Deliverable 7.4.1-2-3

Disaster Risk Reduction and Climate Change Adaptation: Advancing Community-Based Approaches, Community Trust, and their Effectiveness Evaluation

Work Package 4, Task 4.1

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List of Acronyms

CB - Community Based
CCA – Climate Change Adaptation
CBA – Community Based Adaptation
CBDRR – Community Based Disaster Risk Reduction
CH – Cultural heritage
DDR – Disaster Risk Reduction
EC – European Commission
EU – European Union
EWS – Early Warning System
IPCC – Intergovernmental Panel on Climate Change
MENA – Middle East and North Africa
NGO - Non-Governmental Organization
OECD – Organization for Economic Co-operation and Development
RACER - Relevant, Accepted, Credible, Easy, Robust
SWOT – Strengths, Weaknesses, Opportunities, Threats
TS – Transversal Spoke
UNDP - United Nations Development Program
UNDRR – United Nations office for Disaster Risk Reduction
UNEP - United Nations Environment Program
UNFCCC - United Nations Framework Convention on Climate Change
WMO - World Meteorological Organization
WP – Work Package

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Executive summary

This document pertains to the extended partnership RETURN (multi-Risk sciEnce for resilienT commUnities undeR a changiNg climate) and is the output of task 4.1 "Common set of methods and guidelines for CB activities" of WP4 "Community-based (CB) approaches, codesign and policies" within Spoke 7 – TS3 – "Communities' resilience to risks: social, economic, legal and cultural dimensions". For reasons of completeness and cohesion, and to avoid overlaps and repetitions, this deliverable combines what was previously intended as three separate deliverables: DV 7.4.1 (Transdisciplinary co-design methods and guidelines CB approaches), DV 7.4.2 (Model of trust dynamics in DRR), and DV 7.4.3 (Model of effectiveness evaluation of the CB approaches).
Deliverable 4.2, titled "Disaster Risk Reduction and Climate Change Adaptation: Advancing CB Approaches, Community Trust, and their Effectiveness Evaluation", aims at providing a structured and concise review of the state of the art of the research as regards innovative CB approaches for participatory decision-making in the field of Disaster Risk Reduction (DRR) and Climate Change Adaptation (CCA), that can be used for: co-construction of early warning systems, citizen participation in civil protection planning and integration of DRR and CCA in planning processes. The review also investigates the evaluation methods commonly used to gauge the efficacy of these CB approaches. A significant emphasis is placed on understanding the role of trust and its dynamics in shaping community engagement. Besides the literature review, this deliverable also provides guidelines and steps to follow to implement and evaluate a CB approach, with a specific attention to trust dynamics.

This deliverable is divided into two parts:

PART I – EXISTING KNOWLEDGE provides an overview of the concept of a CB approach and of its relevance in the process of advancing climate change adaptation and disaster risk reduction. Also, it summarizes the main findings derived from a comprehensive review of both scientific and grey literature conducted to understand which the main approaches and tools are available to involve communities in CCA and DRR, to integrate trust, and to evaluate the effectiveness of the approaches. Additionally, Part I introduces a conceptual framework that describes the dimensions, and the relations among them, which are crucial for successful implementation of CB approaches in the domains of DRR and CCA.

PART II – GUIDELINES consists of a manual intended for practitioners who need to implement a CB approach to address the impacts of climate change and mitigate disaster risk. This part outlines the step-by-step process required for involving communities effectively, for integrating the dimension of community trust, and for assessing the effectiveness of the CB approach itself. Moreover, it offers a set of informative cards that elaborate on the array of tools that can be used to integrate communities into the DRR and CCA process, and a Toolkit Matrix that supports the selection of the most appropriate tool to use.

Both scientific and grey literature were found running search strings on research engines (e.g., Scopus, Web of Science). The literature review followed a deductive process: papers have been analysed according to predetermined categories which were deemed most effective to support the understanding of the context of the research reported in the papers and of the CB approach analysed. The results obtained from

the literature review, merged with additional knowledge derived from the literature about other relevant concepts (e.g., participation, agency, adaptation, risk management) served as the foundation for the elaboration of the conceptual framework, which, in turn, underpinned the elaboration of the guidelines for integrating the community within the decision-making process, integrating trust, and evaluating the effectiveness of the CB approach.

The literature analysis underscores several key findings. Firstly, it reveals that the type of communities that can be engaged in a CB approach for DRR and CCA is diverse, ranging from communities of place, interest, to practice. These communities can participate individually or collaboratively with other communities. Furthermore, CB approaches exhibit variations based on the extent of community participation and involvement: from merely informing the community, to fully co-designing CCA/DRR strategies. A host of enabling and constraining factors influences community engagement, encompassing institutional and socio-cultural contexts, along with internal community dynamics. The literature review also showcases an extensive array of tools employed to engage communities, encompassing participatory methodologies, like workshops, interactive simulations, public events, and citizen science, and qualitative/quantitative techniques such as focus groups, questionnaires, field visits, and transect walks.

Regarding the significance of trust in the context of CCA and DRR, the literature review demonstrates that trust frequently plays a pivotal role in stimulating community involvement, facilitating collaboration among agencies and communities, helping with overcoming doubt and skepticism about participatory approaches, promoting the capacity-building of communities, and ultimately guaranteeing the long-term viability and sustainability of initiatives. Trust represents a dynamic and complex factor that can serve to establish good practices within communities and institutions, fostering their involvement and participation in DRR- and CCA-related activities, thus acting as a prerequisite for the development of a resilient community. Trust can be developed through continuous communication, transparency, mutual comprehension, and joint decision-making processes.

As for evaluating the effectiveness of CB approaches, the literature demonstrates wide disparities in terms of methods employed (qualitative, quantitative, or both), the actor who leads the evaluation (external or internal to the community), participatory or non-participatory approaches, evaluation timing (ex-ante, interim, ex-post), and scope (process-oriented or result-oriented). Additionally, the analysis reveals several pivotal conditions for the effectiveness of a community-based approach, including community ownership, context sensitivity, inclusivity and equity, local knowledge integration, long-term engagement, and availability of resources.

Underpinning the identification of the steps to follow and the set of tools to be applied to implement a CB approach for DRR and CCA there is the conceptual framework as described in Chapter 5 and represented in Figure 27. It represents the key dimensions and sub-dimensions, together with the relationships among them, which are crucial for the implementation of a CB approach. The dimensions are: “Climate change adaptation” and “Disaster risk reduction”; “Local context”; “Community agency”; “(community of) Place”; “(community of) Practice”; “(community of) Interest”; “Trust”; “Participatory Process”; “Outputs”; “Outcomes”; “Impacts”; “Evaluation of effectiveness”.

The guidelines, based on the framework, provide practical instructions for effectively engaging communities in DRR and CCA efforts. They offer step-by-step procedures to involve the community, integrate the dimension of community trust, and assess the approach's effectiveness. These guidelines are structured into three parts. The first part aims to ensure a participatory, inclusive, and contextually appropriate process that empowers communities to contribute to decision-making. This part is structured into four main sections: "Before starting," "Prepare for participation," "Implement and monitor participation," and "Finalize the participation process". The second part of the guidelines is dedicated to actions aimed at bolstering community trust throughout the various phases of the DRR process. It consists of four steps, organised along the phase of the DRR cycle: "Prevention"; "Preparedness"; "Response"; "Recovery". The third part is dedicated to evaluating the CB approach and consists of four sections: "Before starting"; "Planning the effectiveness evaluation process"; "Implementing the evaluation process"; "Finalizing the evaluation".

Overall, this deliverable fosters a deeper understanding of CB approaches and their role in enhancing the development of effective strategies to tackle disaster- and climate-related risks. By integrating both a theoretical foundation and actionable steps, the document adds value to the broader RETURN project and to the field of DRR and CCA. This document will find resonance in Task 4.2, 4.3, and 4.4, which, respectively, concentrate on co-constructing early warning systems, engaging citizens in civil protection planning, and integrating DRR and CCA into planning processes via co-design. These tasks build upon the insights and guidelines unveiled in this deliverable, which could be a catalyst for better practices. To conclude, this deliverable´s guidelines hold the potential to undergo testing and validation. A trial phase would present an opportunity for further enhancement, ensuring that the guidelines evolve based on real-world implementation and feedback. In this vein, an updated iteration of the guidelines may be proposed, fortified by the integration of practical insights to strengthen the overall quality of this document.

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Return

PART I – EXISTING KNOWLEDGE

1 Introduction

The extended partnership **RETURN** (multi-Risk sciEnce for resilienT commUnities undeR a changiNg climate) aims to enhance the understanding of environmental, natural, and anthropic risks and how they interact with the impacts of climate change. Additionally, the partnership seeks to improve risk assessment methodologies for prevention, adaptation, and mitigation strategies, as well as promote a more efficient and sustainable utilization of data, products, and services related to risk management. Lastly, the RETURN project aims to establish a strong connection between research and the development of final products, including a comprehensive framework that provides valuable insights into complex natural multi-hazard dynamics and advanced predictive models to assess multi-risk across short- and long-term time scales.

Transversal Spoke 7 (TS3) "Communities' Resilience to Risks: social, economic, legal and cultural dimensions" within the RETURN project aims to enhance risk perception at all levels, incorporating uncertainty conditions into cognitive and decision-making processes. It supports preparedness and resilience through information, education, training, and participatory approaches, while also defining technological, methodological, and political measures for risk mitigation, preserving cultural and natural heritage. This Spoke explores legal aspects and decision-making responsibility chains, ultimately contributing to the development of a resilient socioeconomic model for multi-level risk governance that involves all key actors in disaster risk preparation and adaptation.

The Spoke 7 is structured into seven Working Packages (WP). WP1 is responsible for the spoke management, dissemination, and exploitation. WP2 focuses on the development of innovative tools for evaluating the effectiveness of risk mitigation strategies, incorporating stakeholder perspectives, and assessing the costs and benefits. WP3 defines innovative technological, methodological, and political measures of risk mitigation to safeguard the cultural heritage, including also cultural landscapes and intangible values, which represent a central element of resilience and cohesion of communities. WP4 aims to develop innovative policies and participatory governance measures for planning, co-design, and co-decision-making in Disaster Risk Reduction (DRR) and Climate Change Adaptation (CCA). WP5 is about the design of innovative nudging interventions, based on the analysis of the gap between risk perception and objective risk, to improve the choices of different stakeholders during the phases of emergency management. WP6 defines new models and strategies for risk education and (top-down and bottom-up) communication, tailored for different target groups and a variety of risks, educational settings, and communication channels. WP7 deals with the legal and ethical aspects prospects.

1.1. Rational and objective of Task 4.1 and Deliverable 4.2

The main objective of WP4 “Community-Based (CB) approaches, codesign and policies”, is to define innovative policies and participatory governance measures for planning, co-design, and co-decision-making in DRR and CCA. The WP is led by CIMA foundation, in partnership with Eurac Research, POLIMI, UNIBA, UNIFI, UNIKORE. Within WP4, Task 4.1 “Common set of methods and guidelines for community-based (CB) activities” aims at providing a reasoned review of different innovative CB participatory approaches for inclusive decision-making processes in the field of DRR and CCA, also identifying methods

and approaches useful to evaluate the effectiveness of the CB approaches. Task 4.1 will also develop a model for the analysis of trust dynamics in DRR for community resilience. The identified models, methodologies as well as guidelines will be tested via proof of content (PoC) and their effectiveness will be evaluated. The review will be used in Task 4.2 "CB Early Warning Systems (EWS) based on preparedness principles to empower individuals and Communities", Task 4.3 "Citizen participation in civil protection planning (CPP) considering different demographic and sociocultural contexts" and Task 4.4 "New approach in integrated planning based on co-design processes for DRR e CCA policies".

1.2. Interlinkages with other project activities

This paragraph aims to explain how Task 4.1 interacts (benefitting, complementing, and overlapping) in many ways with WPs within the same Spoke 7 (TS3) and with other spokes. Precisely, the paragraph will explore the relationship between task 4.1 and other tasks within WP4, task 4.1 and WPs within Spoke 7 (TS7) as well as between task 4.1 and WPs another spokes.

1.2.1 Task 4.1 within Spoke 7 (TS3)

First, Task 4.1 will deliver outputs that are relevant for the implementation of Tasks 4.2, Task 4.3, and Task 4.4, where Return partners are involved in the creation of methodologies and guidelines for implementing community-based approaches in early warning systems, citizen participation in civil protection planning, and co-design processes for DRR and CCA policies, respectively.

Second, Task 4.1 establishes relationships with tasks in other WPs of the same Spoke 7, complementing their work. WP2 is dedicated to crafting novel tools for gauging the efficiency of risk mitigation strategies. These tools encompass stakeholder viewpoints and encompass evaluations of costs and benefits. Consequently, a comparison between the outcomes of WP2 and the current task is valuable, as both entail the design of participatory methodologies for evaluating the adopted DRR strategies.

WP3 focuses on conducting a multi-risk assessment for cultural heritage (CH) and exploring the impact of CH on resilience. The outcomes of this task (4.1) can be instrumental in assisting the formulation of innovative technological, methodological, and policy-oriented actions for mitigating risks and preserving cultural heritage. This document (DV 4.2) may ensure that these measures not only guarantee the protection of cultural heritage but also involve and engage communities throughout the entire process of implementing risk mitigation strategies.

WP5 examines psychological, sociological, and behavioral aspects of decision-making in emergency management, and aligns well with the objectives of this task 4.1. Specifically, Task 5.3 in WP5 aims to identify trust models at the community and policy-maker levels, which can benefit from the insights on trust dynamics in community-based approaches for DRR and CCA presented in this task. Task 5.4 in WP5 aims to design nudging interventions to improve prevention, participation, and response choices; the role of trust identified in this literature review (DV 4.2) is relevant to inform these interventions.

Also, Task 4.1 can be useful for activities in WP6, as it is dedicated to developing models and recommending tools for risk education and communication, with an emphasis on stakeholder and communities inclusivity; therefore, it can gain valuable insights from the findings of this task.

Understanding risk within communities is essential for effectively involving them in decision-making processes related to DRR and CCA. As a result, risk communication and education are important tools suggested in this task for implementing community-based approaches, making the findings and recommendations relevant to WP6's objectives.

1.2.2 Task 4.1 and other Spokes

Task 4.1 partially overlaps with some of the tasks within Spoke TS1 "Urban and metropolitan settlements", which aims to develop a framework for understanding and modelling urban systems in the context of DRR and CCA. Specifically, WP5 "Urban labs for dynamic multi-risk management" focuses on testing decision support tools for selecting multi-risk mitigation and adaptation strategies. Tasks such as the setup report for a city-scale exercise for risk scenario evaluation (Task 5.2), simulation testing of mitigation and adaptation scenarios (Task 5.3), and development of decision support tools for policy and strategies selection (Task 5.4) contribute to, and may benefit from, the guidelines provided by this deliverable in terms of community engagement in risk scenario drawing, evaluation, and strategy selection. Additionally, WP6 focuses on co-design, capacity building, and stakeholder interaction, offering training activities for vulnerability and impact assessment, and DRR strategy development targeting public institutions, civil society stakeholders, and the general population. WP6's selection of models and tools for scenario and multi-risk assessments (Task 6.1), awareness raising (Task 6.2), and capacity building and training activities (Task 6.3) align with the objectives of this deliverable.

There are also overlaps between Task 4.1 and tasks in other WPs within Spoke VS1 "Water", VS3 "Earthquake and volcanoes", and TS2 "Multi-Risk Resilience of Critical Infrastructures". Specifically, WP5 "Integration toward a Digital Twin" in Spoke VS1 aims to create a model that integrates flood, drought, and coastal flooding and beach erosion risk, to be validated with respect to community resilience strategies, and supports risk mitigation and adaptation strategies' assessment. WP7 "Strategies for loss reduction based on a systemic approach" in Spoke VS3 aims to develop risk and resilience metrics, risk maps, and apply multi-criteria analysis for assessing mitigation/adaptation strategies, which could benefit from the guidelines provided in this deliverable regarding community involvement in elaborating CCA and/or DRR strategies. Lastly, WP6 "Integrated Technologies and Solutions for Holistic Risk Reduction" in TS2 aims to provide risk prevention solutions with early-warning protocols, open-knowledge sharing platforms, and training platforms for re-skilling or up-skilling people.

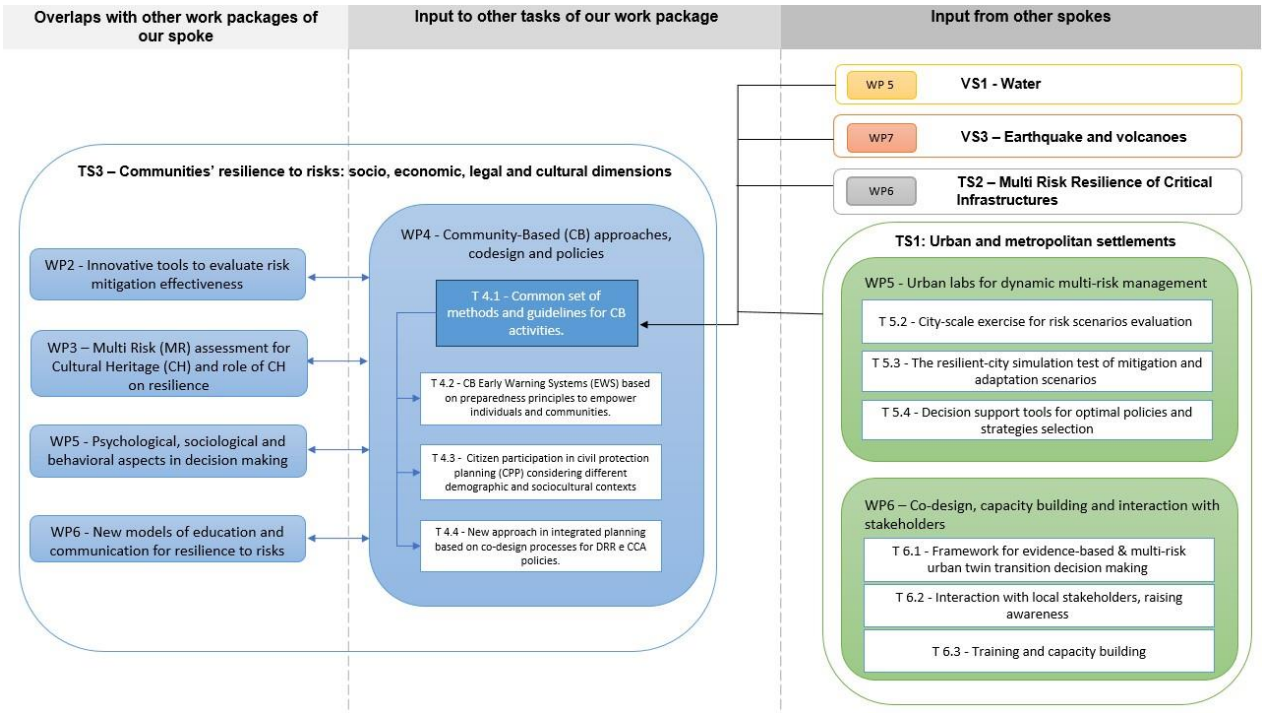

Figure 1: Overview of relationships between Task 4.1 and other WPs/Spokes

1.3. Scope and structure of the document

Deliverable 4.2 aims to provide an overview of the literature analysis on existing approaches, methods, and tools for engaging and involving communities in the field of DRR and CCA alongside with approaches for evaluating the effectiveness of participatory activities. It also critically examines the scientific literature on the role played by the dynamics and models of community trust on DRR and CCA. Besides providing a comprehensive, structured, and concise review of the peer-review and grey literature, Deliverable 4.2 will deliver guidelines on how to implement participatory approaches at community level, assisting community in establishing more appropriate and sustainable participatory approaches and governance structures for effective and inclusive decision and policy making.

Deliverable 4.2 resulted from the integration of three deliverables that were initially conceived separate:

- **DV 4.2 Transdisciplinary co-design methods and guidelines CB approaches:** the document will contain a reasoned review of existing and innovative methods, methodologies, and models for Community-based approach in the field of DRR and CCA. It will also deliver guidelines on how to apply a CB approach.
- **DV 4.3 Model of trust dynamics in DRR and CCA:** the document will contain the analysis of the role played by the dynamics and models of community trust on DRR and CCA, with specific emphasis on complexities involved in trust dynamics.

- **DV 4.4 Model of effectiveness evaluation of the CB approaches:** the document will contain a selection and description of methods and approaches useful to evaluate the effectiveness of the CB approaches tested in Proof of Concepts (D4.5 and D4.7).

Several reasons are behind the decision to integrate the three deliverables into one. Firstly, the topics covered in the aforementioned deliverables are interconnected: the identification of methods and tools for implementing a participative community approach (DV 4.2) are related to the evaluation of their effectiveness of the participatory process (DV 4.4), while we consider the dimension of community trust (DV 4.3) a dimension that influences the success of participatory processes and the initiation and the implementation of community-based approaches. By combining these deliverables, we can provide a more comprehensive and cohesive overview of the subject matter. Secondly, the relevant literature was reviewed and summarized by adopting a common methodological approach; therefore, integrating the deliverables would avoid unnecessary duplication and ensure consistency, also allowing a unified analysis and synthesis of the findings. Lastly, to develop comprehensive guidelines that consider the various aspects of community-based approaches, effectiveness evaluation methods, and the role of trust dynamics in engaging within the community, the guidelines should incorporate elements covered in the separate deliverables. This integrated approach will provide a more practical and valuable resource for policymakers and practitioners working in the field of DRR and CCA.

This deliverable consists of 9 chapters, each containing subchapters or sections, divided in two parts. Part 1, titled “Existing knowledge”, encompasses chapters from 1 to 5 presenting a comprehensive overview of the current state of the art concerning CB approaches. Part 2, titled "Guidelines," offers practical support for implementing a CB approach through a step-by-step guide and accompanying materials. Chapter 1 introduces the objective and rationale of the task and explains how this deliverable aligns with other WPs. Chapter 2 emphasizes the significance of a CB approach in DRR and CCA, discusses the evolution of the concept over time, and provides an overview of the normative framework at the national and EU levels supporting CB approaches. Chapter 3 outlines the methodological steps used for the literature analysis, and the criteria used to select and analyse relevant papers in the peer-review and grey literature. It also offers concise definitions of key terms used in this deliverable to establish a common understanding. Chapter 4 presents the main findings from the literature review, covering CB approaches for DRR and CCA, trust dynamics models, and CB approach effectiveness evaluation. Chapter 5 introduces the framework underpinning CB approaches, including relevant dimensions, sub-dimensions, and relationships, derived from both the literature review and the expertise of the authors of this document. Chapter 6 offers guidelines on engaging communities step-by-step in DRR and CCA, integrating community trust, and evaluating a CB approach effectiveness. Chapter 7 provides practical guidance on selecting and applying suitable participatory tools based on the community's context and characteristics. Chapter 8 summarizes the document's main takeaways, while Chapter 9 lists the references.

2 Importance of a community-based approach in DRR and CCA

2.1. Participatory processes in the political and regulatory framework

The recognition of the importance of community participation in DRR emerged in the 1980s when it was acknowledged that communities possess resources and capacities that can be utilized to reduce disaster risks (Bubb & Le Dé, 2022). The underlying concept of community-based DRR strategies is that they should be designed to benefit the community by addressing local concerns and needs. Likewise, a growing body of literature emphasized the significance of incorporating local knowledge and practices in development projects (Mercert et al., 2010). During the 1980s and 1990s, the popularity of CB management programs surged, with non-governmental organizations (NGOs) playing an increasingly supportive role in empowering communities (Chacowry, 2023). While the United Nations Framework Convention on Climate Change (UNFCCC) recognized the importance of community involvement and participation in addressing climate change impacts as early as 1992, the concept of community-based adaptation took longer to gain traction within adaptation policies. First, until the 2000s, the focus was on mitigation, rather than on adaptation, as the primary way to resolve the climate crisis (Ayers & Forsyth, 2009). The release of the Fourth Assessment Report by the IPCC in 2007 pushed further the necessity to complement mitigation with adaptation, since mitigation would not been able to prevent all the effects of climate change (IPCC et al., 2007). Second, until the 2000s, most adaptation efforts focused on top-down approaches, where policies were formulated by national or local authorities and then implemented at the community level, often overlooking the specific needs, knowledge, and capacities of local communities (Ayers & Forsyth, 2009). The Millennium Development Goals marked a shift in perspective, acknowledging that top-down approaches were insufficient. Subsequently, in the mid-2000s, various international agreements and declarations, such as the Bali Action Plan in 2007 and the Sustainable Development Goals in 2015, paved the way for the mainstreaming of CB adaptation within climate change adaptation frameworks. Regarding disaster risk, the Sendai Framework for Disaster Risk Reduction, adopted by the United Nations in 2015, stressed the importance of empowering local authorities and communities through inclusive, accessible, and non-discriminatory participation (UNDRR, 2015). Eventually, it became widely understood that CB approaches were the most effective means of making more relevant and democratic decisions, fostering social learning and social capital, and enhancing adaptive capacity and resilience in the face of both climate change and disaster risk (Brugger et al., 2018).

In the Italian context, the Tuscany Region was the first institution to adopt a law introducing participatory practices within its institutional activities. Following an extensive participatory process initiated in 2006, the Regional Council approved Regional Law 69/2007, titled “Regulations on the promotion of participation in developing regional and local policies” in December 2007. This regional law has formed the basis for numerous participatory processes covering a wide range of topics. These processes have included the localization of a waste treatment plant, the development of strategic territorial plans, the

restoration of historic buildings, participatory budgeting, urban space renovation, waste collection and disposal policies, and educational projects aimed at promoting active citizenship in schools. Furthermore, under this legal framework, Tuscany has also facilitated several participatory processes in the field of municipal civil protection planning. For example, Stazzema was the first Tuscan municipality to embark on a participatory process, followed by Carrara, Montelupo Fiorentino, and several Unions of Municipalities.

At the national level, the crucial role of participation in developing risk management measures has been officially recognized through Legislative Decree No. 1, dated January 2, 2018, known as the "Civil Protection Code". The new Civil Protection Code aimed to reorganize the legislative framework governing the National Civil Protection System, striving for a more comprehensive integration of both structural and non-structural aspects of the risk management cycle. Moreover, the Code underscored the significance of inclusive dynamics in the policy-making processes. Community participation emerged as a fundamental tool within civil protection planning, serving as a cornerstone for the formulation and implementation of risk management policies.

In the context of adaptation policies, both the National Climate Change Adaptation Strategy and the National Climate Change Adaptation Plan have acknowledged the significant role of participatory processes. They are seen as essential components in the development of adaptation policies and strategies, as well as effective measures for enhancing the resilience of local communities. The National Climate Change Adaptation Strategy (2014) identified participatory processes as a crucial resource for policymaking across various sectors, including water resources, natural hazards, agriculture, and urban development. Direct engagement of citizens has been deemed essential to ensure collective decision-making in identifying climate risk mitigation policies and to enhance the effectiveness of both structural and non-structural measures. In the water resource sector, participatory processes have been recognized as a valuable tool for addressing the uncertainties associated with meteorological predictions and water availability forecasts. The National Adaptation Strategy acknowledges that this uncertainty can hinder the development of both planned and autonomous adaptation measures, emphasizing that a robust participatory approach is essential for ensuring the potential for successful outcomes. River Contracts have been highlighted as a significant participatory approach aimed at promoting sound water resource management, as well as the protection and enhancement of river territories. They also contribute to mitigating hydraulic risks.

The National Climate Change Adaptation Plan, which began its development process in 2016 and is now nearing approval following public consultations and a Strategic Environmental Assessment (SEA), reaffirms the importance of participatory processes. These processes are particularly emphasized in the strategies for natural risk management and the water resource sectors within the draft document. Additionally, the methodological document for defining local adaptation strategies and plans, an annex

to the National Adaptation Plan, includes a section on the pivotal role of participatory processes in shaping adaptation policies. It also provides tools and methods, such as the influence and importance matrix, for stakeholder mapping and engagement.

At the local level, several initiatives have been undertaken to involve communities in the development of adaptation policies. For example, the municipality of Bologna, through the BlueAp project in 2015, engaged the local community in the creation of its adaptation plan. This involved integrating scientific knowledge on climate trends and future scenarios with development priorities and adaptation needs expressed by various stakeholders, including universities, schools, technical agencies, trade associations, consumer associations, environmental NGOs, and philanthropic foundations. Conversely, the Interreg Italy-France ADAPT project (Maritime Program 2014-2020) provided guidance on promoting local participation in adaptation policies. It initiated urban partnerships for adaptation in Livorno, Sassari, Oristano, La Spezia, and Savona, aiming to support the development of action plans addressing specific risks. These plans identified emergency procedures related to climate change drivers, with a special focus on water resource management.

2.2. Participatory processes: The perspective of the research community

As previously mentioned, the research on CB approaches to climate change adaptation and climate-related disaster risk reduction dates to the early 2000s. Since then, CB approaches have become a growing focus of research. The early literature focused on explaining the advantages of integrating communities in devising CCA and DRR strategies, in opposition with top-down approaches that originates from higher levels of governance and are then imposed on local communities (McNamara & Buggy, 2017). The main reasons mentioned for the preference of bottom-up over top-down approaches were the importance of the human dimension in bringing about changes, the value of the role of local knowledge in strengthening adaptive capacity, and the relevance of centring on the scale at which the impact of climate change and climate-related disasters are felt (Adger, 2003; Ayers & Forsyth, 2009; Kelly & Adger, 2000; Pelling, 2002; Roncoli et al., 2001; Smit & Wandel, 2006; Van Aalst et al., 2008). Top-down approaches were also criticized for focusing too much on techno-centric solutions, meaning that strategies primarily relied on technological and engineering solutions, using infrastructure development as the main means of reducing vulnerabilities and enhancing resilience (Ayers & Forsyth, 2009; Van Aalst et al., 2008). From 2010 onwards, the research on CB approaches increased, and a more consistent body of publications emerged. The focused shifted on identifying the key enabling and constraining factors for effective CB approaches, including resources, capacities and knowledge, institutional support, power-dynamics, gender inequalities and social disparities (McNamara & Buggy, 2017). Lately, the academic literature has increasingly highlighted the need to rethink CB approaches, questioning the idea that community involvement per se leads to more positive outcomes, so that nowadays the debate around the weaknesses of CB approaches and what are the best way to address them is lively (McNamara et al., 2020; McNamara & Buggy, 2017; Wamsler et al., 2020). The main criticisms point to the difficulty of implementing a participatory approach throughout the entire project/policy life cycle or show that often a CB approach is not sustained over time

(McNamara et al., 2020; Mills-Novoa, 2023). Moreover, criticism emerged because CB approaches often operate at local level, which can limit their scope and impact, and because often communities lack expertise to address complex adaptation and risk reduction issues (Dodman & Mitlin, 2013; Mfitumukiza et al., 2020). Among the main criticisms, there is also the fact that in participatory processes decision-making may become time-consuming, and accountability and quality control may be difficult to secure (Mills-Novoa, 2023; Ophiyandri et al., 2016; Thaler et al., 2022). This might constitute a significant problem, like climate change, which requires rapid interventions. However, it is important to note that these criticisms highlight areas of concern but don't negate the potential benefits of community-based approaches.

Adopting a CB approach to CCA and DRR is of significant relevance due to several reasons. To begin with, co-design adaptation and risk reduction strategies with the communities has the advantage of resulting in strategies best tailored to local needs, cultures, beliefs, and practice. Consequently, these strategies are more effective in diminishing vulnerability and enhancing resilience, and, at the same time, are more sustainable over time (D. Archer, 2016; Ayers & Forsyth, 2009). Also, communities can bring a deeper understanding of their local environment, its vulnerabilities, resources and historical patterns of weather and hazards, which supports the devise of adaptation and risk reduction strategies (Mercer et al., 2010; Restrepo et al., 2018; Vasileiou et al., 2022). Moreover, involving communities in decision-making processes empowers them to take ownership of their well-being and this has a positive effect on the likely that people support and implement the DRR/CCA strategy effectively and in the long term (Bhawra et al., 2021; Cretney, 2018; Murti et al., 2020). Engaging community also foster social cohesion and strengthen the community´s skills and capacities, which are essential for effective disaster response and recovery, and to cope with changing conditions (Brugger et al., 2018; Fazey et al., 2021; Liu et al., 2018). Last, effective CB approaches have the potential to influence higher-level policies; indeed, if the CB initiative is successful, policymakers are more likely to adopt similar approaches in other contexts as well and on a broader scale (D. Archer, 2016; E. Lisa Schipper et al., 2014). To sum up, a community-based approach recognizes that communities are not just passive recipients of adaptation and risk reduction policies, but active stakeholders with valuable insights and contributions. To address the complex challenges of CCA and DRR, involving communities is essential for fostering resilience and diminishing vulnerabilities.

In implementing activities and developing guidelines, this document integrates Disaster Risk Reduction with Climate Change Adaptation for two primary reasons. First, it recognizes that climate change is one of the factors driving disaster risk; second, it acknowledges that climate change is heightening the vulnerability of communities to both natural and human-induced hazards (UNDRR, 2008; Wahlström, 2015).

Climate change contributes to the intensification of extreme weather events, such as storms, floods, and heatwaves, and disrupts the Earth's climate system, leading, for instance, to changes in drought patterns and rainfall distribution (Pidcock & McSweeney, 2022). With global warming limited to 2.5°C, projections indicate that stronger storms could become twice as frequent as today, the number of individuals experiencing severe droughts may double within 80 years, extreme heat and humidity could annually

impact 1.2 billion people by 2100, and by 2050, mosquitoes carrying vector-borne diseases like Malaria could potentially reach an additional 500 million individuals; furthermore, in regions already prone to wildfires, the fire season may extend by three months by 2030 (Bacmeister et al., 2018; Li et al., 2020; Pokhrel et al., 2021; Ross, 2020; Ryan et al., 2019). Beyond the direct effects on disaster risks, climate change has eroded the ability of individuals and communities across the globe to effectively withstand and respond to disasters, weakening their resilience and strengthening their vulnerability (UNDRR, 2021). Resilience and vulnerability to disasters hinge on levels of preparedness, coping mechanisms, and adaptive capacities (IPCC, 2022). These are intertwined with the accessibility of resources, encompassing both tangible assets like infrastructure and essential resources such as water, energy, and land, as well as intangible elements like self-efficacy and the presence of trust among individuals and between communities and institutions. Given that climate change impacts both natural and human resources, it fundamentally influences society's capacity to react to disasters when they arise.

Additionally, there is value in integrating DRR and CCA because they share common objectives of increasing community resilience and reducing vulnerability (Forino et al., 2019; Wen et al., 2023). By coordinating these efforts, duplication can be avoided, resources can be streamlined, and interventions can be optimized in their effectiveness. Furthermore, since climate change is a long-term challenge with projected increasing impacts, it is crucial to consider climate change and the associated uncertainties when planning for risk management.

3 Approach for identifying, selecting, and analyzing methods and tools for community-based approaches in the field of Disaster Risk Reduction and Climate Change Adaptation

3.1. Aim of the literature review

The goal of this literature review is threefold. First, it seeks to provide a reasoned, structured, and synthetic overview of different CB approaches for inclusive and participatory decision-making processes in the fields of DRR and CCA. Second, it aims to examine existing methods used to evaluate the effectiveness of CB approaches, including an investigation into the categories and indicators used to assess effectiveness, as well as into the prerequisites for the success of CB approaches. Lastly, this literature review addresses the role of trust dynamics in DRR and CCA, and how they can inform the outcomes and results of CB approaches for related community engagement.

The literature review is guided by the following research questions:

1. Which are the most common and innovative community-based approaches used in the field of CCA and DRR?
2. How does the dimension of trust affect responses to DRR and CCA, and how it can be helpful for developing effective community-based approaches in the field of DRR and CCA?
3. Which are the most common methods for measuring the effectiveness of community-based approaches in the field of both CCA and DRR?

By addressing these research questions, this literature review seeks to provide a comprehensive understanding of the prevailing community-based approaches in the realms of CCA and DRR (their underlying principles, mechanisms, and potential benefits), shading light on the influence of trust in these approaches, and exploring the diverse methods employed to assess their effectiveness. In so doing, the review will advance knowledge base surrounding community-based approaches in DRR and CCA, with the goal of informing future research, policymaking, and practice in these fields, so to design more effective and inclusive decision-making processes in the face of disaster risks and climate change impacts.

3.2. Approach for literature review

This section presents a summary of the methodology employed in conducting the literature review. The reviews were conducted according to the preferred reporting items for systematic reviews and meta-analyses (PRISMA) statement (Moher et al., 2015). The review encompassed four distinct phases: (i) keywords search; (ii) screening of the abstracts of the papers identified by keywords search; (iii) selection of relevant papers; (iv) comprehensive analysis of selected papers.

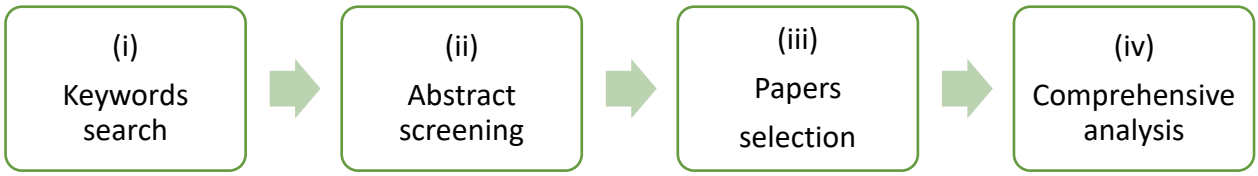

Figure 2: Stages of literature review

3.2.1 Phase one: Keywords search

A comprehensive approach was adopted to identify pertinent literature regarding the subject of investigation. Both grey literature (non-peer-reviewed sources, e.g., report on project activities, description of the official approach and position of an institution on a specific issue, etc.) and scientific literature (peer-reviewed articles) were considered. To ensure a comprehensive search of scientific research, three research engines were utilized: Web of Science, Scopus, and PubMed. In the case of grey literature, keyword strings were employed to conduct searches across the most relevant repositories on DRR and CCA (e.g., Prevention Web and Climate Adapt) and on the website of key national and international institutions for DRR (e.g., UNDRR and WMO) and CCA (e.g., UNFCCC, UNEP and European Commission). Multiple keyword strings were developed to capture papers that focused on community participation, bottom-up approaches, effectiveness evaluation, and trust. The keyword strings were tailored to address the research questions, as listed in the previous paragraph, and were utilized for both scientific and grey literature searching. As to innovative community-based approaches and methods for effectiveness evaluation, the same keyword strings were used. Furthermore, specific strings were developed to investigate the role of trust and trust dynamics (See comprehensive list in Table 1).

Table 1: String for literature search

SEARCH STRINGS	SEARCH ENGINE	SEARCH RESULTS	SELECTED BY ABSTRACT SCREENING	SELECTED BY FULL TEXT SCREENING
"evaluation" AND "particip*" AND" climate change adaptation"	Web of Science	121	21	12
"monitoring" AND "particip*" AND" climate change adaptation"	Web of Science	58	13	8
"evaluation" AND "particip*" AND "disaster risk reduction"	Web of Science	109	13	8
"monitoring" AND "particip*" AND" disaster risk reduction"	Web of Science	71	1	1
"community-based approaches" AND "climate change adaptation"	Web of Science	10	4	1
"community-based" AND "particip*" AND "disaster risk reduction"	Web of Science	123	19	8
"community-based" AND "particip*" AND "climate change adaptation"	Web of Science	110	18	8

community-based co-design AND "climate change adaptation"	Web of Science	2	/	/
community-based co-creation AND "climate change adaptation"	Web of Science	2	/	/
bottom-up AND "climate change adaptation"	Web of Science	157	77	24
community-based co-design AND "disaster risk reduction"	Web of Science	2	/	/
community-based co-creation AND "disaster risk reduction"	Web of Science	3	/	/
bottom-up AND "disaster risk reduction"	Web of Science	85	40	12
trust AND community AND disaster AND resilience	Web of Science; Scoups; Pubmed	207	75	57
participatory AND trust AND community AND climate change	Web of Science; Scoups; Pubmed	127	66	26
participatory AND trust AND community AND risk reduction	Web of Science; Scoups; Pubmed	94	55	18
Community-based OR bottom-up OR participat* OR co-design OR co-creation	Institutional repositories: Climate-Adapt; Prevention Web	/	51	18
TOTAL:		1281	453	201

Note 1: The total number of papers analysed in-depth is lower than 201, as some search strings resulted in duplicate papers (see the PRISMA flowchart below). Papers retrieved by snowballing are 4; these are not counted in this table.

