demonstrated the effects of a crisis on society. Simultaneously, we could observe how people were helping each other in a time of need. This is where this study comes in, as we seek to understand how these bottom-up measures relate to the concept of resilience. In this study, the pan-

demic is used as a social laboratory, but is itself not the main topic of interest.

**We developed a comprehensive conceptual framework to better understand the relationship between community resilience and bottom-up initiatives.** Over 70 bottom-up initiatives were identified and seven of them selected for more in-depth case studies. The analysis in this study showed that the interaction between resilience and bottom-up activity must be analyzed from two different perspectives in terms of mutual impacts simultaneously: the first perspective, *Resilience Building*, shows the possible impact of bottom-up initiatives on community resilience, while the second perspective, *Enabling Actions*, describes the fact that spontaneous emergence of bottom-up initiatives is based on existing capabilities within the community.

**Overall, we conclude that bottom-up initiatives are positively influencing community resilience.** We have identified important components (*People-Place Connection, Engaged Governance, Community Networks, Knowledge, Skills & Learning, Diverse & Innovative Economy, and Community Infrastructure*) and competencies (*Agency and Self-Organizing*) that are relevant for a resilient community reaction. Even though bottom-up initiatives cannot and should not replace top-down approaches, we consider these activities as important complements in the event of a crisis.

We formulated **three recommendations** to increase community resilience and establish a resilient culture:

**1** it's important to better understand resilience and thus create a conceptual agreement,

**2** it's crucial to formulate basic conditions for a resilient culture through an integrative approach, bringing together the relevant stakeholders,

**3** and fostering resilience skills in society is significant to overcome future crises and to continuously develop and learn.

# Introduction

In recent years, countries all over the world have been challenged by different crises. Prominent examples from a European perspective are the financial crisis erupting in 2008, the impact of forced migration on European political systems (especially after 2015), the Covid-19 pandemic, different natural catastrophes, and most recently the war in Ukraine. Crises are part of our reality and, as a society, we need to learn how to not only cope with crises but attempt to emerge even stronger after a crisis. One of the concepts to help us do so is *resilience*. In our understanding, an integrative perspective is essential when building resilience. This means that all actors in society must be involved to some extent, instead of delegating the responsibility to a state or a large aid organization alone. Complementary to this integrative perspective, a range of approaches as well as concepts must be applied to build resilience. In this study, we focus on social resilience, specifically on the resilience of communities as well as on actors from society which respond spontaneously and in a self-organized manner to a crisis. We refer to such actors as *bottom-up initiatives*.

It has become apparent that in addition to the traditional top-down approaches of policy makers and professional aid workers, so-called “grass-roots” or “bottom-up” movements from the civilian population also play an important role in enabling resilient responses by society to adverse events (Fransen et al. 2021, 4-5). However, resilience should not only be understood as a reaction to something negative, because resilient societies are agile even in times without crisis and can foster innovation and bring new opportunities for societal transformation (Lukesch 2016, 303).

If we think back to the first lockdowns due to the pandemic in early 2020, we can see how hard our societies were hit virtually overnight. At the same time, we immediately saw people supporting each other, for example, through neighborly help, by buying groceries for the elderly or through projects by students who tutored children through Zoom because schools were closed. Ordinary peo-

ple self-organized to help each other. This is where this study comes in, as we seek to understand how these bottom-up actions relate to the concept of resilience.

In more detail, the goal of this study is to better understand what constitutes community resilience and the role bottom-up initiatives play in fostering it. Further, we want to understand the impact logic of said bottom-up initiatives on community resilience. We focus on bottom-up initiatives emerging in Switzerland, Germany and Austria during the Covid-19 pandemic. The pandemic is used as a social laboratory, but it is itself not the main topic of interest. Therefore, we also examine bottom-up initiatives that emerged during other crises and find that the applied framework seems to be generally applicable.

In order to develop a theory-based community resilience framework to understand the effect of bottom-up initiatives, we conduct an extensive literature review to define community resilience as well as bottom-up initiatives. Further, we run several expert interviews to learn more about bottom-up initiatives, community resilience and the appropriate method to measure impact for our purposes. We apply a qualitative approach to describe the relationships between bottom-up initiatives and community resilience (see section 2).

We researched and catalogued over 70 bottom-up initiatives from Switzerland, Germany, and Austria during the pandemic and other crises. We used indicators from the literature to describe the bottom-up initiatives in our catalogue (see section 3).

To investigate the relationship between bottom-up initiatives and community resilience, we conducted seven case studies to test our conceptual framework of community resilience in practice. Each case study focused on a specific bottom-up initiative, and we conducted semi-structured interviews with the initiators of the respective bottom-up initiatives (see section 3).

# Community resilience framework

Before we can explore different bottom-up initiatives and discuss their relationships to community resilience, we need to briefly review the literature on the subject. Since the term resilience is used by a number of disciplines, ranging from psychology, economics, and engineering to crisis management, there are many ways to define resilience (Scharte and Thoma 2016, 124). In this study, we focus specifically on community resilience.

In the following, we explain our model for discussing the complex system of community resilience. Figure 1 illustrates how many different concepts overlap and how resilience can be examined from a variety of perspectives. Resilience can be achieved through bottom-up approaches, for example, bottom-up initiatives, as well as top-down approaches, such as central state crisis management. In addition, resilience can be considered at different levels. For example, the resilience of individuals (individual resilience) can be analyzed, as it is often done in psychology, or the resilience of different countries or cities can be compared (social resilience). When analyzing resilience, we can also focus more on

resources (e.g., number of hospital beds) or on capabilities (e.g., first aid knowledge). In this study, we construct a community resilience framework, focusing on capabilities, and use this framework to evaluate the impact of bottom-up initiatives on community resilience.

The works of Berkes and Ross (2013) as well as Maclean and colleagues (2014) provide the theoretical foundation for the development of our community resilience framework. Their approach was further developed and extended using other concepts so that it can be used for the analysis in our case studies.

In this section, we present the results of our literature review and explain the applied community resilience framework as well as its relationship with bottom-up initiatives. First, we summarize our understanding of community resilience as well as the community resilience components and competencies (section 2.1). Second, we characterize our definition of bottom-up initiatives (section 2.2), and finally, we discuss the interactive relationship between such initiatives and community resilience (section 2.3).



Figure 1: Community resilience system

## 2.1 Communities as foundational pillars for resilience

### Community resilience definition

In recent years, an increasing number and diversity of actors have addressed the topic of community resilience. Next to purely scientific literature, a series of applied toolkits (e.g., Hegney, Ross, and Baker 2008; HUD 2022; Towe et al. 2015) focus on how to promote community resilience in practice. In addition, the field of crisis and disaster management (e.g., IRGC or Sendai etc.) stress the importance of strengthening resilience at different levels.

To gain an understanding of how civil society initiatives influence resilience, we need to define the level at which we investigate social resilience. Existing literature captures different levels of social resilience: individual, family, tribe or clan, locality or neighborhood, community, regions or nations, social associations (clubs, faith), organization (firms, etc.), and systems, such as environmental systems or economic systems (Buckle 2006, 93). Because local communities are viewed as an essential frontline in preparing for and dealing with the consequences of a disaster, we concentrate on the community level and, consequently, on community resilience (Kwok et al. 2018, 3). Community stands (1) for a *group of people* connected by the place where they move, live or to which they feel connected and (2) for the *space of action* of an individual detached from the geographical space of movement, although these spaces often overlap (Lukesch 2016, 308–10; Rapaport et al. 2018, 471). An example of a community is therefore a city, a neighborhood, or a village, in which people live and to which they feel

connected, but also a profession, hobby, or other activity in which people are engaged.

In this study, we focus on the *manifestation* of community resilience, meaning that we determine which factors are essential for a system to be able to react resiliently (Huber et al. 2017, 98–99). We are specifically interested in what capabilities are necessary for communities to react resiliently to crises. Furthermore, we examine which circumstances lead to innovative solutions and how capabilities that have emerged during a crisis can be adaptively integrated into a new normality (Huber et al. 2017, 99–100). Whether a resilient system is normatively good or bad depends on the designated goal and the historical context (Wink 2016, 5). To give an extreme example, a drug cartel or a terrorist group can be resilient. Therefore, more resilience is not always a desired outcome and depends on the applied definition as well as on what resilience is built against (Kupers 2014, 27). This, of course, equally applies to community resilience.

In summary, we deploy a definition of community resilience based on Berkes and Ross (2013) that takes into consideration the other concepts described above:

*Community resilience is the capability of a community to resist and potentially thrive in a period of pressure, disturbance, or change with solutions, actions, or development that are sustainable for the community.*



## Community resilience components and competencies

After establishing the theoretical meaning of resilience, we now focus on the components as well as competencies which constitute community resilience. Maclean and colleagues (2014) describe six relevant components (*Knowledge, Skills & Learning, Community Networks, People-Place Connection, Community Infrastructure, Diverse and Innovative Economy, and Engaged*

*Governance*) for community resilience. Berkes and Ross (2013), building on a similar conceptual framework, additionally concentrate on two core competencies (*Agency and Self-Organizing*) which are essential for a community to be able to react resiliently (see Table 1 for the description of components). In the applied framework, the six components are therefore relevant conditions for a community to respond resiliently to a crisis and are activated through *Agency and Self-Organizing*, making the latter necessary conditions.