The grey and scientific literature search using the developed keyword strings yielded a total of 1332 papers, all of them containing the desired keywords in their abstracts (Table 1). In addition to keyword searching, manual search was employed to expand the search scope: this involved examining the reference lists of relevant papers and identifying the most cited papers to integrate additional sources that were not captured through the initial search process.

3.2.2 Phase two: Abstract screening

To identify the papers directly relevant to the research questions, the first screening consisted in reading the abstracts of the papers that resulted from the search and selecting only the relevant ones. Search results from each database were then exported to *Zotero*, provided by C*orporation for Digital Scholarship*, and duplicates were identified and deleted.

3.2.3 Phase three: Paper selection

The articles whose abstracts were selected based on their relevance to the objectives of the research, underwent comprehensive reading and rigorous examination. In this phase, we considered only papers that satisfied one or more of the following requirements: (1) original articles, (2) written in English, (3) retrieved in scientific journals, relevant repositories, institutions websites and (4) restricted to social sciences, psychological sciences, medical sciences, and juridical science.

All academic and scientific studies (i.e., articles) that considered **community-based approach** in DRR and CCA were considered eligible for inclusion in the literature review with the following criteria: (1) they presented innovative approaches/tools; (2) they offered detailed descriptions of the approaches or tools; (3) they focused on approaches or tools capable of fostering active community participation throughout the entire process of diagnosing, identifying, prioritizing, developing, and implementing DRR and CCA strategies.

All non-scientific studies (e.g., reports, guidelines, policy briefs, working papers, etc.) were considered eligible based on the following inclusion criteria: 1) they cantered on case studies dedicated to the application of CBAs to real decision-making scenarios; 2) they provided sufficient details about the case to enable thorough analysis.

For this review, all studies that presented methodologies for **assessing the effectiveness** of community-based approaches were included, subject to the following inclusion criterion: (1) the studies outlined the criteria, dimensions, and indicators utilized in the evaluation process.

Empirical studies that investigated the role of **trust dynamics** in DRR or CCA were deemed eligible based on the following inclusion criteria: (1) they employed cohort, case-control, cross-sectional study, and/or experimental design. Publications were excluded if (1) they were not original articles (e.g., proceeding, review, opinion paper, or dissertation), and (2) they did not specifically focus on natural disaster and/or climate change. A total of 193 articles met the inclusion criteria and were included in the quantitative analyses (Figure 3).

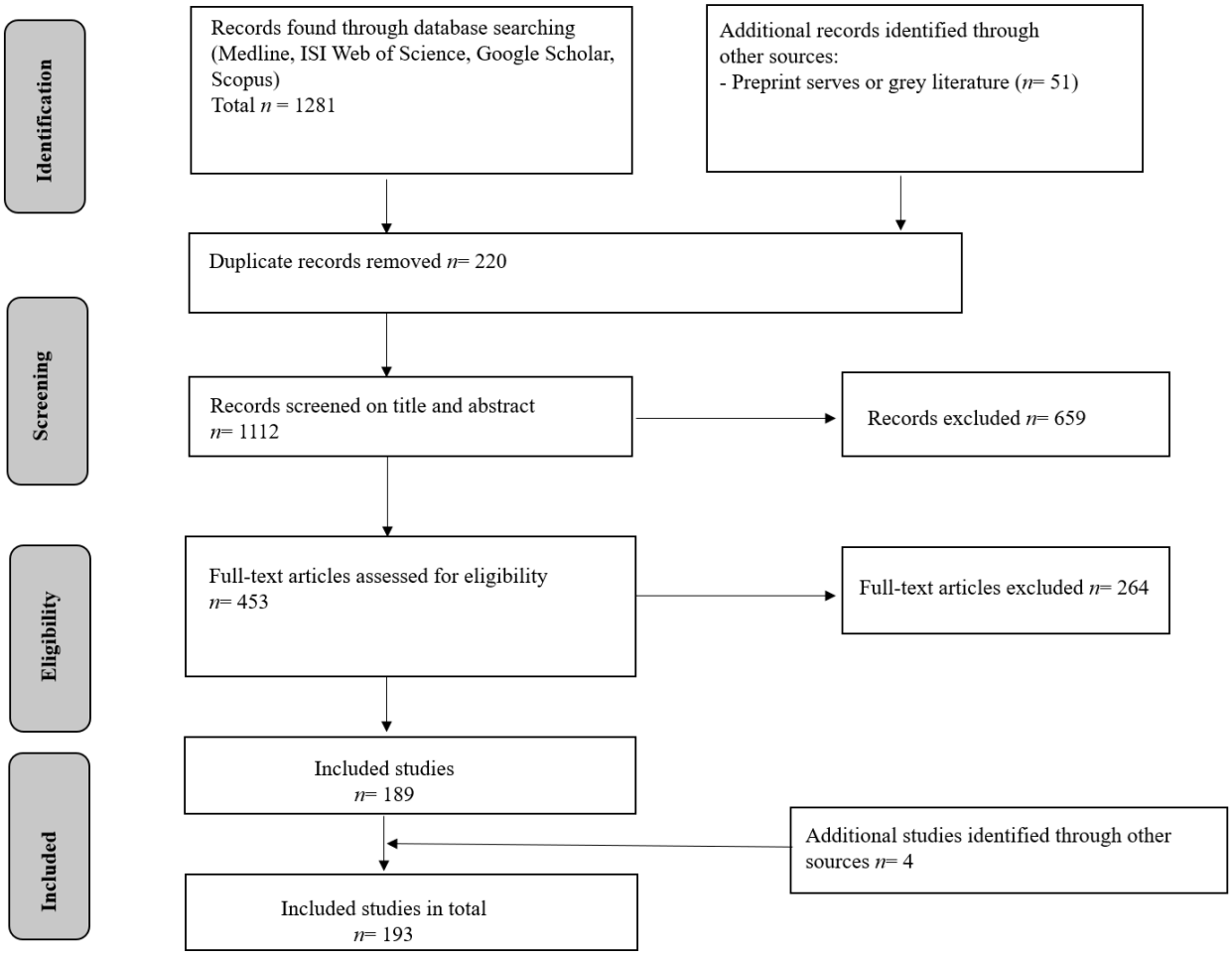

Figure 3: PRISMA flowchart of study selection

3.2.4 Phase four: Comprehensive analysis

After selecting the relevant papers and integrating them with papers identified through manual search and snowballing, the fourth phase involved a detailed analysis of these papers. To facilitate this analysis, an Excel table was prepared in advance, encompassing five dimensions and 22 categories. The Excel table served as a framework to systematize and categorize the findings extracted from the reviewed papers, aiding in the synthesis and organization of the literature review.

Overall, the criteria for this literature review involved an iterative process of screening, selection and reading to ensure the inclusion of papers that focused on the selected keywords. The following two sections present, respectively:

- an outline of the dimensions composing the Excel table, along with a brief reflection on the process undertaken to create the table, as well as a comprehensive description of each dimension incorporated in the table.

- A concise overview of how key theoretical concepts were operationalized to establish a shared understanding for this deliverable.

3.3. Dimensions and categories of analysis

The Excel sheet served for the literature review comprises five dimensions, further subdivided into a total of 22 categories. This comprehensive structure facilitated the analysis of the papers incorporated in this review, enabling a deeper comprehension of community-based approaches, methodologies for evaluation effectiveness, and trust dynamics in the fields of DDR and CCA.

The five dimensions are the following:

1. **General information** gathers basic details about the papers selected for analysis.
2. **Context of the area under study** captures information regarding the background and setting of the research discussed within each paper.
3. **Targeted community characteristics** groups qualitative data regarding the characteristics of the targeted communities being studied in each paper.
4. **Community based and participatory approach** delineates the community-based participatory approach described in the papers, with a specific focus on trust dynamics and inclusivity of decision-making processes.
5. **Evaluation of the community-based approach** aggregates information concerning the methodology for the evaluation of the process of community participation.

This structured Excel sheet serves as a valuable tool for organizing and analysing the information obtained from the examined papers, ensuring a comprehensive approach to the literature review process. Through the utilization of this Excel sheet, complete with predefined dimensions and categories for the analysis of the selected papers, a deductive content analysis methodology was implemented. This approach draws upon preexisting categories and models to examine data in a top-down manner, aiding in the construction of meaning. This method unveils the prevailing theories, methodologies and practices related to the subject matter under consideration.

This approach offers several strengths as it helps in conducting a systematic analysis, which allows for an efficient organization of the extracted information. Additionally, this approach facilitates easy comparison and synthesis of findings, enabling the identification of patterns within the literature. However, by fitting complex information into predefined categories, there is a risk of oversimplification, potentially overlooking nuances and unique aspects within the data. Moreover, the deductive nature of the analysis might restrict the exploration of emerging themes or unexpected findings that fall outside the predefined dimensions. Recognizing the limitations associated with a deductive approach that may potentially undermine the robustness of the literature review findings, we maintained a flexible mindset throughout the analysis process. This flexibility allowed for the inclusion of unexpected findings that did not neatly align with the predefined framework. By embracing this approach, we were able to capture nuanced and unique insights, thereby enhancing the richness of our analysis. This strategy ensured a more

comprehensive examination of the literature, guarding against oversimplification and enabling the exploration of emerging themes.

3.3.1 Descriptions of dimensions and categories of analysis

This paragraph provides a detailed description of the structure of the Excel sheet, encompassing the explanations of the 22 categories that constitutes the columns of the Excel sheet. These categories collectively form the five dimensions previously outlined.

Dimension 1: General information.

- **String**: the keywords string associated with the paper under analysis. If a paper is retrieved from multiple strings, all relevant strings are indicated in this field.
- **Literature type**: the source typology of the paper. This is grey literature (non-peer-reviewed sources) or scientific literature (peer-reviewed articles).
- **Reference**: the citation of the paper.
- **Link/DOI**: the link to the website address where the paper can be found.
- **Partner:** the name of the partner who add the paper and was responsible for its analysis.
- **Keywords**: the list of keywords, as reported in each paper.

Dimension 2: Context of the area under study

- **Geographical Scale:** the country where the approaches/tools/models were developed, tested, or evaluated.
- **Geographical Context:** the specific geographical setting where the approaches/tools/models were applied, such as coastal, island, mountainous, urban, or rural areas.

Dimension 3: Community characteristics

- **Type of community**: three types of communities are considered: community of practice, community of interest, and community of place. For a detailed explanation of the terms, please refer to the paragraph "Key concepts and definitions" in the subsequent paragraph of this chapter (3.4.1).
- **Characteristics of the community**: type of individuals, groups, and actors which compose the community under examination (e.g., residents of an urban neighborhoods, farmers and peasants, researchers, and representatives of the municipalities and of citizens groups).

Dimension 4: Community based approach and Trust dynamics

- **Level of application of the tool / approach**: indicates whether the tools or approach were conceptualized solely in a theoretical context without practical implementation (i.e., theoretical), were employed within a community and subsequently examined by the authors (i.e., studied), were devised by the authors and tested in an actual scenario or using standardized questionnaire (i.e., tested), or, in addition to application, underwent evaluation (i.e., evaluated).

- **Objective of CB approach:** the objectives of the community-based approach and/or of the specific tool utilized in the process of community-based adaptation and disaster risk management planning. E.g., capacity building, decision-making, solution findings.
- **Aim of the study**[1]: the aims of basic research (e.g., cross-sectional studies with qualitative or quantitative data) where sociological and psychological variables are examined in relation to DRR and CCA in targeted populations.
- **Sector of intervention:** the sector in which the community-based approach is implemented (e.g., DRR/CCA planning, ecosystem management, food security, nature-based solutions, agroforestry).
- **Phase of the DRR management/CCA cycle**: the phase of the disaster risk and/or climate change management cycle in which the community is involved in developing a risk reduction or adaptation strategy. Information is organized following the classic phases of the DRR cycle (prevention, preparedness, response, reconstruction) and the CCA cycle (vulnerability assessment, adaptation option identification and assessment, implementation, monitoring, and evaluation).
- **Main topic(s) addressed**: the main topics addressed within each paper (e.g., CCA, DRR, vulnerability, resilience, trust).
- **Type of tools used in the CB approach**: the tools employed to engage with individuals and actors within the community, (e.g., focus groups, transect walks, and seasonal calendars). While the terms "approach" and "tool" may have slightly different meanings, the prevailing understanding is that an “approach” refers to the overall way of addressing community participation within CCA and DRR, while a “tool” serves as a device for fulfilling a specific purpose or function, such as information gathering, facilitating discussions, or exploring options.
- **Duration of the CB process**: the duration of the CB approach. The time span can vary significantly, ranging from several years to a few months or weeks, depending on various factors. These factors include the complexity of the issue being addressed, the availability of resources and funding, the level of community engagement, and the specific objectives and activities of the approach. Each CB approach has its own unique timeframe based on the specific circumstances and goals of the initiative.

Dimension 5: Evaluation of the community-based approach

- **Evaluation method used to assess the CB-approach**: list of assessment methods employed to evaluate the effectiveness of the CB approach being examined. The methods used may vary among the papers and can include both qualitative and quantitative research methods, such as surveys, interviews, case studies, observations, data analysis, and participatory evaluations. Moreover, the chosen evaluation methods can vary depending on the entity conducting the assessment, such as self-assessment by the community or evaluation by an external party. These methods aim to assess various aspects of the CB approach, such as its outcomes, impacts, processes, sustainability, and community engagement.

[1] This dimension has been used to analyze only papers that revolve on trust.

- **Indicators of evaluation of the approach**: the indicators utilized by each paper to evaluate the effectiveness of the CB approach under investigation. It provides insight into the measurable criteria (e.g., number of participants involved), or the aspects and characteristics (e.g., transparency), that each paper considers as benchmarks for measuring and assessing the effectiveness of the approach. These indicators can vary among papers and encompass both qualitative and quantitative measures.
- **Conditions for efficacy of the approach and recommendations**: the specific requirements that need to be in place for the CB approach to be effective. These conditions can include factors such as adequate resources, appropriate context, skilled facilitators, and supportive organizational structures. Additionally, this column may also include any recommendations provided by the papers on how to improve the effectiveness of the approach.
- **Results in terms of efficacy**: the results obtained in relation to the intended objective of the CB approach examined in the paper (e.g., residents of an urban area influenced the decision about how to allocate funds for CCA projects). This column also provides an insight into any unexpected results that emerged during the implementation or evaluation of the approach (e.g., by implementing improved watering systems, labor requirements for farmers decreased). The focus of the results can vary across papers, ranging from outcomes related to community participation (process-oriented outcomes) to outcomes related to disaster risk management or climate change adaptation (impact-oriented outcomes).

3.4. Key concepts and definitions

This section aims to establish a shared understanding on some key terms that are relevant for the scope of this deliverable. These key terms are:

- Community
- Community-based approach
- Participation
- Trust
- Resilience
- Disaster risk reduction
- Climate change adaptation
- Evaluation

3.4.1 Community

The fundamental definition of "community" entails a collective of actors, such as individuals, organizations, and businesses, who possess a shared identity (Kruse et al., 2017). We conceive community as a multi-layered concept that is threefold; indeed, a community can be place-based, interest-based, or practice-based.

- Community of place. A group of individuals who share a common physical or online space as the primary basis of their connection and interaction (Christenson & Jerry W, 1989). A community of place emerges when individuals, due to their shared physical presence or frequenting of a specific space, develop a collective identity and perceive themselves as members of a community (Miller, 1992). The transition from merely coexisting in the same space to sharing a common identity occurs as individuals in the community of place also share social experiences, meanings, and actions. Examples of a community of place are individuals who live in the same urban neighbourhood or residents of a remote mountain settlement.
- Community of interest. The interest-based conception of community pertains to groups of actors who establish a collective identity based on their shared concerns, purposes, and goals (Briard & Carter, 2013; Henri & Pudelko, 2003). What sets a community of interest apart is that its members may reside in disparate locations, have sporadic or even absent contact, yet still maintain a shared identity rooted in a common topic of interest. A community of interest can emerge within an existing community of place, but it is formed based on additional elements beyond the mere sharing of physical space. For instance, Keller introduces the concept of residents in a contaminated area who strengthen their connections due to a shared concern (Keller, 1992). Prior to the disaster, these residents only had a common identity rooted in their shared location. However, after the disaster, they developed shared concerns and a collective determination to mobilize and address the challenges posed by the disaster. In this scenario, rallying around a common issue has fostered social relationships and agency among the affected community members. Additional examples of a community of interests are individuals who share the same occupation (e.g., farmers, rangers, businessmen, and fishermen) as well as individuals who share

common concerns, needs, or objectives related to a specific topic or context (e.g., students, members of religious groups, landowners, women, people with disabilities, indigenous minorities, representatives of civil protection associations, and civil society actors).

- Community of practice. Building on the definition given by the social-learning theorist Etienne Wenger, a community of practice consists of a heterogeneous group of actors (e.g., individuals, associations, governmental and non-governmental agencies and organizations) which share a common interest or concern - the domain-, and collaborate to manage and address it (Etienne, 1998). The actors that compose the community operate as a network, fostering regular interactions and establishing relationships among its members. Wassermann and Faust define a social network as a collection of actors (individuals, groups or organizations) and the relationships that exist between them; relational ties are channels for transfer for resources, skills and knowledge (Wasserman & Faust, 1994). The activities conducted within a community of practice extend beyond the routine tasks and established responsibilities of actors' daily work or personal lives. Instead, activities are understood as new practices which community´s members gradually jointly learn how to perform. A community of practice defines itself in doing, meaning that activities in which members engage are not pre-defined or pre-institutionalized or formalized. Through their collaboration, community members engage in a collective learning process to enhance their skills and deepen their knowledge to better act within the domain. Through a process of social learning, participants' understanding of a particular domain evolves as they engage in interactions with others, transcending individual perspectives and becoming embedded within a larger social framework (Reed et al., 2010). A community of practice distinguishes from a community of interests or of place, neither of which implies a shared practice. An example of a community of practice in the realm of DRR and CCA is a network of actors (comprising, citizens, researchers from diverse disciplines - including climate scientists, urban planners, and agronomists-, policymakers, community leaders and NGOs) that organize regular meetings, workshops, and knowledge-sharing events to enhance the resilience and preparedness of a certain territory in response to climate-related risks within their specific geographical context.

3.4.2 Community-based approach

Community-based approach in DDR/CCA refers to participatory activities that involve members of a community and fosters community level co-leadership and co-design in the context of CCA and DRR. It is understood as a process that begins by raising awareness among the community about their capacity and responsibilities in disaster risk management and climate change adaptation and culminates in equipping the community with the necessary skills, established systems, and capability to independently address minor localized climate-related disasters. Furthermore, the community is also prepared to activate and collaborate with government systems for swift response in the event of a major disaster and for climate change mitigation and adaptation (Oxfam & adpc, 2014). Similarly, Scott and Few define a CB approach as “the process by which people, organizations and societies strengthen and sustain their abilities to take effective decisions and actions to reduce disaster risk” (Scott & Few, 2016, p. 147). CB approaches can

target communities of place, interest, or practice, either individually or collectively. In the optimal situation, the objectives of community involvement should encompass the following:

- Capacity-building: in DRR and CCA, it describes the process of strengthening the knowledge, skills, abilities, and resources of communities to effectively address risks and climate change challenges. It involves empowering community members to understand the risks they face, enhancing their ability to make informed decisions, and equipping them with the necessary tools and capacities to implement appropriate measures. Capacity-building activities may include training programs, knowledge sharing, skill development, institutional strengthening, and promoting collaboration among community members and stakeholders. Ultimately, capacity-building increases a community adaptive capacity and resilience to climate-related impacts and risks. Capacity building is considered a fundamental step for communities to become active actors in the decision-making process, as it enables the members of a community to develop competences to take greater control of their own lives.
- Solution-finding: in DRR and CCA, solution finding is related to the process of identifying and proposing strategies and actions to address the challenges posed by climate-related risks within a community. It involves engaging community members in problem-solving discussions, sharing local knowledge and experiences, exploring innovative actions, considering their feasibility, effectiveness, and sustainability, and collectively proposing the most suitable DRR and CCA solutions. Solution-findings also encompasses assessing risks and vulnerabilities, serving as an essential preliminary activity for formulating strategies and actions. While decision-making is the broader process of making choices and taking actions, solution-finding is a specific component of decision-making. However, often solutions-findings does not result in any input to the decision-making process and may remain disconnected from the actual selection and implementation of decisions.
- Decision-making: the specific act of making a choice or selecting a course of action from the available alternatives. It involves weighing the pros and cons of different options and considering various factors such as feasibility, cost-effectiveness, and impact. This specific understanding of decision-making distinguishes it from the broader policy process (i.e., the decision-making process), which encompasses other steps such as capacity-building and solution finding. While decision-making as the policy process involves multiple stages, decision-making as intended here focuses on the specific act of making a choice among alternatives. The process of involving community members in making informed choices, reaching agreements, and taking actions is critical as it ensures that decisions are inclusive and reflective of the needs, perspectives, and interests of the community. By engaging community members in decision-making, a CB approach seeks to empower individuals, foster ownership, and enhance the effectiveness and sustainability of DRR and CCA initiatives.

CB approaches utilize participatory processes to engage and empower community members. However, as participation can vary in terms of depth and breadth (as per the definition of participation see below), the concept of community-based is operationalized in various shades. In the best-case scenario, a CB approach

is aimed at empowering the community to support and complement decision-makers and co-lead the process of designing the DRR/CCA strategy. However, in practice, the objective of the CB approach might not be to enable the community to co-lead and take decisions. Instead, it could solely focus on enhancing the community´s capacities or involving the community in finding potential solutions for a problem that, however, has been top-down identified and with the final decision remaining top-down as well. Community involvement in DRR and CC management can be hindered by various factors such as power dynamics, resources, and institutional structures. Practical and ideological constraints may arise that restrict community involvement to specific stages of the process. This may result in a partial rather than comprehensive engagement of the community in the decision-making process for DRR/CCA strategies.

3.4.3 Participation

Participation extends beyond mere citizens involvement or granting them absolute control. As articulated by Arnstein (1969), participation falls within the broader scope of citizen power. It involves the decentralization and distribution of power to enable citizens, typically marginalized from mainstream political and economic processes, to have a meaningful impact on their future. True participation should result in citizens' ability to influence the outcomes of decisions that affect their lives, for instance by including inputs gathered through public consultation in the decision-making process. However, participation is often reduced to a superficial exercise, where citizens are merely consulted without any real power to shape the political processes. Arnstein presents a ladder of participation, ranging from nonparticipation to various degrees of tokenism (informing, consultation, placation), and ultimately to degrees of citizen power, where citizens have increasing decision-making authority (partnership, delegated power, citizen control). Genuine participation is distinguished by the effective consideration of citizens' needs and perspectives. However, as Cornwall emphasizes, while empowering citizens to determine what is best for them and act, it is important to ensure that those with formal institutional power (such as the state) do not abdicate their responsibilities (Cornwall, 2008).

The concept of participation remains ambiguous, as it lacks clear boundaries or criteria. There is no specific threshold of the number of people required to label a citizen involvement process as "participation," nor is there a set of predetermined activities that define participation. Bebbington and colleagues propose a Cartesian framework for assessing forms of participation based on the dimensions of depth and breadth. “Depth” (i.e., degree of participation) is positioned on one of the Cartesian axes, with one extreme representing full participation in the decision-making stages, and the other extreme representing more superficial participation (Bebbington et al., 1993). “Breadth” (i.e., level of inclusion) occupies the other Cartesian axis: at one extreme, participation involves only a few individuals, while at the other extreme, it encompasses inclusive participation. For example, in a deep participatory process, participants are engaged from the initial stages through the decision-making process. However, if only a limited number of people are involved, participation remains limited in scope. On the other hand, a wide range of individuals may be included, but if their involvement is limited to being informed or consulted without genuine influence, the participation becomes superficial.

3.4.4 Trust

Trust constitutes a fundamental objective in the realm of risk communication. Within the field of communication science, trust concerns a general belief or expectation that a received message is both truthful and reliable. Additionally, trust entails the perception of the communicator´s competence and honesty, which is conveyed through the dissemination of accurate, objective, and comprehensive information (Siegrist, 2021). These attributes are similarly reflected in the definition of trust from the realm of psychological science, where trust pertains to a "reliance on or confidence in the dependability of someone or something" (American Psychological Association, 2023). Trust involves "a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behaviour of another" (Rousseau et al., 1998, p. 395). Two predominant trust models can be utilized to elucidate the functioning of this relationship. Gillespie's model (2012) postulates that trust encompasses two discrete yet interconnected constituents, namely reliance and disclosure. Reliance is characterized as the disposition of the trusting party to rely on a trustee and is manifested through acceptance of the trustee's influence, exemplified by putting trust in the trustee's abilities and judgment. On the other hand, disclosure is defined as the inclination of the trusting party to share pertinent information with the trustee and is demonstrated by means of open communication and the exchange of ideas with the trustee. In contrast, McAllister's model (1995) emphasizes the cognitive and affective factors associated with trust. According to this model, trust is established based on the cognitive evaluations made by the trusting parties regarding the skills and competence of the trustee, as well as the emotional bonds formed between individuals within a specific community. Trust in community, and specifically in political institutions, is fundamental for planning communication strategies (Marincioni, 2020). The concept of trust, closely related to community resilience during natural disasters, has been explored with increasing interest in disaster management academic literature over the past decade. While the resilience of communities encompasses many dimensions, such as social, economic, institutional, infrastructure, and environmental factors (Mendonça et al., 2018), the trust dimension is an essential concept primarily attributed to communities' key social skills to prepare for, mitigate, withstand, and recover from calamities (Stoyan et al. 2014). Starting from a series of studies carried out over the years, some barriers were identified in the face of active commitment to climate change, including distrust of information sources. Moreover, at local, national, and international levels, an absence of trust in the responsibility taken by governments and local policymakers, and in the significance of their actions, has been highlighted (P. Becker, 2018; Lorenzoni & Pidgeon, 2006). To enhance trust, it is thus critical to carefully consider the dynamics, communication, and reciprocal relationships of both trusting parties and trustees.

3.4.5 Resilience

Resilience indicates the ability of a social-ecological system to effectively handle disruptions by responding or reorganizing in a manner that preserves its fundamental function, identity, and structure, while simultaneously retaining the capacity for adaptation, learning, and transformation (Arctic Council, 2013). Social-ecological systems include physical, ecological, and social as well as human processes. The resilience of social-ecological systems is a complex concept which depends on resilience of all the processes that compose it. Within the wide set of human processes, individual resilience play an important role. At the

psychological level, resilience constitutes "the process and outcome of successfully adapting to difficult or challenging life experiences, especially through mental, emotional, and behavioral flexibility and adjustment to external and internal demands" (American Psychological Association, s.d.). The extent to which individuals effectively adjust to challenges relies on their interactions with the environment, the presence and effectiveness of social support systems, and the utilization of coping mechanisms. To support healthy adaptation at the individual level in the aftermath of disasters, the community can play an important role (Pfefferbaum et al., 2013). Hence, alongside individual resilience, the concept of community resilience has emerged. Several studies have shown that the community level is an important scale for resilience building (Kruse et al., 2017). Community resilience arises from fundamental sets of adaptive capacities, encompassing economic development, social capital, information and communication, and community competence. These capacities operate in the presence of uncertainties, collectively forming a strategy for disaster preparedness (Norris et al., 2008). Community resilience is characterized by its relational nature, requiring active and coordinated interactions among various stakeholders. Additionally, it is influenced by the unique demographic, historical, jurisdictional, and economic characteristics of the community's residents (Ellis et al., 2022). Considering the context-specific nature of community resilience development, essential components for its establishment and recovery include decision-making abilities, adaptability, collaboration, and reliance on trustworthy sources of information (Pfefferbaum et al., 2013). In the realm of disaster risk reduction, community resilience does not imply reverting to the pre-event condition. Rather, it refers to the community's ability to adapt its dynamics and structures to enhance its capacity in preventing, preparing for, and responding to potential future disasters (Wyss et al., 2022). For example, a community may establish an Emergency Response Team composed of local volunteers and it may conduct awareness campaigns and educational programs to inform residents about earthquake risks, safety measures, and evacuation procedures.

3.4.6 Climate Change Adaptation

The United Nations Intergovernmental Panel on Climate Change defines adaptation to climate change as "In human systems, the process of adjustment to actual or expected climate and its effects, in order to moderate harm or exploit beneficial opportunities" (IPCC, 2022). IPCC frames adaptation as a process, a recurring position in the adaptation literature. The United Nations Development Program (UNDP) presents adaptation as "*a process by which strategies to moderate, cope with and take advantage of the consequences of climate events are enhanced, developed and implemented*" (UNDP, 2004, p. 36), whereas Berrang-Ford et al (2019) speaks of adaptation "*efforts*" (i.e., "*what a government is actually doing in response to the vulnerabilities it faces and its adaptation goals, and also the ways in which governments discuss, mobilize and organize for adaptation*", p. 441). The concept of adaptation efforts includes both process-based (e.g., changes in the decision-making procedures) and output-based concepts (such as a specific investment to increase the current resilience of local farmers, e.g., new irrigation systems). Moreover, this adaptation process takes the form of a wide range of actions that can be classified as structural, institutional, ecological, or behavioural. Structural adaptations involve the physical modification of infrastructure and built environment (e.g., the construction of flood barriers). Institutional adaptations

entail the development of policies, regulations, and governance mechanisms to facilitate adaptive responses (e.g., the establishment of a climate change adaptation department within a government agency). Ecological adaptations focus on restoring and conserving natural ecosystems to strengthen their ability to withstand climate impacts (e.g., creation of wetlands to provide natural flood protection, enhance biodiversity, and support carbon sequestration). Lastly, behavioural adaptations involve changes in individual and collective behaviours, practices, and decision-making processes (e.g., the adoption of water conservation practices by households). The adaptation definition proposed by IPCC highlights that adaptation policies should be aimed at both present and predicted climate ("in response to actual and expected impacts" - Moser and Ekstrom, 2010, p.1); and that it should also focus on the possible positive effects of climate change on society. The epistemic framework of adaptation is also characterized by other related dimensions. Thus, an adaptation strategy/measure can be framed according to: i) the outcome – adaptation can be transformational (a policy changing the fundamental attributes of a system in response to climate and its effects) or incremental (Field et al, 2014; O'Brien, 2012); ii) the timing – adaptation can be anticipatory/proactive (i.e. planned and deliberate decisions to prepare for potential effects of climate change) or reactive, as a response to some impacts of climate change (Fussel, 2007, Fankhauser et al, 1999); iii) the decision-making process - purposefully planned (i.e. policies developed by governments or other public institutions as a result of a planning process) or autonomous (Fussel, 2007; Fankhauser et al, 1999; Wilson et al, 2020)

3.4.7 Disaster Risk Reduction

According to the United Nations Office for Disaster Risk Reduction, disaster risk reduction encompasses a range of activities aimed at preventing and reducing new risks, as well as managing existing risks, to enhance resilience and minimize the impact of disasters (UNDRR, 2007). It should be noted that disaster risk reduction is distinct from disaster risk management, as the former serves as the overarching policy objective of the latter. In the context of this literature review, the term "disaster" specifically refers to natural disasters. A natural disaster is an event (e.g., a hurricane, an earthquake, and a wildfire) that occurs due to natural hazards and results in significant damage and losses to a community (which can be of practice, interest, or place). Such disasters have adverse impacts on human life, infrastructure, economy, and the environment. The extent of damage caused by a disaster is influenced by factors such as the level of community exposure (i.e., proximity to the hazard zones), vulnerability, resilience, and capacity (i.e., all the material and immaterial resources that a community can use when it confronts with a disaster):

$$\boldsymbol{Disaster\ risk} = \frac{\boldsymbol{hazard} \times \boldsymbol{exposure} \times \boldsymbol{vulnerability}}{\boldsymbol{capacity}}$$

This equation shows that a strategy aimed at reducing disaster risk can decrease one or more elements in the numerator (hazard, exposure, and vulnerability) or enhance the element in the denominator (community capacity). Alternatively, it can accomplish both objectives simultaneously.

3.4.8 Evaluation

As defined by the European Commission, an evaluation is a systematic and objective assessment of an ongoing or completed policy, program, or project, including its conception, formulation, implementation, and results (European Commission, 2004).The aim of an evaluation process is to determine the extent to which the objective of the initiative has been achieved and to assess its effectiveness, relevance, efficiency, and impact. Often the evaluation is based on monitoring activities (i.e., the collection and analysis of data and information to track the progress and performance of a policy, program, or project). There are multiple evaluation methodologies which differ based on:

- the methods used (i.e., qualitative, quantitative, or both).
- The actor who leads the evaluation (i.e., external, or internal).
- The approach (i.e., participatory, or non-participatory).
- When the evaluation occurs (ex-ante, interim, ex-post).
- The scope (i.e., process-oriented, or result-oriented).

Among the evaluation criteria, we emphasize the criterion of “Effectiveness” as it encompasses all other criteria. The Organization for Economic Cooperation and Development (OECD), defines effectiveness as the extent to which objectives pursued by an intervention are achieved and specifies that an effectiveness indicator is calculated by relating an output, result or impact indicator to a quantified objective (OECD, 1991). This definition is board and allows for various operationalizations, depending on the specific objective of the intervention. This is evident from the papers analyzed for this literature review. For example, J. Mercer and colleagues evaluate the effectiveness of a participatory approach that combines indigenous and scientific knowledge by examining its impact on reducing vulnerability to environmental hazards and fostering collaboration among stakeholders (Mercer et al., 2010). On the other hand, Wesche and colleagues consider a participatory scenario building process effective when it is inclusive and when the proposed scenario is feasible (Wesche & Armitage, 2014). This difference between papers is due to what each considers as an indicator of effectiveness. The European Commission defines an indicator as “a tool to measure the achievement of an objective” (European Commission, 2017). An indicator provides evidence about a phenomenon or condition, and it is used to assess progress, performance, or change related to a specific aspect of interest. Indicators can be quantitative, qualitative, or a mix of both; also, they can be compound, indices, or proxy indicators (Guijt and Woodhill, 2002). Indicators also differ depending on:

- the scope of application: input/process/results/outcome/impact oriented.
- The source of data used: primary, secondary, fact-based, or perception based.
- Their reliability, in terms of being RACER (Relevant, Accepted, Credible, Easy and Robust) or SMART (Specific, Measurable, Achievable, Relevant, and Timebound) (Lammerts van Bueren, and Blom, 1997).

4. Main findings from literature review

This chapter presents the key findings from the literature review on:

- Methods for implementing a CB-approach in the field of DRR and CCA.
- Dynamics of trust within a CB approach framework.
- Methods for the evaluation of the effectiveness of the CB-approach.

What emerges from the results of the literature review is essential for developing a Conceptual framework and the Guidelines for the application of community-based approaches and for the effectiveness evaluation of such an approach, to be presented in chapters 5 and 6, respectively.

4.1. Transdisciplinary co-design methods for community-based approaches in in the field of DRR and CCA

This section presents a reasoned review of existing innovative methods, models, and tools for implementing a CB approach for inclusive decision-making in the context of DDR and CCA. It is divided into two sub-sections: the first focuses on the main findings from peer-reviewed literature, while the second examines the same aspects but with a focus on grey literature. By summarizing the key findings, this section draws upon dimensions and corresponding categories described in Chapter 3.

4.1.1. Main findings from peer-reviewed literature

In total, 187 papers were collected (this number does not consider papers that resulted from multiple search strings), but only 74 were analyzed, following the inclusive/exclusive selection criteria as detailed in Chapter 3. However, since some papers discussed multiple approaches, the actual number of CB approaches examined is slightly higher (93). Most papers were found using the **search string** "bottom-up AND climate change adaptation" (20), followed by "bottom-up and disaster risk reduction" (9), and "evaluation AND particip* AND climate change adaptation" (8), while the remaining (37) were found using the remaining search strings as listed in Table 1 in Chapter 3.

Regarding the **keywords** used to identify papers, the results of the analysis show that a diverse range of keywords has been utilized. Among the most common keywords there are “disaster risk reduction”, “climate change adaptation”, “participation”, “resilience” and “vulnerability” (Figure 4). "DRR " appeared in the highest number of papers, accounting for 19 out of the total (26%), followed by "CCA" with 15 mentions (20%), "Participation" with 15 mentions (20%), "Resilience” with 14 mentions (19%), "Vulnerability” with 12 mentions (16%), and "Community based” with 11 mentions (15%).

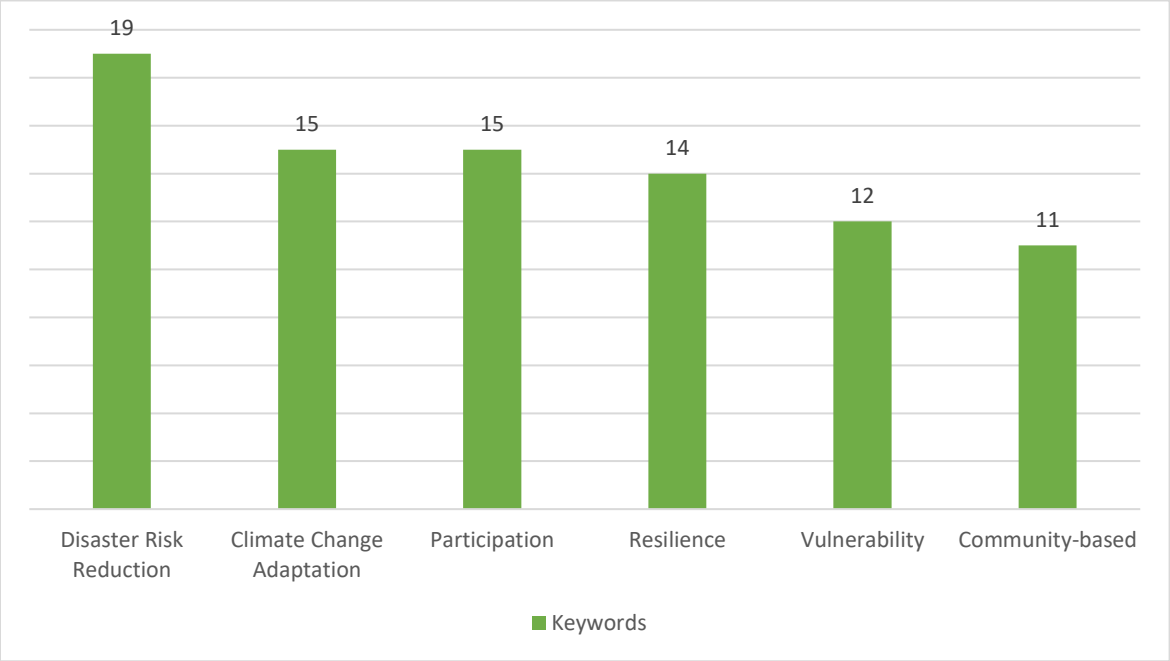

Figure 4: Number of papers by selected main keywords.

The **geographical scale** of application of the methods, tools and approaches is broad, covering a wide range of countries across North and South America, Europe, Africa, Asia, and Oceania. However, there is a lack of studies exploring CB approaches for DRR and CCA in the MENA region and Central Asia (Figure 5). In terms of **geographical context**, most CB approaches focuses on rural (26) and urban (26) areas, followed by coastal (21), island (16), and mountain (4) regions (Figure 6). Two papers don´t provide information regarding the geographical context of the CB approaches analyzed: these are classified as n.a (not applicable). Assigning unique geographical label was not always straightforward as some areas possess multiple characteristics (e.g., being both coastal and rural, or urban and island): in this case we chose the most representative and predominant ones.