## Community Resilience



Figure 2: Community resilience framework (Own figure based on Berkes & Ross 2013 and Maclean et al. 2014)

Figure 2 depicts the applied community resilience framework. The six components as relevant conditions for a resilient reaction are shown by means of pink icons. In order to activate a resilient response, however, two further competences are necessary. The competency *Agency* is represented by the white shimmer around the icons. It

describes the feeling of responsibility for an issue and thus the ability to see the need for action in a community. In addition, *Self-Organizing* describes the competency to react independently and in a self-organized manner. It's represented by the connecting lines which bring people and components together to enable a resilient response.

Since communities are quite heterogeneous, these six components were extracted by the cited authors from numerous case studies and refer to key structures occurring in all communities (Berkes and Ross 2013; Maclean, Cuthill, and Ross 2014).

Because community resilience is a complex system and the cited authors tried to identify more general key structures, the applied framework still consists of rather broadly defined com-

ponents. Thus, to better operationalize the six components and make the framework more suitable for our case studies, we defined a sub-level of attributes for each component which characterize them in more detail.

Table 1 explains the meaning of each component and lists the corresponding attributes. A more detailed description of the components and attributes can be found in appendix A.




Component	Description of the component	Attributes
 <b>Knowledge, Skills &amp; Learning</b>	Individual and group capacity to respond to local needs and issues. As well as knowledge and skills within the community which help to both identify and start dealing with a crisis.	Knowledge partnerships
		Technology & innovation
		Skills development & consolidation
 <b>Community Networks</b>	Social processes as well as activities that can support individuals and groups	Social capital
		Social cohesion
 <b>People-Place Connection</b>	Connections and interdependencies of humans and their environment. Further, it encompasses interrelated concepts such as socio-ecological systems	Connection to place
		Sustainable livelihood development
 <b>Community Infrastructure</b>	Supports people during a crisis or disturbance	Diverse services
		Welfare state
		Infrastructure
 <b>Diverse and Innovative Economy</b>	A local or regional economy covering a range of industries and services can draw on a more diverse set of skills and expertise	Diverse economy in community
		Diverse employment in community
 <b>Engaged Governance</b>	A community requires both leadership and engagement in collaborative responses to crises	Inspired leadership
		Collaboration of stakeholders
		Shared vision
		Functioning communication
		Developing ownership

Table 1: Community resilience components and attributes  
(Own table based on Berkes & Ross 2013 and Maclean et al. 2014)

## 2.2 Action from the bottom up

Spontaneous neighborhood help (e.g., buying groceries for the elderly), a group of volunteers tutoring children at home, and local businesses supporting the community during a crisis through specialized products are just a few examples of bottom-up initiatives which we observed in our analysis during the pandemic in 2020 and 2021. Apart from the pandemic, volunteer-based bottom-up initiatives contributed, for example, to disaster relief during different floods in Germany.

Since existing literature does not agree on a single definition of bottom-up initiatives, it is important to explain where the focus of this study lies. Bottom-up initiatives can be defined as community-based civic action groups organized by private households (Seebauer et al. 2019, 101). Other definitions focus on whether bottom-up initiatives are started and managed by civil society actors or individuals, whether they have received public money, or whether they are profit-oriented. An important common characteristic of such initiatives in all definitions is that the overall objective serves the community (The TESS Project 2017, 6). Other studies also mention the importance of the participatory character of the organizational structure (Seebauer et al. 2019, 2).

We combine these definitions in our project and further include local businesses, because our case studies provide examples of businesses supporting their communities during a crisis beyond their usual operations. Thus, we employ the following definition of bottom-up initiatives in this study:

*Bottom-up initiatives are community-based and participatory civic action groups initiated and organized by individuals in a community, which may act either as private persons, organizations, or local businesses. Bottom-up initiatives may or may not have received public funding and may be non-profit- or profit-oriented but the overall objective of the bottom-up initiative is to serve the community.*

In compiling sources on bottom-up initiatives, we noticed the following clear pattern: At the beginning of a crisis, civic engagement increases rapidly, peaks and then declines over time. This can be explained by the fact that initially the pressure of suffering, and therefore the level of engagement, is highest. After a while, and especially in the countries we examined, top-down institutions usually take over or smaller groups evolve into larger structures and themselves institutionalize. As a result, many of the initiatives are very short-lived. Although not the focus of this report, this finding led to the identification of different phases that an initiative may run through in its development. Similar phases and critical development steps for bottom-up or grassroots initiatives have also been identified in other contexts, for example, in literature focused on grassroots innovation in the environmental movement (Bergman et al. 2010; Moser et al. 2018; Ornetzeder and Rohrer 2013; Seyfang and Haxeltine 2012). There may also be links between the emergence of bottom-up initiatives and existing theories in the transformation literature, for example, for strategic niche management (Kemp, Schot, and Hoogma 1998; Seyfang and Haxeltine 2012). Although there is little literature linking the concepts to crisis management, we see many parallels.

## 2.3 Linking bottom-up initiatives and community resilience

So far, we have introduced the concept of community resilience and described the definition of bottom-up initiatives used in the study. Linking the two concepts is now the final step before we can begin the analysis. As described in section 1, the original goal of the study was to understand the extent to which bottom-up initiatives can strengthen community resilience. However, the analyzed system of community resilience is much more complex and shows relevant effects in the opposite direction as well. Therefore, we cannot limit our analysis to a one-way relationship. Since our analysis shows relevant influen-

ces in both directions, we analyze this interaction between resilience and bottom-up activity simultaneously from two different perspectives in terms of mutual impacts. We call the first perspective *Resilience Building*, which shows the possible impact of bottom-up initiatives on community resilience. The second perspective we call *Enabling Actions*, which assumes that the spontaneous emergence of bottom-up initiatives is based on existing capabilities within the community (Fransen et al. 2021, 4-5). This interactive relationship is depicted by the two arrows in Figure 3.



Figure 3: Interaction between bottom-up initiatives and community resilience

Following the first perspective, *Resilience Building*, we can assess whether a bottom-up initiative reinforced a community and possibly increased resilience in the community during a crisis. For example, when the bottom-up initiative Local Hero (see box 1) developed a webpage to foster local gastronomy during the pandemic, we can argue that it helped reinforce community resilience.



*We are all people who are not easily satisfied.*

**Paddy Käser**  
Co-Founder Local Hero

*Within a very short time, the Local Hero platforms were created in Bern, Winterthur, Solothurn, Zug, and Zurich. They gave local businesses the opportunity to present their offerings online during the lockdown. Currently, the platforms are no longer online, but there is still a newsletter with information about current local developments and trends. During the lockdown, prize money sponsored by BKW was also paid out to five SMEs which had reacted particularly innovatively during the crisis.*

Box 1: Local Hero

The webpage helped local businesses to sell their products and so reduced the negative effect of the crisis on the local economy. Following this perspective, Local Hero helped local restaurants to stay in business and might have had a positive influence on several components of community resilience such as *People-Place Connection*, *Diverse and Innovative Economy*, and *Engaged Governance*. It is important to understand that this bottom-up initiative not only positively impacted and bolstered the local economy but potentially also strengthened community resilience, even

if this was not the initial or explicit goal. For example, *People-Place Connection* and *Engaged Governance* were additionally strengthened in the community through the interactions on Local Hero's webpage and newsletters and the interactions they created (see section 3.3).

The second perspective, *Enabling Action*, describes the relationship between bottom-up initiatives and community resilience from the opposite direction. The emergence of bottom-up initiatives might well be a predictor for already existing community resilience. Only a resilient community should be able to produce bottom-up initiatives. Therefore, it is interesting to identify which components of the community resilience framework encouraged the emergence of a bottom-up initiative. In the case study mentioned above, we find that the emergence of Local Hero was made possible by a set of community resilience components: *Knowledge, Skills & Learning*, *Community Network* and *People-Place Connections* (see section 3.4).

In summary, the applied community resilience framework seems to capture the complex relationship between bottom-up initiatives and community resilience. It is important to understand how components of community resilience *Enable Action* through the emergence of bottom-up initiatives. At the same time, it is crucial to be able to analyze whether a new bottom-up initiative further promotes *Resilience Building* in a community. The latter perspective is particularly important because all the bottom-up initiatives analyzed in this study were not directly aimed at promoting community resilience, but rather sought to address a specific problem within their community during a crisis.

# 3 Case study analysis

After this rather theoretical and abstract part, we would now like to apply the presented concept to real cases. The pandemic allowed us to identify numerous bottom-up initiatives which were active very recently. Additionally, initiatives formed during crises such as floods help to

ensure the applicability of our work to a broad range of topics. By applying the theoretical framework to a diverse set of case studies, we demonstrate how bottom-up initiatives and community resilience are related.