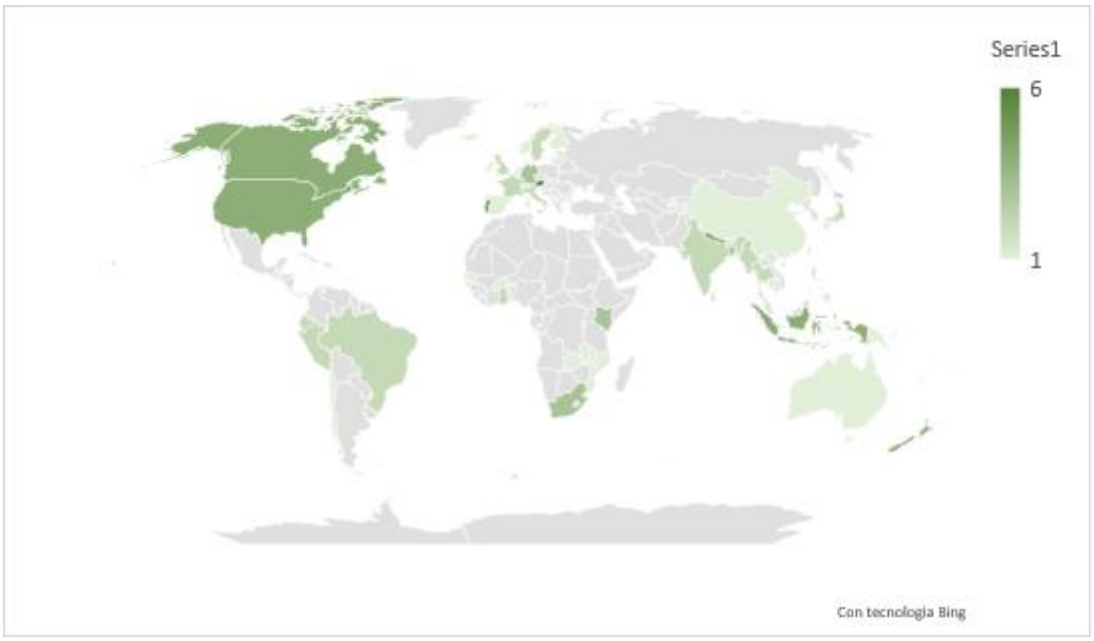

Figure 5: Distribution of CB approaches by country

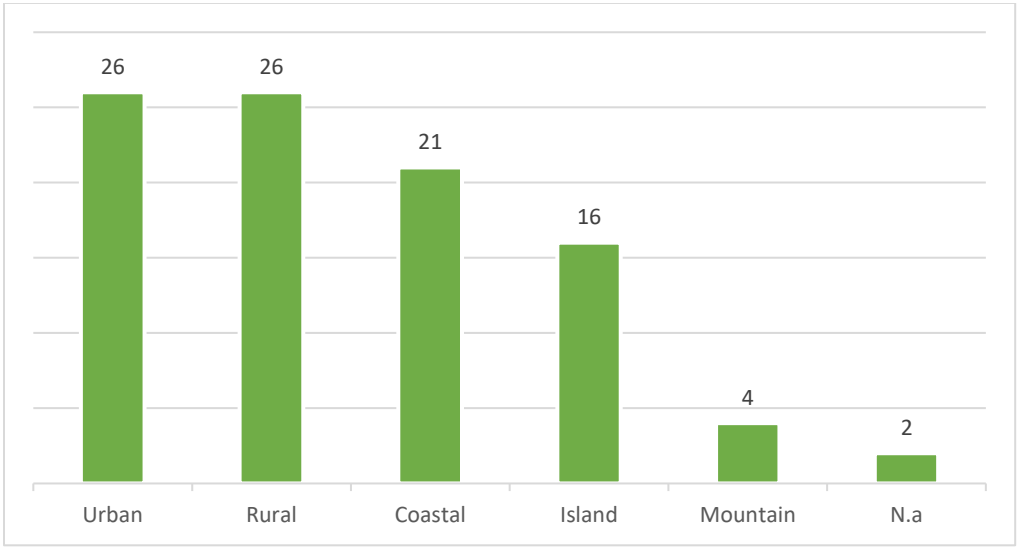

Figure 6: Number of CB approaches by geographical context

Regarding the **type of community** involved in the community-based approach, the analysis of papers reveals that most approaches (61, or the 63%) involve a single type of community. Among these, 41 engage with a community of place (41%), 13 papers with a community of interest (14%), and 7 with a community of practice (7%). Out of the total CB approaches analyzed, 32 involves more than one type of community. Specifically, 27 approaches (29%) involve both a community of place and a community of interest, and 5

approaches involve a community of place and a community of practice (5%). However, none approach involves a community of interest and a community of practice, nor do any of the approaches involve all three types of communities simultaneously.

Out of the 94 approaches analyzed in the papers, 73 of them, representing the 77%, present approaches aimed at DRR and/or CCA that involve members of a community of place (individually or together with members of a community of practices or interests). Given that climate-related disasters and changes are often localized phenomena (i.e., they occur in specific spatially defined positions and are limited to areas), the most engaged individuals are those who reside, work, visit or spend a significant amount of time, in the geographical area affected. In most of the cases, these community of place are represented by residents of town, a municipality, a neighbourhood, or of other physical and geographical spaces (Ahn et al., 2023; Ajulo et al., 2020; D. Archer, 2016; Lin, 2019).

40 papers, representing the 42%, explore CB approaches that involve members of a community of interest (individually or together with members of a community of place). Communities of interest can emerge within existing community of place or beyond it, and most of them are composed by individuals or groups of individuals (e.g., farmers, rangers, businessmen, and fishermen, representatives of civil protection associations) that share common problem, concerns, needs, or objectives related to a specific topic or context (e.g., individuals affected by a disaster and/or involved in the DRR and/or CCA measures and/or strategies) (I. S. Campos et al., 2016; Cradock-Henry et al., 2021; Marchezini et al., 2017; Mills-Novoa, 2023).

12 papers, representing the 13%, detail CB approaches that involve members of a community of practice (individually or together with members of a community of place). An example of a community of practice as presented in a paper is a group composed by local NGOs, authorities, civil society associations, religious leaders, private sector and individuals, and experts which committed in a participatory learning process (Chacowry, 2023). Another example is that of a so-called Community Partnership for Self-Reliance established in Alaska as a collaboration between a university, an NGO, and some rural communities (Chapin et al., 2016). One last example is that of a collaborative learning process aimed at reducing food losses, established between farmer groups, social scientists and ecologists (Restrepo et al., 2018).

The sum of percentages does not add up to 100 because a community-based approach often involves multiple types of communities. This indicates that many studies recognize the interaction between different types of communities in the context of community-based approaches.

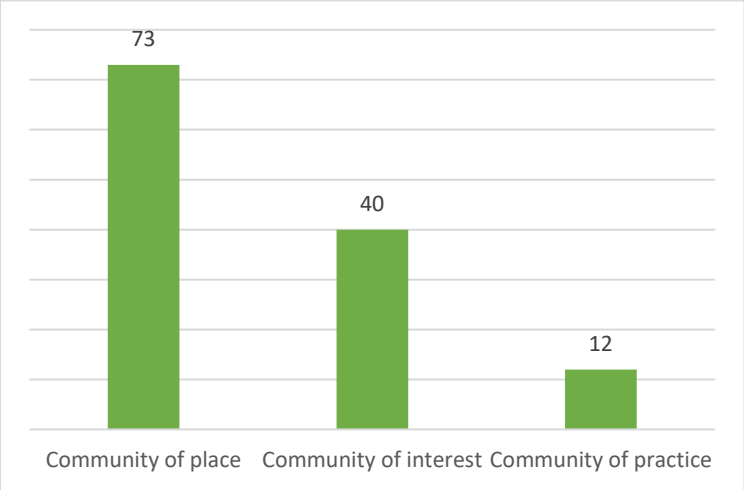

Figure 7: Number of CB approaches by type of community involved.

As regard the **level of application** of the CB approach, out of the 74 papers analyzed, 50 papers (67%) study tools, methods, and processes implemented at the national, regional, or local level to engage and involve a community in DRR and/or CCA decision-making. 21 papers (28%) tested in a specific case study an approach that has been theoretically developed or proposed by the authors of the paper, sometimes in collaboration with other actors (e.g., institutional organizations). It is worth noting that only one paper describes a CB approach that is purely theoretical, without any empirical testing (Thaler & Seebauer, 2019). Finally, two papers provide a literature review or report a wide set of case studies that review existing approaches (Flood et al., 2018; Whitney et al., 2017). These papers are classified as "n.a." in Figure 8, as they contribute to the understanding of CB approaches, rather than providing details about a single CB approach. Among all the papers, 67 (91%) not only provide description of methods and tools but also include an assessment of the effectiveness of the approach. However, the extent to which this evaluation is conducted systematically varies among the papers. Section 4.3 of this chapter, titled "Model of the effectiveness evaluation of the CB approaches," provides detailed information on this aspect.

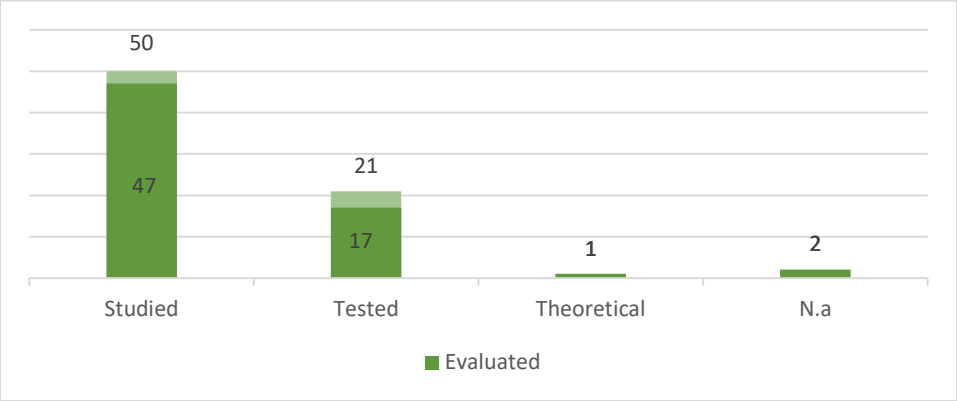

Figure 8: Number of papers by level of application of the CB approach examined.

Among the papers analyzed, 37 present methods aimed at empowering/involving a community in the DRR/CCA **decision-making** process. The level of power given to the community in the decision-making process varies, as well as the phase of the DRR or CCA cycle in which the community is involved. In the analyzed papers, the involvement of the community in decision-making does not necessarily mean involvement in each decision but in most of the cases it is limited to certain phases of the process and on specific aspects (e.g., initial phase for the selection of high-risk areas).

37 papers detail community-based approaches aimed at strengthening the community's role in **identifying solutions**. It is important to distinguish between solution-finding and decision-making, as community involvement in proposing a solution does not always correspond to involvement in the final decision on which solution to implement (Choptiany et al., 2017; Karina Barquet & Lydia Cumiskey, 2018; Mercer et al., 2010; Van Aalst et al., 2008).

53 papers describe methods aiming to **enhance community's capacities.** Capacity building is considered a fundamental step for communities to become active actors in the decision-making process, as it enables community members to develop skills and knowledge necessary to adapt to climate change and prepare for, survive, and thrive after a disaster, thus developing competences needed to take greater control of their own lives.

In 2 papers it was not possible to analyze this aspect ("n.a." in Figure 9): in one paper, the focus is on evaluating participatory climate change adaptation projects in general, from people's perspectives, without presenting a specific project (Samaddar et al., 2021) ; in the other paper, the authors focus on assessing the achievements of an urban disaster risk reduction-neighbourhood approach, but the characteristics of the participatory approach are not specified, and the evaluation is results-oriented rather than process-oriented (Sarmiento et al., 2017).

The analysis of papers revealed that achieving the objective of a community-based approach does not necessarily correspond to an active, inclusive, and deep community participation. On the contrary, participation in decision-making, capacity-building, and solution finding is often marginal or limited. For

example, Chowdhooree and colleagues, and Songok and colleagues, report cases where the community is involved in finding potential solutions for a problem that, however, has been top-down identified and for which the final decision is taken top-down (Chowdhooree et al., 2020; Songok et al., 2011). Community involvement in DRR and CC management can be limited depending on various factors such as power dynamics, resources, and institutional structures (Samaddar et al., 2022; Zubir & Amirrol, 2011). Practical and ideological constraints and challenges (e.g., participation bias, lack time) may also arise that restrict community involvement to specific stages or aspects of the DRR and/or CCA process (Ahn et al., 2023; Bojovic et al., 2015; Wesche & Armitage, 2014). Therefore, when discussing a CB approach, it is important to not only consider the stated objectives of the approach but also assess the extent to which the community is actively engaged and truly empowered throughout the entire process.

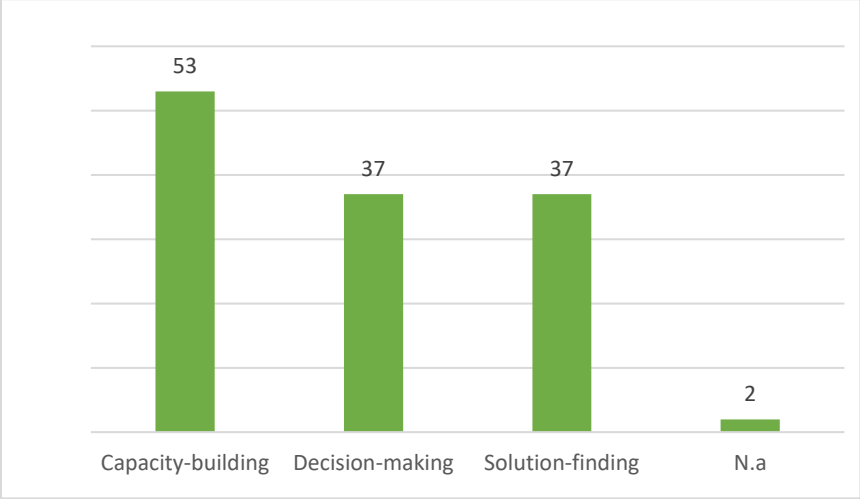

Figure 9: Number of papers by objective of the CB approach.

It is important to highlight here that applying a specific label to define the objective of a CB approach is indeed a complex process. It involves carefully reading and interpreting the paper to understand the intended purpose of community participation. However, this process can be subjective and open to interpretation due to several reasons:

- the objectives of the community-based approach may not always be explicitly stated or clearly defined in the paper. The authors may focus on multiple objectives that overlap or build upon each other, making it challenging to pinpoint a single objective. When multiple objectives were found to be relevant in a paper, we chose to indicate more than one objective. However, if one objective was significantly more prominent than others, we focused on highlighting the prevailing objective.
- The emphasis of the approach may shift during the implementation process. While an objective may be mentioned, the actual focus of the approach could be more on another aspect. This could be due to evolving project needs, changing priorities, or unforeseen challenges encountered during the implementation.

- The labels used to report the objectives of the community engagement process were determined by the authors of this deliverable in advance. During the analysis, the findings from the papers were categorized based on these predetermined labels. This approach allows for a systematic analysis and comparison but may also introduce variations in interpretation: we acknowledge that different individuals may analyze the papers differently, leading to potentially varied results.

In terms of **sector of intervention**, the analysis of the CB approaches reveals a diverse range of sectors in which they are applied. Some approaches specifically target climate-related disaster risks or adaptation issues, while others address climate change or natural hazards more broadly. Within the first group, there are approaches focused on managing floods or droughts, agricultural and forestry practices, tourism sector resilience, and urban and infrastructure planning. In contrast, the latter group of approaches takes a broader perspective, encompassing disaster management, resource management, ecosystem management, and nature-based solutions. The wide variety of sectors addressed by the CB approaches, coupled with the differences in how these sectors are categorized in the papers, makes it challenging to classify the approaches into a limited set of categories. The lack of a standardized framework for sector classification contributes to the difficulty in identifying clear patterns across the literature. Therefore, it is important to recognize the multifaceted nature of the sectors in which CB approaches are applied.

As this deliverable serves as a foundation for task 4.2 “CB Early Warning Systems (EWS) based on preparedness principles to empower individuals and communities”, it is important to highlight that 6 papers specifically address community participation in the development of early warning systems. Among these papers, 2 discuss the development of bottom up EWS in Indonesia (Bott & Braun, 2019; Sutton et al., 2022); another paper focuses on a similar approach implemented in Brazil (Marchezini et al., 2017); similarly, one paper explores community participation in the establishment of an EWS in Nepal (Gladfelter, 2018). Furthermore, one paper presents an EWS framework for European Nordic countries (i.e., Denmark, Iceland, and Finland) with an emphasis on community participation and preparedness principles (Henriksen et al., 2018). Lastly, one paper conducts a literature review of case studies that integrate local knowledge into the context of setting up monitoring systems and warning signs for early detection and response (Vasileiou et al., 2022). These papers collectively provide valuable insights into the various approaches, experiences, and challenges related to community participation in the development of CB Early Warning Systems.

The analysis of papers based on their **primary focus**, either on CCA or DRR, reveals that 82% of the papers primarily address solely disaster risk while a smaller proportion (slightly over 17%) solely focus on CCA without directly addressing the topic of disaster risk.

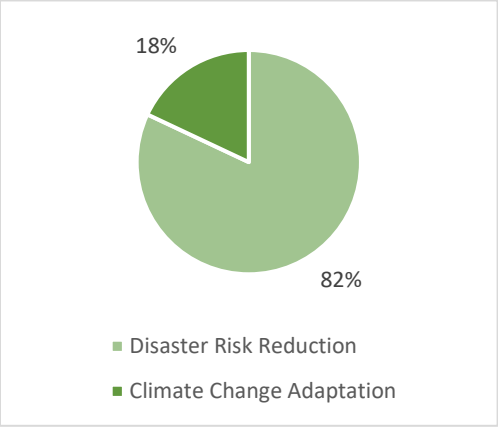

Figure 10: Percentage of papers focusing mainly on CCA or DRR.

Categorizing the papers into predefined **phases of DRR and CCA** was difficult for the following reasons:

- each paper employs different terminology and criteria to define which activities belong to a specific phase.
- Many papers integrate CCA and DDR because they are examining disasters related to climate change: it is common for risk prevention activities to also serve as climate change adaptation measures. In cases where DRR and CCA activities are closely interconnected in the studied papers, we have chosen to use the phases of the DRR cycle.
- Boundaries between phases of the DDR and CCA are often unclear, and there is an overlap and blurring between them so the classification of papers into cycle phases is to be taken carefully.

Consequently, the distribution of CB tools across the identified cycle phases (Figure 11 and 12) is to handle with care, as it captures general trends but may not capture all nuances and variations in the literature.

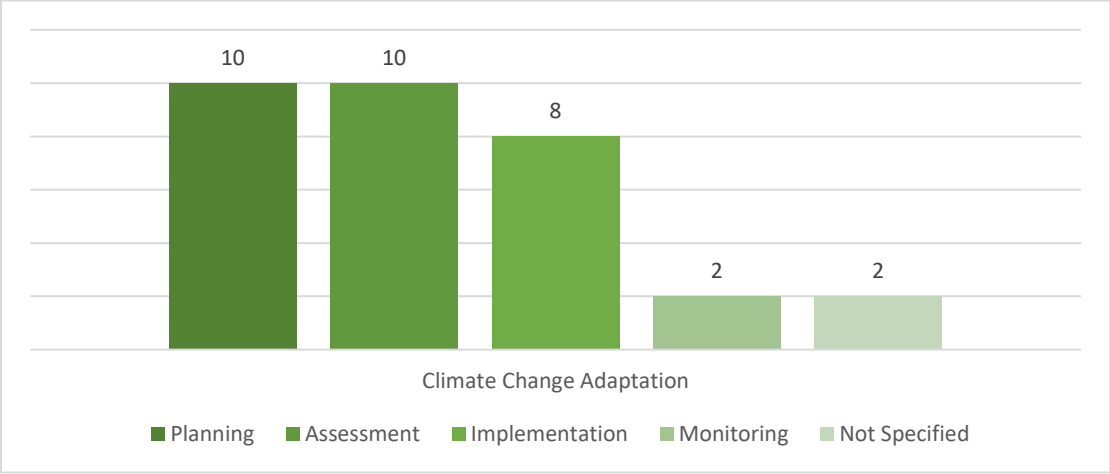

Figure 11: Number of papers by CCA cycle phases.

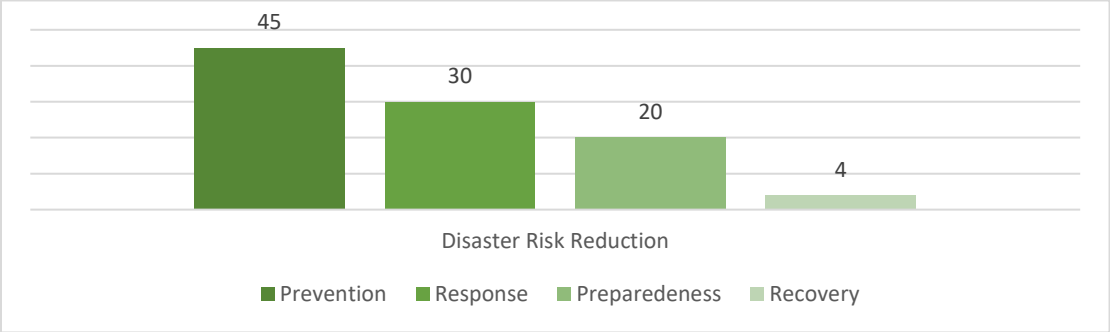

Figure 12: Number of papers by DRR cycle phases.

The literature analysis has revealed a diverse range of **tools and methods** employed within community-based approaches for DRR and CCA. The tools and methods differ in different way: (a) in terms of the phase of the DRR and CCA cycle during which they are applied; (b) in terms of the objectives they aim to achieve, such as hazard ranking and assessment, vulnerability and resilience assessment, climate change strategy discussion, elaboration, implementation, and evaluation, information gathering and dissemination, consultation, and more. The tools also differ in the level of community participation they entail; (c) in terms of how participation is interpreted, conceived, and planned by those who lead the process (e.g., community consultation, collaboration, or community empowerment. Some papers perceive participation as community information sharing, while others view it as community consultation, collaboration, or community empowerment; (d) socio-economic, cultural, institutional and context factors.

The analysis of the papers revealed that often the tools of the CB approach primarily focus on enhancing people's capacities, on supporting the community in identifying and prioritizing solutions, or on facilitating community consultation. Moreover, even when the tools support a comprehensive bottom-up decision-making process, they often apply only to certain phases of the DRR/CCA cycle, rather than encompassing the entire cycle (Barrett et al., 2015; Duda et al., 2020; Islam et al., 2020). As a result, it is not the entire DRR/CCA cycle that becomes community-based, but only specific parts of it.

The methods described and tested in the analyzed papers divide in:

- participatory and co-design methods.
- Qualitative-quantitative methods.

Among the participatory and co-design methods, the most used are workshops (described in 55 papers). A workshop is a flexible participatory activity for actors' involvement, collaborative learning, problem-solving, and capacity building, where participants engage in activities and discussions (Caron Chess & Kristen Purcell, 1999; Sanoff, 1999; Young et al., 1993). The paper analyzed mainly mentioned the following types of workshops: Delphi workshops, Future workshops, Charettes, and the World Café. To have a meaningful discussion about workshops as a community participatory method, it is essential to discuss the specific tools that are used during workshops. Within workshops, the most frequently employed set of tools includes generating concept mapping, problem and decision trees, scenario adaptation pathway,

maps, and SWOT analysis. 34 out of 74 papers (47%) describe a CB approach that uses one or more than one tool within this set. The second most common set of tools, described in 16 papers (21%), conducted during workshops includes the elaboration of seasonal calendars, trend analysis, and timeline building. Follow: matrix and rankings, costs-benefits analysis, SWOT analysis, multicriteria analysis; videos and readings; stakeholders and network analysis. The second most common participatory method (described in 31 papers) is group interactions in the forms of discussions, meetings, and online platforms, mentioned in 17 (23%), 8 (11%), and 6 (8%) papers respectively.

Among the qualitative/quantitative tools, the most used are the ones needed for gathering information and relevant data from community members (described in 40 papers, the 54%). Information might refer to vulnerability, resource allocation, risk perception, community needs, and resilience, among others. 15 out of 74 papers (20%) mentioned structured, unstructured, or semi-structured interviews as the preferred technique used to gather relevant data, while 16 papers (22%) reported using quantitative tools, such as closed questionnaires, to collect information. 5 papers describe focus groups as an information gathering tool (7%). Besides these tools, also observations (described in 12 papers, the 16%) - transect walks (7), field visits (3), town watching (2) - are used to record events and qualitatively collect information from a certain community.

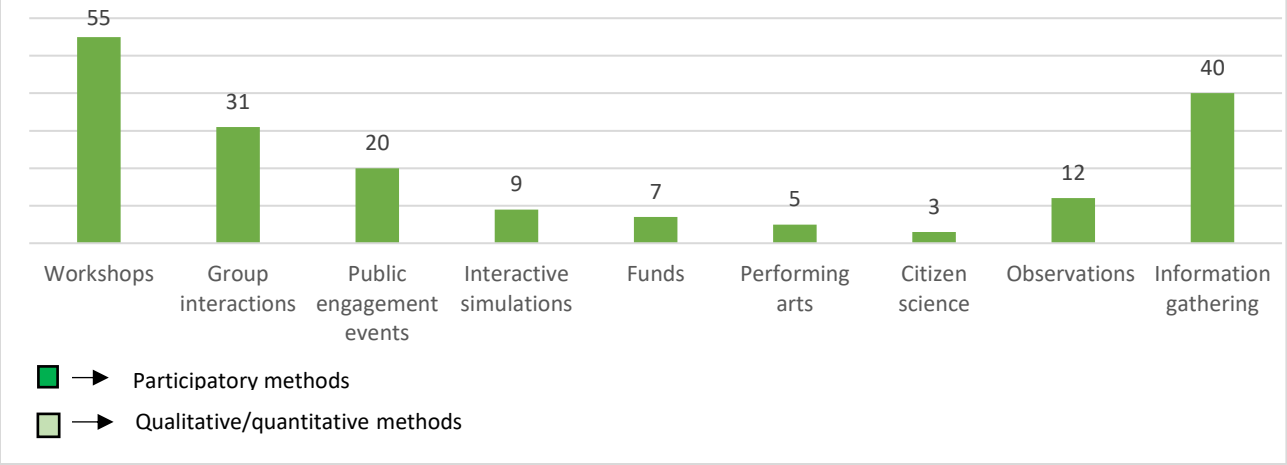

Figure 13: Number of papers by method.

Table 2: Participatory methods, tools, and a brief explanation

PARTICIPATORY METHOD	PARTICIPATORY TOOLS	BRIEF EXPLANATION
Workshops (Delphi, Future workshop, Charette, World Café)	Scenario adaptation pathway, Concept mapping, Problem trees, Decision trees, SWOT analysis, Mapping	Techniques for visually organizing concepts, ideas, and relationships to analyze, evaluate and take decisions.

	Seasonal calendar, Trend analysis, Timelines	Representations and examinations of patterns of events over time.
	Costs benefits analysis, Multi criteria analysis, Matrix and rankings	Assessing and analyzing for planning and assigning values to options.
	Videos, Readings	Conveying information and knowledge through visual and written formats.
	Stakeholders' analysis, Network analysis	Identify and assess interests, influence, dynamics, and relationships.
Group interaction	Discussions	Unstructured conversations for exchanging ideas and opinions.
	Meetings	Formal gatherings for collaborative discussions and/or decision-making.
	Online platforms	Digital spaces facilitating communication, collaboration, and information sharing.
Public engagement event	Information desks	Dedicated areas to disseminate information and provide assistance.
	Public displays	Visual presentations in public spaces to share information and raise awareness.
	Seminars and lessons	Educational sessions conducted by experts to convey knowledge and skills.
Performing arts	Theatre	Live performances to convey messages, stories, or ideas.
	Songs	Musical compositions to convey messages, express ideas, and evoke emotions.
	Oral Histories	Narratives about past events, experiences, or traditions.
Interactive simulation	Serious games	Educational games designed to address serious issues and promote learning.
	Mocks	Simulated situations used for practice and training.
Citizen science		Collaborative scientific research approach that involves members of the public in data collection.
Funds	Participatory budgeting	Financial resources allocated by the community and for the community for specific purposes.
	Money saving groups	Collaborative initiatives where individuals pool their savings for mutual support.
QUALITATIVE/QUANTITATIVE METHOD	**QUALITATIVE/QUANTITATIVE TOOL**	**BRIEF EXPLANATION**
Observation	Transect walks	Walking through an area to observe and record changes in environmental characteristics and human activities.
	Field visits	On-site visits to collect first-hand information and engage with local communities.
	Town watching	Data collection in urban areas to understand patterns of resource use, activities, and social dynamics.

Information gathering	Interviews	Face-to-face conversations with individuals to gather information and insights.
	Focus groups	Group discussions and in-depth interviews involving a small number of participants to explore specific topics or issues.
	Questionnaires/ Survey	Structured set of questions to collect data and opinions.

4.1.2. Main findings from grey literature

A total of 51 papers were gathered for the grey literature review. Nonetheless, only 18 of these papers provided a comprehensive description of the application of CB approaches, suitable for an in-depth examination. Most of these papers present compilations of case studies, resulting in a total of 41 instances of CB approach applications analyzed.

Regarding the **geographical scale** of method, tool, and approach applications, our evaluation of the grey literature centered on documents featuring case studies from both within and outside the European Union (EU). Parallel to the findings from the scientific literature review, most of the examined CB applications in the grey literature pertain to countries beyond the EU. Specifically, out of 41 case studies, only 1 (2%) was conducted within Europe (Sweden), while the prevalent countries were Nepal (3), Indonesia (3), Malawi (2), Peru (2), Sri Lanka (2), and Kyrgyzstan (2). The deployment of a community-based adaptation (CBA) inherently hinges on contextual factors and is customarily tailored to the social and cultural intricacies of the targeted community. However, it's worth noting that the socio-economic and cultural framework of local communities in the EU and Italy substantially contrasts with that of countries outside the EU, particularly at the local or community level.

The **geographical context** of the Community-Based Adaptation (CBA) applications is predominantly local in 35 instances (85%). In four case studies, activities extend to the regional level in addition to the local level (10%). Furthermore, three case studies encompass a portion of the entire approach conducted at the national level (7%). There is a lack of information about the geographical scale in two case studies. Setting the boundaries of the geographical location (e.g., rural, mountain, urban, …) is instead quite complex and many CB applications are settled in mixed environments (e.g., rural/mountain, urban/island). Therefore, in some case studies, we characterised the setting with multiple environmental attributes. This is why the number of environmental settings presented in Figure 14 is higher than the number of the case studies analysed. Of the total CB applications, 22 (54%) are situated in rural settings, while 12 (29%) are in urban environments. Additionally, three cases (7%) are focused on river basins, five (12%) pertain to island or

coastal areas, six (15%) center around mountainous landscapes, and geographical specification is absent in three cases (11%).

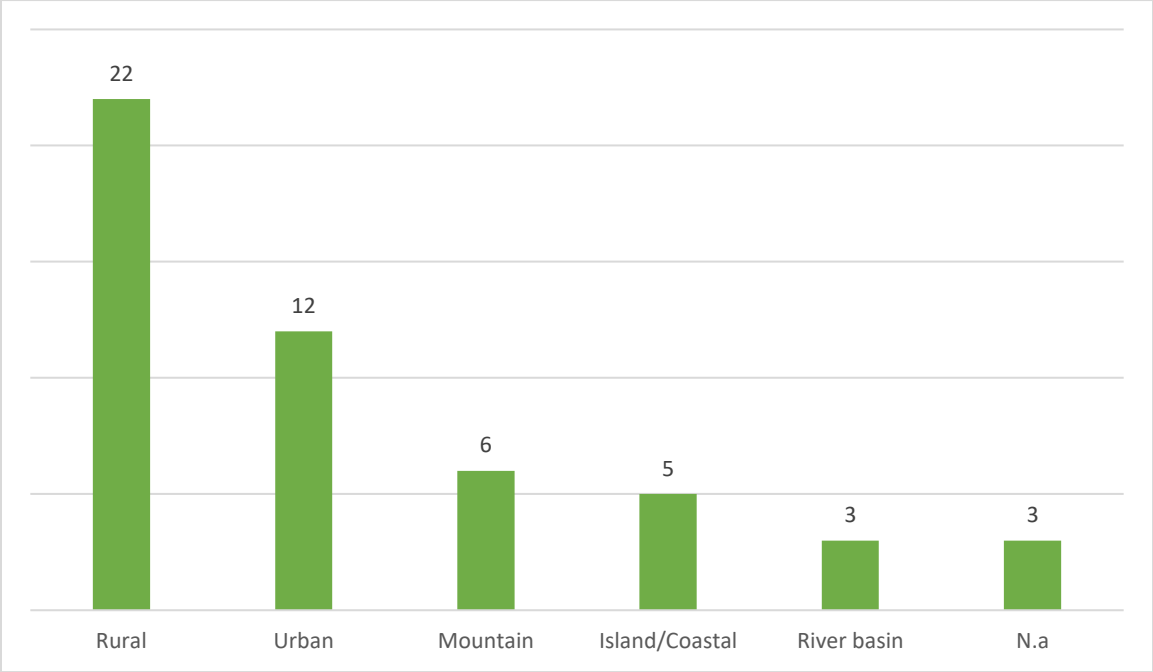

Figure 14: Number of case studies by geographical context.

Regarding the **types of communities** engaged, an analysis of the grey literature underscores that most approaches involve multiple types of communities. Specifically, 31 approaches (76%) are implemented with at least two distinct types of communities. Out of these, 25 (61%) encompass both a community of place and a community of interest, while 4 (10%) combine a community of place with a community of practice. In 10 case studies, CBAs are focused on a single type of community: one study involves a community of interest (farmers), six studies center around a community of place, and three studies concentrate on a community of practice (e.g., a collective of public and private stakeholders,

encompassing government officials, academia, civil society, the private sector, and citizens, already engaged in addressing coastal risks).

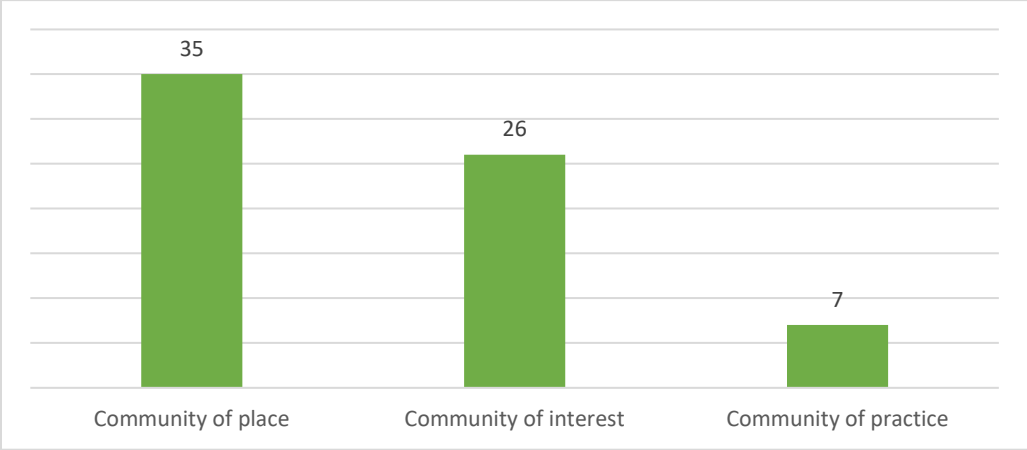

Figure 15: Number of CB approaches by type of community involved.

The most recurring community´s members engaged in the CBAs is rural villages residents (23 case studies - 56%), in some cases organized in village committees, whereas in other projects citizens are involved in activities with less structured workshops and focus groups. Public administration officials are engaged in 13 (32%) case studies; in some cases, as reference point to facilitate the engagement of the local community by international NGOs or academic groups, but in some other cases public officials were directly engaged in the CBA as an active group in workshops, focus groups or local disaster risk management committee. These are the case studies where a dedicated role of a public administration (or related technical agency) is specified, and due to the concise description of some case studies in grey literature, setting the boundaries of the community´s members engaged in the process is not always feasible. Schools are specifically involved in CBA activities in 9 (22%) projects and even farmers are another recurring stakeholder (5 projects – 12%). Specific key vulnerable categories (women, elders, and person with disabilities) are explicitly engaged in 7 case studies (17%).

The **main objectives** of the CBAs analyzed in the grey literature are quite diversified. This is clearly influenced by the geographical scale of the project, the type of community and community´s members engaged, the presence of public administration officials involved in the CB activities and by the duration of the process. Furthermore, here again the heterogeneity of documents and publications from the grey literature hampers a straightforward and clear identification of the key dimensions and objectives of each CBA application. Moreover, grey literature is mostly composed by institutional or NGOs' reports on the organization own activities, frequently presenting CBA applications without a neutral assessment of the project outcomes or of the effectiveness of the community engagement activities. In some papers goals and targets of the CBA developed are presented in an optimistic standpoint, but the real effectiveness of the approach is not evaluated at the end of the activities, especially in terms of stakeholder inclusion in the decision-making process and in the identification of intervention strategies or measures. On the

contrary, many CBA experiences are developed by DRR or CCA international organizations with high expertise and skills in this sector and they apply CBAs as a result of many previous experiences and tests. Thus, in many cases, the CBA activities are part of wider DRR or CCA projects, applying well-structured approaches, previously tested in various other projects.

Made these premises, some points can be highlighted on the main goals of the approaches described and studied in the grey literature. The CB approaches described are often organized over a plurality of steps and activities, sometimes starting with risk awareness activities and training programs of the involved community (i.e., capacity-building) followed by a second group of activities dedicated to improving decision making procedures and to identify policy options (i.e., solutions-finding and capacity-building). In 10% of the selected case studies the CBA is structured over this whole process, from risk awareness activities to the identification of strategies and measures. On the contrary, in the 37% of the analyzed CBA applications, the activities start with training programs and risk awareness activities (i.e., capacity-building) and ends with the inclusion of the community in activities aimed at collecting data and local knowledge, with the aim to increase the quality of the decision-making process and to better tailor decisions to the local context. In these approaches, there is no explicit mention to the identification of strategies or measures throughout the participatory process. On the contrary, CB approaches with a single goal seem to be less frequent: none CB approach is exclusively dedicated to public awareness, capacity building or solution finding; 12% of the approaches has risk awareness and capacity building goals and 17% of the approaches is dedicated to the decision-making process. As previously stated, even though the CBAs analyzed in the grey literature seem to be overarching and ambitious in goals and in the level of participation fostered, these documents are often reports and publications coming from the same organization that planned and organized the CB activities. Usually, there are not third-party evaluations and a detailed description of activities and outcomes obtained. Therefore, it is difficult to have a clear picture on the level of engagement of the target community. This point is again coherent with the considerations coming from the scientific literature review.

Regarding the **phase of the DRR/CCA cycle**, the analysis of the grey literature revealed that most CBA are dedicated to DRR or civil protection activities. The 69% (28) of the case studies is dedicated to: DRR planning (32% of approaches analysed), civil protection planning (15%) or early warning systems (22%).

21% of case studies are dedicated to adaptation planning processes and 10% is dedicated to integrated climate change adaptation and disaster risk reduction planning.

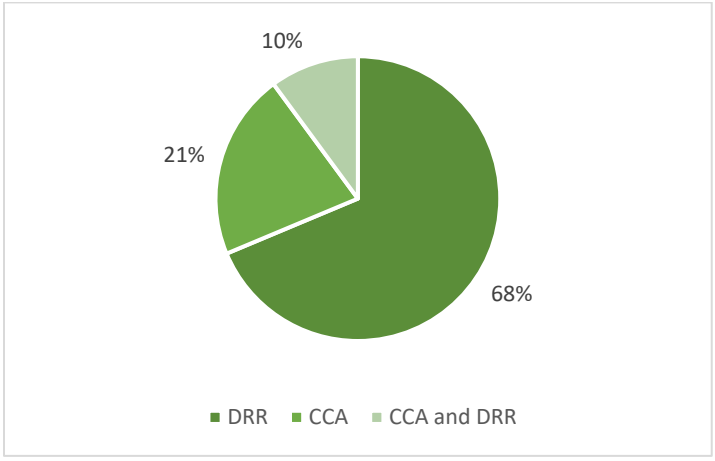

Figure 16: Percentage of papers focusing on CCA or DRR or both

As regards the specific **sector of intervention**, it is worth noting that CBAs projects dedicated to adaptation start between 2005 and 2010. A first collection of case studies dedicated to community-based adaptation was developed by the International Institute for Environment and Development in 2009. These adaptation projects are focused on various sectors: 8 case studies are dedicated to agricultural production (20%), 1 to urban planning and 2 to the management of water resources.