## 3.1 Putting faces to names by talking to activists

At first, the search for bottom initiatives was quite difficult as the online footprint often only consisted of a Facebook group or a mention on a website. In addition, we had no clear idea what kind of bottom-up initiatives existed. Interestingly, there was also very little coverage of such initiatives in the media during the pandemic. Before the search, we conducted interviews with professionals from different fields (e.g., disaster managers, community organizers) to find as many sources as possible. Based on these sources, we started an internet and media search to compile our sample of initiatives. Eventually, we identified well over 100 bottom-up initiatives, which focused on a range of topics. We decided to focus on and document 17 indicators to characterize the identified bottom-up initiatives.

The inspiration for the indicators describing the initiatives stems from studies by Jaeger-Erben et al. (2015) and Faser et al. (2021). The table in appendix B lists over 70 initiatives which formed the sample for our study. We opted to choose our sample based on diversity, rather than creating a representative sample, and are aware that our sample comes with certain biases due to the method and timing of the search.

Since the identified initiatives had diverse goals, we tried to divide them into topic areas. We were surprised about the great diversity of the initiatives, especially because this diversity was seldom portrayed in mainstream media. We grouped the identified bottom-up initiatives into seven topic areas as shown in Figure 4.

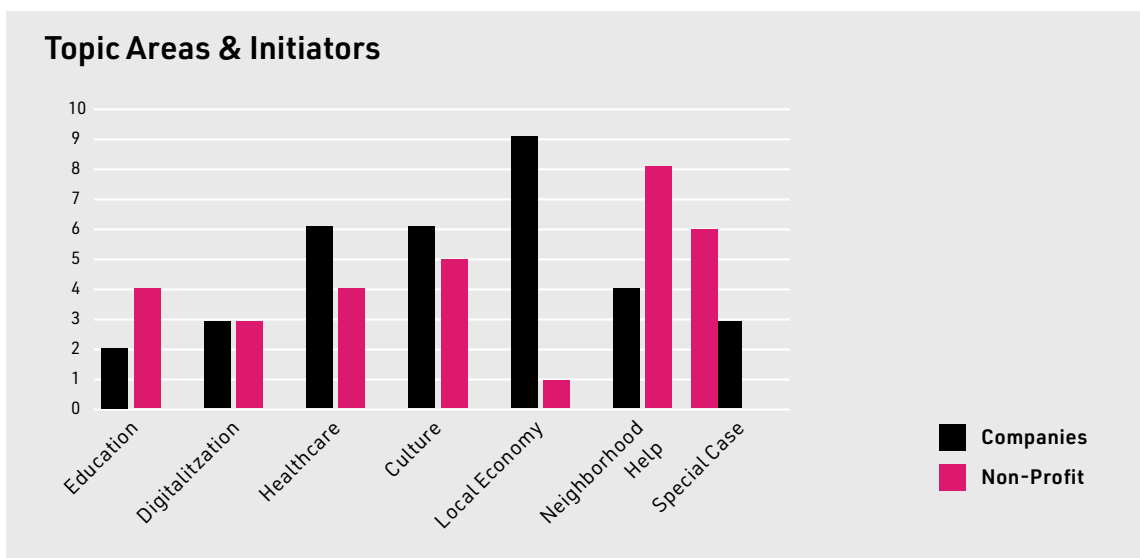


Figure 4: Bottom-up initiative topic areas

**Education:** Furthering education, especially for youth, and other initiatives related to the education sector.

**Digitalization:** Supporting the move from the physical to the digital realm through knowledge transfer, IT support for hardware and software, and digital services (websites, apps, programs).

**Healthcare:** Supporting the healthcare sector through innovation, resources, and knowledge, and other initiatives related to the healthcare sector.

**Culture:** Keeping cultural offers alive and creating new cultural opportunities but also supporting the people working in this sector.

**Local Economy:** Bolstering and supporting the local economy, especially smaller businesses lacking necessary resources or diversification options.

**Neighborhood Help:** Supporting individuals and others in the community with simple tasks in their everyday lives.

**Special Case:** Miscellaneous cases such as community organizations, crisis management organizations, and interest groups.

We selected seven of the over 70 identified bottom-up initiatives for more in-depth case studies. Case studies were selected to represent all topic areas and based on diversity. Choices were discussed in the team and contingent on the response and willingness of the case study representatives. The selected bottom-up initiatives are briefly described in box 2 on the following page.








### 3.2 From method to practice: Applying the framework

Each case study consists of a questionnaire as well as a semi-structured interview. Prior to the semi-structured interview, the person representing the bottom-up initiative and the project team, acting as an expert panel, completed a questionnaire on the impact of the initiative on the components and attributes of community resilience. In order to make the terminology of the framework more comprehensible to respondents, the definitions of components and attributes were first simplified. We intentionally did not ask directly about the theoretical concept of resilience and instead referred to commonly understood concepts.

In a first step, we formulated a question for each component to determine whether the bottom-up initiative influenced community resilience. Second, we formulated a question for each attribute to understand what helped the

emergence of the bottom-up initiative. Since we were dealing with very different individuals with different educational backgrounds, we decided to use a 1-to-5-point response scale shown as stars. This was done to elicit intuitive answers since this scale is familiar to people with all backgrounds (e.g., from rating products online, movie reviews, restaurant guide). We then compared the self-assessment and expert assessment regarding community resilience to understand whether the applied community resilience framework is valid. Further questions about the interrelationship between bottom-up initiatives and community resilience were discussed during a one-hour semi-structured interview. Overall, the accordance rate between the assessments of the project team and the participants was around 75-80%. This shows the applicability of the community resilience framework for practical analysis.

## Selected bottom-up initiatives

<p><b>LOCAL HERO</b></p> 	<p>The day of the lockdowns, a small group of friends in Bern, Switzerland, came together and developed an idea to help local businesses. Within days, the online platform Local Hero was up and running, allowing local businesses to sell wares and receive support online during the lockdowns. The success inspired similar platforms in other major Swiss cities.</p> <p>While the online platform is no longer in operation, the group still regularly publishes a newsletter with information about current local developments and trends and is working on new ideas.</p>
<p><b>GLOCAL ROOTS</b></p> 	<p>Glocal Roots is a young refugee organization based in Zurich. It develops structures, projects and networks that allow people with a refugee background to live autonomously and in a self-determined way and to actively contribute with their skills to their new society. It works in Switzerland and abroad.</p> <p>Glocal Roots is an organization in motion, where project ideas are developed with and for refugees. The projects originate from the grassroots and are developed and implemented cooperatively through volunteer engagement.</p>
<p><b>LONG-COVID SCHWEIZ</b></p> 	<p>A group of long-covid patients and concerned parties organized in early 2021 to raise awareness and push research on the disease in Switzerland. Long-Covid Schweiz originated from a Facebook group from 2020 which supported patients and enabled exchange among covid long-haulers.</p> <p>It took a lot of effort from the initiators to get noticed by authorities. Due to the group's partly political agenda, which called on public authorities to act, it turned out to be very difficult to find supporters. Thus, most of the early successes were purely bottom up and collaboration with top-down institutions happened only later.</p>
<p><b>LERN-FAIR (CORONA SCHOOL)</b></p> 	<p>In the first lockdown, in response to the closure of schools in Germany, German students founded Corona School. This online platform connects schoolchildren with student volunteers to support their learning. The first version of the platform was up and running on March 15, 2020, within days of school closures.</p> <p>In 2021, the platform evolved into Lern-Fair to signal its longevity and continued need after the pandemic. The focus now increasingly lies on students with German as a second language and on equality in education.</p>
<p><b>UNITED WE STREAM</b></p> 	<p>The successful fundraising campaign for Berlin clubs grew into a global cultural platform and community-driven streaming initiative in the digital space. With the help of United We Stream, clubs, artists, and employees within the club scene received money, a voice, and an opportunity to keep club culture alive.</p> <p>The cross-genre and interdisciplinary streams offer low-threshold access and connect local cultural spaces, artists, creators, companies, and institutions with a global audience. United We Stream confronted the Covid-19 crisis and continues to advocate for club cultural values in the context of digital cultural mediation.</p>
<p><b>GÄRNGSCHEE (BASEL HILFT)</b></p> 	<p>Right at the start of the Swiss lockdowns, Bajour, an online news-site based in Basel, Switzerland, started a public Facebook group where people in need could post their problems and others could volunteer to help. The platform grew quickly to over 15,000 members in Basel. The idea inspired others to found similar groups in other Swiss cities such as Bern.</p> <p>Bajour soon saw the need for professional management and moderation of the activities within the Facebook group and the network of people in need which developed out of it. For this purpose, it financed a part-time position for the management of the group and employed volunteers for services such as a telephone hotline for people in need, paying volunteers for services where possible.</p>
<p><b>ESSEN PACKT AN!</b></p> 	<p>In response to a massive storm front in Germany, in 2014, locals from Essen came together in an effort to clear the roads and help others in need. They founded a Facebook group and organized. Up to 4,500 people came together in this group, Essen packt an!, and helped each other through the crisis.</p> <p>After the initial efforts, the group moved on to help others in need. Until today, its efforts include help during disasters, help for the homeless and crowdfunding for people in need.</p>

Box 2: Selected Bottom-up initiatives



### 3.3 Bottom-up initiatives strengthen community resilience

In this section, we discuss the results of the initial question of the study, namely, whether bottom-up initiatives strengthen community resilience. Table 2 summarizes the positive influence of the examined bottom-up initiatives on the six components of community resilience. The numbers represent averages of the responses to the questionnaire and range from 1 (small or no positive influence) to 5 (large positive influence), originally represented as stars in the questionnaire. We present both the self-assess-

ment summary and the expert assessment aggregated from the seven case studies in the table. It is important to remember that these assessments were done independently. Right away we see that the community resilience components *Knowledge, Skills & Learning*, *Community Networks*, and *Engaged Governance* seemed to be strongly influenced by the bottom-up initiatives in the analyzed case studies. The aggregate value is 4 or higher for all three components.







Community resilience component	Bottom-up initiative self-assessment	Project team expert assessment
 <b>Knowledge, Skills &amp; Learning</b>	<b>4.1</b>	<b>4.1</b>
 <b>Community Networks</b>	<b>4.7</b>	<b>4.1</b>
 People-Place Connection	3.4	2.7
 Community Infrastructure	2.6	3.3
 Diverse and Innovative Economy	1.3	1.4
 <b>Engaged Governance</b>	<b>4.4</b>	<b>4.2</b>

Table 2: Bottom-up initiative effect on community resilience

The effect on *Knowledge, Skills & Learning* can be explained by the personal growth of the people involved in the initiatives (initiators as well as volunteers and other affected people) as well as the development of communication structures that are always needed and help to strengthen this component. The effect on *Community Networks* is explained by the more intensive contact with other organizations; the construction, growth, or welding together of the community; and the growth of networks within and beyond the community. Finally, the effect on *Engaged Governance* can be explained by the role model function of the initiators and volunteers for other individuals in the community. In the interviews, people often described how their actions during the crisis had an inspiring and empowering influence on their personal network.

*People-Place Connection* does not seem to have been a key component, primarily due to the fact that many of the analyzed pandemic-rela-

ted bottom-up initiatives were mostly digitally active, meaning that the immediate link to the near neighborhood was less important than for initiatives started during other crises. Still, the component was important in some cases, as the Local Hero initiative in section 2.4 shows and reflected in the average value of 3.4.

The effect of the bottom-up initiatives on the component *Community Infrastructure* showed less relevance in our analysis. Even though several initiatives created new infrastructure on a small scale (primarily assorted services, but also communication infrastructure and transport infrastructure through websites and online networks), these effects were all viewed as being small. Given that the description of this component also captures large-scale topics such as the healthcare system, this is not surprising.

The impact on *Diverse and Innovative Economy* was also estimated to be rather low. Some

bottom-up initiatives tried to support local businesses, but these endeavors were often selective and the bottom-up initiatives we analyzed in the case studies focused on a specific sector instead of the economy as a whole. Thus, it is not

possible to make an argument that the specific bottom-up initiatives analyzed in this project influenced the component *Diverse and Innovative Economy* as a whole.

### 3.4 Bottom-up initiatives indicate existing community resilience

Let us turn our attention to the second part of the interaction and analyze which community resilience components were important for bottom-up initiatives to emerge. In the questionnaire, questions were formulated for each attribute, and the scores of the answers for each attribute were aggregated from the attribute level to the respective component level by calculating the average of the scores for the constituent attributes. We again present both the result of the

self-assessment as well as the expert assessment across all case studies. Table 3 presents the estimated level of importance of the community resilience components for the emergence of the respective bottom-up initiative. As before, the components *Knowledge, Skills & Learning*, *Community Networks* and *Engaged Governance* of the community resilience framework seem to be most important.







Community resilience component	Bottom-up initiative self-assessment	Project team expert assessment
 <b>Knowledge, Skills &amp; Learning</b>	4.4	4
 <b>Community Networks</b>	4.4	3.9
 People-Place Connection	3.3	3.5
 Community Infrastructure	2.4	2.3
 Diverse and Innovative Economy	1.9	2.6
 <b>Engaged Governance</b>	4	3.9

Table 3: Community resilience & bottom-up initiative emergence

The emergence of a bottom-up initiative always builds on the existing know-how of the individuals within the community. Diverse knowledge is the foundation for an agile and innovative reaction. These attributes are summarized in the *Knowledge, Skills & Learning* component.

*Community Networks* was also a relevant component for bottom-up initiatives to emerge. Especially the attribute *Social Capital* is essential for the emergence of bottom-up initiatives, particularly at the beginning but also when the initiatives grow and eventually institutionalize. Most of the interviewed initiators emphasize the

importance of their personal friendships, acquaintances, and professional network.

All interviewed initiators emphasized the importance of communication for the emergence of bottom-up initiatives. It is crucial for a bottom-up initiative to communicate to media and gain much-needed public attention. This public attention leads to the initiatives receiving more support (monetary support or volunteers) but also to positive feedback and expressions of appreciation for all involved individuals. Attention, feedback, and appreciation were identified to be very important in keeping the involved people



## Resilience cannot be developed until basic needs are met.

Liska Bernet  
Founder Glocal Roots

*Glocal Roots is a young refugee organization based in Zurich. It develops structures, projects and networks that allow people with a refugee background to live autonomously and in a self-determined way and to actively contribute with their skills to their new society. It works in Switzerland and abroad. Glocal Roots is an organization in motion, where project ideas are developed with and for refugees. The projects originate from the grass-roots and are developed and implemented cooperatively through volunteer engagement.*

Box 3: Glocal Roots

motivated. The communication is also important internally for the organization of the initiatives. These capabilities are all covered by attributes of *Engaged Governance*.

The connection of people to the space they live in (*People-Place Connection*) was also central to some of the initiatives. However, since many of the initiatives functioned online, the importance of this component varied greatly between initiatives.

The components *Community Infrastructure* and *Diverse and Innovative Economy* were often not considered to be relevant by bottom-up initiative representatives, which we found surprising. The interviews indicated that this may be to some part related to the wording in the questionnaire. Yet inquiries during the interviews showed that both components were relevant for the bottom-up initiatives to come into being in the first place. It seems that the relevance of the components *Community Infrastructure* and *Diverse and Innovative Economy* were taken for granted by the interviewed bottom-up initiative representatives. As the conversations have shown, partial aspects of the two components were central to the emergence of most of the initiatives. In conversation with Glocal Roots (see box 3), we were able to further elaborate on this phenomenon. We concluded that building resilience also depends on the context of a community. Glocal Roots accompanies projects in both

Athens and Zurich with the goal of empowering people with refugee backgrounds. However, depending on the city where the activities take place, their work varies greatly, in part because building resilience requires that basic needs are met.

Comparisons with bottom-up initiatives active in other crises confirm our hypothesis that the relevance of the two components *Community Infrastructure* and *Diverse and Innovative Economy* was underestimated by the interviewees in the case of the pandemic and the countries of interest. The analyzed countries have very strong manifestations of these components. It seems that these components were therefore taken for granted. Following this, we argue that the context (cultural or economic) of a community is central to the analysis of community resilience.

### 3.5 Case study conclusion: Building on partnerships and existing connections

Following the results from the case studies, we conclude that bottom-up initiatives can have a positive effect on community resilience. We argue that this effect could apply to other cases and situations as well, and because we focused on different crises, we hypothesize that bottom-up initiatives in general might have a positive impact on community resilience. The case studies further confirm that bottom-up initiatives can react quickly and agilely in a crisis. Many successful

bottom-up initiatives were ready within days or even hours with innovative and effective solutions as, right at the beginning of the pandemic, the confusion was great and top-down approaches to certain problems were overwhelmed or did not yet exist. Due to their relative independence from organizational as well as political constraints, bottom-up initiatives have the potential to react faster than top-down engagement (The TESS Project 2017, 2). For example, in the beginning, tutoring for



## There was never time to stop and reflect. That didn't happen until later.

Nicole Erfurth  
Board Member United We Stream

*The successful fundraising campaign for Berlin clubs grew into a global cultural platform and community-driven streaming initiative in the digital space. With the help of United We Stream, clubs, artists, and employees within the club scene received money, a voice, and an opportunity to keep club culture alive. The cross-genre and interdisciplinary streams offer low-threshold access and connect local cultural spaces, artists, creators, companies, and institutions with a global audience. United We Stream confronted the Covid-19 crisis and continues to advocate for club cultural values in the context of digital cultural mediation.*

Box 4: United We Stream

students who were struggling to keep up with their schoolwork because of lockdowns was offered primarily by bottom-up initiatives. Only over time did the state address this problem and act appropriately. Unfortunately, these measures were not well coordinated with the existing offerings of the bottom-up initiatives, sometimes resulting in competing instead of symbiotic relationships.