Looking at the case studies focused on DRR topics and analyzing them by the phases of the DRR policy cycle, it emerges that there are no applications of CBAs to response or reconstruction activities. DRR case studies are dedicated to preparedness (56% of the whole case studies analyzed) and/or prevention activities (39%), whereas the application of the CBA to climate change adaptation issues is split between climate risk and vulnerability assessment activities (34%) and adaptation option identification and assessment (39%).

The approaches presented in the grey literature apply a series of **tools** for inclusive decision-making. However, in the grey literature there is no detail description on project activities and on the tools used to facilitate the inclusion and the engagement of stakeholders and communities in the CBA process. The most recurring tools are workshops, meetings, focus groups, interviews, online surveys, trainings, specific tools for climate vulnerability and capacity assessment, participatory vulnerability analysis (to mobilize people to assess the root causes of their vulnerability at different social levels); participatory videos (children are

informed on climate change; then, they interviewed other children and elders to collect info about cc and impacts).

4.2. Models of trust dynamics in disaster risk reduction and climate change adaptation

This section presents a reasoned review of model of trust in the context of DDR and CCA, by mainly considering mainly the scientific peer-reviewed literature. By summarizing the key findings, this section is divided into 3 subsections. The first subsection includes the results and draws upon dimensions and corresponding categories described in Chapter 3, the second subsection includes a discussion of the literature concerning trust, and the third subsection introduces the limitations concerning the measurement of trust dynamics in the selected studies.

4.2.1. Main findings from peer-reviewed literature

In total, 196 papers were selected by abstract reading; 101 papers describing trust dynamics were pertinent to the study aim and fully analyzed. Most papers were found using the **search string** "trust and community and disaster and resilience" (57), followed by "participatory and trust and community and climate change" (26), and "participatory and trust and community and risk reduction" (18).

Figure 17 provides an overview of the type of selected studies on trust dynamics. Most of the studies (37) were quantitative research (cross-sectional analytic, longitudinal, or experimental studies), followed by qualitative research (31), studies with participatory design (25) and mixed methods research (8).

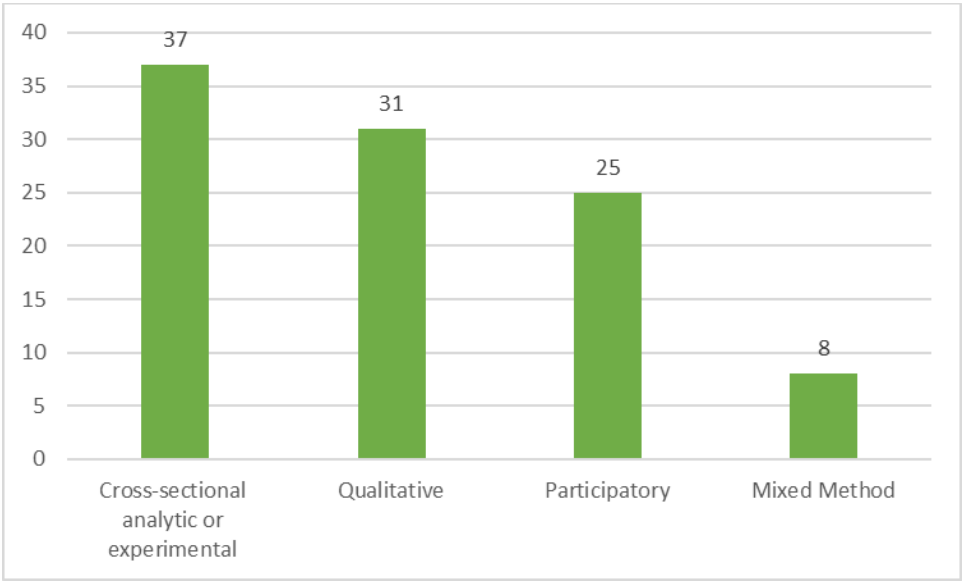

Figure 17: Type of studies on trust dynamics.

A wide range of keywords were employed to index the examined papers. Figure 18 provides an overview of the number of papers identified by main keywords. "Resilience" appeared in the highest number of

papers (43), followed by "Preparedness" (18), “Trust” (14), "Social capital" (13), “Risk perception” (10), and “Health” (11).

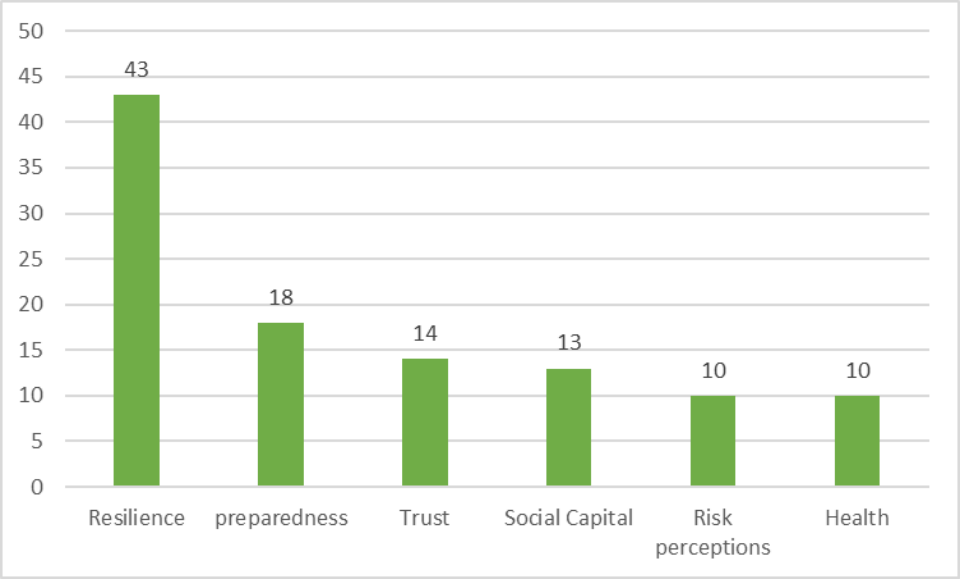

Figure 18: Number of papers by selected main keywords and topics.

Figure 19 and Figure 20 provide information about the **geographical scale** and context of the areas studied in the analyzed papers. Figure 19 reveals that the trust dynamics discussed in the papers cover a range of countries across North and South America, Oceania, south Asia, Europe, and Africa in a gradually decreasing way. However, there is a lack of studies exploring the trust dynamics in the MENA region and in Central and North Asia.

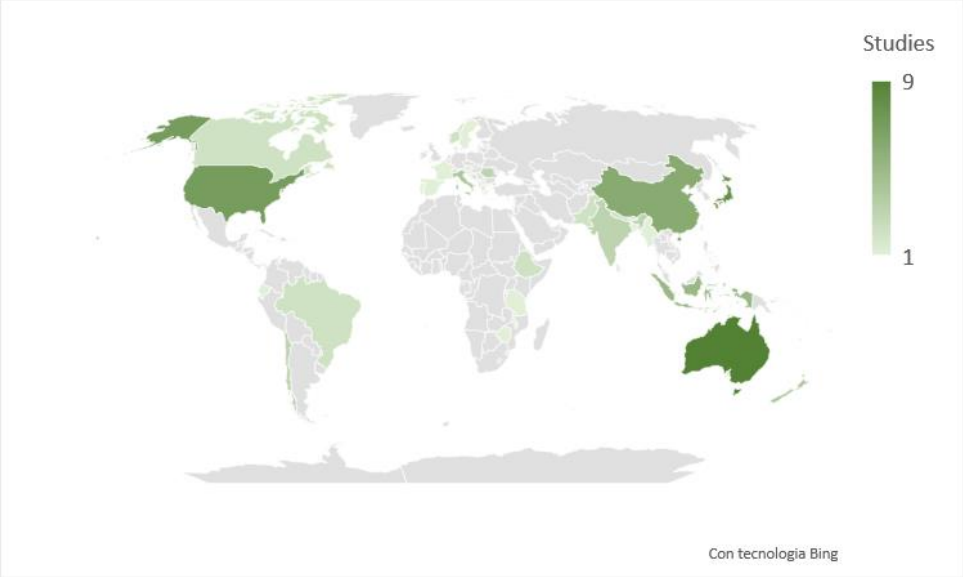

Figure 19: Number of trust dynamics studies by geographical scale.

Figure 20 provides an overview of the **geographical context** where the trust dynamics studies reported in the papers have been applied. The main context includes rural, mixed geographical setting, coastal and urban areas, followed by large metropolitan areas, islands, and mountain regions. Specifically, the geographic context we have named as “mixed” represents studies conducted in places with multiple characteristics, such as being both coastal and rural, or urban and island.

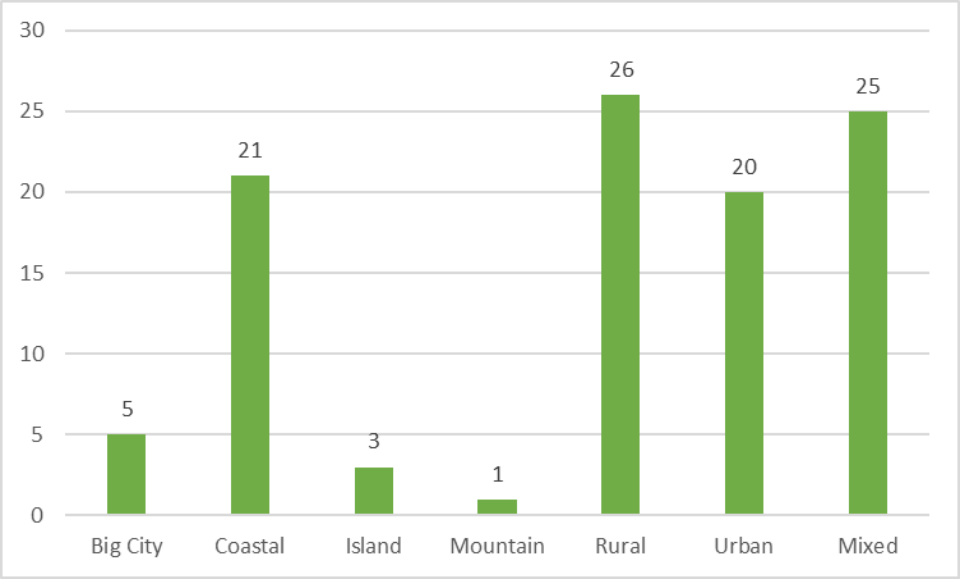

Figure 20: Number of trust dynamics studies by geographical context.

Regarding the **type of community** involved, out of the 101 papers analyzed, 58 of them display approaches aimed at disaster risk reduction and/or climate change adaptation that involve members of a community of place. It's reasonable that those who live in or spend a lot of time in the affected area would be the people most involved in these studies. Community of place have historically acted collectively to manage weather-dependent, fluctuating, and seasonal change, on which their livelihoods depend. Also, the impacts of community trust in the field of DDR and CCA are felt particularly by this type of community through a multitude of primary and secondary effects cascading through social systems.

Communities of practice are present in 20 of the 101 studies. The trust dynamic studies that involve this type of community describe research designs that engage members of an NGO, officials responsible for civil protection, or representatives from local, regional, or national institutions (i.e., volunteers, government officials, researchers, agencies members). The actors that compose this type of community operate as a network, fostering regular interactions and establishing relationships among its members. The communities of practice often serve the function of assist communities of place by providing community information, helping communicate messages to the public, and improving the public's trust in national government health agencies.

Communities of interest are present in 17 of the 101 studies. People who work as farmers, rangers, company owners, or fisherman make up the majority of the community of interest. Community of interest are represented by people who have similar needs, goals, or worries over a certain subject or situation, usually belonging to the same land. In the event of a disaster, local communities which share common interests are often the first responders before the support from outsiders […]. These persons are civil society actors, landowners, women, people with disabilities, indigenous minority, students, members of religious groups, and representatives of civil protection organizations.

Finally, 6 of the 101 studies on trust dynamics were classified as “mixed community” because they involved two or three types of communities.

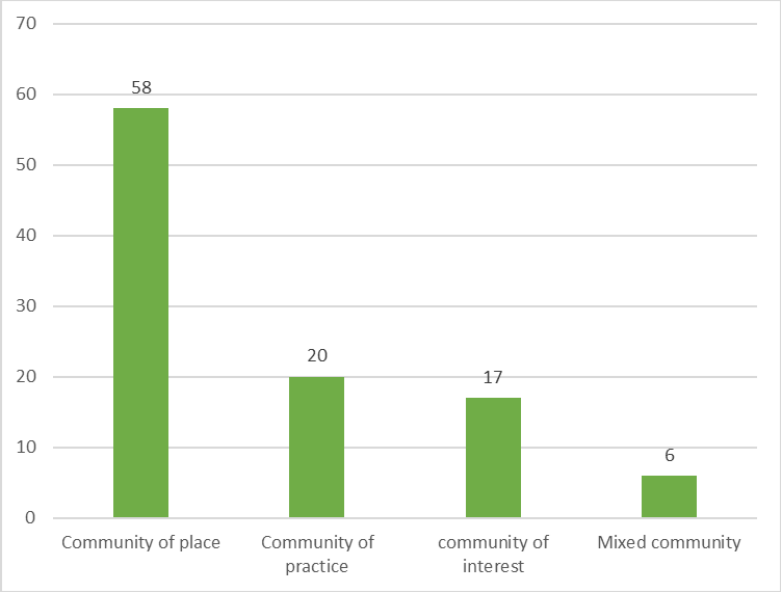

Figure 21: Number of trust dynamics studies by type of community involved.

Out of the 101 papers analyzed, 39 papers describe research in which behavioral and psychological aspects related to trust dynamics involving the community in relation to DRR/CCA topic were evaluated. Most of these studies had a qualitative approach, aimed at identifying important variables related to trust dynamics in relation to different phases of DDR and CCA.

On the other hand, 38 papers test an approach that has been theoretically developed by the authors and then tested in specific cross-sectional designs. In these studies, the aim was to understand the psychological antecedents, behavioral patterns or health aspects related to trust dynamics. The literature highlights different variables significantly related to community trust, both positively and negatively. For example, it was found that building trust among community residents is related to social capital (a set of social networks that include reciprocity, common rules, norms, and public engagement that helps to understand how a community organizes itself to work with rapid change) (Correa-Velez et al., 2014, Kirbyet al., 2019, Shahid et al., 2022) and on repeated social interactions over an extended period (Gero et al., 2020; Joerin et al., 2018).

Among the selected papers, 21 present a developed approaches aimed at improving the community trust. However, the level of community trust varies, as well as the phase of the DRR or CCA cycle in which the decision is made. For example, recovery experiences influenced patterns of trust in local communities, and shaped people’s expectations of future disaster management. Also, positive experiences during the

recovery process fostered trust and confidence in others, whereas negative experiences tended to erode trust and generate uncertainty. In addition, a resilience approach as well includes the impact of trust and trustworthiness, all of which are enablers of coordination, cooperation, and organizing and distributing responsibility in the community for future disaster management.

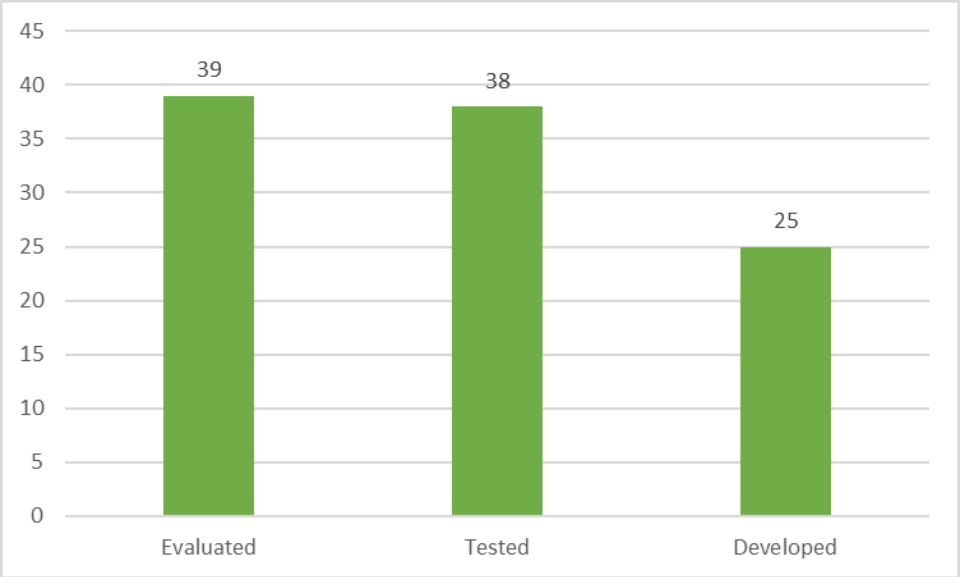

Figure 22: Number of trust dynamics studies by level of application.

Figure 23 provides an overview of the categorization of the papers into predefined phases of disaster risk reduction (DRR) and climate change adaptation (CCA). Firstly, many papers integrate both CCA and DRR activities. Since we are examining disasters related to climate change, it is common for risk prevention activities to also serve as climate change adaptation measures. The analysis reveals that most papers (31) focused on the response phase, in which the adaptive capacities or resources to adaptation after a disturbance or adversity are examined; 18 papers focused on the preparedness phase, referring to factors that can influence the degree to which people prepare for a disaster, including: the extent to which they feel that they are in danger of experiencing a disaster (risk perception); their past experiences of disasters; and the sociocultural context; 9 papers focused on prevention phase; 8t papers focused on reconstruction phase.

Finally, most of the studies on trust dynamics were classified as “Mixed phase”, because they address DDR and CCA from multiple phases perspectives and because many papers integrate both climate change adaptation and disaster risk reduction activities. With respect to this overview, it is important to note that each publication uses a distinct set of terms and standards to specify which actions fall under certain phases, making categorization difficult. Additionally, there is frequently overlap and blurring between phases, and the lines dividing them are frequently unclear.

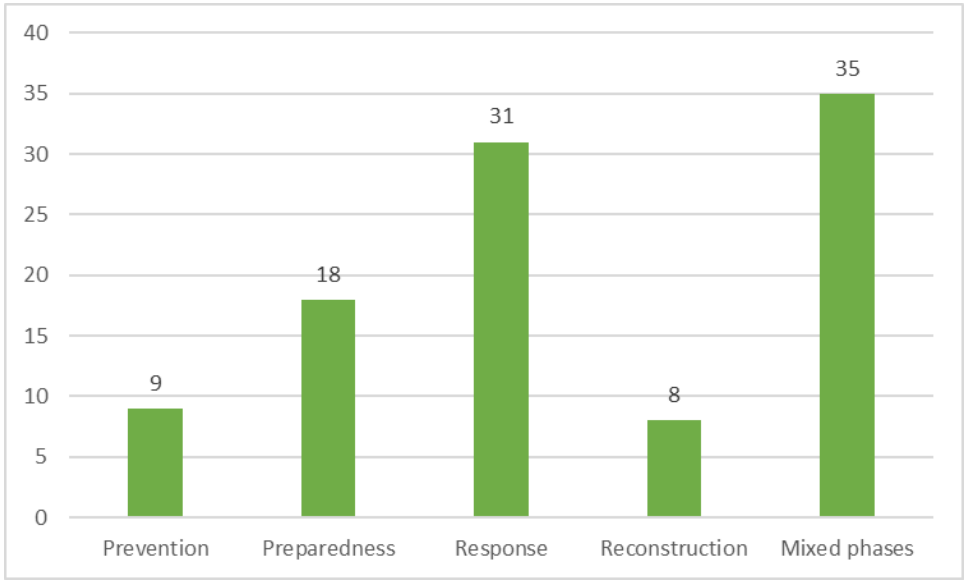

Figure 23: Number of trust dynamics studies by DRR cycle phases.

Figure 24 presents the distribution of papers based on their primary focus, either on CCA or DRR. The analysis reveals that 66% (67) of the paper papers primarily address the topic of disaster risk. On the other hand, 14% (14) of papers focus on CCA without directly addressing the topic of disaster risk. 20% of the papers included a focus on both topics (DDR and CCA).

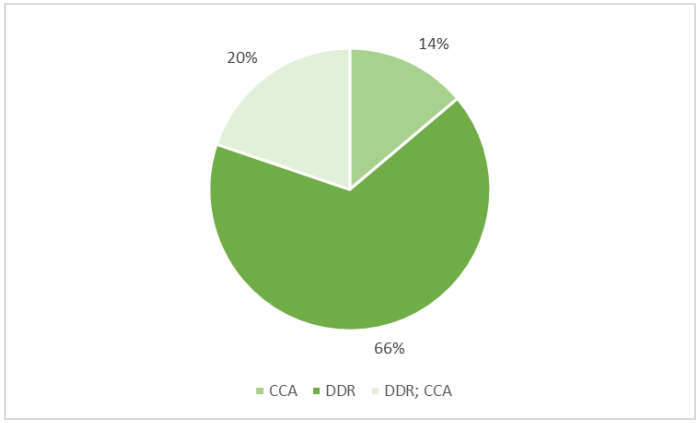

Figure 24: Percentage of papers focusing on CCA or DRR.

The literature analysis has revealed a diverse range of tools employed within the studies on trust dynamics for DDR and CCA worldwide. The tools exhibit variations in several aspects. Firstly, they differ in terms of type of studies in which they are applied (interviews or focus groups for qualitative studies, questionnaire for cross-sectional studies, and mixed methods for participatory interventions). Additionally, they vary in

terms of the objectives they aim to achieve, such as disaster perception, community engagement, adaptive capacity, vulnerability and resilience assessment, climate change perception, social capital, and various level of community trust.

Accordingly, the main issue in assessing trust dynamics is translating abstract and complex notions into measurable terms. Existing measures of trust are problematic as they do not always account for the indicators' multifaceted and dynamic nature. Consequently, the literature review yields a comprehensive set of tools with considerable diversity.

As shown in Figure 25, mixed methods are the most used tools in the studies (36); they could include focus group discussions, open-ended interviews, surveys, questionnaires, and observation. On the other hand, 27 studies used survey method, followed by interviews (23), questionnaires (11), focus groups (3) and workshops (1).

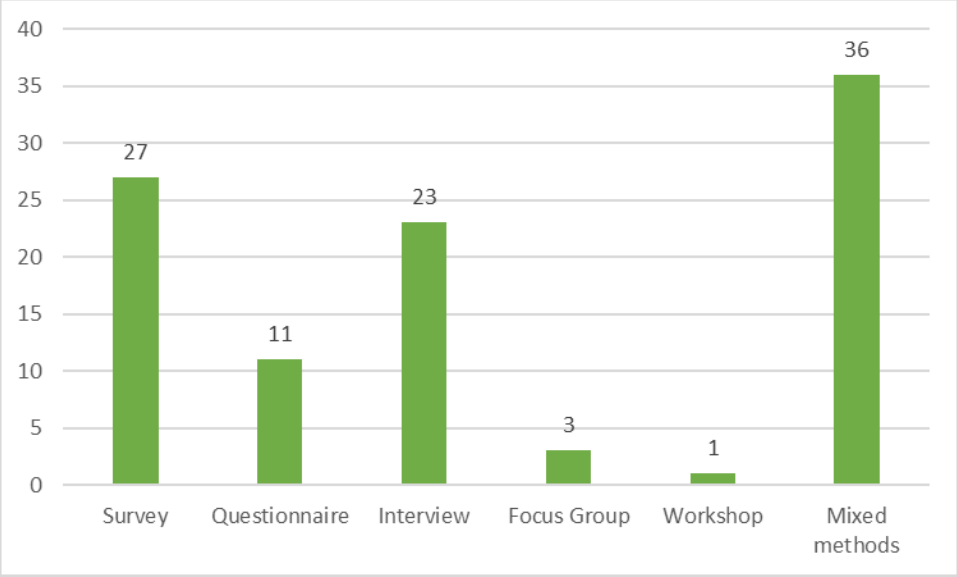

Figure 25: Number of papers by tools.

4.2.2. Summary of main findings on trust dynamics

There is a consensus among scholars that populations that are more prepared for emergencies are more capable of better reacting during the materialization of varied adversities (Hemond & Rober, 2012). A multitude of aspects influences the preparedness and resilience on the individual, family, community, and society levels, which may mitigate the response to natural hazards (Stone et al., 2014). Overall, literature suggests that trust (in local and national entities) is one of the most important elements. It is a fundamental requirement for individuals to understand risks and process uncertainties (Sutton et al., 2021; Longstaff & Yang, 2008). With respect to the importance of community trust, recent literature continues

to emphasize how it is vital for effective disaster management and preparedness (Bodas et al., 2022; Faisal et al., 2021; Matthews et al., 2020).

The different phases of DRR (e.g., prevention, protection, mitigation, response, and recovery) are influenced by community trust at each level. All these levels are highly interdependent and require using existing preparedness networks and activities, coordinate and unify efforts, improve training, and exercise programs. Consequently, at each of these stages it becomes critical to implement community trust. In the phases of prevention, protection and mitigation, Pratama and Nurmandi (2020) emphasize how the interdependencies amongst national agencies and organizations through interactive processes such as face-to-face dialogues increase community trust, build social capital, and can develop into collaborative culture, which substantially increases the speed of decision-making and leads to fruitful collaborations against disaster (Ansell & Gash 2008; Emerson et al. 2011; Kapucu, Arslan & Demiroz 2010). Significantly, these authors show that trust in terms of dependability and competence is substantially associated with collaborative planning. At this stage, efforts should be implemented to engage the community in emergency preparedness: preparing brochures on disaster readiness and their medications, conducting audience research on where diverse residents get trusted health risk information before and during disasters, enlisting volunteers in medical units and standing up neighbor-to-neighbor disaster assistance networks, and holding formal public deliberations about difficult decisions anticipated in the emergency, such as how best to use scarce medical resources (Schoch-Spana et al., 2015). It is important forging relationships and building trust through diverse cross-sector collaborations and partnerships before disasters. Such collaborations and partnerships were shown to tailor disaster response to the needs of specific communities and populations as well as address key challenges such as gaps in information, services, and resources (Pollock et al., 2019). In these initial stages of preparedness to natural hazard, Norris (2008) describes the effective use of information and communication as the “creation of common meanings and understandings and the provision of opportunities to articulate needs, views, and attitudes” (p. 140). Patin (2020) also emphasizes how the capacity of effective communication is closely linked to community trust. Defining characteristics of this capacity include responsible media, narratives, skills, infrastructure, and especially trusted sources of information; specifically, for information to be useful it needs to come from a trusted information source, which have previously demonstrated reliability.

With respect to the response phase, Matthews and colleagues (2020) emphasizes the importance of social cohesion, which can be implemented through community trust. Personal social cohesion helps to facilitate group-level coordinated action with individual-level health consequences (Macinko & Starfield, 2001). It is assessed through individual subjective perceptions of levels of belonging, generalized reciprocity (kindness of strangers), optimism (hope for the future) and especially of social trust (trust in strangers) (Berry & Shipley, 2009). It has been observed that social trust is relevant for understanding prosocial forms of community participation (e.g., volunteering), influencing levels of social cohesion (Ding et al., 2011). Feelings of trust could also increase perceptions of access to emergency information, knowledge of community resources, and help with transportation during disaster periods, ultimately impacting perceptions of community preparedness (Goidel et al., 2019). At the same time, the response process should also focus on local capacity-building programs agreed between community, NGOs and institutions

that are specific and consistent for the population (Tsai et al., 2022). These programs should train the local communities and NGOs to communicate with the government, also to avoid disputes during the post-disaster recovery and reconstruction phases. As a result, an aim of the programs is to strengthen the trust between the community, NGOs and governments, given that mutual trust is crucial for the partnership (Baas et al., 2008).

In the recovery process, on the other hand, it is critical to manage the relationships between disaster-affected and neighbouring populations. Trust, social norms, and networks are crucial in triggering successful outcomes in rebuilding disaster affected areas (Joerin et al., 2018). Specifically, Gero and colleagues (2020) found that following a natural disaster, the relocation of individuals from affected areas to a different community was associated with weakening of both generalized and local trust, thus suggesting that dismissing the role of trust in the recovery process could have detrimental effect on social cohesion and consequently also on the broader management of the disaster. For this reason, institutions must be able to manage the recovery process and the relationships between the local communities while avoiding the weakening of community trust.

4.2.3 How to integrate trust dynamics into the community-based approach for Disaster Risk Reduction and Climate Change Adaptation

As already observed, the scientific literature concerning public health preparedness system for managing natural hazards stresses that it is necessary to implement the community trust on multiple levels (i.e., individuals, communities, and businesses, and government public health agencies) which are all responsible for the system's overall integrity. However, a key issue is represented by the detection of appropriate strategies to measure and promote community trust. The importance of trust has been proven in many disaster situations (Castro-Correa et al., 2020; Sadri et al., 2018). A common feature of current frameworks available to measure trust in disaster management is their reliance on indices to measure resilience (e. g., trust in public health department, Adams et al., 2018; trust in local implementers, Anderson et al., 2021). However, many social indicators are not easily measurable, because it can be difficult to capture the dynamic nature of trust. For example, social trust and community trust are difficult to measure directly, because they are process indicators rather than simply measurable outcome indicators (Kwok et al., 2016).

Hence, there exist both theoretical and practical challenges when attempting to quantify the changes in trust over time, often making it unfeasible to confine trust assessment to a numerical scale. To illustrate, gauging the quantity of community-based organizations within a particular community may fail to adequately capture the underlying social capital, which serves as a fundamental attribute of trust. Consequently, more meaningful approaches are needed to identify the role of community-based organizations in enhancing trust and in sustaining a culture of resilience (Cutter, 2016).

In fact, the effective use of direct measures for a comprehensive trust assessment is minimal, since their use is mainly limited to higher level trust investment decision making and comparison of trust level across multiple settings. For example, direct methods such as questionnaire surveys have been used to measure indicators such as levels of trust in public health, trust in government, or trust in authorities (Adams et al.,

2018; Bian et al., 2022; Alves et al., 2021). However, the feasibility and replicability of such methods are questionable due to time and resource constraints and provides significant theoretical and practical obstacles in updating and monitoring trust within a community context (Heyns & Rothmann, 2021). Consequently, there is an important need for a reliable, and resource- and time-effective approach to assess trust dynamics in DRR. In addition, indirect methods were also used to measure trust. For example, voter turnout has been used as an indirect measure of trust in political institutions in democracies, or the per capita consumption of bottled water has been conceived as another relevant proxy indicator of trust in water supply organizations. However, the use of these methodologies is frequently limited to specific locations. It might sometimes be difficult or expensive to collect enough indirect observations to make useful conclusions.

Accordingly, a main issue in assessing trust dynamics is translating abstract and complex notions into measurable terms. Existing measures of trust are problematic as they do not always account for trust indicators' multifaceted and dynamic nature. Therefore, innovative, and reliable measurement approaches are required to improve the incorporation of trust dynamics measures in disaster management policy and practice. The adoption of a mixed approach to trust, which has received limited attention in a disaster management context, may assist in overcoming the conceptual issues associated with measuring such indicators, by capturing important aspects of the target indicators and facilitating robust trust dynamics measurement.

After the critical review of the literature on trust dynamics in DRR and CCA, we propose two key issues and a possible implementation of a mixed method for comprehensive analysis of trust within a community. First, a considerable number of theoretical frameworks have yet to be put into practice, while the ones that have been applied were solely within settings where the implementations relied on the usage of census data that is publicly accessible, with the objective of creating trust indices (Antronico et al., 2023; Appleby-Arnold et al., 202; Gero et al., 2020). The selection of census data variables has an important limitation, in that the required objective variables may not be available or directly translatable to the indicator being measured. Other frameworks have used direct indicators such as interviews and surveys, which take time and are difficult to update on a regular basis (Joerin et al., 2018). Also, the existing trust frameworks typically neglect important, more dynamic, and process-oriented indicators largely due to the difficulty in their measurement.

Second, the key conceptual challenge in measuring trust in DRR and CCA for community resilience is that both trust and resilience are not stable aspect, but also process-oriented phenomena. Thus, a need exists to use both process and outcome indicators. The outcome indicator shows how well certain activities accomplish their proposed results, and the process indicator is a measure of how well the activities are implemented (Cox & Hamlen, 2015). Both, process, and outcome indicators are vital for measuring trust dynamics, because process indicators help to understand the community and the sustainability of community initiatives, whilst outcome indicators indicate community capacity building and empowerment achievements (Kafle, 2012). For example, the number of civic organizations is a measure of civic engagement in social networks. Nevertheless, the presence of several civic organizations cannot improve trust dynamics on its own. It is critical to understand how the activities of a civic organization might

promote community trust, which are process-oriented indicators. Hence, there is a need to conceptualize an innovative approach to enable effective assessment of trust that objectively captures key facets of indicators to be longitudinally assessed and easily updated.

Notably, a mixed approach has received limited attention in disaster management context to date. This innovative approach to trust dynamics can help to address the challenges in identifying key facets of process-oriented social resilience indicators which have proven difficult to measure.

A mixed methods research design is a procedure for collecting, analysing, and "mixing" both quantitative and qualitative research and methods in a single study to understand a research problem. O'Cathain et al. (2007) explains that "using both qualitative and quantitative methods allow an issue to be addressed more widely and more completely" (p.148) and can be a legitimate reason for conducting mixed methods research, and this also applies for trust dynamics in DRR. To ensure that researchers can assess the "yield" (O'Cathain et al., 2007, p.147) of mixed methods research, it is important to clarify how integration has been achieved at different stages of a study. This can be enabled by an integration of procedures for design, conversion, analysis, interpretation, and integration stages.

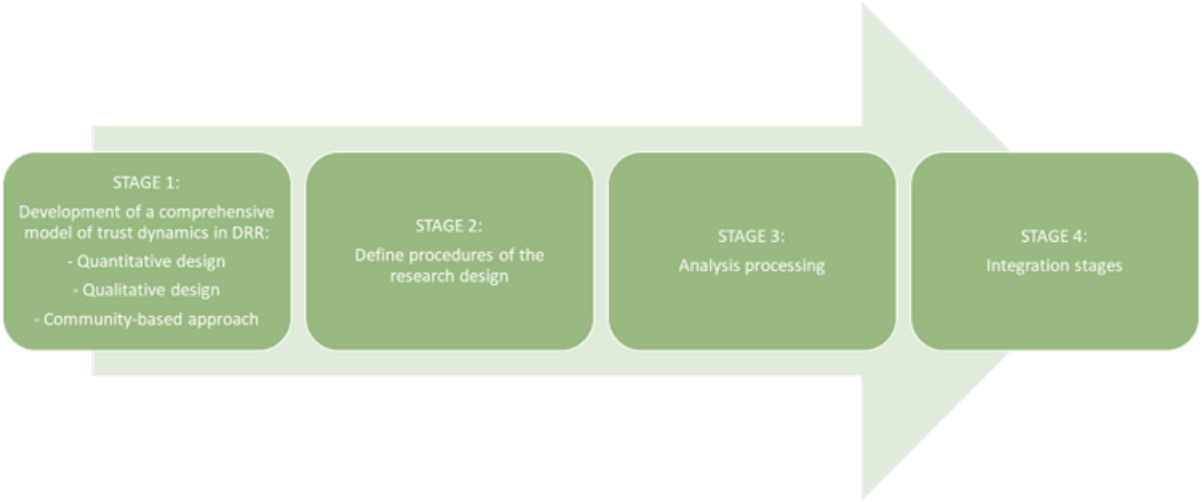

Figure 26: Mixed method process for measuring trust in DRR for community resilience

The first stage involves the identification of the proper framework to apply in a given context and situation for the analysis of trust dynamics and their indicators, also in relation to the specific phase of DRR and CCA (e.g., preparedness, response, recovery). This initial stage serves to generate the set of questions and hypotheses that focus on both the quantitative and qualitative aspects of research; it also serves as a prerequisite for preparing community-based interventions.

In the second stage, it is crucial to outline the procedures for research design, data collection, and sampling. This stage is essential for ensuring that the research is conducted in a systematic and organized manner, laying the foundation for the subsequent stages of analysis and integration. This stage is necessary

to select the appropriate subset of individuals and entities to recruit for answering specific research questions. In this stage, it is also critical to identify which kind of information is imperative to retrieve and how it will be collected (e.g., by survey, interviews, focus group, and so on) to address specific indicators of trust, based on the selected methodologies, the nature of the research questions, and the available resources.

After the completion of data collection, which relies on the decisions made in Stage 1 and Stage 2, Stage 3 indicates to analyze data using suitable methodologies that encompass and capitalize on both qualitative information (e.g., via the application thematic content analysis on interviews) and quantitative information (e.g., via the application of statistical analysis on surveys).

Stage 4 involves the combination of qualitative and quantitative data and their interpretation and integration, so to provide a picture of trust dynamics and their development in the specific context. The synthesis implied in this stage of integration will also serve as an indirect measure of participation to and effectiveness of CB approaches.

It is noteworthy that both qualitative and quantitative research have already provided valuable insights into the dynamics of trust in DRR and CCA. However, on their own, these two approaches have limitations in drawing certain conclusions. A merely quantitative approach fails to explain the reciprocal influence between trust dynamics and community resilience in the specific context of DRR and CCA, whereas a merely qualitative approach prevents researchers to make casual inferences on the relationship between trust and other variables related to resilience.

By considering the interaction between these two approaches, a comprehensive interpretation of the response to community-based actions and their impact can be achieved.

Nevertheless, it is important to emphasize that in order to conduct a fruitful examination of trust dynamics through mixed method research, and to ensure that the research has a beneficial effect on encouraging community involvement, agency, and resilience, it is essential to improve the quality of communication from institutional agencies and their ability to engage citizens. This requirement for effective investigations and interventions on trust dynamics in DRR and CCA will be extensively discussed in Chapter 5.

4.3. Model of the effectiveness evaluation of the community-based approaches

This section presents a comprehensive review of the literature on effectiveness evaluation of CB approaches for inclusive decision-making in the context of DRR and CCA. It is divided into two sub-sections: the first focuses on the main findings from peer-reviewed literature, while the second examines the same aspects but with a focus on grey literature. By summarizing the key findings, this section draws upon dimension five, and corresponding categories, described in Chapter 3.

4.3.1. Main findings from peer-reviewed literature

The literature review reveals that papers differ in terms of the rigor and methodology employed in evaluating the effectiveness of community-based approaches. Some papers adopt a systematic approach to evaluate the outcomes and/or impacts of participatory tools, utilizing robust data collection methods

and predefined effectiveness frameworks, dimensions, and indicators (Islam et al., 2020; Khadka et al., 2018a; Knapp et al., 2017; Samaddar et al., 2022). Other papers (Chowdhooree et al., 2020; Songok et al., 2011; Van Aalst et al., 2008; Wamsler et al., 2020) provide a more qualitative or anecdotal assessment of effectiveness without following a structured evaluation process. The variability in the systematic evaluation of effectiveness can be attributed to several factors, including (a) paper research objectives, (b) available resources, (c) time constraints, and (d) disciplinary or methodological differences.

The effectiveness evaluation methodologies which papers report vary according to (i) when the CB approach is evaluated, (ii) the scope of the evaluation, (iii) and the method used to evaluate. Concerning the **"when"** the evaluation occurs, some papers conduct the evaluation *in-itinere*, during the implementation of the CB approach (Chowdhooree et al., 2020; Fazey et al., 2021; Khadka et al., 2018a); others assess the approach shortly after its completion *(evaluation ex post)* (Brugger et al., 2018; Clissold & McNamara, 2020; Samaddar et al., 2022), while a few studies evaluate the approach over a longer period, spanning months or even years (Chacowry, 2023). Additionally, some papers compare data collected before, during, and/or after the implementation of the approach (Chan et al., 2017).

Concerning the **scope of the evaluation**, papers vary in terms of the objective of the evaluation process, which influences the selection of indicators used to assess the effectiveness of the community-based approach. This literature review has revealed that evaluation methodologies can be process-oriented, focusing on the evaluation of the implementation and effectiveness of the CB approach; outcome-oriented, focusing on the results/outcomes/impacts of the CB approach on the community of place/geographical context in which it is applied; or a mix of both. While assessing the implementation of the CB-approach implies evaluating successful community engagement, assessing the outcomes of the CB-approach enables to evaluate reductions in DRR and progress in CCA.