A functioning relationship between top-down and bottom-up action is critical for an overall efficient reaction during a crisis. This is also reflected in the Sendai Framework for Disaster Risk Reduction 2015-2030, which indicates that disaster risk reduction requires the commitment and partnership of society as a whole (Brebbia et al. 2018). This is only possible if top-down approaches, such as government initiatives and programs, and bottom-up action, such as citizen groups reacting to a crisis, work together, communicate effectively, and know as well as respect each other's strengths. Relying solely on top-down approaches is known to undermine local capacities and knowledge (Brebbia et al. 2018). Besides our findings, several additional case studies in other contexts have shown the importance of community resilience and bottom-up approaches (Aldrich 2012; Butler et al. 2015; Oktari et al. 2020). Modern crisis management literature approaches the subject of resilience from those two angles: bottom up and top down (Haeffele and Storr 2020).

While discussing the possible effect of the bottom-up initiatives, the interviewees explained that, especially in the beginning, they could not focus on impact measurement because they had to invest most of their energy and time in achieving the goals they had set (e.g., United We Stream in box 4). Nevertheless, effects can be measured by quantitative measures (money collected in fundraising campaigns, number of people who signed up on a neighborhood help platform) or by qualitative feedback (feedback forms, direct feedback from people affected). Some of these feedback mechanisms were already employed by bottom-up initiatives such as United We Stream. Positive experiences and the feeling of having an impact were also especially important for the bottom-up initiatives. This reaffirms the importance of motivation, confirmation, and success for the persistence of a bottom-up initiative.

Our theory-based approach differs from other practically applied projects in that we focus on the motivation of individuals within communities, among other components. *Agency* and *Self-Organizing* are key competencies which are particularly significant in the analysis of bottom-up initiatives because the initiators react out of their own motivation. The examined cases revealed that most of the initiators of bottom-up initiatives had already gained experience in associations or other social commitments before the crisis. The interviewees repeatedly stressed the relevance of positive feedback for bottom-up initiatives. Especially in challenging times, this is central to the motivation of the people involved.

It is very exciting to see how concordant the postulated community resilience components and competencies from our conceptual framework were with the content of the conversations about the initiatives in the case studies. Several interview partners even confirmed that the questionnaire based on the framework helped them to rethink their own impact logic. Important learnings made by bottom-up initiatives are seldom documented and remain very much within the respective specialist areas or with involved individuals. This requires a renewed interdisciplinary exchange when the next problem or crisis arises. Thus, networks and relationships are extremely important for fostering community resilience through bottom-up action (mostly through multipliers in the community).

# Discussion and conclusion

## 4.1 Main results: From theory to action and back

Crises are part of our reality and, as a society, we need to learn how to cope with them and attempt to emerge even stronger after a crisis. Resilience is one of the central concepts besides other relevant crisis management approaches (e.g., preparedness through resources). In this study, we focus on social resilience, specifically on the resilience of communities, as well as actors from society who respond spontaneously and in a self-organized manner to a crisis. To build resilience, an integrative perspective needs to be applied, meaning that all actors in society – not only the state or large aid organizations, but also actors such as bottom-up initiatives – must be involved. While bottom-up initiatives

cannot and should not replace top-down approaches, their integration into existing crisis management is essential. The two approaches should be complementary to each other in the event of a crisis.

Looking back to the beginning of 2020, we witnessed the tragic impact of the pandemic on society, while also seeing people supporting each other through bottom-up actions (e.g., neighborly help). This is where our study comes in, as we seek to understand how these bottom-up actions relate to the concept of community resilience. We summarize the findings of this study in three main results:

1

We conclude that it is essential to also involve the population of a community in crisis management and that they need to be part of the solution. The large number of bottom-up initiatives emerging as a response to the Covid-19 pandemic proved this thesis and showed that people are willing to come together as a community and support each other in a crisis. Our classification of bottom-up initiatives in six distinct topic areas clearly shows how diverse and extensive civic engagement in a crisis can be (view sections 3.1-3.2). We were surprised to see such a large variety of activities.

2

We have successfully identified important components (*People-Place Connection, Engaged Governance, Community Networks, Knowledge, Skills & Learning, Diverse & Innovative Economy, and Community Infrastructure*) as well as competencies (*Agency and Self-Organizing*) of community resilience. The analysis of the cases shows that the applied community resilience framework can meaningfully explain the effect of bottom-up initiatives on community resilience (see sections 3.3-3.4)

3

The results of the case studies strongly indicate that community resilience can be strengthened through bottom-up initiatives (see sections 3.3-3.5). It became clear during the analysis that the relationship between bottom-up initiatives and community resilience is not one-sided and needs to be viewed as an interaction: bottom-up initiatives can strengthen community resilience (first perspective), while the emergence of bottom-up initiatives is also an indication of a resilient community (second perspective). We identified the community resilience components *Knowledge, Skills & Learning, Community Networks, and Engaged Governance* as being most relevant for both perspectives, applying two separate questionnaires, one for each perspective, in the case studies.

Additional to the main results, the study identified further relevant questions that should be addressed and elaborated in the future.

- This study employed a qualitative approach – it's important to complement it with quantitative indicators to measure community resilience. The analysis of community resilience could strongly benefit from the use of a combined methodological approach.
- A better understanding of the impact of different cultural or economic contexts on the community resilience framework (e.g., available resources, political systems, and experience with crises and discrimination) is essential for the further application of the framework. This might also include analysis of sociodemographic characteristics of communities.
- The case studies have shown that bottom-up initiatives go through various phases. E.g., initiatives experience different challenges in the beginning or when they possibly scale into a larger organization. This could be an important topic for further study, especially regarding the future support of bottom-up action.
- It's relevant to investigate the effect of societal transformation on resilience – what will happen to resilience when the whole society is transformed in its foundations?

## 4.2 Recommendations for a strong resilience culture

Overall, our goal is to establish a strong resilience culture. This way we hope to sustainably overcome future crises and to continuously develop and learn. In Figure 5, we summarize the

necessary three approaches to increase community resilience through bottom-up activities and to increase social resilience in general based on the findings of the study.

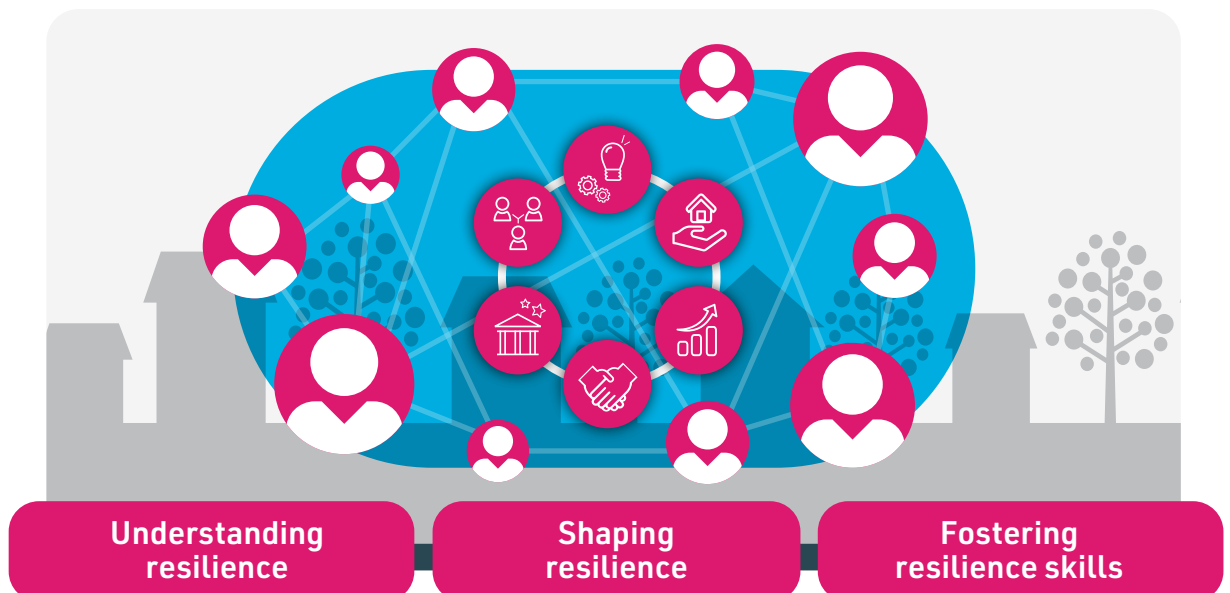


Figure 5: Three approaches to increase community resilience

## 1 Understanding resilience

**It's crucial to better understand the meaning of social resilience and, in more detail, community resilience through bottom-up activities. Conceptual agreements are needed, and more findings need to be collected to establish a culture of resilience. Government agencies and other specialist communities need tools to develop the resilience concept by themselves. Thus, we propose a series of next steps and projects to understand resilience:**

- Reflection of the resilience concept together with relevant stakeholders.
- Establishment of an instrument to periodically measure the level of resilience and to understand the meaning of resilience for society.
- Further investigation of the relationship between bottom-up and top-down approaches with regards to resilience.
- Further analyses on different aspects of resilience such as polarization and learnings from other countries.