Regarding the **methods used to evaluate**, and specifically regarding **how data are collected**, among the papers that employ specific and robust evaluation methodologies, the most frequently utilized data collection techniques include (i) structured interviews, (ii) surveys with representative samples, (iii) observation, and (iv) document analysis (e.g., adaptation or risk reduction strategies, government/NGOs documents). In contrast, less robust evaluation techniques involve (i) self-reported questionnaires without rigorous validation, (ii) non-standardized interviews, (iii) data collection relying on volunteers, subjective observations, and (iv) participant feedback.

As regards **how information and data are analyzed**, in most cases, the effectiveness of a community-based approach is evaluated by using a mix of different indicators. However, only a few papers mention indicators that meet all the quality criteria to be considered SMART or RACER indicators. The main challenge lies in defining indicators that can be quantitatively measured. Currently, most indicators used to assess the effectiveness of a CB approach are qualitative, such as measuring increased vulnerability, decreased resilience, social justice, equity, and fairness aspects.

Among **process-oriented indicators**, the most frequently reported, mentioned in 10 papers, can be categorized as measuring "inclusiveness and equity" during the CB process. This category encompasses

indicators which assess the extent of participation by representatives from different community groups, considering factors such as gender, age, ethnicity, faith, and socio-economic conditions, together with fairness in distribution of benefits among participants (D. Archer, 2016; Clissold & McNamara, 2020; McNamara et al., 2020; Samaddar et al., 2022). Another indicator, reported in 7 papers, is the level of participation, which refers to the degree of community involvement (involving the community extensively in decision-making processes or assign a more passive role) in DRR and/or CCA (Sarmiento et al., 2017; Wamsler et al., 2020). The level of participation serves as an indicator of effectiveness, with deeper community involvement being considered more effective than superficial participation (Chacowry, 2023; Chowdhooree et al., 2020). Lastly, a wide temporal scale is considered as an indicator of the effectiveness of a CB approach in 6 papers. It refers to the sustainability of the participatory process over time: if the approach continues to be employed beyond its initial stages and demonstrates long-term application, it is deemed effective (Clissold & McNamara, 2020; Sarmiento et al., 2017).

Among **outcome-oriented indicators**, positive unintended effects/outcomes/impacts of CB approaches are considered a meter of their success in 27 papers. These unintended effects refer to the indirect benefits that arise from community involvement in disaster risk and climate change management, such as improvements in broader social, economic, and environmental conditions (Bott & Braun, 2019; Chacowry, 2023; Lin, 2019). Specifically, the papers highlight the strengthening of social networks, increased self-reliance and self-efficacy, and community empowerment as positive unintended effects on the social system. Improved risk management is the second most mentioned indicator of effectiveness (20 papers), encompassing successful coping strategies, enhanced prevention and preparedness, improved response, and reconstruction (Liu et al., 2018; Thaler et al., 2019, 2022). Knowledge and capacity enhancement is reported as an indicator of effective community-based approaches in 17 papers, reflecting improvements in community learning about climate change and risk issues, as well as the ability to adapt to climate change impacts and mitigate hazards (Bakema et al., 2019; Ensor et al., 2018; Sakurai et al., 2020).

Table 3: Number of papers per effectiveness indicator identified[2].

RESULTS ORIENTED	NUMBER OF PAPERS	PROCESS ORIENTED	NUMBER OF PAPERS
Increase resilience	7	Level of participation	7
Decrease vulnerability	10	Extent of participation	1
Risk management	20	Inclusiveness and equity	10
Climate change management	8	Transparency and accountability	2
Positive social/economic/environmental indirect effects	27	Acceptability and appropriateness	5
Increase knowledge and capacities	17	Wide spatial scale	1
Fair distribution of benefits	2	Wide temporal scale	6

[2] The total number of papers in this table exceeds the number of papers analyzed for this literature review because some papers report multiple indicators simultaneously.

Impact on policy formulation and governance	9		
Feasibility	7		

Overall, while the indicators of effectiveness are the measurable criteria used to assess the extent to which the community-based approach has achieved its intended goals, the **condition for effectiveness** focuses on the specific requirements that need to be in place for the community-based approach to be effective. It should be noted that certain papers consider as conditions for effectiveness what others have regarded as indicators of effectiveness. For example, inclusive and meaningful participation is considered both an indicator of the effectiveness of a community-based approach (in terms of its success in being truly community-based) and a condition for the approach to work. The distinction or boundary between the two is sometimes unclear. Additionally, conditions for efficacy often translate into recommendations for a community-based approach to be effective. The conditions for effectiveness vary significantly among papers, making it challenging to provide a concise summary of all the information.

In general, the conditions for effectiveness focus on several key aspects, including:

- Characteristics of the community: This includes factors such as social cohesion, distribution of power, willingness to participate, economic conditions that meet basic livelihood needs, place attachment, absence of fatalism in the face of natural hazards, and the level of education, flexibility, and open-mindedness of individuals (Clissold & McNamara, 2020; Songok et al., 2011; Van Aalst et al., 2008).
- External context: This pertains to the supportive legal framework, institutional and governmental support, the presence of the rule of law, and good governance practices (Knapp et al., 2017; Mercer et al., 2010; Zubir & Amirrol, 2011).
- Availability of resources and knowledge: This encompasses the availability of technical, financial, and human resources, as well as the integration of multiple sources of knowledge, including scientific and local knowledge (Ahn et al., 2023; Bott & Braun, 2019; Thaler et al., 2019).
- Efficient participatory tools: Having prepared facilitators, expertise in organizing the approach, overcoming language barriers, ensuring effective communication, engaging with citizens in smart ways, clarifying benefits (Bubb & Le Dé, 2022; Choptiany et al., 2017; Van Aalst et al., 2008).
- Respect for community norms, priorities, and values: This entails aligning the community-based approach with the norms, priorities, and values of the community being served (Cradock-Henry et al., 2021; Thaler et al., 2019; Wolff et al., 2021).
- Access to information and knowledge: Ensuring that the community has access to relevant information and knowledge related to disaster risk reduction and climate change adaptation (Khadka et al., 2018b; Lasage et al., 2015).
- Previous experiences with participation: Drawing on past experiences with community participation in decision-making processes (Islam et al., 2020).

- Inclusive and deep participation: Ensuring the inclusion of diverse community members and going beyond mere consultation to achieve deep participation in decision-making processes. Ensuring that the community's ideas and perspectives are effectively integrated into the DRR and CCA strategies (Bott & Braun, 2019; Chapin et al., 2016; Chowdhooree et al., 2020).
- Accountability, legitimacy and transparency of the community involvement process (Barrett et al., 2015; Grüneis et al., 2018; Songok et al., 2011).
- Trust: Building trust among community members and between community members and facilitators/authorities/NGOs involved in the process (I. S. Campos et al., 2016; Ford et al., 2016; Sutton et al., 2022).
- Decentralized authority: Allowing for decentralized authority and decision-making power in the management of disaster risk and climate change (Ahn et al., 2023; Chu et al., 2016; Zubir & Amirrol, 2011).
- Sense of collective efficacy and self-efficacy: Fostering a sense of collective and self-efficacy within the community to take action and address risks and challenges (Bott & Braun, 2019; Duda et al., 2020; Sutton et al., 2022).
- Balancing wide reach and quality: Striking a balance between the wide reach of the disaster risk reduction and climate change adaptation strategy and the quality of the strategy itself (Chu et al., 2016; Van Aalst et al., 2008).
- Shared responsibility: Avoiding placing the entire responsibility for DRR and CCA solely on the community, recognizing that causes and solutions may be rooted in wider national and international dynamics (Cretney, 2018; Gladfelter, 2018; Van Aalst et al., 2008).
- Data sovereignty: Ensuring the community has access to information on and/or control over where, with whom, how and when project data are shared (Bhawra et al., 2021).
- Ongoing evaluation to iteratively redesign activities that are not effective (Brugger et al., 2018).

As regards the **results of implementing a CB approach** to DRR and/or CCA (whether it has been successful or not), it is observed that papers often present achievements in an unsystematic manner. This means that papers often combine the results concerning the success of the approach in engaging the community (process-oriented results) with the results related to its effectiveness in managing disaster risks and addressing climate change (impact-oriented results). Moreover, the definition of success varies across papers, depending on how "community-based" and "community participation" are conceptualized, as well as the specific research objectives. Indeed, while some papers explicitly state the research objective, others don´t. Overall, results in terms of the efficacy of the community-based process align with the effectiveness indicators presented earlier, as results are typically presented (explicitly or implicitly) as achievements based on the effectiveness indicators utilized by each paper. In the specific, most of the papers present positive results both in terms of community participation and disaster risk reduction and/or climate change adaptation (Chacowry, 2023; Henriksen et al., 2018; Khadka et al., 2018a; Zubir & Amirrol, 2011). However, when presenting results, papers often tend to emphasize the successful aspects of the community-based approach while neglecting to discuss elements that were less clearly successful. For instance, studies may highlight the success of an approach in involving the community in assessing its

vulnerability, developing an adaptation plan, or facilitating post-disaster reconstruction. However, these same approaches may have failed in adequately involving minority groups or addressing the needs of marginalized individuals within the adaptation plan (Restrepo et al., 2018; Schmid et al., 2016). As a result, there is a lack of comprehensive discussion regarding community-based approaches that considers all the elements necessary for a CB approach to be called effectively participatory, and for risk and climate change to be effectively managed. Moreover, it is important to note that many of the papers also acknowledge that the reported results primarily capture the situation shortly after the conclusion of the community involvement project (Knapp et al., 2017; Yang, 2020). In most cases, a comprehensive long-term analysis of the project is lacking, which provides limited clues about the sustainability of the community-based approach over time and its long-term impacts on DRR and/or CCA.

4.3.2. Main findings from grey literature

As previously mentioned, grey literature primarily compiles CB experiences of both international and national institutions, as well as NGOs. Most of the reviewed papers consist of collections of diverse case studies, presented briefly, lacking specific discussions on the evaluation of utilized approaches. None of the papers offer quantitative assessments of project activities or the effectiveness of the participatory approaches. Descriptions outlining the strengths and weaknesses of various CB approaches are available within the guidelines put forth by national or international institutions, as well as NGOs, particularly with an emphasis on DRR and CCA. However, the analyzed papers provide numerous insights into the conditions contributing to the effectiveness of the methods applied in the respective case studies. Among these insights, certain dimensions consistently emerge as **conditions of the effectiveness** of CB approaches in DRR and CCA projects:

- The engagement of the target community should be integrated across all phases of the CB project, spanning from its initiation to the final evaluation phase. During the initial stages, the goals and objectives of the participatory process should be shared with both the community and the principal stakeholders of the project. Furthermore, there should be clear and evident advantages for the local community to participate in the CB project, and those facilitating the engagement should be capable of articulating these benefits right from the outset. It is essential to vividly demonstrate the results and concrete outcomes of the engagement process. For instance, in certain case studies, the proposed CB methodology and the primary expected outcomes have been adapted in response to the emerging community needs right at the project's inception (UNDP, 2007; UNISDR, 2017). Other case studies underscore the significance of collaboratively generating all project outputs (such as informational materials, educational content, and research publications like academic journal articles) in partnership with the community (CARE, 2014). Actively involving the community in the activities of the CCA/DRR project also carries the benefit of fostering ownership of the CB approach and increasing the community's commitment to engaging in CB activities throughout the entire project duration.
- CB approaches typically form a component of broader DRR/CCA projects. Nevertheless, even if the CB approach isn't the central focus of the project, specific financial resources should be allocated to it. This is crucial to ensure the progression of activities and the sustained engagement

of the community throughout the entire CB activities duration (UNDP, 2007). Additionally, certain professionals, such as facilitators, play a pivotal role in effective CB processes. Therefore, funding to support these essential roles must be seamlessly integrated into the project budget.

- Striking a balance between scientific information and local knowledge: several case studies have acknowledged both knowledge as essential to draft local strategies for mitigating vulnerabilities (IIED, 2009). Local knowledge is vital for identifying coping mechanisms and adaptive solutions. In certain projects, the process of pinpointing climate change adaptation strategies commenced with an evaluation of technologies and solutions already in practice among farmers. Nonetheless, the incorporation of scientific knowledge becomes indispensable when devising solutions to address unparalleled climate impacts. For instance, farmers in the Andes region (Bolivia and Chile) exhibited an understanding of localized weather patterns, yet they lacked insights into the more intricate relationships between sea temperatures and anticipated weather changes, as well as the ability to forecast critical meteorological phenomena.
- A holistic approach is advised, manifesting in various forms: (a) The collaboration between communities and local governments, as well as authorities, remains indispensable throughout the entirety of the project. It's pivotal to engage pertinent government departments, extending from central offices to the grassroots level. Mechanisms like organizing committees or coordinating bodies can be devised as formal solutions. In one case study, a shared secretariat was established among local public administration officials, community stakeholders, and international NGOs (UNDP, 2007). (b) Even when a project focuses on specific issues and target groups, research papers underscore the significance of involving a broader spectrum of stakeholders to enhance the inclusivity of the initiatives. For instance, in projects centered on agricultural production, involvement should transcend farmers, as the entire community holds importance in comprehending the environmental context and broader community needs. Moreover, in many economically challenged countries, the entire family engages in agricultural activities, with women playing a pivotal role in harvesting tasks, albeit not directly participating in decision-making processes. Consequently, engaging entire families rather than individuals emerges as an effective solution to address gender-related concerns and bolster the efficacy of the CB approach (IIED, 2009). Several papers also underscore the pertinence of engaging elders or village leaders to ensure the sustained engagement of the entire community throughout the project's duration. (c) The role of local non-governmental, formal, or informal institutions (e.g., churches, schools) can prove pivotal for effectively engaging the local community, maintaining consensus, and nurturing behavioral change (UNDP, 2007). (d) The presence of academia and the scientific research community has emerged as a key resource in cultivating an effective CB approach. In some instances, universities and research institutions have amassed pertinent local data, vital for delving into local cultural dynamics and traditional knowledge (UNISDR, 2017).
- A successful approach for enhancing the effectiveness of a CB approach involves striking a balance between traditional/local and contemporary risk communication methodologies. In specific case studies (UNDP, 2007), risk communication has leveraged methods resonating with the target communities (such as festive events, community gatherings, and information billboards). This

strategy heightened the efficacy of communication efforts, ensuring broader community engagement and clearer message conveyance (CARE, 2014). Conversely, other instances have documented the utilization of communication techniques proposed and executed by international NGOs, often involving communication experts. For instance, participatory videos were developed in a project that engaged children to interview elders and other pivotal stakeholders. This approach notably heightened children's awareness of climate change impacts. Additionally, integrating participatory videos into pre-existing disaster and climate change risk reduction initiatives strengthened the nexus between scientific climate data and local wisdom, fostering more meaningful adaptation discussions. Nonetheless, it's important to acknowledge that participatory videos *"cannot magically alter power dynamics within communities and might even exacerbate or reinforce them" (IIED, 2009, pag. 127).* The introduction of video-making, often a novel venture in numerous communities, can potentially lead to tensions surrounding access and usage rights. Furthermore, people might share experiences differently on camera compared to other forms of interaction. Beyond videos, innovative communication techniques have been implemented. For example, one case study documented awareness campaigns led by students through the creation of a climate-focused newspaper. Initially, students collected climate change data and weather information, which they then organized into a Student Climate Newspaper, distributed to their parents and the wider community (UNISDR, 2017). In another instance, the use of social media proved successful in expanding the reach of risk communication endeavors (UNISDR, 2017).

- The incorporation of incentives to actively engage the community in project activities has proven effective (e.g., recognizing outstanding videos or communication efforts created by students for the entire community) (UNDP, 2007).
- In certain CB projects, local actors have taken on the role of training their own communities in DRR/CCA matters. For instance, the "farmer-to-farmer approach" has been utilized, where local farmers receive training in farmers' schools from their peers. This approach involves learning novel farming techniques through field visits to other local farms (IIED, 2009). Moreover, in some case studies, children have been regarded not just as passive members of the community, but also as valuable contributors. Students are educated about disasters and climate change, imbibing the significance of community-driven initiatives in DRR from an early age. Subsequently, they assume the responsibility of educating other children and raising awareness among their parents and the broader community.

4.4. Summary of the main findings

Chapter 4 presented the primary findings derived from an extensive literature review encompassing methods for implementing a CB approach within the realms of DRR and CCA. Additionally, it delved into the dynamics of trust during CB approach implementations, and methods for evaluating the effectiveness of such approaches. Chapter 4 serves as the foundation for the development of a Conceptual Framework and the subsequent Guidelines for applying and evaluating CB Approaches, as presented in Chapters 5 and 6.

The literature review encompassed both scientific and grey literature. Specifically, our analysis covered a total of 193 resources. This included 74 scientific papers and 18 pieces from grey literature, all related to CB approaches and methods for evaluating their effectiveness. Additionally, we reviewed 101 scientific papers addressing trust dynamics.

Our findings regarding the methods and tools for implementing CB approaches indicate that these approaches have primarily been tested in countries in North and South America, Europe, Oceania, and South-East Asia. We observed fewer case studies in Africa, with a notable lack of case studies in the MENA region and central Asia. These CB approaches have been implemented in various geographical contexts, mainly in rural and urban areas. In terms of the types of communities engaged, the literature review revealed a prevalence of "community of place," followed by "community of interest" and "community of practice." There is no consistent pattern among grey and scientific papers regarding the number of community types involved, with some focusing on a single type of community while others involve two or three types simultaneously. Regarding the objectives of the CB approach (solution-findings, capacity-building, decision-making), our literature analysis uncovered the challenge of assigning specific labels to these approaches. This challenge arises from the need to interpret the paper's intended purpose, which can be subjective. Several factors contribute to this subjectivity: objectives may not be explicitly stated or clearly defined in the paper, there may be multiple overlapping or evolving aims, the approach's focus might change during implementation due to shifting project needs or unforeseen challenges, and the predetermined labels used for reporting objectives can introduce variations in interpretation. Consequently, different analysts may categorize papers differently based on these factors. Regarding the sector of intervention, the literature review highlighted the multifaceted nature of the sectors where CB approaches are applied. These approaches span various domains, from addressing specific disaster risks or adaptation issues to dealing with general concerns broadly related to climate change and natural hazards. Regarding the phases of the CCA cycle, most approaches analyzed in the papers focused on the planning, assessment, and implementation phases, whereas when it is about DRR, they focused on the prevention, response and preparedness phases. Furthermore, the literature review unveiled a wide array of tools employed to engage communities in various phases of CCA/DRR strategy development. Each approach utilizes distinct tools or sets of tools depending on factors such as the type of community involved, the number of participants, the desired level of community participation, and the specific purpose of the participatory activity (e.g., vulnerability assessment, risk mapping, adaptation pathway definition, etc.).

The analysis of papers regarding trust dynamics revealed that these studies covered various countries across North and South America, Oceania, South Asia, Europe, and Africa, with less representation in the MENA region and Central and North Asia. The geographical contexts studied included rural, mixed geographical settings, coastal and urban areas, with notable emphasis on community of place, followed by communities of practice, and communities of interest. The analysis of papers that focus on trust dynamics revealed that communities of practice often play a supportive role, especially in assisting communities of place by sharing community-related information, facilitating the dissemination of public messages, and enhancing public trust in national government health agencies. Regarding the phases of

DRR and CCA, most approaches analyzed in the papers focused on the response phase, followed by preparedness, prevention, and reconstruction. Many papers integrated both CCA and DRR activities, as these domains often overlap. Furthermore, the tools used in these studies varied widely, with mixed methods being the most common, followed by surveys, interviews, questionnaires, focus groups, and workshops.

The literature emphasizes the crucial role of trust in enhancing preparedness and resilience during various phases of DRR and CCA. Trust in local and national entities is considered fundamental for individuals to navigate uncertainty and understand risks; therefore, it is vital for effective disaster management and preparedness. Effective communication plays a significant role in the initial stages of preparedness, with trusted sources of information being essential. Social cohesion, facilitated by community trust, is highlighted during the response phase, influencing individual-level health consequences and community preparedness. In the recovery process, managing relationships between disaster-affected and neighboring populations is crucial, as mismanagement can weaken trust and social cohesion. Overall, the literature underscores the need to implement community trust across multiple levels, including individuals, communities, businesses, and government public health agencies, to enhance the public health preparedness system for managing natural hazards. To conclude, the literature analysis revealed that measuring trust dynamics in the context of DRR and CCA presents significant challenges. Existing frameworks often rely on indices based on available data or direct indicators such as interviews and surveys, which may not adequately capture the dynamic nature of trust. This is because trust is also a process indicator, and its measurement goes beyond numeric values. Additionally, many frameworks have not been implemented in practice, and some neglect important, more dynamic, and process-oriented indicators.

As the final step of our literature review, we focused on the analysis of effectiveness evaluation methods as proposed in the scientific and grey papers. The peer-review literature revealed variations in the rigor and methodology used to evaluate a CB approach effectiveness. Some studies employ systematic methods with predefined frameworks and indicators, while others provide more qualitative or anecdotal assessments. These differences stem from various factors like research objectives, available resources, time constraints, and disciplinary preferences. The evaluation methodologies also differ in terms of timing, scope, and methods used. Evaluations occur during implementation, shortly after completion, or over an extended period. The scope can be process-oriented, focusing on the participatory processes, or outcome-oriented, assessing the impact of the CB approach in terms of CCA and DRR. Methods for data collection range from structured interviews and surveys to field observation and document analysis. Some studies use less robust techniques like self-reported questionnaires, non-standardized interviews, and subjective observations. In terms of data analysis, most studies use a mix of indicators, but only a few employ indicators meeting quality criteria like being SMART or RACER. Among the process-oriented indicators, many capture aspects like inclusiveness, equity, level of participation, and sustainability of the participatory process over time. Outcome-oriented indicators include positive unintended effects, improved risk management, and knowledge and capacity enhancement, which are considered measures of effectiveness.

The reviewed grey literature predominantly comprises case studies of CB approaches for DRR and CCA provided by international and national institutions as well as NGOs which, however, often lack detailed discussions regarding the evaluation of these approaches and rarely include quantitative assessments. Some of these papers briefly outline the strengths and weaknesses of various CB approaches, usually within their guidelines and recommendations sections. Nevertheless, these papers do offer valuable insights into the factors contributing to the effectiveness of CB approaches in DRR and CCA projects. For example, they highlight the importance of community engagement across all phases of the CB approach. They also stress the need to allocate financial resources specifically for community involvement. Striking a balance between local and scientific knowledge is emphasized for effective decision-making. Additionally, they encourage holistic collaboration among communities, local authorities, diverse stakeholders, and local institutions such as churches and schools. Effective communication involves balancing traditional and modern methods of risk communication to ensure effective message delivery. Incentives are suggested to encourage active community engagement. Lastly, fostering local capacity building empowers local actors to take on roles as educators within their communities.

In summary, the analysis of the literature review has unveiled the diverse manifestations of a CB approach. This diversity hinges on factors such as the specific community involved, the tools employed for community engagement and participation promotion, the objectives set for participation, and the phase within the DRR and CCA cycle. A consistent theme that permeates the literature on CB approaches for DRR and CCA is the recognition of community engagement's pivotal role in augmenting resilience and sustainability. Many studies underscore the wealth of knowledge held by local communities, which should be thoughtfully harmonized with scientific insights. Furthermore, there's a strong emphasis on inclusivity, underscoring the importance of involving a wide spectrum of community members, considering variables such as gender, age, ethnicity, socioeconomic status, and cultural diversity. Amid the various manifestations of a CB approach, a common thread woven throughout is the critical role of community trust in shaping the success of CB approaches and the subsequent formulation of adaptation and disaster risk reduction strategies. Trust emerges as a foundational element underpinning effective community engagement, cooperation, and the collective pursuit of resilience and sustainability.

5. Conceptual framework for community-based approaches in Disaster Risk Reduction and Climate Change Adaptation

This section presents a conceptual framework and illustrates its dimensions and relationships, which are essential components for the implementation of a community-based approach in the context of DRR and CCA. By outlining the conceptual foundation that underlies a CB approach, this framework precedes the drafting of practical and actionable steps for implementing the approach (Chapter 6 – Part II "Guidelines").

The development of the framework followed a multi-step process that drew from both the literature review and prior research experience. Initially, we examined the papers included in the literature review, focusing on the prevalent concepts that were recurrently utilized to underpin the research about the involvement of communities in DRR and CCA. We identified the key concepts that frequently emerged when elucidating the drivers, consequences, and measures pertaining to community involvement in addressing climate change and disaster risk reduction. Subsequently, we merged these findings with our preexisting knowledge on the subject matter, which we had accumulated through previous research activities in the domains of social systems, communities, participation, climate change, and disaster risks. Our conceptual framework was, in part, built upon fundamental concepts such as agency, social innovation, social practices, social networks, and social change, which are rooted in mainstream social science theories and that we then tailored and adapted to clarify, through the framework, the concept of the CB approach in the context of DRR and CCA.

5.1. General approach

The conceptual framework underlying community-based approaches for DRR and CCA is embedded in the fundamental principle of community engagement, categorized as either of place, interest, or practice. At its core is the need to adapt to climate changes and reduce disaster risks. The realization of this need propels the community into action, framed by community agency, a response woven with the local context within which the community exists and with its internal dynamics (i.e., enabling/constraining factors). This agency catalyzes the activation of a participatory process which, in its diverse forms, becomes the channel through which the community's intentions are actualized. The results stemming from this process reverberate across the community, molding its capacity to effectively adapt and mitigate risks. These results, together with the participatory process as a whole, form the basis of an assessment aimed at gauging the effectiveness of the community´s engagement to address both climate change and disaster risks.

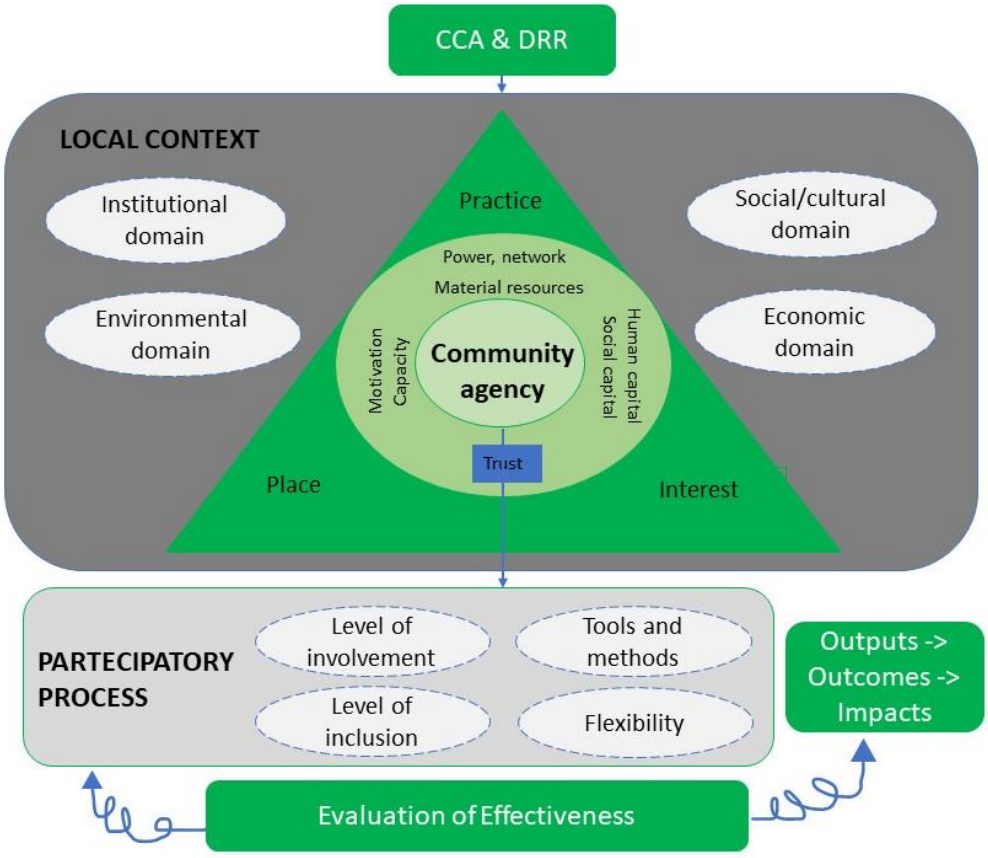

Figure 27: CB approach framework

5.2. Key dimensions of the framework

The framework is composed by 6 key dimensions: Climate change adaptation and Disaster risk reduction; Local context; Community agency; Participatory process; Evaluation of effectiveness; Outputs, outcomes, and impacts. These key dimensions, together with their subdimensions, are explained in the following paragraphs. A specific sub-paragraph (5.2.3.1) is dedicated to the concept of Trust, which represents a key dimension impacting on Community agency and his critically relevant for the success of a community-based approach.

5.2.1. Climate Change Adaptation and Disaster Risk Reduction

Engaging the community in the decision-making process is driven by the necessity to decrease its vulnerability, allowing for enhanced adaptation to climate change and a reduction in disaster risks.

The opportunity for implementing a CB approach arises when a geographical context (i.e., a country, a region, a municipality) is either currently affected by climate change or anticipates future impacts. This is significant because climate change not only causes direct damage but also amplifies disaster risks in these areas. The effects of climate change are diverse and span from environmental effects to social/cultural,

economic, health, political and security effects. Among these impacts, for this deliverable we focused on a cross-cutting impact, which is disasters risk. Climate change increases the frequency, intensity, and unpredictability of natural hazards, such as hurricanes, floods, or droughts, that in turn can lead to an elevated risk of disasters (Pidcock & McSweeney, 2022). Addressing the connection between climate change and disaster risk requires integrated approaches that combine **climate change adaptation** with **disaster risk reduction** strategies. By implementing measures to adapt to changing climate conditions, and by increasing risk resilience and reducing vulnerabilities, it is possible to minimize the future risks posed by climate-related disasters (IPCC, 2022).

5.2.2. Local context

When implementing a CB approach, there are several enabling and constraining factors to be considered. These refer to the dimension "Local context" and to the following sub-dimensions: "Institutional domain"; "Environmental domain"; "Social/cultural domain"; "Economic domain".

As each CB approach takes place within a specific setting, a fundamental dimension that shapes a CB approach is the **local context**. This encompasses all the factors external to the community that impact on the level of involvement of the community itself – and influence community agency (explained below). The factors can be clustered within four domains: institutional, environmental, social/cultural, and economic. The local context can significantly influence the level of participation in a CB approach for DRR and CCA, functioning as a barrier or as a facilitator. Understanding the local context is essential to tailor an approach that address the community specific needs and considers the opportunities for the community to participate in the decision-making process, ensuring that interventions are contextually appropriate.

The **institutional domain** represents the set of government and non-governmental organizations, their reciprocal power relations (i.e., degree of autonomy, independence, and decentralization), and their level of effectiveness. The distribution of power influences the opportunity for a community to be involved. For example, decentralizing the leadership of disaster risk management to the local level facilitate community involvement in preparedness and response (Chu et al., 2016; Zubir & Amirrol, 2011). A community may be involved also because of the level of effectiveness of the institutional framework: a respected government may invite citizens to collaborate (Adger, 2003; Thaler et al., 2019); similarly, dysfunctional institutions may be the trigger for residents to step in (McEwen et al., 2018; Songok et al., 2011; Thaler & Seebauer, 2019). The institutional domain also comprises all laws, regulations and policies that provide the basis for guiding actions related to DRR and CCA and that determine the extent to which a community can engage and influence these actions. It may include, among the others, decision-making rules, systems of property rights, sanctioning rules, rules on land use planning, and building codes. For example, the lack of provision for public consultation and engagement in decision-making process could hinder citizens´ participation; also, legal barriers may exist that restrict the formation of community organizations, furthering impeding community engagement in DRR/CCA initiatives (Chu et al., 2016; Songok et al., 2011).

The **environmental domain**, including geographical features, climate conditions, and natural resources provision, can affect communities' vulnerabilities and adaptive capacities, influencing their ability and willingness to participate. For example, an unfair allocation of natural resources might increase inequality

among inhabitants of a specific area, thus preventing some actors to participate and leading to rivalry between communities (Chacowry, 2023; Lin, 2019). Another example is that of a region vulnerable to sea-level rise: proximity to the ocean increases the inhabitants´ exposure to climate-related hazards and this may lead community members to take action to address their vulnerability (Fazey et al., 2021; Sutton et al., 2022). However, concern for the impact of natural disasters could also limit community participation: for example, community members may be preoccupied with attaining basic security levels, leaving limited time and resources for active engagement in community-based approaches (McNamara et al., 2020; Van Aalst et al., 2008).

The **social and cultural domain** also shapes community dynamics and its opportunity to participate (Ensor et al., 2018; Thaler et al., 2019). This domain encompasses shared norms, power dynamics, cultural beliefs, traditions and heritage, and values. For example, a conservative and hierarchical society, where individuals and organizations adhere to traditional norms and are deferent to authority, may discourage changes (e.g., in the way policymakers engage with communities) and emergence of innovative ideas, inhibiting participatory processes (D. Archer, 2016). Moreover, deeply entrenched gender roles or traditional power dynamics may limit the involvement of marginalized groups or certain individuals in decision-making processes (Clissold & McNamara, 2020; Wolff et al., 2021). General policy apathy towards participations can also constrains the success of a CB approach, as it was evident, for example, in a district in Kenya, where the opportunity to mainstream the participation of agro-pastoralists in CCA and DRR was hindered by a general lack of policy interest (Songok et al., 2011). Factors such as risk awareness, collaboration between citizens and public administration, and the prevalence of an organic societal structure, rather than an individualistic one, are additional elements that influence the opportunity for implementing CB approaches (Thaler et al., 2019).

The **economic domain** includes factors such as income levels, availability of labor, capital and technology, access to financial services and economic opportunities, and the overall economic well-being of the society to which the community belongs. These factors can support or hinder a CB approach. For example, an area with stable and diverse livelihood opportunities may have more resources and time available for participating in CB activities, as individuals are not focused on fulfilling immediate survival needs; on the contrary, a society experiencing poverty and resource constraints may prevent a community to allocate time and resources to participate in CB approaches, as the primary focus would be on meeting basic needs (Chu et al., 2016; McNamara et al., 2020; Songok et al., 2011; Van Aalst et al., 2008).

5.2.3. Community´s agency

The community's motivation to address the necessity of climate change adaptation and disaster risk reduction drives them to act. The action that results is framed by agency which, as introduced by Margaret S. Archer and elaborated below, influences the decision and the ability to act, consequently impacting the outcomes of community actions (M. S. Archer, 1995). Together with Community´s agency there are four other dimensions: “(community of) Place”; “(community of) Practice”; “(community of) Interest”; “Trust”. Due to Trust’s pivotal role in determining the success of a CB approach, a dedicated section (5.2.3.1) has

been allocated to address this aspect. Within these key dimensions lie three sub-dimensions: “Human capital”; “Social capital”; “Resources”, explained below.

At the core of a CB approach lies the community. Indeed, to ensure the successful implementation of CCA and DRR strategies, effective decision-making is crucial. Such decision-making should consider the needs, interests, and vulnerabilities of the communities affected by climate change and disasters, and it should empower them by enabling communities to shape their own futures (UNDRR, 2015). By considering these factors, decision-makers can make informed choices that ensure social equity and justice, promote ownership among affected communities, and enable sustainable impacts (involved communities are more likely to implement CCA/DRR strategies over time). The opportunity to engage with communities depends on **community agency** that consequently stands as an essential element for the realization of a CB approach. Agency is the ability of individuals, or more generally of actors, to pursue and to realize goals they value and have reason to value, as well as to fulfil a potential (Sen, 1999; Ton et al., 2021). In a CB approach, community agency empowers and mobilizes community members to participate in decision-making processes and take collective action for DRR and CCA. Both the willingness of a community to engage in a participatory process, and the capabilities of the community to take part in the process (two elements that impact on agency), are not straightforward. On the contrary, both willingness and capabilities are influenced by the local context and depend on the community social capital, human capital, and resources (Bott & Braun, 2019; Thaler et al., 2019, 2022; Thaler & Seebauer, 2019).

Social capital refers to relationships, distribution of power and leadership, and networks within a community, as well as to shared norms and values, and collaboration and cooperation attitudes (Newton, 1997; OECD, 2001). The strength of social ties influences the willingness among community members to engage in collective actions, mobilize resources, and share knowledge, leading to increased participation (Bott & Braun, 2019; Islam et al., 2020; Songok et al., 2011). Within social capital, leadership is of particular relevance as it influences participation paths; for instance, when a community of practice is led by a single individual, it becomes vulnerable to the limitations and constraints of that sole leader (Kong et al., 2020). Furthermore, an excessively strong leadership could enforce its vision, resulting in adaptation or risk reduction strategies that neglect the needs, interests, and priorities of other community actors; powerful leader may also have limited information about adaptation factors or insufficient implementation power, thereby influencing the outcomes of participation (Chapin et al., 2016).

Human capital refers to skills, knowledge, motivation, and attitudes of the individuals and/or actors that compose a community (G. S. Becker, 1964; OECD, 2001). Communities with a higher level of human capital, and with a diverse range of expertise, are more likely to have higher levels of participation and to positively influence the DRR/CCA process (Wamsler et al., 2020). The involvement of communities with a certain level of understanding of the issue at stake can lead to more effective discussions and debates with experts and policymakers during the elaboration of adaptation and/or risk reduction strategies, thus enhancing the participatory process (Islam et al., 2020; Samaddar et al., 2022). Additionally, the community's attitude and motivation towards risk reduction is crucial. A fatalistic approach towards risk may have a detrimental effect on community agency: if community members believe that they have no control over the risks they

face, they may become passive in taking measures to mitigate risks (Samaddar et al., 2022; Van Aalst et al., 2008).

Resources encompass the tangible and non-tangible assets available within a community, such as technological tools, and availability of time. Communities with adequate material resources are better equipped to implement CB initiatives; for example, the presence of appropriate communication tools like user-friendly online platforms, can prevent the exclusion of vulnerable community members (e.g., youth, older individuals, or people with disabilities) from participating in decision-making processes (Ahn et al., 2023). Conversely, limitations to community agency may arise due to time constraints resulting from employment, family responsibilities, and other commitments (Wesche & Armitage, 2014).

A CB approach can engage with a **community of place, of practice, of interest**, with a combination of two types of communities, or with the three types of communities at once. Which type of community acts as agent depends on how the CCA and/or DRR process is initiated: directly by the community itself (bottom-up), or by an external actor such as a local authority or a research group (top-down) (Cretney, 2018; Schmid et al., 2016; Thaler & Seebauer, 2019). In the first scenario, community members recognize the importance of addressing DRR and/or CCA and take the initiative to organize and implement relevant actions. Community members may come together due to shared geographical location and their exposure to the same disaster risks and climate change effects (community of place), a shared interest and concern for addressing these risks/effects (community of interest), or their involvement in a learning process and the adoption of new practices (community of practice) - all of which represent expressions of agency (Archer, 1995) in addressing these risks/effects. Because of the complexity of the issue at stakes, often the community receives the support of authorities and experts. On the other hand, an external actor may initiate a CB approach by recognizing the vulnerabilities and risks faced by a particular community and proactively engaging with it. Depending on the issue at stake, the contexts, as well as on the expertise, skills and knowledge required, this external actor can choose the most suitable type of community to engage with in the process.

5.2.3.1. Trust impact on community´s agency

Trust is defined as "a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behavior of another" (Rousseau et al., 1998, p. 395). It is noteworthy that trust is a key component for an effective implementation of CB approaches in DRR and CCA. As it happens with community participation, trust indeed represents both an objective and a means for the development of community agency. This because there is empirical evidence supporting the view that:

1. the individual experience of trust predicts willingness to coordinate efforts with others and cooperate with requests from authorities (De Cremer & Tyler, 2007; Pagliaro et al., 2021). Notably, it has been observed that, in situations that require interpersonal coordination to optimize collective outcomes, trust in others is an important predictor of the willingness to cooperate (Balliet & Van Lange, 2013).

2. Trust in government may explain individuals' variations in their cooperation with government policies and recommendations (Chanley, Rudolph, & Rahn, 2000; Kim, 2005; Riccucci, Van Ryzin, & Li, 2016; Scholz & Lubell, 1998; Scholz & Pinney, 1995). Thus, for an appropriate implementation of community agency, it is imperative to consider that trust in government plays an important role for increasing the compliance and cooperation of individuals with government policies and recommendations (Kim, 2005; Makkai & Braithwaite, 1994). It has been shown indeed that trust in federal, state, or local government is associated with individuals' preparedness for various emergencies such as earthquakes, hurricanes and other health-related situations (Arlikatti, Lindell, & Prater, 2007; Basolo et al., 2009; Murphy, Cody, Frank, Glik, & Ang, 2009; Greer et al., 2018). Individuals are more cooperative with government decisions if they have greater trust in government (Chanley et al., 2000; Levi & Stoker, 2000; Ruscio, 1997; Scholz & Lubell, 1998; Scholz & Pinney, 1995; Thomas, 1998). Moreover, they are more likely to adopt emergency preparedness measures when they perceive higher trust in government (Ablah et al., 2009; Longstaff & Yang, 2008; Murphy et al., 2009; Greer et al., 2018; Paton, 2010).
3. A need exists to promote trust at interpersonal, community and institutional levels, so that prevention, preparedness, responses, and recovery to DRR and CCA are sensitive and balanced to the different needs of their actors. In fact, during the disaster management cycle people tend to trust more about the help of fellow human beings (such as relatives and neighbors), rather than to the circumstance that state-led services or international relief will be provided. Accordingly, the fellow community members may have higher role in personal security strategies than any other security constellation when a disaster occurs, but over a longer period of time this may lead to potentially adverse consequences as the trust to the state in general and its public services may fail, while people may become too self-confident even refusing to use or accept the state provided resources (Bambals, 2015).

Thus, to better conceptualize the role of trust in community agency, it can be said that trust represents both a prerequisite and a result of community agency, as trust is influenced in its dynamics by social capital, human capital and resources in the community, and at the same time it can recursively generate changes in all these domains.

Such recursive nature of trust dynamics has been frequently reported in relevant literature on DRR and CCA. For example, Cairone and colleagues (2019), while evidencing that trust in institutions can play a critical role in improving the perceived resilience of a community, also stressed that an effective communication relies on the citizens' trust in the communicator.

Figure 28 provides a graphical representation of the recursive nature of trust dynamics in community agency.

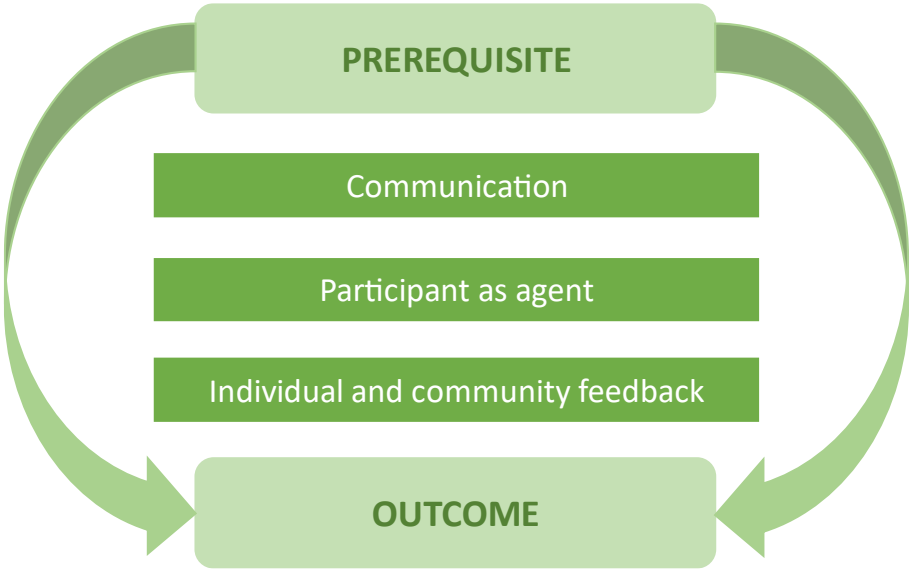

Figure 28: Trust dynamics in community agency.

As illustrated in Figure 28, the trust dynamics within a community agency are influenced by three key indicators that can be used to assess the overall quality of trust and the potential for improved outcomes of CB approaches throughout the different stages of the disaster risk management cycle. These indicators consist of (1) the quality and clarity of communication among the actors of trust, (2) the individual and community perception of active agency and capacity to positively influence outcomes of CB interventions, and (3) the presence of feedback mechanisms at both the individual and community levels that serve to provide support and information on the impact of participatory actions, ensuring the possibility of modifying subsequent actions based on the feedback received.

Notably, it has been observed that previous encounters with communication quality, participated involvement in community practices, and institutional feedback in the aftermath of natural disasters have a noticeable impact on individuals' trust in governments and local communities. These experiences also shape people's anticipations regarding future disaster management (He et al., 2021). This happens because of the interconnectedness among the three domains of communication, active participation, and feedback. For instance, when institutions engage in inadequate communication characterized by ambiguity or idiosyncrasies, it has the potential to reduce community participation to DRR and CCA initiatives. As a result, individuals and groups may adopt decision-making approaches that discourage assuming responsibility, thereby disengaging from participatory involvement in positive community practices. Correspondingly, the absence of feedback regarding participated actions taken within the community can contribute to a diminished perception of community effectiveness among citizens, as well as foster mistrust towards institutions.

Accordingly, Moreno and colleagues (2019) argued that for communities to exhibit resilience in the face of critical events, a strong foundation of trust is needed. As observed before, trust and the perception of trustworthiness in the context of DRR and CCA are dependent upon the responsiveness of institutions and community members, based on their capacity to communicate openly and handle the situation. Within this context, Kitagawa (2018) examined the significance of promoting agency and participation through collaborative projects in community learning for disaster preparedness, emphasizing the need for the population's commitment and cooperation to prevent and mitigate anticipated large-scale disasters. Considering that human agency represents a key factor in determining how individuals and society respond to environmental risks (Brown & Westaway, 2011), these collaborations establish empowering and trustworthy relationships between community members and authorities: through collaborative efforts, both parties can familiarize themselves, exchange ideas and information, and jointly develop preparedness plans. At the community level, developing these types of participatory approach before disaster occurrences is crucial for building trust, raising awareness, and enhancing the general public's knowledge base. Hence, to foster a positive and virtuous culture of trust in DRR and CCA, it is imperative to take into account all three domains of the trust dynamics: effective communication that aligns with the context and participants, active engagement of community members as catalysts for change, and the establishment of adequate feedback mechanisms to collectively assess the impact of participatory processes.

5.2.4. Participatory process

The community´s agency catalyzes the activation of a "Participatory process" which is the main dimension encompassing four sub-dimensions: "Degree of participation"; "Tools and methods"; "Level of inclusion"; "Flexibility".

In a CB approach, the agent (i.e., the community) acts and brings about a change (i.e., the community´s agency) by engaging in a **participatory process**. This process can take different forms depending on the:

- degree of participation.
- Level of inclusion.
- Tools and methods.
- Flexibility.

The **"Degree of participation"** sub-dimension refers to the depth of involvement that the community have in decision-making related to DRR and/or CCA strategies planning. This dimension is based on the conceptual model of the "ladder of citizen participation," originally introduced by S. Arnstein, which illustrates the continuum of community engagement. According to this model, community involvement can range from lower levels, where community members have limited influence and power, to higher levels of participation, where members have substantial influence and decision-making authority (Arnstein, 1969). Based on Arnstein´s model, this framework interprets this sub-dimension as ranging from the lowest level of "information," where community members are merely informed about decisions, to "gather information" where community members are listened to; moving higher on the spectrum:

"consultation" where the community´s opinions are sought and decision-makers are open for discussion, but decisions are taken by external actors, to the top level of "co-design", that involves collaborative decision-making and partnership between community members and external actors. This last level signifies a transformative level of involvement where community members play a central role in shaping the outcomes of CCA and DRR strategies and have the authority to affect and lead the decision-making process. The levels are not “watertight” compartments; rather, the features of each level are generally cumulative as the degree of community involvement deepens.

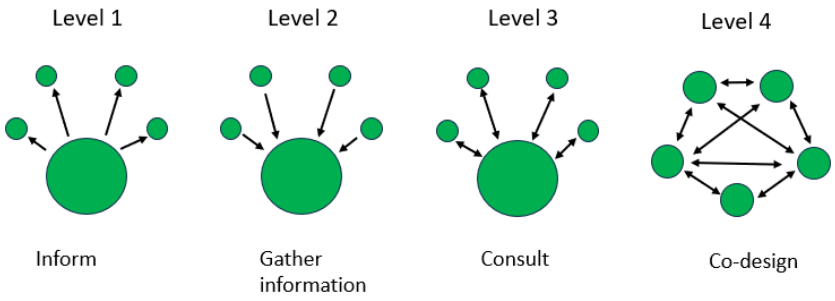

Figure 29: Degree of participation, adapted from Patterson Kirk Wallace as cited in Health Canada (2000).

The **“Level of inclusion”** sub-dimension refers to the extent to which all members of the community are meaningfully involved in the decision-making process and have the chance to influence the outcome of the DRR and/or CCA strategy formulation process. A high level of inclusion ensures that the perspectives, interests and needs of all members are considered, allowing for a more comprehensive and representative decision-making process (Samaddar et al., 2021). On the other hand, a low level of inclusion might be employed in certain situations to streamline specific steps of the process or to ensure efficiency in addressing specialized aspects that require inputs from experts with specific knowledge (Chu et al., 2016; Khadka et al., 2018a; Van Riet & Van Niekerk, 2012; Wolff et al., 2021). In such cases, involving a wide range of community members with limited understanding of the subject matter might not be productive. However, a low level of inclusion could also underrepresent or marginalize certain segments of the community, posing challenges in achieving equitable, and responsive to the needs of all community members, outcomes (Gladfelter, 2018; Lasage et al., 2015; Liu et al., 2018; Songok et al., 2011). Barriers to the involvement of marginalized members, minorities, or vulnerable individuals, might be social, economic, cultural, or political. Finding the optimal balance between high and low inclusion levels is crucial to foster effective community participation. While a low level of inclusion can be appropriate in certain circumstances, it is crucial to balance it with meaningful community engagement in other aspects of the CB approach, and to recognize that even in such cases, communication and transparency are essential to keep the community informed about the project's progress and to address any concerns that may arise (Barrett et al., 2015; McNamara et al., 2020). As a general principle, CB approaches should strive to include diverse perspectives and ensure that everybody’s voices are heard, especially when decisions significantly

impact the broader community. Context-specific considerations to decide the right level of inclusion should guide the CB approach.

Deciding which is the right degree of participation (sub-dimension 1) and the right level of inclusion (sub-dimension 2) is not an easy step:

"A 'deep' (a.n., "degree of participation") *and 'wide'* (a.n., "level of inclusion") *participatory process might be the ideal, in abstract, but in practice it can prove either virtually impossible to achieve or so cumbersome and time-consuming that everyone begins to lose interest. In this regard, it makes more sense to think in terms of optimum participation: getting the balance between depth and inclusion right for the purpose at hand"* (Cornwall, 2008, p. 276).

"Tools and methods" include all the different activities that can be performed within a participatory process to inform, obtain information from, consult, and co-design with, community members. The selection of appropriate tools and methods is essential to ensure effective community participation and to serve the final purpose of planning for CCA and DRR. These activities should be tailored to the community´s specific context and needs to facilitate the process of engagement; at the same time, activities should align with the goal of the CB approach, being it risk assessment, vulnerability analysis or the identification of adaptation strategies (Brugger et al., 2018; Khadka et al., 2018a; Samaddar et al., 2021). The selection of the appropriate tool and method depends on various factors, including the avenue of participation and the form of communication, whether it is online or face to face; the size of the involved group; the desired degree of participation; the geographical scope, such as a neighborhood, city, region, or country; the available resources in terms of time and budget; and the skills and expertise of the participants, ranging from basic to advanced levels.

"Flexibility" refers to the fact that participation occurs at a time when aspects of the project design are still open for discussion, allowing for iterative processes and adjustments based on the input and feedback from the community members (Brugger et al., 2018). Thus, flexibility in what is to be planned. Moreover, flexibility is intended to as the property of the participation process to suit the evolving needs and characteristics of the community and the changing context. This ensures that participation remains relevant to the circumstances (Ford et al., 2016).

To conclude, different stages of the CCA/DRR cycle, as well as varying contexts and community characteristics, may require different approaches to participation, in terms of degree of participation, level of inclusion, tools and methods, and flexibility. How these sub-dimensions interact among them and the intensity of each, determine the features of the participation process.

5.2.5. Outputs, Outcomes, and Impacts

The participatory process yields result in terms of climate change adaptation, disaster risk reduction, and community engagement. These results are outlined through the dimensions of "Outputs"; "Outcomes"; "Impacts".

"Outputs" are the immediate and tangible products, services, or activities delivered as a result of the process. They are quantifiable and can be easily measured. Examples of outputs could be the establishment of an early warning system and the distribution of emergency kit to households (Chu et al., 2016; Van Aalst et al., 2008). **"Outcomes"** are the changes that occur as a result of the outputs; they are the medium-term effects of the process on the targeted community and are often related to changes in knowledge, behavior, or attitudes, or skills, for example in disaster preparedness among community members (I. Campos et al., 2016; Mechler et al., 2018; Sakurai et al., 2020). **"Impacts"** are the long-term effects that occur because of the outcomes and outputs, they represent the ultimate goals of the process and reflect the broader improvement in the condition of the community. The reduction in the number of injuries during extreme weather events due to the EWS, improved preparedness, and increased resilience, are examples of impacts (Bott & Braun, 2019; Grüneis et al., 2018; Liu et al., 2018).

5.2.6. Evaluation of effectiveness

To complete a CB approach there is its assessment, which is explained through the dimension of "Evaluation of effectiveness".

"Evaluation of effectiveness" refers to the process aimed at assessing the success of the CB approach. This evaluation can be twofold: it can focus on evaluating the participatory process itself (process-oriented evaluation), using its sub-dimension as benchmarks (i.e., Degree of participation, Level of inclusion, Tools and Methods, and Flexibility), or it can concentrate on evaluating the results of the participatory process (results-oriented evaluation), such as the success of the risk reduction or CC adaptation measure adopted. Indeed, an effective CB approach is the one that achieves its objectives in terms of both community participation and of CCA and DRR. More generally, the evaluation of effectiveness process relies on suitable indicators to assess the approach against predefined criteria. Moreover, the evaluation process of a CB approach can take place either after the approach is completed (ex-post) or during its implementation (in-itinere). Different actors such as policymakers, public administration, entrepreneurs, or the community itself can undertake the evaluation process, which serves multiple purposes, ranging from supporting decision-making to critically assessing and improving the CB approach. Data collection and analysis tools used in the evaluation can be qualitative, quantitative, or a combination of both. Examples of these tools include semi-structured interviews (involving open questions and storytelling), structured interviews (using questionnaires), focus groups, expert panels, and case study observations (Brugger et al., 2018; Chowdhooree et al., 2020; Thaler et al., 2019; Wesche & Armitage, 2014).

PART II – GUIDELINES

6. Operationalization of community-based approaches in the field of Disaster Risk Reduction and Climate Change Adaptation

6.1. Rational and objectives of the guidelines

This chapter presents instructions and guidance on how to implement a CB approach in the context of a CCA and/or DRR strategy. Based on the conceptual framework developed in Chapter 5, Part I, the community implementing a participatory process can be diverse both in terms of type (i.e., place, practice, interest), dimensions (i.e., small, medium, big municipalities), capacity to act (i.e., availability of material resources, human capacity) and environmental, institutional, economic, and social characteristics.

These guidelines provide a manual for implementing community-based approaches that can be initiated, developed, and validated by public administrations at different levels, in conjunction with supporting entities such as researchers and practitioners (referred to as the Working Group). The objective is to contribute to the formulation of policy-making processes within the realms of DRR and CCA. According to the grey and scientific literature, the practice of participatory processes is broad and diversified. Participatory approaches are proposed by non-Governmental Organizations with the aim to increase the effectiveness of their activities and support, exploring local traditions, needs and priorities. Participatory processes are also led by academic organizations with the aim to test the functioning of a particular method and its effectiveness in properly engaging local communities. In these cases, the role of public administrations is extremely various: sometimes public administrations are simply informed about the process, in other cases they are engaged as a relevant stakeholder, whereas in other cases public administration is an instrument to reach the whole community in the participatory activities.

These guidelines primarily target three groups: public administrators at various levels and with varying levels of expertise, in collaboration with researchers and practitioners, also known as facilitators. They have the flexibility to tailor the guidelines to align with the specific requirements of the community, the desired degree of engagement (e.g., inform, gather information, consult, co-design), and the extent of inclusivity (e.g., the number of community members involved).

The guidelines propose to involve the community in all stages of the DRR/CCA policy cycle and are designed to ensure the most meaningful and appropriate level of participation. The guidelines conceive a participatory process generated and legitimated by a public administration, where community participation is considered a part of a policy-making process, leading to modifications in decisions made by the public organization and in the trust dynamics between the community and the public authority. To enhance opportunities for a meaningful public participation, the authors suggest following the instructions entirety.

The guidelines are structured into three sections. The first section focuses on the steps and instructions for implementing a CB approach, the second section addresses steps and instructions for enhancing trust dynamics within the community, between the community and public institutions, and among community members, while the third section outlines steps and instructions for monitoring and evaluating the effectiveness of CB approaches. Each section begins with a set of key elements aimed at enhancing the effectiveness and inclusivity of participatory approaches.

Each section is structured into multiple steps or phases, each comprising various activities. The description of each section includes an overview of its step or phase, activities, and a table containing operational

instructions, which detail key individuals and their roles, anticipated outcomes, necessary tools, and prerequisites. Furthermore, text boxes offer guidance for activity implementation, propose questions to facilitate the process, and outline essential conditions that need to be met.

6.2. Implementing a community-based approach

This section provides a detailed explanation of the essential steps required to effectively establish an inclusive and innovative CB approach for participatory decision-making aimed at the development of CCA and DRR strategies. CB approaches are fundamentally rooted in participatory processes, which serve as the means to engage and involve communities in the decision-making process. Participatory processes encompass multiple dimensions, with the primary ones being:

- **Level of Involvement**: this dimension pertains to the extent to which community members are actively engaged in the decision-making process. It spans a spectrum from merely informing them about forthcoming decisions to gather information, consult, and even decision-making. The selection of the appropriate level of involvement should align with the specific objectives and goals of the particular participatory initiative.
- **Level of Inclusion**: this dimension relates to determining who should be included in the participatory process. The choice hinges on the particular context and the desired outcomes. It can involve engaging all members of the community or specifically targeting key stakeholders based on their relevance and influence.
- **Flexibility**: flexibility within the participatory process is vital as it enables adaptation to changing circumstances and evolving community needs. It empowers the process to remain agile, allowing for adjustments in approach and methods. Flexibility is essential for accommodating unforeseen challenges and capitalizing on unexpected opportunities.

6.2.1 Key elements for an effective, inclusive, and innovative community participatory processes

This section provides an indication of main key elements to consider when implementing a community-based approach.

Optimal timing

It is crucial to identify the most suitable timing for initiating a participatory process. Engaging a community represents a valuable opportunity to establish trust bonds and foster beneficial collaborations. However, it is essential to allocate sufficient time for overcoming skepticism and resistance. Therefore, commencing the process during a period free from ambiguity, such as avoiding proximity to elections, is vital. Additionally, selecting times that enable citizens to assume responsibility for the outcomes of their participation is essential. Otherwise, participation may prove futile or even counterproductive. The full advantages of participatory principles are realized when they extend beyond the confines of a single planning activity and become an integral part of the local community's interactions with political and administrative institutions on one hand, and the social, economic, and cultural components of the territory on the other. Hence, it is imperative to promote the ongoing continuity of participatory practices, without ever assuming them to be a given.

Public administration endorsement

The leader of the public administration, such as the mayor, along with council members, should recognize and advocate for an inclusive community engagement. They must grasp the benefits, as well as the intricacies, inherent in such involvement, acknowledging that it encompasses both political and technical dimensions. It is recommending identify the needed resources and mechanisms to effectively manage this participatory process.

Information and capacities enhancement

Prior to launching a participatory process, it is crucial to enhance the knowledge and skills of the public administration regarding DRR and CCA planning. This also includes motivating key stakeholders, such as institutions, sectors, groups, and individuals, who will bear responsibility for the success of the participatory planning process. The effectiveness of the participatory process hinges on their commitment. Furthermore, it is essential for the entire public administration, encompassing both political and technical members, to have faith in the participatory process. They should remain consistently informed, actively engaged, and motivated to play an integral role in these activities.

It is also important for the local community to comprehend and appreciate the significance of its contribution, including the potential innovations it can introduce within the predefined decision-making framework. To this end, organizers should exercise caution and implement certain key measures: i) Facilitating the meaningful and informed participation of non-experts by equipping them with a comprehensive understanding of the subject matter and the process itself. ii) Designing meetings that resonate with and engage the residents, by presenting themes directly relevant to their lives and structuring activities that offer direct connections to their daily experiences. Therefore, careful consideration should be given to the choice of meeting venues, considering locations significant to the community or the relevant neighborhood, particularly in medium and large cities. iii) Establishing dedicated "spaces" for participation where local stakeholders, such as representatives from voluntary civil protection sectors, associations, employer groups, and entrepreneurs, can play an active and operational role in the process.

Facilitating the participatory process is a challenging endeavor

The Public Administration plays an active role in this process, and its perspectives and objectives may at times clash with the preferences and priorities of citizens or other private stakeholders, potentially leading to conflicts among participants. Consequently, it is advisable to enlist the support of process facilitators, particularly during critical junctures of the process. Facilitators bring their specialized skills to the table, effectively managing conflicts and establishing appropriate codes and communication strategies to facilitate quick, transparent, and constructive discussions. As evidenced in the grey literature, dedicated financial resources should be allocated to the community-based process, particularly for funding professionals like facilitators who can adeptly navigate discussions and navigate the more challenging phases of the participatory process.

Key roles of educational institutions

Schools and universities have the potential to infuse innovation into the planning process by introducing fresh ideas and a long-term perspective. When it comes to effectively engaging youth and children, it is imperative not to view them as a homogeneous group with universal values, perspectives, and priorities (UNFCCC, 2021). When involving university students and young professionals, this implies engaging them in their areas of knowledge and expertise. For example, those studying agriculture can contribute to discussions with local

farmers regarding adaptive practices relevant to current or anticipated climate change impacts. Furthermore, schools and universities are particularly susceptible to natural hazards, serving as central hubs in networks that impact the behaviors and movements of many individuals, thus exposing them to natural events. Therefore, it is essential for staff, students, and families to be cognizant of the risks posed by natural events and be familiar with emergency procedures. In the context of Disaster Risk Reduction (DRR), schools should establish regular reviews (at least annually) between their emergency plans and municipal civil protection plans, focusing on interconnections and key responsibilities. Additionally, schools possess the potential to serve as vehicles for promoting, constructing, and disseminating a culture of civil protection. Numerous case studies explored in the literature review depict children not merely as passive members of the community but also as valuable contributors. For instance, students can receive education about disasters and climate change from an early age, instilling an understanding of the significance of community initiatives in DRR. Subsequently, they can take on the responsibility of educating other children and raising awareness among their parents and the community. The literature review also reveals various tools and methods for effectively engaging children. In one case study, students engaged in communication and awareness activities through the creation of a newspaper. In another instance, the use of social media proved successful in expanding the reach of risk communication activities (UNISDR, 2017). In yet another case, children were involved in interviewing elders and other key stakeholders to gain insights into climate-related risks and current coping strategies. These insights were then used to produce short films aimed at communicating this information to the community.

Develop a common language

The participatory process serves as a platform to construct a unified and suitable lexicon pertaining to climate change and disaster risk reduction matters. This involves forging a shared understanding of key aspects, the most pressing challenges, and effective coping strategies. Therefore, it is crucial to actively engage those responsible for communication channels and promptly identify any variations in meaning that citizens from diverse cultural and geographical backgrounds may ascribe to the terminology employed.

Physical accessibility and inclusive planning

It is equally important to plan the logistical aspects of the participatory process to facilitate the engagement of socially vulnerable individuals and those with disabilities. Their unique insights into their own safety are particularly vital, especially within the DRR framework. This information is essential for the careful development of preventive measures, warning systems, and rescue procedures. Consideration should be given to the timing and locations of workshops, focus groups, and other community-based activities, considering the habits and availability of the local community. For instance, scheduling sessions during working hours on weekdays can be an effective means of engaging stakeholders from the public administration. Alternatively, in certain contexts, weekends can provide an opportune occasion for meetings with citizens, during which activities such as presenting the goals or outcomes of the community-based process can be organized alongside local traditional ceremonies.

Inclusive process

Heterogeneity within the group is paramount because it guarantees a diverse range of perspectives and experiences. In CB initiatives, the involvement of individuals from various backgrounds, age groups, genders, ethnicities, and socio-economic statuses fosters a richer pool of insights and ideas. This diversity helps ensure that the solutions and decisions made are comprehensive and inclusive, reflecting the needs and aspirations

of the entire community. When different points of view are considered, it leads to more balanced and equitable outcomes, reducing the risk of overlooking marginalized voices and reinforcing social cohesion. Heterogeneity in a CB approach is essential for its effectiveness, promoting a more representative approach to community involvement and decision-making.

Socially determined gender-related differences influence how individuals and communities experience the impacts of extreme weather events and climate change effects, as well as their capacity to respond to these impacts and influence decision-making processes related to them. These disparities arise from factors like gender inequality in decision-making, access to resources, and information. Household gender dynamics and cultural norms can obstruct women's participation in decision-making processes, even when such policy-making activities are designed to be participatory. Moreover, women are more susceptible to the effects of extreme weather events (for instance, in Bangladesh, they are less likely to know how to swim and are more vulnerable to floods). They can also face an increased risk of gender-based violence during times of scarcity, such as droughts linked to socio-economic crises or when displaced by natural disasters. Additionally, women often bear responsibility for everyday activities that are highly impacted by climate change, activities that are also essential for the local community, such as subsistence farming (UNFCCC, 2021).

6.2.2 Steps and instructions

The implementation of a community-based approach involves four distinct steps: Before starting, Setting the scene, implement and monitor the participation, and finalizing the participation process. Within each of these steps, multiple activities are delineated, each specifying the precise actions to be undertaken in order to effectively execute the approach.

Figure 30: Participatory process flowchart

Step 1: Before starting - Towards the participatory process

Activity 1.1. Verify the coherence of the CB approach in relation to the socio-cultural context

To determine whether a CB approach is suitable for addressing critical DRR/CCA issues and enhancing community resilience, several dimensions should be considered and assessed, which are:

- **Community interest**: community's potential interest in the project, considering factors such as the project type, location, and how it may impact the community.
- **History of community involvement:** community participation in previous similar projects, expected level of involvement in the process, existing dynamics between public authorities and the community.
- **Potential conflicts:** conflicts arising from the project, particularly concerning clashes between social or economic values.

These dimensions can be analyzed individually or in combination and they may vary depending on the specific circumstances. The decision to involve the community into DDR/CCA policy cycles should be made on a case-by-case basis.

Activity 1.2. Verify the coherence of the CB approach in relation to the legal context

To determine whether a CB approach is suitable for addressing critical DRR/CCA issues and enhancing community resilience, it is essential to determine the adaptability of the current legal and institutional structures to incorporate the results of the participatory process. Evaluate the feasibility of integrating the outcomes of the community-based process within the existing legal and institutional framework is relevant. This assessment should include an examination of any plans for revising or updating regulatory instruments that may be affected by the process. Additionally, it is vital to assess the extent to which the community engaged in the decision-making process will genuinely influence the outcomes, thereby establishing their room for meaningful input (i.e., room for maneuver").

BOX - Which are the consequences of not involving the community?

- Delays and increased costs: late community involvement can lead to project delays and higher costs.
- Lack of community support: the absence of community support during policy implementation can undermine its success.
- Loss of credibility or legitimacy: failure to engage with the community can result in a loss of credibility or legitimacy in the eyes of the community.
- Potential litigation: neglecting community participation may increase the risk of legal disputes related to the CCA/DRR process.

Step 2: Setting the scene - Prepare the participation

Activity 2.1. Launch the Community Based approach process

The first sub-activity consists in establishing a **Working Group (WG)** and formalize the group within the administration (the responsible authority). The WG will support the responsible authority (decision-maker) in planning, managing, and developing the participatory process. The WG will coordinate the process and may consist of people from both within and outside the authority (e.g., consultants). The working group will serve as a point of contact and communication channel between the authority and stakeholders.

Key dimensions to consider when creating a Working Group:

- Is the WG comprehensive of both technical and political members? The WG should include both political and technical members, as well as representatives from different sectors. This will ensure that the WG has the human resources and competencies to tackle the complexities of DRR and CCA planning.
- Are roles and responsibilities in the WG clearly assigned? The WG should have a coordinator and a technical office responsible for drafting policies and strategies. It is advisable to formalize the WG composition through a resolution to identify WG members, their sectors, and their commitment to the participatory planning process.
- Is it necessary to engage an external consultant too? Engaging an external consultant is not mandatory, but it can be helpful for several reasons. First, a participatory process is a complex undertaking that requires specialized knowledge of engagement methodologies, psychology, and social sciences. This can be helpful to properly manage critical issues and challenges that could arise in the engagement of local stakeholders (e.g., conflicts or tensions can emerge during the participatory activities when dealing with delicate issues, such as civil protection planning or water resource issues. Second, DRR and CCA are complex topics that require specialized knowledge and analytical skills. An external consultant can support the WG with a variety of tasks, such as drafting CCA/DRR policies. If a consultant is engaged, they should be considered a member of the WG.
- Which sector of the public administration should be engaged in the WG? The sectors to engage in the WG will depend on the specific goals of the participatory process. For example, if the goal is to develop a Municipal Civil Protection Plan, the following sectors should be considered: Municipal Police, Urban planning, Environment and public green, Instruction, Social services, Communication/press office, and Counter for public relations, demographic services, and social and health services.
- How many times should the WG meet? The WG should meet regularly throughout the participatory process, with coordination meetings at the beginning and end of each stage. It is highly recommended to write minutes at the end of each meeting.

The **second sub-activity is to deliver training and educational sessions for the WG**. It is important to establish a common epistemic framework and knowledge base on the topic for the WG before it begins the participatory process. The training should be carefully tailored to the characteristics of the context, allowing the WG, through the coordinator, to express its own opinions on training needs. Therefore, while designing the training some guiding questions might be useful, such as:

- Who should oversee the training activity? The public administration's technical agencies can have human resources and technical knowledge to organize and lead the training sessions; however, in this case, an external consultant can be the most effective choice to bring scientific knowledge on DRR/CCA issues.
- Which module should be included in the WG training activity? The training plan should provide: i) in-depth knowledge on key topics relating to participation issues: methods, objectives, opportunities, and challenges of engaging citizens; ii) another module could be aimed at setting a common epistemic framework to define a straightforward and shared vocabulary on the key topics of the participatory process; iii) when dealing with DRR or CCA issues, another training session may also be dedicated to

modelling tools for climate and weather-related impact forecasts (e.g., sources and problems of the quantification of forecast-related uncertainty).

The third **sub-activity consists in analyzing the local context**. The WG should conduct a background research and context analysis to identify and define the context in which the participatory process will take place; understand where and how the issues to be improved fit into the larger context; define the scope and rationale of the participatory process. The analysis should focus on the following dimensions: Social context (e.g., community analysis); Economic context (e.g., income levels, availability of labor, capital and technology, access to financial services and economic opportunities, overall economic well-being of the society to which the community belongs); Environmental context; Institutional and trust context (laws, regulations, policies; institutions, agencies, NGOs, climate-change networks, research institutes, service providers, government); Disaster risk and climate change impacts and management strategies. A SWOT analysis can be an effective tool for systematically evaluating existing policies and risk management strategies to better characterize the goals and objectives of the participatory process.

The **fourth sub-activity is about specify participation scope and rationale,** together with expected overall outcomes and results, and a timeline. Based on the context analysis and its own needs and expectations, the public authority should identify the general goal of the participatory process. The WG can use a brainstorming or focus group, based on the SWOT analysis, to better define the scope of community-based participation for solving the local context gaps. As a first step in identifying the possible objectives of the participatory process, it is important to identify which phase should be focused on: CCA: vulnerability assessment, adaptation option identification and assessment, implementation, monitoring, and evaluation; DRR: prevention, preparedness, response, reconstruction.

The last **sub-activity consists in notify the entire local community** about the commencement of the DRR/CCA strategy planning process. Emphasize the significance of public participation in these critical matters and provide a broad outline of the expected timeline. Furthermore, clarify the scope of influence (i.e., “room for maneuver”) available to the community that will participate in the process, outlining what aspects they can genuinely impact. This initiative serves the dual purpose of clarifying the precise objectives of the participatory process for both the authorities and the Working Group. Moreover, it extends an opportunity to the entire community to actively shape the planning process, track the progress of activities, understand what they will have the opportunity to influence, and request inclusion if they feel the CB approach overlooks any specific group or individual. This notification will be particularly crucial once the decisions regarding whom to involve in the participation process have been determined. To increase the effectiveness of the whole CB process, a public meeting should be organized at the beginning of WG activities, aiming at presenting the first results of the preliminary context analysis and to discuss a first draft of the participation pathway. This meeting should include a discussion phase in which citizens can express their opinion on the results achieved so far.

Activity 2.2. Develop a community-based strategy

Developing a strategy consists in many sub-activities. First, identify the s**pecific objectives** to be reached based on the needs of the public authority, the selected phase of DRR/CCA, and the insights from the public meeting (1.e). Second, **identify the main boundaries** of the participatory process, focusing on the available human and economic resources (e.g., from the public administration, resources coming from a dedicated EU project), time, legal requirements (e.g., officials or departments mandatory for the approval of target DRR procedure, procedural steps necessary to approve a DRR strategy). This is essential for tailoring of the goals

of the CBA and to organizing a realistic and effective timeline. Thid, **determine the level of inclusion and the degree of participation** that best suits the specific objective and phase of the DRR/CCA strategy planning (i.e., how much opportunity the community will have to provide input to the strategy planning phase). The "Degree of participation" refers to the depth of involvement that the community have in decision-making related to DRR and/or CCA strategies planning. This dimension is based on the conceptual model of the "ladder of citizen participation". The "Level of inclusion" refers to the extent to which all members of the community are meaningfully involved in the decision-making process and have the chance to influence the outcome of the DRR and/or CCA strategy formulation process. A high level of inclusion ensures that the perspectives, interests and needs of all members are considered, allowing for a more comprehensive and representative decision-making process. These two aspects of the participatory process can be identified through internal WG meetings. The outcome of these meetings will be an initial conceptual framework for the construction of the CB process. Note that the engagement of the local community should be carefully tailored to the degree of participation possible/expected and the desired level of inclusion. For example, involving a wide range of community members with limited understanding of the subject matter might not be productive. Additionally, a deep degree of participation (i.e., co-design) can be detrimental to the reputation of the public administration if the WG is not truly interested in the involvement of the community and there is no feedback to engaged stakeholders on their contribution during the whole duration of the process.

BOX - Degree of participation, how to choose?[3]

Level 1: Inform when/to

- Factual information is needed to describe a policy, program, or strategy.
- A decision has already been made.
- The community needs to know the results of a process.
- There is need for acceptance of a proposal or decision before a decision may be made.
- Foster transparency so that the community can better understand the rationale behind decisions and accept it.
- Prevent marginalization of certain groups by ensuring that all community members have equal access to knowledge.
- Build trust between the community and external actors.
- Strengthen accountability: an informed community can better monitor the decision-makers activities: decision-makers, in turn, are held accountable for their actions.
- It is expected that the community will be involved to provide insights, identify potential challenges, and contribute to well-informed decisions.
- An emergency or crisis required immediate action.

Level 2: Gather information when/to:

- Policymakers do not have all the information they need to design a policy, program, or strategy.
- The decision-making process is still open and there is the opportunity to influence the final decision.
- There is the will to align the decision with the community needs and/or interests.
- Foster a sense of ownership for the decision adopted and buy-in for the decision-making process.
- Promote inclusivity and representation of diverse perspectives.

[3] Reference: Health Canada – Policy Toolkit for Public Involvement in Decision Making.

- Strengthen trust between the community and external actors by demonstrating respect for the community´s knowledge.
- Enhance transparency, legitimacy of decisions, and accountability of decision-makers.
- The community has at least a basic understanding of the issue at stake.

Level 3: Discuss or involve when:

- A two-way information exchange is needed.
- Individuals and groups have an interest in the issue and will likely be affected by the outcome.
- There is an opportunity to influence the outcome.
- Encourage discussion among and with stakeholders.
- Input may shape policy directions/program delivery.

Level 4: Consult when/to (in addition to elements listed under Level 2 and 3):

- Foster mutual learning and capacity building between the community and external actors
- Foster empowerment: the community can impact deeply on the final decision.
- Strengthen relationships between the community and external actors, and social cohesion within the community, by providing a space for dialogue and collaboration.
- There is opportunity for shared agenda setting.

Level 5: Partner/co-design when/to (in addition to elements listed under Level 2,3, and 4):

- Empower the community to manage the process.
- The community have the will and resources to actively contribute to co-designing solutions.
- Policy-makers have accepted the role of “enabler” and “supporter”.

BOX: How to ensure that the level of participation is appropriate.[4]

- Conduct a preliminary assessment (e.g., make informal contact and review available information) to identify interested parties' interests and preferences.
- Consider factors, such as the type and scale of the proposed project and the likely level and nature of public interest.
- Consider whether there is traditionally a high level of public interest and participation in the community.
- Consider the level of public interest in past projects of a similar scope or nature.
- Identify the activities and techniques that have worked well in the community in the past.
- Be prepared to adapt the plan as public interests shift, increase, or decrease.

Activity 2.3. Stakeholders mapping

The **first sub-activity** in developing a participatory decision-making process is to **identify the stakeholders**. Stakeholders are those who have a specific interest in what is at stake, even if they do not necessarily have formal power of decision or explicit legal competence. A stakeholder is therefore a subject whose opinions or decisions, whose attitudes or behaviors can objectively favor or hinder the achievement of one specific

[4] Reference: Health Canada – Policy Toolkit for Public Involvement in Decision Making.

objective of the process in place. In addition to identification, **stakeholders are mapped and analyzed** through a matrix, which provides a structured framework for understanding their roles and relationships. For detailed guidance on building this matrix, please refer to the explanation in the box below. Through stakeholder mapping and analysis, it is possible to determine which individuals need to be involved and in what capacity. The **second sub-activity** consists in developing a detailed **understanding of the local context**. This additional context analysis should be useful to support the subsequent stakeholder analysis and to better identify a- Environmental domain. For example, geographical features, climate conditions, and natural resources provision, can affect communities' vulnerabilities and adaptive capacities, influencing their ability and willingness to participate). b. Institutional domain. For example, existing legislation, good practices implemented on the territory, and the general framework of bodies or associations that may be interested in solving the identified problem, including their mutual power relations (e.g., degree of autonomy, independence, and decentralization).

A **third sub-activity** consists in deciding which is the community to be involved (of place, of interest, of practice), as well as Identify roles within the community, power distribution, needs, and interests.

Finally, **identify contact person(s**) within the community and establish contacts. These contact persons are essential to guarantee a high level of engagement and commitment from the local stakeholder during each step of the participatory process. The role of local, non-governmental, formal, or informal institutions (such as churches, schools, or village leaders) can be crucial as contact person, with the aim to maintain consensus in the participatory process and to foster behavioral change. Case studies presented in the literature review have shown that the engagement of relevant institutions (e.g., school or church representatives) or influential persons (e.g., elders or village leaders), as an intermediary between the WG and the community, has been effective in increasing people's participation during the whole duration of the project.

BOX: Recommendations for comprehensively engaging all relevant stakeholders.

- Be careful to be inclusive in the selection of stakeholders. To ensure that a participatory process is truly effective, it is essential for it to be inclusive. This means ensuring the full and meaningful participation and leadership of all groups and individuals - particularly the most vulnerable - in identifying and reducing risk.
- Be careful to engage all the affected groups and people. Literature review has shown the importance of engaging a comprehensive group of stakeholders to increase the inclusiveness of the activities and the overall effectiveness of the participatory process. For example, in projects dedicated to agricultural production, engagement should not be limited to farmers, because all community members are important to better understand the environmental context and the wider community needs. Moreover, the whole farmer family is engaged in agricultural activities in many poor countries, and women are a key part of harvesting activities, yet they are not directly engaged in decision-making processes. Therefore, engaging the entire family instead of individuals emerges as an effective solution to address gender concerns and to increase the efficacy of the CB approach.
- Be careful to also include actors that may hold conflicting positions. It is particularly important to identify possible "opponents" of the process - actors oriented towards a maintenance of consolidated positions and solutions – and to identify possible "allies" – actors oriented towards change and innovation - who support the Working Group in overcoming obstacles.