## 2 Shaping resilience

**To increase resilience, it is important to establish basic conditions for a resilient culture. Thus, impulses are needed as well as learning from each other to develop the conditions. An integrative approach in shaping resilience is needed, bringing together the relevant stakeholders. Therefore, we also suggest a series of activities and projects to shape resilience:**

- Enabling networking for relevant stakeholders in the resilience community to produce corporative solutions.
- Establishment of tools to work closely with regional networks and activists.
- Organization of further activities to develop general conditions together with the community.

## 3 Fostering resilience skills

**Strengthening resilience skills in society is crucial to overcome future crises sustainably and to continuously develop and learn. Therefore, specific support is needed to implement as well as actively promote skills of regional multipliers to establish a resilience culture. Here are several ideas for projects to foster resilience skills:**

- Development of better infrastructures in promoting bottom-up activities (e.g., quicker access to financing).
- Projects fostering resilience skills need to be integrated in already existing community developing activities.
- Development of strategies on how to integrate a resilience culture in education.
- Establishment of instruments to reward multipliers for exceptional contributions to resilience.
- Development of programs and materials to support local initiates in the resilience field.

In summary, the results of this study confirm the importance of social resilience through bottom-up actions for the sustainable management of crises in a society. This focus on bottom-up resilience is essential to complement existing top-down approaches. In view of current and future crises, it is of great importance to explore, make visible and actively promote the strengthening of social resilience through bottom-up activities and in general. This way, it is possible to learn to deal efficiently with crises and emerge stronger from crisis situations.





# Bibliography



- Aldrich, Daniel P. 2012. *Post-Crisis Japanese Nuclear Policy: From Top-Down Directives to Bottom-Up Activism*. Rochester, NY: Social Science Research Network. SSRN Scholarly Paper. [papers.ssrn.com/abstract=1982646](https://papers.ssrn.com/abstract=1982646) (June 9, 2022).
- Bergman, Noam et al. 2010. "Bottom-up, Social Innovation for Addressing Climate Change." In Brighton, UK: University of Oxford.
- Berkes, Fikret, and Helen Ross. 2013. "Community Resilience: Toward an Integrated Approach." *Society & Natural Resources* 26(1): 5-20.
- Brebbia, C. A., Timothy Sim, Lena Dominelli, and Jocelyn Lau. 2018. "A Pathway to Initiative Bottom-up Community-Based Disaster Risk Reduction within a Top-down System: The Case of China." In *Disaster Management*, WIT Press. [books.google.ch/books?hl=en&lr=&id=BsxJDwAAQBAJ&oi=fnd&pg=PA171&dq=bottom-up+top-down+crisis+resilience&ots=hQnqgwLsiw&sig=ElHbXQOUmyG-PoPg0RQOvrJuKjXw&redir\\_esc=y#v=onepage&q&f=false](https://books.google.ch/books?hl=en&lr=&id=BsxJDwAAQBAJ&oi=fnd&pg=PA171&dq=bottom-up+top-down+crisis+resilience&ots=hQnqgwLsiw&sig=ElHbXQOUmyG-PoPg0RQOvrJuKjXw&redir_esc=y#v=onepage&q&f=false).
- Buckle, Philip. 2006. "Assessing Social Resilience." In *Disaster Resilience: An Integrated Approach*, Charles C Thomas Publisher, 88-103.
- Butler, J. R. A. et al. 2015. "Integrating Top-Down and Bottom-Up Adaptation Planning to Build Adaptive Capacity: A Structured Learning Approach." *Coastal Management* 43(4): 346-64.
- Fransen, Jan et al. 2021. "The Emergence of Urban Community Resilience Initiatives During the COVID-19 Pandemic: An International Exploratory Study." *The European Journal of Development Research*. <https://link.springer.com/10.1057/s41287-020-00348-y> (March 17, 2021).
- Haeffele, Stefanie, and Virgil Henry Storr. 2020. *Bottom-up Responses to Crisis*. Springer Nature.
- Hegney, Desley, Helen Ross, and Peter Baker. 2008. "Building Resilience in Rural Communities: Toolkit."
- Huber, Samuel W., Thomas Kuhn, Thomas Kuhn, and Swiss Procurement Agency armasuisse, Switzerland. 2017. "Towards an Operationalizable Definition of Resilience." In *Proceedings: 7th REA Symposium 2017*, Liège, Belgium: Lnu Press. [www.resilience-engineering-association.org/wp-content/uploads/2018/06/REA-Proceedings-Final-Version.pdf#page=98](http://www.resilience-engineering-association.org/wp-content/uploads/2018/06/REA-Proceedings-Final-Version.pdf#page=98) (March 26, 2021).
- HUD. 2022. *Community Resilience Toolkit*. United States Department of Housing and Urban Development (HUD). [www.hudexchange.info/resource/5981/community-resilience-toolkit/](https://www.hudexchange.info/resource/5981/community-resilience-toolkit/) (June 21, 2022).
- Jaeger-Erben, Melanie, Jana Rückert-John, and Martina Schäfer. 2015. "Sustainable Consumption through Social Innovation: A Typology of Innovations for Sustainable Consumption Practices." *Journal of Cleaner Production* 108: 784-98.
- Kemp, René, Johan Schot, and Remco Hoogma. 1998. "Regime Shifts to Sustainability through Processes of Niche Formation: The Approach of Strategic Niche Management." *Technology Analysis & Strategic Management* 10(2): 175-98.
- Kupers, Roland, ed. 2014. *Turbulence: A Corporate Perspective on Collaborating for Resilience*. Amsterdam: Amsterdam University Press.
- Kwok, Alan H. et al. 2018. "A Bottom-up Approach to Developing a Neighbourhood-Based Resilience Measurement Framework." *Disaster Prevention and Management: An International Journal* 27(2): 255-70.
- Lukesch, Robert. 2016. "Resiliente Regionen. Zur Intelligenz regionaler Handlungssysteme." In *Multidisziplinäre Perspektiven der Resilienzforschung*, ed. Rüdiger Wink. Wiesbaden: Springer Fachmedien Wiesbaden, 295-332. [http://link.springer.com/10.1007/978-3-658-09623-6\\_13](http://link.springer.com/10.1007/978-3-658-09623-6_13) (August 9, 2022).
- Maclea, Kirsten, Michael Cuthill, and Helen Ross. 2014. "Six Attributes of Social Resilience." *Journal of Environmental Planning and Management*: 14.
- Moser, Stephanie et al. 2018. "Analyse von freiwilligen Angeboten und Initiativen mit Bezug zu suffizientem Verhalten." [boris.unibe.ch/121199/](http://boris.unibe.ch/121199/) (August 9, 2022).
- Oktari, Rina S. et al. 2020. "City Resilience towards Coastal Hazards: An Integrated Bottom-Up and Top-Down Assessment." *Water* 12(10).
- Ornetzeder, Michael, and Harald Rohrer. 2013. "Of Solar Collectors, Wind Power, and Car Sharing: Comparing and Understanding Successful Cases of Grassroots Innovations." *Global Environmental Change* 23(5): 856-67.
- Rapaport, Carmit et al. 2018. "The Relationship between Community Type and Community Resilience." *International Journal of Disaster Risk Reduction* 31: 470-77.
- Scharte, Benjamin, and Klaus Thoma. 2016. "Resilienz – Ingenieurwissenschaftliche Perspektive." In *Multidisziplinäre Perspektiven der Resilienzforschung*, ed. Rüdiger Wink. Wiesbaden: Springer Fachmedien Wiesbaden, 123-50. [http://link.springer.com/10.1007/978-3-658-09623-6\\_6](http://link.springer.com/10.1007/978-3-658-09623-6_6) (August 9, 2022).
- Seebauer, Sebastian, Stefan Ortner, Philipp Babicky, and Thomas Thaler. 2019. "Bottom-up Citizen Initiatives as Emergent Actors in Flood Risk Management: Mapping Roles, Relations and Limitations." *Journal of Flood Risk Management* 12(3): e12468.
- Seyfang, Gill, and Alex Haxeltine. 2012. "Growing Grassroots Innovations: Exploring the Role of Community-Based Initiatives in Governing Sustainable Energy Transitions." *Environment and Planning C: Government and Policy* 30(3).
- The TESS Project. 2017. *Final Publishable Summary Report*. [http://www.tess-transition.eu/wp-content/uploads/2017/02/TESS-Final\\_report\\_2017.pdf](http://www.tess-transition.eu/wp-content/uploads/2017/02/TESS-Final_report_2017.pdf) (May 8, 2022).
- Towe, Vivian L. et al. 2015. *Community Resilience: Learn and Tell Toolkit*. RAND Corporation. [www.rand.org/pubs/tools/TL163.html](http://www.rand.org/pubs/tools/TL163.html) (June 21, 2022).
- Wink, Rüdiger. 2016. "Resilienzperspektive als wissenschaftliche Chance. Eine Einstimmung zu diesem Sammelband." In *Multidisziplinäre Perspektiven der Resilienzforschung*, ed. Rüdiger Wink. Wiesbaden: Springer Fachmedien Wiesbaden, 1-11. [http://link.springer.com/10.1007/978-3-658-09623-6\\_1](http://link.springer.com/10.1007/978-3-658-09623-6_1) (August 9, 2022).



# Appendix

## Appendix A: Detailed description of components and attributes

Components	Description of the components	Attributes	Description of the attributes
<b>Knowledge, Skills &amp; Learning</b> 	<p>This component refers to individual and group capacity to respond to local needs and issues. It refers to knowledge and skills within the community which help to both identify and start dealing with a crisis and specific problems which arise as a part of it. The focus does not lie on groundbreaking innovation but rather on the application of existing, often subject-specific knowledge to a specific situation at hand.</p>	Knowledge Partnerships	The ability of the community to come together, across disciplines, and to exchange knowledge and perspectives. Interdisciplinary partnerships are essential for solving far-reaching and complex issues. By contributing knowledge from their respective fields of interest and expertise, the people in such partnerships can quickly respond and create solutions by bringing along a broader range of skills.
		Technology & Innovation	The adaptation, use, and further development of knowledge, processes, and technology from other places and levels. The focus lies on the implementation of solutions which are already in use in a different context, for example, on a national or international level, and are thus more easily and quickly implemented on a local level.
		Skills Development & Consolidation	Subject-specific knowledge which is applied to the crisis and problems which arise from it. Specifically, management and economic skills are important for communities in crises.
<b>Community Networks</b> 	<p>This component is closely related to the concept of social capital and captures social processes as well as activities that can support individuals and groups in a certain place. During periods of pressure, disturbance, or change these networks provide essential support, operationalize community capacity, identify opportunities, and provide focus for renewed optimism and hope. Volunteer workers and local leaders can facilitate community networks. Individuals tend to draw support from existing networks in a crisis but also manage to create new networks by working together.</p>	Social Capital	Describes the individual connections between people. Personal connections are at the core of a community. In times of crisis, these connections help communities cope with and solve problems.
		Social Cohesion	This attribute captures the shared values and culture of a community, as well as the feeling of togetherness or the bond within the community, instead of on an individual level.
<b>People-Place Connections</b> 	<p>This component captures the connections and interdependencies of humans and their environment. Further, it encompasses interrelated concepts such as socio-ecological systems.</p>	Connection to Place	Studies suggest that much of the passion and commitment to protect a community emanates from the connection and bond which people feel to a place. Individuals connected to a place possess good knowledge of the community and what parts are important to it. This connection also makes people feel more responsible for the place and the community.
		Sustainable Livelihood Development	Describes the sustainable development of the physical or geographical place in which the community is based. A physical space, which provides for the economic, ecological, and social needs of a community, is essential for the community's resilience.
<b>Community Infrastructure</b> 	<p>Community infrastructure supports people during a crisis or disturbance. Our definition ranges from basic infrastructure and services such as medical, transport, power, and communication infrastructure to recreational and community infrastructure, such as meeting spaces, but also government and neighborhood support for social welfare.</p>	Diverse Services	Diverse services range from community spaces and meeting spaces, through cultural services, all the way to specific services such as telephone hotlines for mental health support.
		Welfare State	Infrastructure and support in the form of social welfare is important for a community, especially during crises, for a society to meet its basic needs. This component describes support and welfare from different levels, not just the government. Neighborhood help or crowdfunding are examples of bottom-up, community-level approaches to welfare.
		Infrastructure	Infrastructure on a technical level provides the basis for the actions within a community during a crisis. Transportation, power, and communication infrastructure represent more long-term, permanent resources.

Components	Description of the components	Attributes	Description of the attributes
<b>Diverse and Innovative Economy</b> 	A local or regional economy covering a range of industries and services can draw on a more diverse set of skills and expertise and is more resilient to change in the economy.	Diverse Economy in Community	Describes the diversity of sectors and areas in which local businesses are active within a community. A more diverse economy provides a wider range of services and is more resilient to system shocks, making sure that the services provided within a community remain active despite crises.
		Diverse Employment in Community	The diversity of employment influences both the job security during a crisis and the diversity of knowledge and perspectives which the people within a community possess.
<b>Engaged Governance</b> 	A community requires both leadership and engagement in collaborative responses to crises. For effective problem-solving, genuine participation of private, public, and community sector stakeholders is crucial. For resilient community governance, broad engagement across the entire community is needed.	Inspired Leadership	People and groups which initiate and lead change within a community are an important part of the community's reaction to a crisis. For leadership to arise, engagement with the topic, empowerment, and knowledge of the community are needed.
		Collaboration of Stakeholders	The ability of groups of people within the community to collaborate with other stakeholders inside and outside the community
		Shared Vision	The level to which the people within a community share a goal (or goals) for the future
		Functioning Communication	The communication within the community and its groups or institutions, but also the communication with actors outside the community such as media, word of mouth, etc.
		Developing Ownership	The level of responsibility individuals feel for a specific project, goal, or the community as a whole

## Appendix B: List of identified bottom-up initiatives

Bottom up Initiative Title	Country	Founding Purpose	Topic Areas	Source
ZUSAMMENHALT	DE	Covid	Neighborhood Help	<a href="https://zusammenhalt.gl">zusammenhalt.gl</a>
HILF-JETZT	CH	Covid	Neighborhood Help	<a href="https://www.hilf-jetzt.ch">www.hilf-jetzt.ch</a>
CORONA SCHNELLTESTZENTRUM DRIVE-IN BELP	CH	Covid	Healthcare	<a href="https://gurtenfestival.ch/de/news/corona-schnelltestzentrum-drive-in-belp">gurtenfestival.ch/de/news/corona-schnelltestzentrum-drive-in-belp</a>
HAMSTERLI	CH	Covid	Local Economy	<a href="https://hamsterli.ch">hamsterli.ch</a>
HELPGASTRO	CH	Covid	Local Economy	<a href="https://www.falstaff.ch/nd/mit-helppgastro-lieblingslokale-unterstuetzen">www.falstaff.ch/nd/mit-helppgastro-lieblingslokale-unterstuetzen</a>
LOCAL HERO	CH	Covid	Local Economy	<a href="https://www.local-hero.ch">www.local-hero.ch</a>
STAGE AT HOME	CH	Covid	Culture	<a href="https://stage-at-home.ch">stage-at-home.ch</a>
GÄRN GSCHÉE - BASEL HILFT	CH	Covid	Neighborhood Help	<a href="https://xn--grngschee-v2a.ch/#basel_hilft">xn--grngschee-v2a.ch/#basel_hilft</a>
ZACKIGONLINE	CH	Covid	Digitalization	<a href="https://zackigonline.ch">zackigonline.ch</a>
FIVE UP	CH	Covid	Neighborhood Help	<a href="https://www.fiveup.org">www.fiveup.org</a>
COUGHVID	CH	Covid	Healthcare	<a href="https://coughvid.epfl.ch">coughvid.epfl.ch</a>
MACARDO DESINFEKTIONS-MITTEL	CH	Covid	Local Economy	<a href="https://www.macardo.ch/schnaps-von-thurgauer-bevoelkerung-wird-zu-desinfektionsmittel">www.macardo.ch/schnaps-von-thurgauer-bevoelkerung-wird-zu-desinfektionsmittel</a>
POGASTRO TOUCHLESS SPEISEKARTE	CH	Covid	Local Economy	<a href="https://www.pogastro.com/de-ch/services/digitale-touchless-speisekarte">www.pogastro.com/de-ch/services/digitale-touchless-speisekarte</a>
ACKR	CH	Business	Local Economy	<a href="https://www.ackr.ch">www.ackr.ch</a>
CORONA - FUNDERS	CH	Covid	Local Economy	<a href="https://www.funders.ch/corona#about">www.funders.ch/corona#about</a>
CARU	CH	Business	Healthcare	<a href="https://www.caru-care.com">www.caru-care.com</a>
DRIVE-IN FESTIVAL	CH	Covid	Culture	<a href="https://www.driveinfestival.ch">www.driveinfestival.ch</a>
KWEER BALL	CH	Covid	Culture	<a href="https://www.srf.ch/kultur/gesellschaft-religion/party-trotz-corona-dragqueens-zeigt-uns-wie-man-feiert">www.srf.ch/kultur/gesellschaft-religion/party-trotz-corona-dragqueens-zeigt-uns-wie-man-feiert</a>
CLUB Q (CLUB QUARANTINE)	USA	Covid	Culture	<a href="https://www.youtube.com/watch?v=wF3yUVHFxAY">www.youtube.com/watch?v=wF3yUVHFxAY</a>
UNITED WE STREAM	DE	Covid	Culture	<a href="https://unitedwestream.org">unitedwestream.org</a>
AMPELSYSTEM ASE	CH	Business	Local Economy	<a href="https://www.asetechnik.ch/">www.asetechnik.ch/</a>
TEAM.CENTER	CH	Other	Digitalization	<a href="https://www.toponline.ch/tele-top/sendungen/top-fokus/news/top-fokus-innovationen-dank-der-corona-krise-00136687/">www.toponline.ch/tele-top/sendungen/top-fokus/news/top-fokus-innovationen-dank-der-corona-krise-00136687/</a>
MASKEN FORSTER ROHNER	CH	Covid	Local Economy	<a href="https://shop.jakobschlaepfer.ch/de/produkte/hygienemasken.html">shop.jakobschlaepfer.ch/de/produkte/hygienemasken.html</a>
DRIVE-IN KINO	CH	Covid	Culture	<a href="https://driveinkino.ch/">driveinkino.ch/</a>
HELPFULETH	CH	Covid	Healthcare	<a href="https://helpful.ethz.ch/about-us/">helpful.ethz.ch/about-us/</a>
TELEMEDIZIN FÜR HAUSTIERE	CH	Business	Healthcare	<a href="https://pet-care.ch/">pet-care.ch/</a>
VIRACE APP	CH & international	Business	Digitalization	<a href="https://virace.app/">virace.app/</a>
ESSEN PACKT AN!	DE	Crisis	Neighborhood Help	<a href="https://www.essenpacktan.ruhr">www.essenpacktan.ruhr</a>
DLRG DEUTSCHE LEBENS-RETTUNGS-GESELLSCHAFT	DE	Crisis	Special Case	<a href="https://www.dlrg.de/informieren/die-dlrg/">www.dlrg.de/informieren/die-dlrg/</a>
CORONA-COURAGE HALLE	DE	Covid	Local Economy	<a href="https://www.startnext.com/corona-courage-halle?fbclid=IwAR1FokdHYSMPPrFd09VsCabJtLyBJ53tsKf19cV9f-WCRjQq3u5K4v18Ln2w">www.startnext.com/corona-courage-halle?fbclid=IwAR1FokdHYSMPPrFd09VsCabJtLyBJ53tsKf19cV9f-WCRjQq3u5K4v18Ln2w</a>