BOX - Stakeholder analysis and stakeholder matrix.

Stakeholder Analysis is defined "as a series of activities aimed at identifying the sets/groups of stakeholders most relevant to an organization at a given time and with respect to one or more issues of specific interest". This Analysis has the objective of detecting, in a structured and effective manner, which are the stakeholders that an organization/institution must prioritize in its engagement activities with respect to a given objective.

There are two main purposes to which this analysis tends:

a. To organize in a systemic way the different actors that will be involved.
b. To identify which role each stakeholder can play in the decision-making process.

The analysis may be carried out remotely and directly through discussions and interviews with key informants, and through reflection and feedback sessions with the WG. One of the most popular tools for stakeholder mapping is the compilation of the influence/relevance matrix. This method of analysis is based on the analysis of interest and influence variables.

The level of influence can be assessed through these dimensions:

- How much can or could the stakeholder influence the setting and the achievement of the objectives of a project/process?
- What power does the stakeholder have over project design, execution, and results?
- Are the actions that a stakeholder can bring into play able to strengthen or impede our process?
- Both the informal and the formal decision-making power of each stakeholder considered must be considered here.

The level of interest can be assessed through these dimensions:

- How much can the project/process influence the actor's objectives/activities?
- Will the potential project actions lead to positive or negative effects on the actor?

Based on the assigned values for interest and influence, a matrix can be employed to position stakeholders and analyze their relevance in engagement. For instance, the Influence and Interest matrix suggests the following approaches to handling stakeholders:

- Stakeholders with high influence and high interest are classified as "ESSENTIAL". They should be managed with the utmost care. It is necessary to involve them as they have a strong influence on decisions.
- Stakeholders with high influence and low interest are classified as 'APPETIBLE'. They must simply be satisfied in their expectations. They should be involved because they are pressure elements or opinion leaders who can influence public opinion.
- Stakeholders with low influence and high interest are classifiable as "WEEK". They must be kept informed about the progress of the project. They must be involved because they do not have the means to strongly express their interests (they often coincide with the beneficiaries of the process/project).

- Stakeholders with low influence and low interest are classifiable as "MARGINAL". They must simply be monitored to see if their attitude changes

Activity 2.4. Discuss appropriateness of the CB approach

It is important to evaluate the suitability of the CB approach for addressing specific DRR/CCA issues with the targeted community. During the initial phase of the participatory process, it is essential to engage in discussions with the community that will be involved. This initial stage serves several critical purposes:

I. Activating stakeholders: it initiates stakeholders on the path of participation, raising awareness about the administration's planned activities and emphasizing the significance of everyone's contribution to the participatory process.
II. Demonstrating commitment: it provides public administrators with an opportunity to demonstrate their commitment to the CB activities, thereby garnering the support of engaged stakeholders.
III. Methodology confirmation: this stage allows for a review and confirmation of the proposed CB methodology and the primary expected outcomes in collaboration with the community to be engaged, ensuring alignment with their needs.

This activity should be structured to maximize the involvement of as many stakeholders as possible. The participation of the responsible authority and other key members of the working group is crucial. The timing and location of meetings should be discussed within the WG, considering the preferences of stakeholders where feasible.

The **first sub-step** entails informing about benefits and drawbacks of participation. It is imperative to present the direct and evident benefits of participating in the CB project to the local community. The facilitators of the Community-Based Approach (CBA) should be able to articulate these benefits right from the initial engagement. Demonstrating tangible results and outcomes of the engagement process is essential. Previous participatory experiences from other contexts can be shared to illustrate the timeline of a participatory process and the tangible outcomes that have been achieved.

In the **second sub-step**, the focus is on discussing participation overall goals, scope, and focus. This includes presenting what has been deliberated in activity 2.1 (fourth sub-step) and integrate it with inputs and feedback from the community.

The **third sub-step** involves deliberating specific participation objectives, the level of inclusion and degree of participation (activity 2.2).

Lastly, the **final step** involves harmonising the specific objectives, the level of inclusion, and degree of participation with inputs and feedback gathered from the community.

Activity 2.5. Towards a Co-Design of CB activities

The **firs sub-step** of this activities entails choosing the appropriate activities and tools based on the objective, degree of participation, level of inclusion, the timetable of the process, and other relevant factors. To support the choice, practitioners can refer to Chapter 7 and to the Toolkit Matrix (section 7.1). To effectively implement the participatory process, activities cab be categorized into three main phases:

- Phase 1 – Information and stakeholders' activation. In the initial phase, it is crucial to plan moments that activate stakeholders, making them feel like active participants in the process.

- Phase 2 – Dialogue, discussion, and conflict management. The participatory process should include opportunities for citizens to engage in discussions to identify differing perspectives on risk perception, territorial vulnerabilities, and community group priorities.
- Phase 3 – Collection of proposals and positions, and feedback. During this phase, the various proposals put forth by stakeholders will be organized. These proposals will undergo evaluation by experts, and the results will be shared with stakeholders as accepted or modified.

The **second sub-step** centers on gathering feedback from the community and incorporating their input into the creation of the Community participation plan. This plan, drafted by the WG, provides a comprehensive explanation and outline of each stage of community involvement in the decision-making process, primarily for internal reference.

BOX - Sample of Community Participation Plan (Table of Contents)[5]

1. Introduction and Background
    a. Brief project overview.
    b. Summary of proposed community participation plan, including timeline and scope.
    c. Specific community participation objectives.
2. Preliminary Research and Initial Contact
    a. Methods for gathering preliminary information.
    b. List of potentially interested communities and communities' profiles.
    c. Identification of major issues or challenges and anticipated level of interest
3. Summary of the Community involvement plan:
    a. Level of public participation for each objective and phase.
    b. Proposed community participation activities.
    c. Specific roles and responsibilities.
    d. Detailed schedule and budget.
    e. Operational and logistical details for activities.
    f. Work schedule, assignments, and deadlines.
    g. Internal and external communication plan.
    h. Documentation / record keeping process for each activity.
    i. Methods for monitoring and adapting each activity.
    j. How feedback will be provided.
4. Appendices (optional)
    a. Schedule of planned public participation activities.
    b. Site and facilities description (e.g., maps, demographics, geography).
    c. Locations of scheduled public meetings.
    d. Contact lists and databases of key interested parties and other stakeholders.

It is important to consider that often participation plans are meticulously designed, which is crucial for establishing and sharing milestones. However, it is equally important to acknowledge that unexpected circumstances may require adjustments. Rather than adhering strictly to a linear process, participation often unfolds as a recursive process that involves continuous refinement and adaptation. Consequently, the

[5] Reference: Health Canada – Policy Toolkit for Public Involvement in Decision Making.

community participation plan may undergo modifications as needed to effectively respond to evolving situations and needs.

Step 3: Implement and monitor the participation

Activity 3.1. Promote community participation

As a first **sub-activity is important to explain the process** to the community. Clarify the participatory process by creating a Community Participation Plan, which serves as a comprehensive participant guide. This plan should encompass the process's goals, individual steps, and expected outcomes. It functions as a booklet that outlines key information to support stakeholders' participation. Effective communication tools are essential for the public participation process, enabling citizen involvement and raising awareness of the issues. Once the process's themes and objectives have been established, informational materials should be prepared. Emphasize the importance of developing straightforward and effective communication tools. Key elements to present include: (i) the stages of the participatory process; (ii) its objectives and timeline; (iii) contact information for further inquiries. These documents and tools should be user-friendly and understandable to individuals without technical expertise.

Second, in terms of **sub-activity is to communicate the strategy a**nd the tools. Tailor the communication strategy to fit the context and administrative scale of the participatory process. For instance, in the case of a village or small town, word-of-mouth can be an effective approach for promoting participation. This type of communication can be initiated by engaging influential members of the community network. In contrast, in larger urban settings, it's important to design a multi-channel communication campaign to reach diverse groups of citizens, including those less familiar with digital technologies (e.g., the elderly) and those who may be less connected to local cultural and social networks (e.g., residents of foreign origin). To do this activity various communication tools can be used according to the process's phases. During the Start-up phase, it is suitable to organize a press conference involving local media and/or a launch event to introduce the process's objectives, phases, and meeting dates, featuring responsible authorities. During the process, to maintain ongoing engagement with stakeholders, consider creating a website that documents the process steps, establishing a bulletin board to provide updates, and potentially collecting feedback from participants. After each public meeting, preparing reports is advisable to share key issues and proposals that emerged. Providing informational materials on the process and its progress is a best practice. During the conclusion of the process, it is possible to prepare a final report detailing the process and disseminate it through various channels, such as a press conference, website, and social media. Holding a press conference to effectively communicate the results is also recommended. The overall suggestion is to adapt the process to community needs. Identify significant dates or events that could reduce or impact community or partners participation. Assess the suitability and neutrality of venues or community spaces to enhance community confidence, trust, and active participation in meetings or activities.

Activity 3.2. Implement participation activities

To initiate the participatory process, the Working Group (WG) first establishes contact with stakeholders through personal outreach. Subsequently, it ensures that each community engagement activity, forming an integral part of the participation process, is executed by an expert team in a suitable location. The WG also maintains continuous communication with facilitators.

As a second step, the WG proceeds to implement each activity as outlined in the Plan and produces a specific report for each one. Following every participatory meeting, the session leader is responsible for

preparing a summary report, which is then shared with participants and made accessible through the tools utilized to facilitate the process.
It is important to note that the final stages of the participatory process predominantly focus on the deliberative phase. During this phase, community proposals are presented with the assistance of facilitators. Facilitators play a pivotal role in highlighting critical issues, addressing needs and requirements, presenting diverse viewpoints, and fostering innovative ideas. This phase may encompass both plenary meetings and more focused, informal discussions conducted at thematic discussion tables.
Upon the conclusion of this phase, the various proposals generated from discussions are compiled into a comprehensive report for further examination by technical experts and officials.

Activity 3.3. Monitor the process
To evaluate whether the participatory process is progressing as initially defined, it is crucial, right from the beginning of the process, to establish the outcomes to be achieved or the outputs to be realised for each phase. Regarding the monitoring and evaluation process for the CB approach, please refer to Chapter 6.4, which is dedicated to this topic.

Agreed actions or activities may be undertaken by the community and partners working together, or by each taking responsibility for separate activities or projects. Successful implementation is more likely if community leaders or groups are involved throughout the process.
Monitoring should incorporate the perspectives and experiences of a variety of participants and community members and plans should be adjusted accordingly. Knowledge and learning generated from the process itself can also be monitored: about the community, partners, ideas that are generated, what works well, problems that arise, things that did not work well and valuable ways of working or supporting the community. (The Health Canada Policy Toolkit for Public Involvement in Decision Making, 2000)

For example, at the end of a CB process, it could be important to verify whether the solutions envisaged are improvements and functional to the DRR/CCA issues and simultaneously test the degree of involvement of the population in risk mitigation. A useful tool for evaluating these issues is a **Periodic exercise** to verify and update what envisaged by the planning, verifying the validity of the various organizational models adopted. The update must be at least annually and no later than three years.
On the other end, an evaluation of the progresses of the process is very important. In this case it could be possible use a) Event Monitoring Sheet and b) Communication Monitoring Sheet.

“Monitoring implementation can make a valuable contribution to longer-term capability building within the community and support other communities by contributing to the growing evidence base developed from many community engagement processes”. (The Health Canada Policy Toolkit for Public Involvement in Decision Making, 2000).

Step 4: Finalizing the participation process

Activity 4.1. Elaborate and present results of participation process

The outcomes of the participatory process will undergo discussions within the working group and among technical experts to assess their practical application and potential integration into regulatory instruments. It's possible that not all proposals will be accepted, but maintaining transparency in this deliberative process is of utmost importance. During the restitution phase of the process, the working group, process leader, or institutional representative will be responsible for presenting the decisions made and providing explanations for them. This phase may also include accommodating questions and scrutiny from stakeholders. This step holds significant importance as it not only enhances the transparency of the process but also strengthens the accountability of the governing body. This activity includes the organization of a. Internal Meeting with the Working Group and Experts to Evaluate and Select Community Proposals. b. Public Meeting to Present the Results.

Activity 4.2. Formalize new procedures and policies

After presenting the outcomes of the participatory process, the WG, in collaboration with responsible technicians, incorporates these results into procedures and/or policies. It is crucial to promote the developed best practices as an example for other regions or entities to follow.

Table 4: Instructions for implementing a Community-Based Approach

Phase	Activity	Contact persons & responsibilities	Requirements	Tools	Key Outputs
Step 1 – Before starting	1.1	The public administration has the responsibility to assess whether the process can be successfully implemented.	The commitment of the public administration is essential to guarantee the effectiveness of the whole process. The public administration should wholeheartedly embrace its responsibility to provide substantial support for the participation process and genuinely consider its outcomes in the decision-making process.	/	Brief report on activity 1.
	1.2	A technical consultant assists the public administration in assessing the suitability of the CB process to the specific legal and institutional framework.	The potential to impact the legal and institutional framework should be carefully assessed before initiating the participatory process.	/	Brief report on activity 2.
Step 2 – Setting the scene	2.1	The public administration appoints members of the WG and designates officials or sectors responsible for coordinating WG activities. An external consultant may aid the public administration in identifying the most pertinent sectors and stakeholders to involve in the WG. A technical agency of the public administration or an external consultant oversee the provision of training materials and activities.	The public administration oversees the choice of the WG members. The WG includes representatives from all sectors with responsibilities related to the topic of the participatory process. However, the public administration should also consider including an internal or external subject with previous experience in participatory processes.	A preliminary survey administered to the WG members to better tailor the training activities. A SWOT analysis for better characterize the goals and objectives of the participatory process.	A report presenting WG members and their role in the WG activities. Training materials. Context analysis. Scope and rationale defined and shared with stakeholders.

		A technical agency of the public administration or an external consultant oversee the preliminary context analysis. The WG organizes the communication to the population and the first engagement of citizens.	The training activity should be tailored to the topic of the participatory process, focusing on the needs of the WG.	Brainstorming or focus groups for setting the main goal of the participatory process.	Minutes of the meeting with the population.
	2.2	The public administration has the responsibility to set the specific objective of the participatory process. The WG oversees the assessment of available resources and time boundaries for the participatory process. The WG assesses the level of inclusion and degree of participation of the CB approach.	The participatory process should be tailored to the available resources and time. The involvement of the local community should be customized based on the anticipated or desired degree of participation and level inclusion.	/	Minutes of a WG meeting aimed at setting the boundaries of the participatory process, the degree of participation, and the level of inclusion of the target community.
	2.3	The WG is responsible for the stakeholder mapping activity. The WG coordinator identifies stakeholders according to the needs of the public administration and the results of the stakeholder matrix. An external consultant supports the WG and the WG coordinator in filling in the stakeholder matrix.	Stakeholder mapping is a crucial, complex activity for effective participatory processes, requiring experts with local knowledge and the involvement of local institutions, such as mayors or public officials.	Stakeholder matrix.	Detailed context analysis. Community and internal relationship mapped. Report on stakeholder analysis, complete by the stakeholder matrix and information on contact persons.
	2.4	The WG arranges initial interactions with stakeholders, which includes defining the content and structure of each meeting.	The presence of public authorities is essential to demonstrate their commitment to the participatory process	/	Public meetings report.

		Local authorities participate in meetings organized by the WG with stakeholders to officially endorse the CB process.	and their willingness to adopt the outputs of the CB approach. It is crucial to engage the entire group of stakeholders, ensuring that no one is left behind during the initial stages of the process, and striving to secure strong commitment from the local community. It is important for the members of the engaged community to assume full responsibility for actively participating in the participatory activities and fully embracing the results thereof.		A CB process framework with integrated community feedbacks.
		A facilitator coordinates activities and fosters discussion between WG and stakeholders.			
		The stakeholders engaged in the CB approach attend preliminary meetings and provide input on objectives and the structure of the participatory process.			
	2.5	The WG chooses activities and tools.	It is crucial to find the balance between the structure outlined by the WG for the participatory process and the feedback and requirements expressed.	/	Community participation plan.
		The WG engages the community in discussions regarding the chosen CB activities and incorporates their feedback.			
		The WG develops a Community participation plan.			
Step 3 - Implement and monitor the participation	3.1	The WG and facilitators are responsible for developing the Community Participation Plan.	The communication strategy should align with the customs, culture, and communication habits of the local community. Participatory process meetings should be scheduled in consideration of the daily routines of the local community.	/	Report on public meetings. Implementation of communication tools.
		A communication expert, who may be a member of the public administration or an external consultant, should be responsible for crafting the communication plan.			
	3.2	At the end of each participatory activity with the community, the WG coordinator prepares a report.	It is important to disseminate the meeting reports among the participants.	Tools from the Toolkit matrix.	Reports of participatory meetings.

		Facilitators collect the proposals from the community and highlight critical issues, needs and requirements that may emerge during the participatory process. Technicians and officials from the public administration discuss the different proposal emerged during the participatory process.			Report containing the final proposals resulting from the participatory process.
	3.3	The community members and/or the WG members, with the involvement of representative from local authorities choose the members of the M&E team.	It is important to identify straightforward outcomes and outputs since the very beginning of the participatory process activities.		Monitoring sheet.
Step 4 – Finalize the participation process	4.1	The WG and technicians are responsible of assessing the integration of the proposal into the existing regulatory instruments The WG coordinator and public authorities are responsible for presenting the outcomes of the participatory process to the community.	Clearly present the results of the CB activities to the engaged community, especially focusing on the community proposal selected by the public administration. Ensure transparency when explaining why certain proposals were accepted while others were rejected.	/	Public meeting to present process results. Report detailing the selected community proposals.
	4.2	WG members and technicians are responsible for integrating the new proposals into the regulatory framework and procedures of the public administration.	Ensure the careful and comprehensive dissemination of the results of the participatory process.	/	Documentation of integrated procedures (e.g., resolution, law).

6.3. Guidelines for strengthening community trust during natural disaster management.

Community trust and trust in institutions create connections to critical resources that assist communities in natural disaster management. Scholars link community trust to outcomes such as increased volunteerism, healthier inhabitants, and economic prosperity. It forges relationships between neighbors and friends, to whom individuals turn when they require assistance.

6.3.1 Phases and instructions

The Working Group responsible for community-based participatory approaches can undertake specific steps to help build trust in the different disaster risk management phases (i.e., prevention, preparedness, response, and recovery) and CCA, to ensure risks reduction of the enhancement of community resilience, while guaranteeing effective response and recovery capabilities. The foreseen steps correspond with the disaster risk management phases and are characterized by serval activities, as listed in the graph above.

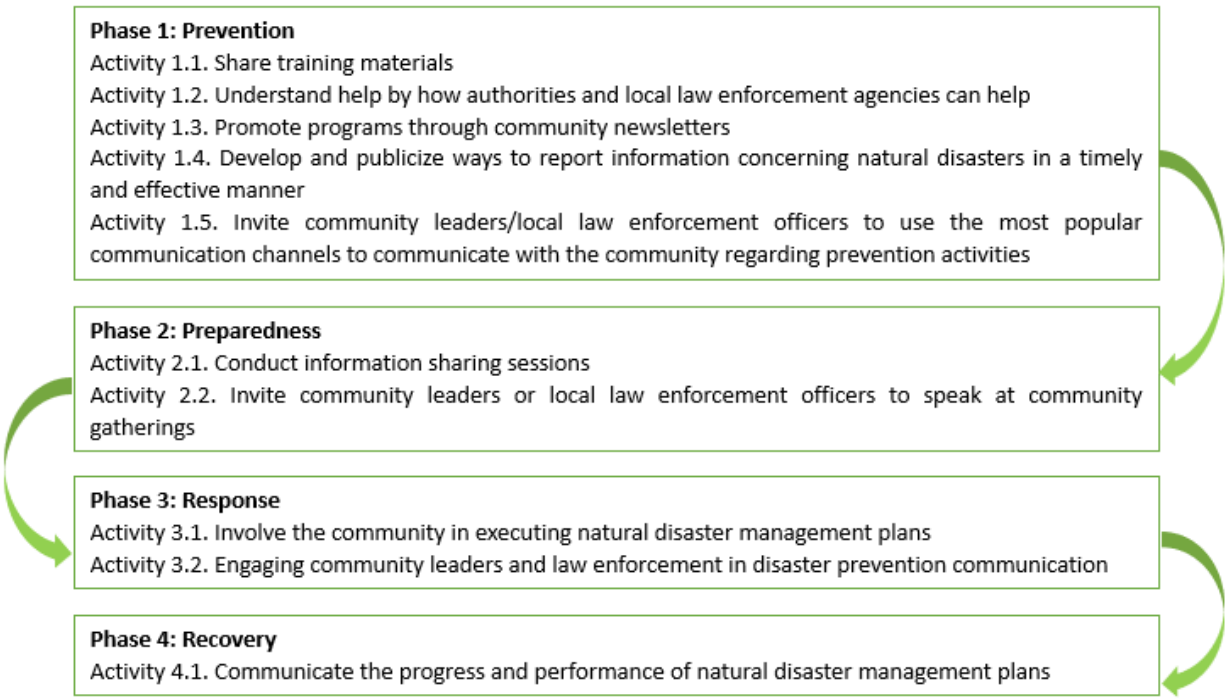

Figure 31: Building trust flowchart

Phase 1: Prevention

Activity 1.1. Share training materials

Share training materials on natural disaster management with community members. In conjunction with local law enforcement agencies, community leaders or authorities, the Working Group (WG) can distribute training materials on natural disaster management throughout their communities and at events.

Activity 1.2. Understand how authorities and local law enforcement agencies can help

Understand how authorities and local law enforcement agencies can help. Many law enforcement agencies have already begun programs to involve the community in preparation of natural disasters. It is important for community leaders or authorities to reach out to their local agencies to find out what programs exist and how they can get involved.

Activity 1.3. Promote programs through community newsletters

Community newsletters are a good way to provide information to the community about disasters such as wildfires, tropical storms, hurricanes, earthquakes. These newsletters may also contain specific information about adverse outcomes and how to manage them.

Activity 1.4. Develop and publicize information material on natural disasters timely and effectively

It is critical to develop and evaluate communication systems specifically designed for disaster risk management, with a focus on enhancing usability. This includes the implementation of mechanisms such as alerts and helplines, to efficiently disseminate vital information within the community. From large cities to small towns, many communities already have access to these systems. An increasing number of local agencies now offer the option to report information by text message, mobile phone application, and/or secure web sites. In most cases, these methods can be used to timely report dangerous events.

Activity 1.5. Engaging community leaders and law enforcement in disaster prevention communication

Invite community leaders or local law enforcement officers to use the most popular communication channels (e.g., phones, social media, television) to communicate with the community regarding prevention activities for natural hazards management.

Phase 2: Preparedness

Activity 2.1. Conduct information sharing sessions

Conduct information sharing sessions, such as public meeting or focus group on natural disaster management topics. Information sharing sessions will enable many more community members to spread the word about natural hazards reporting to the rest of the community. Community members have the credibility and knowledge to make the subject matter relevant to their neighbors.

Activity 2.2. Invite community leaders or local law enforcement officers to speak at community gatherings

Invite community leaders or local law enforcement officers to speak at community gatherings. Officers can speak on a variety of themes to neighborhood associations, faith-based organizations, schools, and other community groups, including the community's role in natural disaster management, and the role of the local law enforcement agency. There should be time for questions and discussion from community members at these meetings.

Phase 3: Response

Activity 3.1. Involve the community in executing natural disaster management plans

Engaging the community in appropriate ways when putting the natural disaster management plans into action increase trust. Doing so builds credibility, shows integrity and responsiveness, and demonstrates the competence of institutions.

Activity 3.2. Engaging community leaders and law enforcement in disaster prevention communication

Invite community leaders or local law enforcement officers to use the most popular communication channels (e.g., phones, social media, television) to communicate with the community regarding prompt actions to manage the disaster.

Phase 4: Recovery

Activity 4.1. Communicate the progress and performance of natural disaster management plans on a regular basis

Authorities communicate the natural disaster management plans' progress and performance on a regular basis, also valorizing the community contribution to their success when appropriate. A regular, clear communication is critical to keeping citizens informed and building community trust. A lack of transparency, even if unintended, breeds mistrust and misinformation. Regularly communicating progress, as well as setbacks or criticisms, is essential to building trust. It is important to note that actions to implement the trust are more substantial on the initial stages of risk management. This happens because the four phases are intertwined, and they often overlap and support each other. For example, recovery actions are likely to start during the response phase, while mitigation techniques may be explored during the recovery phase (Bullock et al., 2013). As a result, disaster management needs a robust implementation of trust dynamics from the initial stages of the risk management process (see Figure 33). Building a strong sense of trust is crucial for limiting damage and accelerating recovery, and communities with a strong sense of trust, solidarity, and active participation react to emergencies more effectively.

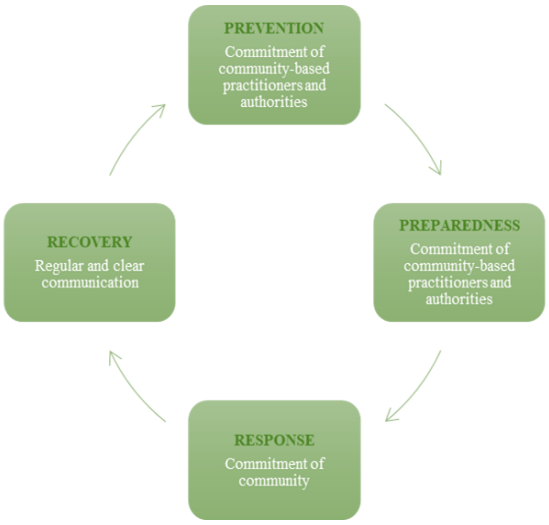

Figure 32: The cycle of risk management phases and the mutual influence of specific aspects of the guidelines

The goal of these guidelines is to build and spread a "culture of trust" at community level. As implied in the different steps of the guidelines and their related suggested actions, **building a culture of trust** is challenging due to the nature of the construct and the requirements involved in its implementation. However, as with many challenging subjects, clear and open communication on disaster risk management is the most effective tool every community can use. Honestly communicating by community-based practitioners, community leaders or local law enforcement on the need and practice for increased security, can help to decrease the sense of fear during risk management and reduce inappropriate responses when the time comes to begin implementing emergency management strategies. The culture of trust is necessary for the community resilience and creates a connection where all people belonging to the community are jointly working toward safeguarding everyone's best safety.

Table 5: Instructions for strengthening community trust

Phase	Activity	Contact persons & responsibilities	Requirements	Tools	Key Outputs
Phase 1 – Prevention	1.1	The WG collaborates with local law enforcement, community leaders, and authorities to disseminate disaster management training materials.	The commitment of the public administration, authorities and local law enforcement is necessary to guarantee the effectiveness of all promoted actions in this phase.	Brochures, websites, newsletters, and reports.	Risk prevention communication plan.
	1.2	Community leaders or authorities reach out to their local law enforcement agencies to learn about existing programs and opportunities for community involvement in disaster preparedness.			
	1.3	Community newsletters can be used to disseminate information about various disasters and their management, helping promote disaster preparedness programs to the community.			
	1.4	Local agencies develop and publicize communication systems for disaster risk management (e.g., alerts and helplines).			
	1.5	Community leaders or local law enforcement officers are invited to utilize popular communication channels for disseminating information to the community about prevention activities.			
Phase 2 –	1.1	Community members participate in information sharing sessions on natural disaster management topics.	The commitment of the public administration, authorities and local law enforcement is necessary	Focus groups. Various materials (slides and reports).	Public meetings report. Information sharing sessions.

		Community members disseminate information about disaster management to the entire community.	to build close and frequent bonds with the community.		
	1.2	Community leaders or local law enforcement officers address various community groups to discuss the community's involvement in natural disaster management and the role of the local law enforcement agency.			
Phase 3 - Response	3.1	The community takes part in executing natural disaster management plans.	The appropriate level of community engagement in emergency management strategies.	/	Community engagement in plans.
	3.2	Community leaders or local law enforcement officers are invited to utilize popular communication channels to communicate with the community which prompt actions to take to manage the disaster.		Most popular communication channels (e.g., phones, social media, television).	Emergency communication plans.
Phase 4 - Recovery	4.1	The authorities communicate the progress and performance of natural disaster management plans.	Communication must be regular and clear.	Popular communication channels (e.g., phones, social media, television) and various materials (brochures, website, newsletters, reports).	Consistent communication regarding the progress of natural disaster management plans.

6.4. Monitoring and evaluating the effectiveness of the application of a community-based approach

This chapter is dedicated to outlining the guidelines on how to monitor the effectiveness of a CB approach. What sets these guidelines apart is their emphasis on conducting a participatory monitoring and evaluation. This process involves active community participation, ideally the same community engaged in the CB approach, which shares control over the design, implementation, and outcomes of the evaluation. This approach differs from the more common evaluations, which are led by external experts who typically assess performance against predefined indicators and employ standardized procedures and tools. Participatory monitoring and evaluation processes offer the advantage of greater inclusivity and better representation of the viewpoints and goals of those most directly impacted by the actions being evaluated.

Effectiveness, in this context, primarily refers to **community participation in co-designing CCA and DRR strategies**; it, in turn, reflects the success of the strategies in adapting to climate change and reducing risks. Indeed, **successful participation means not only meaningful community involvement but also the development of effective DRR/CCA strategies** which enhance community resilience and address vulnerabilities in face of the impact of climate change and disasters. Given the strong interconnection between the effectiveness of participation and the effectiveness of CCA and DRR strategies, it becomes challenging to distinguish between the two. Neither alone is a sufficient condition for deeming a CB approach effective, while we could argue that both are necessary conditions for such an assessment.

So, what exactly should be monitored when initiating the process of evaluating the effectiveness of a CB approach? As mentioned earlier, the effectiveness of a CB approach hinges on both the **effectiveness of community participation** and the **effectiveness of the resulting CCA and DRR**. However, delving into the specifics of what constitutes effectiveness in participation and in DRR and CCA is a complex task, primarily due to its highly context-specific nature. There isn't a universally applicable definition; instead, there's a wide array of elements and indicators that could be considered essential for labelling a CCA/DRR strategy and community participation as effective. However, these factors depend on the context in which a CB approach is implemented, as also showed in the conceptual framework presented earlier (Chapter 5, Part I). This context includes the type of community involved, the level of community agency, the characteristics of the participatory processes, the enabling and constraining factors, and the community's specific needs and concerns related to climate change and disaster risks. It's worth noting that these elements constitute the conceptual framework of a CB approach, as we have conceived it.

As a rule of thumb, a CB approach can be deemed effective if it successfully achieves the objectives outlined during the approach planning stages (as explained in section 6.2.2). Moreover, the effectiveness of the approach is also gauged by its ability to embody the key elements of meaningful public participation, with 'meaningful' denoting a level of participation that aligns best with the community's unique needs, concerns, and capacities.

6.4.1 Key elements for effectiveness evaluation of a community-based approach

While there is no one-size-fits-all approach to monitoring and evaluating a CB approach, certain fundamental considerations should serve to structure and planning an evaluation process, regardless of the specific context.

Intended purpose of the evaluation

Typically, a CB approach evaluation process can serve various aims, e.g., facilitating adaptive management, promoting learning, adapting the approach to evolving circumstances, and ensuring accountability. Each of these objectives imposes distinct demands on the evaluation process. For instance, creating a report might suffice for accountability purposes, but merely generating a report doesn't facilitate the necessary adjustments to the CB approach based on the feedback collected during and after implementation.

Content of the evaluation process

Monitoring and evaluation activities should correspond to what needs to be assessed. A common differentiation lies between process-oriented evaluations and result-oriented evaluations. Process-oriented evaluations focuses on the outcomes of the CB approach concerning community participation, while result-oriented evaluations emphasize the CB approach's outcomes concerning DRR/CCA.

Target of the evaluation process

The audience for whom the evaluation process is intended significantly shapes the monitoring and evaluation activities. To ensure that the process's findings are effectively utilized, it's crucial to tailor the communication format to suit the audience and employ suitable communication channels.

Resources availability

Regardless of the good intentions guiding the design of an effectiveness evaluation process, its characteristics and implementation opportunities are substantially influenced by the availability of resources. These resources encompass human capacities, human capital, time, and financial investments.

In addition to these key considerations, there are also common principles that apply to evaluation processes. First and foremost, it is vital to recognize that these processes serve to document evidence of the success of a CB approach. This documentation is essential for the approach to be scaled up and garner support from both authorities and other communities in the future. This, in turn, enables it to serve as a model for effectively addressing climate change and disaster risks. Another crucial shared objective is that an evaluation process should facilitate learning (to build capacity in the community) and promote community ownership and management of not only the CB approach but also the CCA/DRR strategy.

6.4.2 Steps and instructions

The monitoring and evaluation process is characterized by four steps that are organized in activities. The first steps aim to establish a team of competence persons working in the evaluation; the second steps is

about planning the process of monitoring and evaluations; the third steps consist in the implementation and in the collection of data and data interpretation; the process ends with the evaluation report and the presentation of the results. Below the flowchart of the evaluation process.

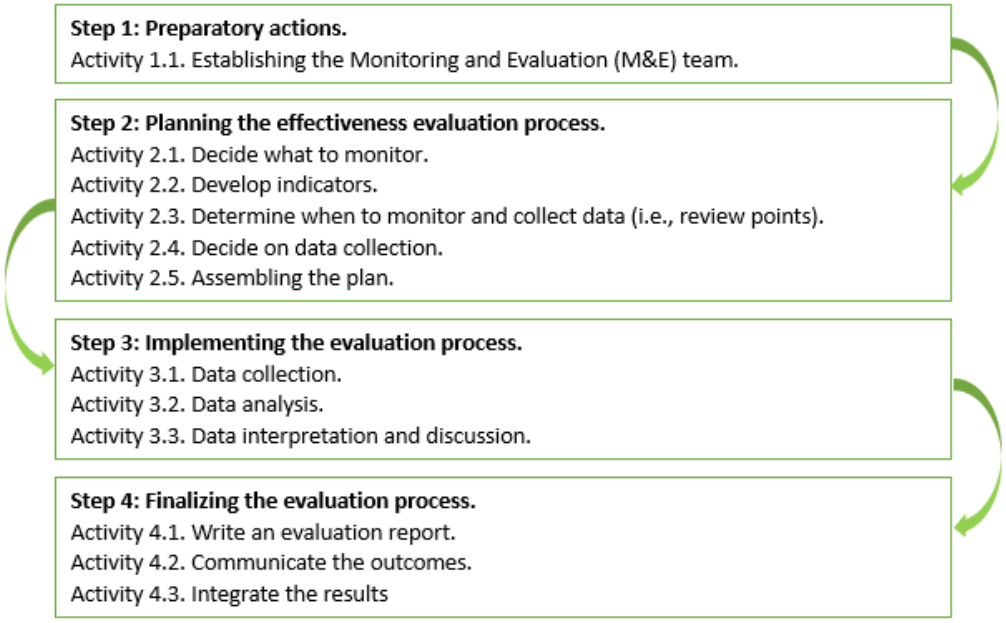

Figure 33: Effectiveness evaluation flowchart.

Step 1: Preparatory actions

Activity 1.1. Establishing the monitoring and evaluation (M&E) team

The monitoring and evaluation process should be managed by a small team (6-8 individuals), primarily composed of community members. It is also advisable to include a facilitator who assumes responsibility for the process, experts specialized in public participation and/or DRR/CCA, as well as representatives from the local decision-making bodies. There may be overlaps between the M&E team and the Working Group (the one responsible for planning the CB approach), particularly if the evaluation process starts during the early stages of the CB approach. It is also possible that community members may volunteer or be co-opted to participate in both teams. In any case, collaboration between the M&E team and the WG is essential throughout all the evaluation and monitoring process, with the latter providing support to the former, especially concerning information and data gathering and analysis.

The selection of members for the M&E team may differ from case to case. Members can be chosen by the Working Group, the community itself, or through a combination of both entities; the selection process may also involve government/authority representatives. Regardless of the approach, it's crucial to ensure that the community is well-informed about the members selection process and its outcomes. Additionally, the community should have the opportunity to nominate members or raise concerns regarding the final selections.

The facilitator can be an external expert or a member of the CB approach project staff; however, they should possess familiarity with public participation, the community, and the project's context. The facilitator's responsibilities include promoting discussion and communication among team members, coordinating all monitoring and evaluation activities, ensuring alignment with the evaluation's scope and plan, addressing any challenges that may arise, maintaining thorough records of activities in an organized and accessible manner, and providing training and capacity-building support to enhance the understanding of the evaluation process among M&E team members.

Regarding M&E team members, it is essential to ensure gender representation and include representatives from minority groups within the community. Additionally, diversity in terms of socio-economic backgrounds should be considered. The team's responsibilities encompass the entire M&E process, from planning and data collection to analysis, discussion, reporting, and communication of results. Team members should have a clear understanding of the importance of evaluating the effectiveness of a CB approach and how it can benefit the community.

Step 2: Planning the effectiveness evaluation process

Activity 2.1. Decide what to monitor

To evaluate the effectiveness of a CB approach it is important to monitor and assess both the involvement of the community in the decision-making process and the achievement of the objectives related to CCA and DRR as stated into the CB process plan. Therefore, the evaluation process should focus on the following aspects:

- **CCA/DRR Outcomes:** this involves assessing the results of the CB approach concerning CCA and DRR. This includes evaluating progress toward achieving objectives related to reducing vulnerability and increasing resilience within the community.
- **Participatory Process**: this aspect entails evaluating how participatory activities are conducted throughout the CB approach and the overall implementation of the approach. It involves examining why and how events and activities unfolded, as well as assessing the relevance, effectiveness, and efficiency of the participatory process.

By focusing on these two key areas, the evaluation process can provide insights into the effectiveness of the CB approach, shedding light on both its tangible outcomes and the quality of community participation. This comprehensive evaluation approach helps to ensure that the CB approach is not only successful in achieving its CCA and DRR goals but also in engaging the community in a meaningful and impactful manner.

Activity 2.2. Develop indicators

Once the decision about what to monitor is taken, to proceed with the evaluation of the effectiveness of a CB approach it is important to develop indicators. The term is here used as an umbrella concept to indicate an observable parameter, characteristic, or variable that provides insight and evidence about a particular phenomenon, condition, or process. Indicators are important as they are the means to track trends, measure progress toward goals, or gauge the effectiveness of interventions. Indicators enable structured measurement and assessment and allow for comparative analysis. Indicators as intended in this section encompass both qualitative and quantitative indicators. Both are useful to conduct a comprehensive evaluation of a CB approach. Indeed, quantitative indicators (represented by a number) are easier to collect and are helpful to map the trend of change; qualitative indicators (represented by an indication of a quality, extent, or level) are important as they help to describe change.

This section won´t provide any list of indicators to be used to evaluate the effectiveness of the CB approach. The reason is that indicators are context specific and vary depending on the specific features of the CB approach under examination, including its specific objective in terms of CCA/DRR, the type of community involved, the enabling and constraining factors, etc. On the contrary, this section provides some evergreen suggestion on how indicator could be developed: what to consider and what make an indicator a good one.

A set of indicators can be determined by the M&E team by doing the following:

Reflect on the objectives of your CB approach. What do you intend to achieve in terms of community participation or CCA/DRR? For example, if your goal is to enhance community resilience, one objective might be to reduce the number of vulnerable households in flood-prone areas. In terms of community participation, if the goal is to enhance community engagement in decision making as regards local disaster preparedness planning, one objective might be to increase the percentage of community members actively involved in contributing to the development and review of plans and policies. The objectives of the CB approach should have been already determined by the Working Group in the Community Participation Plan (see Step 2, sub-step 2a, in section 6.2.2).

Break down your objectives into key performance dimensions, which will be the base for the indicators. These dimensions should cover various aspects of your CB approach's effectiveness. Continuing with the resilience example, dimensions could include the number of flood-resistant infrastructure improvements and the increase in the number of households with an emergency preparedness plan. In terms of community participation, dimension could include attendance to municipality meetings, provision of input, and participation in training exercises.