Bottom up Initiative Title	Country	Founding Purpose	Topic Areas	Source
"WIR BRINGEN DIE KUNST ZU IHNEN"	DE	Covid	Culture	<a href="http://www.kunststiftung-sachsen-anhalt.de/">www.kunststiftung-sachsen-anhalt.de/</a>
MASKEN IN KOSTÜMWERKSTÄTTEN	DE	Covid	Local Economy	<a href="http://buehnen-halle.de/start">buehnen-halle.de/start</a>
GHOST FESTIVAL	CH	Covid	Culture	<a href="http://ghost-festival.ch/index.php/faq">ghost-festival.ch/index.php/faq</a>
SOLIDARITÄT STATT HAMSTER-KÄUFE	DE	Covid	Neighborhood Help	<a href="http://soli-statt-hamster-md.de/#initiativen">soli-statt-hamster-md.de/#initiativen</a>
KINDERBETREUUNG IN ZEITEN VON CORONA MAGDEBURG	DE	Covid	Neighborhood Help	<a href="https://www.facebook.com/groups/2577498025910687">www.facebook.com/groups/2577498025910687</a>
MAKER VS VIRUS	DE	Covid	Healthcare	<a href="http://gruenstreifen-ev.de/maker-vs-virus/">gruenstreifen-ev.de/maker-vs-virus/</a>
QUARANTÄNEHELD*INNEN	DE	Covid	Neighborhood Help	<a href="http://www.quarantaenehelden.org">www.quarantaenehelden.org</a>
NEBENAN.DE	DE	Other	Neighborhood Help	<a href="http://nebenan.de/">nebenan.de/</a>
#MASKEAUF	DE	Covid	Special Case	<a href="http://maskeauf.de/">maskeauf.de/</a>
CORONA SCHOOL / LERN-FAIR	(Inter?)	Covid	Education	<a href="http://www.lern-fair.de/">www.lern-fair.de/</a>
HEYFAIR	DE	Business	Healthcare	<a href="http://www.heyfair.de">www.heyfair.de</a>
TRIAPHON	DE	Other	Healthcare	<a href="http://triaphon.org">triaphon.org</a>
KUBAS	DE, AU	Crisis	Special Case	<a href="http://kubas.uni-halle.de/">kubas.uni-halle.de/</a>
WAS HAB' ICH?	DE	Other	Healthcare	<a href="http://washabich.de/ueber/">washabich.de/ueber/</a>
AUFBRUCH AM ARRENBURG E.V.	DE	Other	Special Case	<a href="http://arrenburg.app/">arrenburg.app/</a>
UTOPIASTADT	DE	Other	Special Case	<a href="http://clownfisch.eu/utopiastadt/">clownfisch.eu/utopiastadt/</a>
INSEL E.V.	DE	Other	Culture	<a href="http://insel.news">insel.news</a>
VEREIN UNTERNEHMER/INNEN FÜR DIE NORDSTADT E.V.	DE	Other	Special Case	<a href="http://nord-stadt.de/entstehung/">nord-stadt.de/entstehung/</a>
#WEITERLERNEN	DE	Covid	Education	<a href="http://weiterlernen.at/">weiterlernen.at/</a>
SPIELEN & LERNEN VON ROBO WUNDERKIND	AT	Covid	Education	<a href="http://blog.robowunderkind.com/de/2021/01/4-wochen-mint-aktivitaten/">blog.robowunderkind.com/de/2021/01/4-wochen-mint-aktivitaten/</a>
DEBUNK THE VIRUS	AT	Covid	Education	<a href="http://www.digitalerkompass.at/debunkthevirus-conspiracy/">www.digitalerkompass.at/debunkthevirus-conspiracy/</a>
CONNECTING ART	AT	Covid	Culture	<a href="http://connectingart.ch/about/">connectingart.ch/about/</a>
CINE CAPSULE	CH	Covid	Culture	<a href="http://www.cinecapsule.com/">www.cinecapsule.com/</a>
VEERTLY	CH (FR)	Covid	Digitalization	<a href="http://www.veertly.com/">www.veertly.com/</a>
#NACHBARSCHAFTSCHALLENGE	AT	Neighborhood Help	Neighborhood Help	<a href="http://corona-nachbarschaftshilfe.at">corona-nachbarschaftshilfe.at</a>
FRAGNEBENAN	AT	Neighborhood Help	Neighborhood Help	<a href="http://b2b.fragnebenan.com/">b2b.fragnebenan.com/</a>
TEAM ÖSTERREICH	AT	Special Case	Special Case	<a href="http://www.teamoesterreich.at/toe/">www.teamoesterreich.at/toe/</a>
TRAIN OF HOPE	AT	Special Case	Special Case	<a href="http://www.trainofhope.at">http://www.trainofhope.at</a>
TOO GOOD TO GO	CH, DE, AT	Special Case	Special Case	<a href="http://toogoodtogo.org/en/movement">toogoodtogo.org/en/movement</a>
PHARMAZIESTUDIERENDE HELFEN ÖSTERREICHWEIT APOTHEKEN	CH, AT	Covid	Healthcare	<a href="http://pharmadelivery.ch/">pharmadelivery.ch/</a>

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<b>GUTENACHTGESCHICHTE</b>	AT	Covid	Digitalization	<a href="http://www.gutenachtgeschichte.at/">www.gutenachtgeschichte.at/</a>
<b>FRAUENDOMÄNE NACHHILFE</b>	AT	Covid	Education	<a href="http://www.frauendomaene.at/about/#team">www.frauendomaene.at/about/#team</a>
<b>HOMESTAGE FESTIVALS</b>	AT	Covid	Culture	<a href="https://www.facebook.com/homestagefestivals/">www.facebook.com/homestagefestivals/</a>
<b>MONTREUX JAZZ FESTIVAL STREAM</b>	CH	Covid	Culture	<a href="http://www.montreuxjazzfestival.com/de/50-konzer-te-im-streaming/">www.montreuxjazzfestival.com/de/50-konzer-te-im-streaming/</a>
<b>ILLUSTRATORS AGAINST COVID-19</b>	AT	Covid	Special Case	<a href="https://bit.ly/3gtgzT2">bit.ly/3gtgzT2</a> <a href="https://www.facebook.com/illustratorsagainst/">www.facebook.com/illustratorsagainst/</a>
<b>EINKAUFEN GEGEN CORONA</b>	AT	Covid	Neighborhood Help	<a href="https://www.instagram.com/einkaufen_gegen_corona/?hl=de">www.instagram.com/einkaufen_gegen_corona/?hl=de</a>
<b>ESQUIRREL</b>	AT	Business	Education	<a href="http://esquirrel.com/at/mission-statement/">esquirrel.com/at/mission-statement/</a>
<b>HOBBYLOBBY</b>	AT	Other	Education	<a href="http://www.viennahobbylobby.com/team">www.viennahobbylobby.com/team</a>
<b>SCHOOLFOX</b>	AT	Other	Digitalization	<a href="http://foxeducation.com/schoolfox/">foxeducation.com/schoolfox/</a>
<b>ALLIANZ LONG COVID</b>	CH	Covid	Healthcare	<a href="http://www.long-covid.online/">www.long-covid.online/</a>
<b>VOIX CIVIQUE</b>	CH	Covid	Special Case	<a href="http://www.voix-civique.ch/">www.voix-civique.ch/</a>
<b>LONG COVID SCHWEIZ</b>	CH	Covid	Healthcare	<a href="http://www.longcovidch.info/">www.longcovidch.info/</a>