- To aid in the indicators´ selection process, consider these guiding questions: How can you confirm that a change has occurred in this specific dimension?, What criteria will define success when you observe it?
- Reviewing existing literature may help in selecting indicators: you could look for common indicators that have been used successfully in similar contexts.

Consider the availability of data and avoid selecting vague or overly general indicators. Indicators should be based on data that can be feasibly collected and analyzed and that provide actionable information.

Validate the indicators. This can be done by sharing them with DRR/CCA/participatory processes experts outside the M&E team and gather their feedback. You could also consider sharing the indicators with other community members and stakeholder to ensure widespread agreement.

BOX- Indicators to assess the outcomes of the CB approach in terms of efficacy of the CCA/DRR strategy. Important aspects for the indicators to capture:

- The community participates in identifying vulnerabilities, designing strategies, and implementing actions.
- Infrastructures are strengthened, early warning systems are improved, and sustainable land use and building practices are promoted.
- Specific measures to reduce disaster risks are implemented (e.g., flood barriers, firebreaks).
- Sustainable practices that reduce environmental degradation and contribute to long-term climate resilience are promoted (e.g., reforestation, sustainable agriculture, and water resource management).
- Timely and accurate information sharing channels are established. This is critical for disaster preparedness and response.
- Trainings are organized to build the capacity of community members and local institutions to understand and address disaster risks and climate impacts.
- Collaboration and trust among various stakeholders, including community members, government agencies, NGOs, and the private sector, is fostered.
- Sufficient resources including funding, technical support, and personnel are allocated to sustain DRR and CCA initiatives.

BOX - Indicators to assess the outcomes of the CB approach in terms of meaningful Public participation. Important aspects for the indicators to capture:

- Community's values and needs are respected and taken into consideration.
- Both indigenous and experts' knowledge is collected, shared, and considered.
- Input from the community is solicitated and can influence decisions and outcomes.
- The process is transparent and consistent to time and resources constraints.
- The community is represented in its wholeness, including marginalized or vulnerable groups.
- Community members are involved from the beginning of the decision-making process and throughout its various stages.
- Participants have access to relevant information about the issues being discussed, allowing them to make informed contributions.
- There are mechanisms for providing feedback to participants on how their input was considered and what decisions were made.

To support the selection of indicators as regards meaningful public participation, it could also be helpful to refer to section 6.2.2 "Steps and instructions" where the conditions to compiled with for each step of the CB approach implementation to be effective, can be found.

Regardless of the specific indicators that the M&E team chooses, tailored to the context and objectives of the CB approach, each indicator should possess the qualities of being RACER (Relevant, Accepted, Credible, Easy, and Robust) and SMART (Specific, Measurable, Achievable, Relevant, and Time-bound). These indicators should:

- Reflect the aspects that the project intends to control.
- Be capable of verification.
- Be measurable, enabling quantitative/qualitative assessment.
- Exhibit sensitivity to capture changes over time.
- Have a defined time-bound aspect, indicating when changes are expected.
- Provide adequate and pertinent information.

Consider that indicators may need to change as the CB process, or the monitoring and evaluation process move forward.

Activity 2.3. Determine when to monitor and collect data (i.e., review points).

It is advisable to plan review points during three distinct phases of the CB approach: Before initiating the CB approach; During the implementation of the CB approach, and after the CB approach is concluded. The organization of review points should be coordinated to coherently align with the community participation plan of action as outlined in the Community Participation Plan, ensuring a harmonious integration of the monitoring and evaluation process within the broader framework of community engagement.

Before commencing the CB approach, it is crucial to gather baseline data for each indicator. Baseline data serves as a reference point, offering a benchmark to monitor progress. This practice applies to both qualitative and quantitative indicators:

- **Quantitative indicators**: this involves quantifying the indicator at the outset, such as identifying the number of flood-prone areas.
- **Qualitative indicators:** here, the objective is to create a snapshot of the situation before initiating the CB approach, focusing on aspects like awareness of flood risk.

Monitoring and evaluation shouldn't be confined to the opening or conclusion of the CB approach. Instead, ongoing assessment during the implementation phase is invaluable. This stage involves continuous data collection, tracking the evolution of indicators, and assessing how the CB approach unfolds in practice. Regular review points during this phase enable real-time adjustments, ensuring that the approach aligns with community needs and objectives. In cases where the M&E team has developed a set of indicators to track not only the participation process but also CCA/DRR aspects, the insights gathered during these phases can play a pivotal role in shaping informed decisions before finalizing the CCA and DRR strategies.

The evaluation process shouldn't cease with the conclusion of the CB approach. Post-implementation review points are essential for assessing the overall impact and effectiveness of the approach. At this stage, the M&E team examines the final outcomes and results achieved, comparing them against the baseline data established earlier. This retrospective analysis allows for a comprehensive assessment of the CB approach's success in achieving its goals. Depending on the objectives of the CB approach and the context, it could be advisable to plan post-implementation review points not only soon after the conclusion of the CB approach but also after some time (months/years). This is done to assess the sustainability of the DRR/CCA strategies and community involvement over time, examining their impacts not only in the short term but also in the medium to long term.

Activity 2.4. Decide on data collection

After determining when to collect data for the selected indicators, the next step is to decide which tools to use to collect data. It is advisable to involve the community (of place, interest, or practice) interested by the CB approach under evaluation in order to collect data. For example, to measure the involvement of community members in decision-making processes related to climate risks in the area before the CB approach begins, it may be beneficial to administer a survey or conduct a focus group. This is instead of having the M&E team collect the necessary information independently. Practitioners can find a list of tools to choose from in Chapter 7.2. Additionally, in Chapter 7.1, there is a Toolkit Matrix that can assist in selecting the most suitable tool, focusing on those indicated as designed for 'Gather information'.

For example, to facilitate data collection for quantitative indicators, the M&E team can utilize participatory tools such as mapping, trend analysis, or transect walks, whereas to assess qualitative indicators effectively, concept mapping, focus groups, interviews, and town observations could be the most appropriate tools to use. These tools enable the team to comprehensively evaluate the existing scenario.

In addition to selecting the appropriate tools, it is also important to determine who should be involved in data collection; for example, it should be evaluated whether it is suitable to include individuals outside the M&E team in data collection. Defining the best approach for these decisions is context-dependent, and there is no one-size-fits-all recommendation.

BOX: Who should be involved in data collection

- Keep data collection within M&T team.

If the data collection process is highly complex or sensitive and when there is no time for engaging and training others to data collection. Also, when data collection requires specialized knowledge or skills that are only available within the M&T team. Finally maintaining control within the team can ensure data security and privacy in cases where data contains confidential or personal information.

- Open data collection to others.

If the goal is to engage and empower the community through participation, involving community members – other than those already involved in the M&E team - in data collection can be beneficial. Moreover, when the M&T team lacks specific expertise or local expertise required for data collection it's wise to collaborate with external experts or with other community members. In some cases, local authorities or government agencies may have the resources and reach to efficiently collect data. If they are cooperative and aligned with the objectives their involvement can be an asset. Furthermore, in some cases it could be beneficial to involve schools in the monitoring efforts. Given that schools are permanent institutions this approach can contribute to the establishment of sustainable long-term monitoring systems. Also, this would enhance students' capabilities in terms of CCA/DRR.

Activity 2.5. Assembling the plan

After determining what aspects to monitor, when to conduct evaluations, and how to gather relevant data for assessing the effectiveness of the CB approach, the next crucial step is to formalize this plan in a written document. The Plan should include a clear schedule for evaluation activities and should specify the roles and responsibilities of all individuals involved in the evaluation process. When drafting the plan is important to ensure that the monitoring and evaluation activities are aligned with the available budget, time, and human resources.

Furthermore, the Plan should provide a comprehensive outline of the communication strategy, explicitly detailing when, to whom, and how the evaluation outcomes will be disseminated. It is of paramount importance to keep the WG and all pertinent stakeholders, including community members, local authorities, and decision-makers, well-informed about the outputs of the evaluation process. The dissemination of outcomes aims to facilitate adjustments in the community involvement process based on the evaluation's findings, ultimately enhancing the outcomes of the CB process. This is further detailed in step 4.

In conclusion, when the Plan reaches its final form, it becomes crucial to establish procedures that enable the WG and pertinent stakeholders, including community members and local authorities, to offer input or

request clarification concerning the Plan's content or any facets of the evaluation and monitoring process. This approach fosters transparency and open channels of communication, empowering stakeholders to actively participate in the evaluation and enhance its overall efficacy. The M&E team will review and incorporate pertinent feedback, suggestions, or insights following the circulation of the Plan.

BOX: Characteristics of a Monitoring and Evaluation Plan

- The document should be clear and concise, presenting information in a straightforward manner. It should avoid technical language that might hinder understanding.
- It should cover all essential aspects of the Evaluation and Monitoring process, including objectives, key indicators, timelines, methodologies and tools, and responsible parties. This enhances transparency and ensures accountability for the successful execution of the evaluation and monitoring.
- It should be easily accessible to all relevant stakeholders, which may include team members, decision-makers, and external parties.
- It should be a flexible document, capable of accommodating feedback and adjustments that may be necessary as the process unfolds.

Step 3: Implementing the evaluation process

Once the decisions regarding the implementation of the monitoring and evaluation process have been made and the plan has been documented and reviewed considering the available budget, the next step is to carry out the evaluation in practice. This involves collecting data, organizing and analyzing data, discuss data, and ultimately producing an evaluation of the effectiveness of the approach.

Activity 3.1. Data collection

This sub-step primarily involves data collection. The decisions about when data should be collected, what data should be collected, which tools to use, and who should collect data have already been discussed in the previous steps. Prior to commencing data collection, it can be beneficial to provide training to data collectors to ensure their understanding of data collection methods and tools. Members of the M&E team who are experts in participatory processes or have previous data collection experience can assist those selected for this task.

As outlined in Step 2, data collection may encompass information related to the outcomes of the CB approach concerning CCA/DRR, and/or outcomes concerning community participation and involvement in decision-making. However, what's crucial is that the data collection aligns with the indicators selected in Step 2 to monitor the effectiveness of the approach. In other words, the data and information collected should be relevant for populating the chosen indicators. For instance, if the M&E team selected an indicator to gauge the effectiveness of the CB approach in terms of community participation, such as the "percentage of community members who participated in municipality meetings," then data on the

number of community members attending those meetings must be collected, and subsequently, the percentage can be calculated. Depending on the decisions made in Step 2, this data can be collected before, during, or after the implementation of the approach.
During data collection, it is crucial to adhere to the planned schedule and methods, ensuring that data collectors follow standardized procedures to maintain consistency. Additionally, accurate and systematic data recording is essential, which may involve using paper forms or digital tools. It's important to label data correctly and make it easily understandable.

Throughout the step ensure that data collection respects ethical principles, including informed consent and data privacy.

Activity 3.2. Data analysis

Once data is collected, the next step is data analysis. The purpose of data analysis is to extract meaningful insights and information from data. This involves double-checking them for errors, outliers or inconsistencies and verifying that all data is complete, accurate, and in a suitable format for analysis (i.e., data cleaning). At this point it is also important to make sure to store data securely to prevent loss.
It is relevant to note that this sub-step can be conducted concurrently with the previous one. While some data may be collected after the conclusion of the CB approach, it is not necessary to wait for all the data to be collected before proceeding with the analysis. On the contrary, as for data that is collected at the beginning or during the process, analyzes can be in real-time, and preliminary insights can be derived.

In practice, data analysis involves organizing the data into tables or graphs and evaluating significant changes. Often, creating a series of charts to visualize the changes is beneficial, allowing for easy comparison with baseline data. Additionally, tools like cost-benefit analysis, SWOT analysis, and multicriteria analysis can be employed to analyze the data. If geographical data is pertinent, GIS software can be utilized for mapping and analyzing spatial data.

BOX: Questions in support of data analysis:

- What changes are taking place?
- What are the patterns and trends in the data?
- Are there any relationships that can be established among the data? E.g., correlations, cause-effect, trade-off.
- Is there any relationship between the data and the location where data has been collected?
- What are the costs and benefits associated with a certain intervention?

Data analysis typically requires digital literacy and statistical skills. Therefore, this sub-step is often carried out by experts, whether they are external to the team or team insiders. Regardless, it's crucial that the results of the analysis are shared with and explained to the entire M&E team. This allows team members to ask questions and provide feedback to enhance the clarity and comprehensibility of the results. Data analysis is not a neutral process; for example, subjective decisions about which data relationships to

emphasize can influence the message conveyed by the data. Therefore, input from the team can be valuable in making the analysis more comprehensive and less influenced by individual perspectives.

In this phase, maintaining communication with the Working Group is crucial. The WG should be regularly updated on the progress of the approach, encompassing both community participation and DRR and CCA aspects. This ongoing communication facilitates the ability to make necessary adjustments to the process, ensuring it remains aligned with the anticipated outcomes and objectives, especially if the indicators indicate any deviations. Additionally, inputs and feedback from the WG about the data collected and the way they are analyzed could help to identify any potentially missing relevant information and could assist in adjusting the analysis to meet the evaluation needs. For example, the WG, being directly involved in the implementation of the CB approach and the use of participatory tools, may provide valuable insights that enhance the evaluation process. The WP could suggest individuals who would be relevant to interview to collect data or propose an additional question to include in a survey that captures a factor relevant to the success of a participatory tool that has been used. This collaborative approach ensures that the evaluation is comprehensive and effectively addresses the nuances of the CB approach.

Activity 3.3. Data interpretation and discussion

Data analysis is just one part of the evaluation process for a CB approach. It must be followed by data interpretation and discussion, which helps in understanding changes, learning lessons, identifying problems and priorities, and determining what is happening, as opposed to what was planned. While data analysis identifies relationships among the data and translates them (especially in the case of quantitative data) into graphs, and tables, data discussion aims to extract meaning from the data. It is data discussion that enables the assessment of the CB approach's progress.

In general, the discussion of the results of data analysis may revolve around these points:

1. Present and share the quantitative or qualitative data that has been collected using the selected indicators and analyzed. This may include tables, charts, graphs, or textual summaries.
2. Present the trends, patterns, or variations identified by the data analysis, and explain the significance of these observations.
3. Discuss how the results align with the objectives or goals of the CB approach.
4. Explore the practical implications of the findings. What do the results mean for the WG implementing the CB approach, or for future actions? Are there lessons learned or insights gained?
5. If applicable, compare the results to predefined targets. This helps in assessing whether you've achieved the desired outcomes.
6. Acknowledge any limitations in data collection or analysis process that might affect the interpretation of results.

Below are some example questions that data discussion can help to answer. These questions align with the conditions (“Pay attention to”) outlined in Chapter 6.2, "Implementing a CB approach" which serves as a guide to ensure the effectiveness of each step of the CB approach implementation. These questions primarily center on the participatory process itself, rather than on the CCA/DRR process. Note that the following is a general list of questions that practitioners can adapt to their specific needs. The adaptation

of this list may depend on various factors, such as the timing of the evaluation, the specific indicators that have been selected, and the precise focus of the evaluation.

ELEMENT	DISCUSSION GUIDING QUESTIONS
Objectives	• Are the objectives for the community participation process achieved?
Planning	• How effectively were community members engaged in the planning process? • Were community members given sufficient opportunities to provide input and feedback? • What modifications were made during planning, and why were they necessary? • Were changes and modifications documented, and was the plan updated accordingly? • Were these modifications effective in improving the planning process? • Are there lessons learned from these modifications that can inform future planning phases? • Did the planning process enhance the overall quality of the community participation process? • Was the planning process tailored to meet the specific needs and circumstances of the CB project? • To what extent did the planning process reflect the expressed preferences and needs of the community? • Was the planning process conducted within the allocated budget? • How closely did the participation process adhere to the participation plan?
Schedule	• Was the timeline set for the process realistic? • Were the public participation activities conducted at appropriate times? • Did the process provide the public with a reasonable amount of time to engage and provide input? • Was the timeline responsive to the community´s needs?
Human resources	• Was the staff time allocated to the process realistic? • Was the workload manageable? • Were internal management and communication processes effective? • Were external resources (e.g., facilitators and experts) necessary, and how effective were they? • Did the contribution of external resources improve the outcome of the process?
Community notice and access to information	• Was community notification provided early enough for meaningful participation in the planning process? • Were all participants equipped with the necessary information to engage effectively and in a timely manner? • Did participants feel they had access to the information needed for meaningful participation? • Was information communicated in culturally sensitive ways? • Were information access restrictions in compliance with relevant laws?

	• Were data ownership rights respected throughout the process?
Community participation activities	• Were all key interested parties identified and given opportunities to participate? • How effective were each of the community participation activities (i.e., reached the objective)? • Were some activities more successful than others, and what contributed to their success? • Were any modifications needed for these activities, and if so, why? • Did the community actively engage in the public participation opportunities provided? • Was the level of public participation appropriate and proportional to public interest? • Were both technical and community knowledge sought and integrated? • Were community concerns, values, and viewpoints considered and respected? • What were the reasons behind individuals or groups choosing not to participate, if applicable? • Did the community perceive sincerity in the intent of the Working Group and responsible authority staff to obtain community input?
Community feedback	• Did community feel its input was fairly considered during the planning process? • Was the process transparent regarding how community input was considered and utilized? • Was the final planning decision generally acceptable to the community? • Did participants believe their needs and concerns were genuinely heard and considered? • Did the community view the planning process as a valuable investment of time and effort? • Was the process considered beneficial by the community?
Community participation outcome	• Did the quantity and quality of community responses influence or improve the process? • Did community input provide additional valuable information to enhance the process? • Was community input factored into the decision-making process for the CB approach? • Was information provided to the community about how their input influenced the planning process? • Are there discernible changes in community dynamics and the CCA/DRR processes because of the process? • Would these changes have occurred without the process's intervention? • What external and internal factors may have influenced these observed changes? • What are the implications of these changes for future project planning and decision-making? • Do these changes align with the process's objectives?

- Were any unexpected or unintended consequences of the process identified?

In essence, discussing results based on indicators involves a comprehensive analysis of the data collected using these specific metrics, with the aim of drawing meaningful insights and informing decision-making.

The most effective way of carrying out the evaluation is to hold regular meetings among the members of the M&E team, providing the opportunity for the team's members to discuss the findings of the data analysis and the conclusions they can derive from these.

Step 4: Finalizing the evaluation process

The final step of the evaluation process involves documenting and disseminating the evaluation results to various stakeholders, including the community, the Working Group responsible for implementing the CB approach, local authorities, and other interested parties. It is crucial to ensure that the evaluation results are incorporated into the CB approach and serve as a foundation for any future CB approaches, as well as for any future evaluation process. This ensures that the lessons learned and recommendations from the evaluation contribute to ongoing and future CCA/DRR strategy participatory designing efforts.

Activity 4.1. Write an evaluation report

The results from the evaluation process should be documented in an evaluation and monitoring report.

BOX: Evaluation and Monitoring report´s key components

a. A concise overview of the evaluation process, its objectives, major findings, and key recommendations. This section should provide a quick snapshot of the report's main points.
b. An introduction that sets the context for the evaluation, including the purpose, scope, and background information about the CB approach and the project being evaluated.
c. A description of the selected indicators for the evaluation, including an explanation of the process used to draft and to choose these indicators.
d. A description of the methods used for data collection and analysis, including details about data sources, tools, and any limitations encountered.
e. The presentation of the evaluation findings, organized according to the indicators and objectives established at the beginning of the evaluation. It should highlight the key outcomes and changes observed during the evaluation.
f. A discussion of the results, providing insights into the meaning and implications of the findings. This section should discuss the effectiveness of the CB approach, the level of community participation, any trends or patterns identified, and any positive impact on CCA and DRR.
g. Concrete recommendations for improving the CB approach, project implementation, and any related strategies. Recommendations should be actionable and based on the evaluation findings.

h. A reflection on lessons learned during the evaluation process, including what worked well and what could be improved for future evaluations.
i. A summary of the key takeaways from the evaluation, emphasizing the overall effectiveness of the CB approach and its impact on DRR/CAA.

The report should be clear and written in a way that is accessible to both technical experts and non-experts. Visual aids, such as charts, graphs, and maps, can help convey information effectively.

Activity 4.2. Communicate the outcomes

The report can help to communicate the outcomes of the evaluation process. This communication should address the Working Group, any interested party, comprised of local authorities, experts or members of the community who were not included in the M&E team. It is important to communicate the outcomes of the evaluation for several reasons:

- Sharing the results transparently builds trust among stakeholders, including the community, local authorities, and other interested parties. When stakeholders see that the process is transparent, they are more likely to engage actively and support future initiatives.
- Making the results public holds responsible parties accountable for their actions and decisions. It ensures that the community, as well as the Working Group, are answerable for the outcomes of the CB approach.
- Dissemination allows all stakeholders to learn from both successes and failures. Lessons learned can be used to refine the CB approach and improve decision-making in future projects.
- Wider dissemination of results enables knowledge sharing not only within the involved community but also among other communities facing similar challenges. This can lead to the adoption of best practices elsewhere.
- When results are integrated into the CB approach and future planning, it ensures continuity and sustainability. The insights gained from the evaluation can guide the development of future projects and initiatives, ensuring they are more effective.

Communicating the results of the evaluation and monitoring process can take various forms. One approach is to arrange and facilitate meetings or workshops involving stakeholders, encompassing the community, local authorities, the WG, and project partners. These gatherings serve as interactive platforms for presenting the findings. It is imperative to tailor the communication style to suit the audience, offering explanations of technical details where necessary. While highlighting achievements and positive impacts, it is equally important to acknowledge challenges and identify areas for improvement. To ensure broad dissemination, consider sharing the final report utilizing additional communication channels like digital platforms, webinars, local media outlets, and concise policy briefs. Moreover, it could be considered to disseminate the report in printed copies. Regardless of the chosen communication channel, it is important to promote open dialogues, actively seek feedback, and encourage questions to foster transparency and learning.

Activity 4.3. Integrate the results

The last sub-step is to ensure that the results are integrated into future planning and decision-making processes to drive continuous improvement of the CB initiative and its sustainability overtime. This could be done by establishing formal feedback mechanisms and loops that connect the evaluation process with the participatory and the decision-making process. This could involve regular meetings or discussions where evaluation findings are considered considering new participatory or CCA/DRR project plans. This would be in addition to the final meeting, the one that serves the purpose of showing the results of the evaluation process (as explained in the previous sub paragraph). It is important to incorporate the evaluation findings, including successes, challenges, and recommendations, into the planning phase of future CB initiatives. This can help address shortcomings and capitalize on what has worked well.
Broadly speaking, it is relevant that policymakers and the WG are willing to adapt future project plans based on the insights gained from the evaluation. Moreover, if certain aspects of the CB approach are not delivering the expected results, adjustments should be made. It could be also considered to offer capacity-building sessions to community members, project staff, and local authorities based on the lessons learned. This can help ensure that new initiatives benefit from improved knowledge and skills.

Keeping thorough records of the evaluation process and its results and making these documents accessible to relevant stakeholders is helpful for reference and future planning. Scheduling periodic reviews where the findings and recommendations from previous evaluations are revisited can help ensure that lessons learned are not forgotten and that continuous improvement remains a priority.

By following this advice, CB initiatives can ensure that the results of their monitoring and evaluation efforts are not only disseminated but also actively used to drive continuous improvement and long-term sustainability.

Table 6: Instructions for monitoring and evaluating a community-based approach

Phase	Activity	Contact persons & responsibilities	Requirements	Tools	Key Outputs
Step 1 – Preparatory action	1.1	The community members and/or the WG members, with the involvement of representative from local authorities, choose the members of the M&E team. Those in charge for the establishment of the M&E team inform the community about the members selection process, and its outcomes. Community members are encouraged to provide feedback on the selection process and its outcomes. The M&E team considers the community´s feedback and may make adaptations based on it.	Diversity of expertise within the M&E team. Community representation. Gender and minorities representation. Include a facilitator within the M&E team. Training and capacity building. Clear roles and responsibilities. Adaptability to community feedback. Cooperation between the M&E team and the WG.	/	M&E team

Step 2 - Planning the effectiveness evaluation process	2.1	The M&E team decides the specific elements to monitor in terms of CCA/DRR outcomes and the participatory process.	Participatory decision-making within the M&E team. Emphasis should be on assessing the inclusivity of the participatory process. The outcomes in terms of CCA/DRR should be regarded as touchstone for the effectiveness of the participatory processes.	Meeting Matrix Decision Tree	A document specifying what aspects of CCA/DRR outcomes, and the participatory process will be monitored.
	2.2	The M&E Team develops indicators to monitor the outputs in terms of CCA/DRR and Participatory process. The M&E team considers validating the indicators sharing them and collecting inputs also from community´s members and other relevant stakeholders. The M&E Team monitors the appropriateness of the selected indicators, ensuring their relevance persists throughout the process's evolution.	Participatory decision-making within the M&E team. The indicators respect the features of being RACER and SMART. The selection of indicators is overseen by experts and community members outside the M&E team. Indicators may need to change as both the participatory and M&E process progress.	Decision Tree Meeting Matrix SWOT analysis	A list of SMART/RACER indicators.

	2.3	The M&E Team decides when to plan the Review points (i.e., ex-ante, interim, and ex-post evaluation).	Participatory decision-making within the M&E team. The arrangement of review points should align seamlessly with the Community Participation Plan.	Meeting Timelines	Review Points plan.
	2.4	The M&E team determines the data collection methods to employ. The M&E team agrees on who should collect data.	Participatory decisions within the E&M team. Involve community´s members in collecting data. The availability of time, expertise, human resources, and financial resources to determine the most suitable individuals to carry out the data collection process.	Meeting SWOT analysis	A plan outlining methods and tools to collect data.
	2.5	The M&E team consolidates all the documents produced this far (including information about what, when, how, and who is involved in the process) into a Monitoring and Evaluation Plan. The M&E team shares the Plan with the community, the WG, any stakeholder (e.g., local authorities, decision-makers).	Participatory decisions within the M&E team. Include all the relevant information and decisions taken so far into the Plan. The Plan should be accessible and transparent.	/	A Monitoring and Evaluation Plan

		The M&E team reviews and incorporates pertinent feedback, suggestions, or insights.	The Plan should be in line with availability of time, budget, and human resources.		
Step 3: Implementing the evaluation process	3.1	Members of the E&M team with expertise in data collection train data collectors. Data collectors collect data.	Data collectors are well-informed about the objectives, tools, and methods of data collection. The collected data aligns with the specified indicators. Properly recording and storing the data. Complying with privacy regulations.	Information gathering tools (see Toolkit matrix).	A dataset consisting of all the information, observations, measurements, and responses obtained from the sample.
	3.2	The M&E team identifies individuals, either within or external to the team, possessing statistical skills to support data analysis.	How data are analyzed impacts on the message communicated by the data.	MCA, CB, and SWOT analysis Mapping	Summary statistics: mean, median, standard deviation,

		The M&E team conducts data cleaning, including error checking and verification of data completeness.	Maintain open dialogue with the WG.	Matrix	percentiles, p-values, confidence intervals, correlations, etc. Data visualizations: charts and graphs. Time-series analysis: forecasts, trend information, and seasonality patterns. Text analysis: word frequency tables, sentiment scores, and topic models. A detailed report and/or a dashboard summarizing the analysis process, findings, and insights.
		The M&E team translates data into tables, graphs, and charts for effective representation.			
		When deemed necessary, the M&E team conducts CB analysis, SWOT analysis, MCA, or employs GIS software for data mapping.			
		Those responsible for data analysis share the analysis outcomes with the entire M&E team.			
		The M&E team collects inputs and feedback regarding data analysis from team members.			
		The M&E team informs the WG about the analysis process.			
		The WG provides inputs regarding any missing relevant data and information, as well as relationships among data.			
		The M&E team adjusts the analysis (e.g., include missing data and relationship) based on the feedback received from the WG.			

	3.3	The M&E team discusses the results of the data analysis.	Participatory discussion within the M&E team. Consider using the suggested questions to guide the discussion.	Meeting	Meetings´ notes and minutes.
Step 4: Finalizing the evaluation process	4.1	The M&E team writes a Monitoring and Evaluation report.	The report should be accessible and avoid over-technical jargon. Consider adhering to the key components of the M&E report.		Monitoring and Evaluation report.
	4.1	The M&E team communicates the outcomes of the evaluation process by sharing the final report: • Organizing meetings, presentations, and workshops. • Using channels such as digital platforms, webinars, local media. • Distributing printed copies. The M&E team promotes discussions about the findings of the evaluation process and seeks feedback.	Reach all the interested parties, including members of the community, stakeholders, decision-makers, the WG. The communication style should fit the audience. Highlight both positive and negative results of the evaluation. Consider employing various communication mechanisms to align with the diverse needs of the target audience.	Workshops, meetings, presentations Webinars Digital platforms	Events for communicating the Monitoring and evaluation report. Printed copies of the report.

	4.2	The M&E team sets up formal feedback mechanism that connects the evaluation process with the participatory and the decision-making process.	Next to successes and positive outcomes, include challenges and weak points. Address both the WG and policy-makers. Ensure circulation and accessibility of the M&E report.	Workshop. Meeting.	Feedback loops. Training sessions. Regular reviews of the M&E report.
		The WG adapts the CB approach to the results of the evaluation.			
		The WG incorporates the evaluation findings into the planning phase of upcoming CB initiatives.			
		Decision-makers integrates the results of the evaluation within the decision-making process.			
		Decision-makers adapt future CCA/DRR plans to the evaluation's insights.			
		The M&E team arranges training sessions aimed at equipping community members, project staff, and decision-makers with new knowledge derived from the evaluation process, ensuring that emerging initiatives can benefit from these insights.			
		The M&E team plans regular reviews of the Monitoring and Evaluation Report to prevent the lessons learned from being overlooked and to facilitate ongoing enhancements of CB approaches.			

7. Selection of tools to implement the community-based approach and evaluate its effectiveness

This chapter presents a selection of most relevant tools, according to what emerged from the literature review, that facilitate the involvement of a community in the process of co-designing DRR and CCA strategies. Practitioners seeking to implement a CB approach or evaluate the effectiveness of such an approach (or both), will find valuable resources among the proposed tools. Indeed, the literature review revealed that the tools suitable for both implementation and evaluation purposes are the same.

Note that the set of tools proposed here is not an exhaustive list; rather, it categorizes tools that have emerged from the analysis of papers in a literature review focused on CB approaches for DRR and CCA[6]. The inclusion criteria for these papers were (1) the presentation of innovative approaches/tools and (2) detailed descriptions of these approaches or tools (as outlined in section 3.2.3). Broadening the scope of the literature review, together with its inclusion/exclusion criteria, to include tools for community engagement as tested in a wider policy context may have revealed additional tools suitable also to engaging communities in designing CCA/DRR strategies. However, this was not the primary objective of this task.

The chapter is structured into two sections. Sections 9.1 introduces a toolkit matrix designed to aid in the selection of the most suitable tool for a CB initiative or for evaluating its effectiveness. Once practitioners identify the most appropriate tool according to their specific needs, Section 9.2 provides an in-depth explanation of each tool. The information is organized into "Tool Cards," where each card offers an overview of the tool and a step-by-step guide to its implementation. Additionally, the cards highlight the key strengths, weaknesses, references to relevant case studies, and, where applicable, links to supporting materials for the tool's application. Within Section 9.2, the Tool Cards are categorized into subsets, further organized as Participatory or Qualitative/Quantitative methods. This structured presentation ensures that practitioners can easily navigate and select the tools that best align with their goals and requirements.

[6] For further clarification of the tools presented here and to explore additional tools, practitioners can refer to the following two documents available at the provided links: https://www.betterevaluation.org/sites/default/files/Annex_D-3DEF.pdf and https://www.metaaccion.com/images/descargas/80tools.pdf .

7.1. Toolkit matrix

The following table has been developed below to assist in determining the most suitable tool for engaging the community and co-designing a CCA/DRR strategy, thereby applying a CB approach to strategy development. Each tool serves a specific purpose and possesses distinct characteristics. Practitioners are encouraged to select the most appropriate tool based on the stage of the strategy development process and the specific attributes of the community and geographical context.

It is important to note that some of the tools are primarily designed for information gathering or communication with the community. While these tools can support community involvement in decision-making, they should not be regarded as standalone tools that alone qualify an approach as "community-based."

We suggest that the selection of the most appropriate tool is done based on the following criteria:

- Degree of Participation: the type of input required from the community or the type of input the community can provide, based on the specific purpose of the activity at hand. This can range from "inform" (providing information to the community), "gather information" (collecting input from the community), "consult" (seeking feedback and opinions from the community) to "co-design" (collaboratively developing the strategy with the community).
- Group Size: the number of individuals involved, categorized as small (within 5 individuals), medium (between 5 and 25 individuals), or large (more than 25 individuals).
- Form of Communication: whether the communication will take place through in-person events or online platforms.
- Phase of the Policy Cycle: the phase of the policy cycle in relation to the DRR/CCA strategy. It could be the initial assessment phase (e.g., evaluating vulnerabilities, adaptive capacities, and resilience factors), the design phase (in which adaptation options or civil protection plans are devised), the implementation phase, or the monitoring phase (in which the strategy's effectiveness is assessed and adjusted).

TOOL	DEGREE OF PARTICIPATION				GROUP SIZE			FORM OF COMMUNICATION		PHASE OF THE POLICY CYCLE			
	INFORM	GATHER INFORMATION	CONSULT	CO-DESIGN	1-5	5-25	>25	ONLINE	IN PERSON	ASSESSMENT	DESIGN	IMPLEMENTATION	MONITORING
Scenario adaptation pathway			x	x	x	x		x	x		x		
Concept mapping			x	x	x	x		x	x	x			x
Problem tree			x	x	x	x		x	x	x	x		x
Decision tree			x	x	x	x		x	x		x		x
SWOT analysis			x	x	x	x		x	x	x			x
Mapping		x			x	x		x	x	x			x
Trend analysis		x			x	x		x	x	x			x
CB analysis			x	x	x	x			x		x		x
Matrix			x	x	x	x		x	x		x		x
MCA			x	x	x	x			x		x		x
Serious Games	x				x	x	x	x	x	x			
Demonstrations	x				x	x	x		x			x	
Meeting	x	x	x	x	x	x	x	x	x	x	x		x
Discussion/Seminar	x		x				x	x	x	x			
Lesson	x					x	x	x	x	x			
Information desk	x						x		x	x			
Public hearing	x		x				x	x	x		x		
Theatre	x	x				x	x		x			x	
Songs and Oral histories	x	x				x	x		x			x	

Citizen science	x	x					x	x	x	x			
Participatory budgeting				x			x		x		x	x	
Money saving group				x	x	x			x			x	
Focus group		x	x		x	x		x	x	x	x		x
Interviews		x			x	x	x	x	x	x			x
Questionnaires		x					x	x	x	x			x
Transect walk		x			x	x			x	x			x
Field visit		x			x	x			x	x			x
Town watching		x			x	x			x	x			x

7.2. Tool cards: How to implement the selected tool for co-designing Disaster Risk Reduction and Climate Change Adaptation strategies

This chapter comprises a collection of tool cards that explain the characteristics and procedures for implementing both participatory tools and qualitative/quantitative tools. A participatory tool is designed to actively engage and foster collaboration with community members or participants. These tools prioritize involving individuals in the research or decision-making process and are frequently employed to directly gather insights, opinions, and local knowledge from those who are impacted by or involved in a specific issue or project. In contrast, qualitative and quantitative tools typically involve limited or no active participation from community members and instead rely on researcher-driven approaches. Qualitative tools are focused on collecting non-numerical data, including opinions, narratives, and descriptions. They delve into the qualitative aspects and contextual nuances of the information. Qualitative research aims to gain a deeper understanding of individuals' experiences, attitudes, and behaviors, often exploring the "why" and "how" behind phenomena. Quantitative tools involve the collection of numerical data that can be subjected to statistical analysis. Quantitative research often seeks answers to questions related to "how many" or "how much" and typically entails a structured and numerical approach.

The choice between these tools depends on the research objectives, the nature of the data required, and the level of community involvement desired in the decision-making process.

7.2.1. Participatory methods

This section offers a collection of tool cards designed to provide guidance on the implementation of participatory tools. These tool cards are categorized under the umbrella of "Participatory Methods," which includes Workshops, Interactive Simulations, Group Interactions, Public Engagement Events, Performing Arts, and Funds. It's important to understand the distinction between a tool and a method. A tool is a specific instrument or technique used to facilitate particular aspects of research or phases of the decision-making process. In contrast, a method refers to the overarching framework or structure for conducting research or decision-making activities. Tools are employed to support the execution of specific tasks within the chosen method. For instance, a workshop is considered a method used to address complex issues or generate creative solutions through collaborative discussions and activities. This method can be effectively implemented by utilizing tools such as a problem tree or trend analysis to facilitate the workshop process.

7.2.1.1. Workshops

Scenario adaptation pathway

SCENARIO AND ADAPTATION PATHWAY

MODE OF COMMUNICATION	GEOGRAPHICAL SCALE	SKILLS REQUIRED	GROUP SIZE
Online In person	Local Regional National	• Facilitator. • Understanding of the topic.	1-5 5-25

BRIEF DESCRIPTION	OBJECTIVES
An exercise to explore and analyze future scenarios of climate change and disaster risks, and to identify strategies.	Create a roadmap of actions to build resilience, reduce vulnerabilities in face of disaster risks, and address the impacts of climate change.

PROCESS

1. Define the objectives of the exercise. Identify the specific focus areas, such as vulnerable sectors, geographic regions, or specific climate change impacts, to be addressed.
2. Develop a set of plausible scenarios that represent different possible futures considering climate change impacts (e.g., scenarios based of different sea-level rise projections). These scenarios should be based, together with participants input, on scientific knowledge and local data. Consider a range of climatic, social, economic, and environmental factors.
3. Explore and discuss the different scenarios. Assess the vulnerabilities and risks associated with each scenario by analyzing the potential impacts on ecosystems, communities, infrastructure, and socio-economic systems (e.g., identify areas prone to coastal erosion, potential impacts on fisheries and tourism, and increased flood risks to coastal communities). This may involve presentations on the scenarios and group discussions.
4. Develop adaptation pathways that outline a sequence of actions to address the challenges and opportunities identified in each scenario (e.g., pathways may focus on costal protection measures, or on promoting a sustainable tourism, or on diversifying livelihood away from coastal activities). Consider short-term and long-term goals, together with feasibility, effectiveness, and co-benefits of potential interventions.
5. Evaluate and prioritize the adaptation options within each pathway (e.g., building seawalls, restoring mangroves ecosystems, promoting community-based tourism). Consider criteria such as effectiveness, feasibility, cost-effectiveness, equity, and environmental sustainability.

STRENGHTS	WEAKNESSES
• As a future-oriented tool, it supports planning, and it enables preventive response to anticipated risks and climate impacts. • Foster understanding of climate change impacts, of disaster risks, and of potential trade-offs among strategies. • It is a holistic tool that considers relationships among multiple sectors, stakeholders and topics.	• Scenarios involve uncertainties posing a challenge in decision-making and in implementing adaptation pathways. • Data and information on future climate impacts, vulnerabilities and adaptation measures may be limited. • Time, expertise and resources intensive.

	• Conflicts between different sectors, interests, and stakeholders may arise, requiring careful mediation.
REFERENCE TO CASE STUDIES/PAPER(s) ANALYSED IN THE LITERATURE REVIEW	**SUPPORTIVE MATERIALS**
(Cradock-Henry et al., 2021) + (Vizinho et al., 2021)	TransformAr Adaptation Pathway Wiki (Pathway generator)

Table 7: Scenario and adaptation pathway

Concept mapping

CONCEPT MAPPING

MODE OF COMMUNICATION	GEOGRAPHICAL SCALE	SKILLS/RESOURCES REQUIRED	GROUP SIZE
Online In person	Local Regional National	• Facilitator • Basic understanding of the concept explored.	1-5 5-25

BRIEF DESCRIPTION	OBJECTIVES
A visual representation of a concept (e.g., resilience, vulnerability) composed by its building blocks, along with their relationships.	Organize complex information, identify relationships, and enhance understanding. Support gaps and patterns identification

PROCESS

1. Identify the concept to explore and represent visually.
2. Brainstorming to generate a list of keywords, topics and ideas associated with the concept.
3. Group and categorize the ideas, keywords, topics based on their relationships. Consider creating clusters or categories to represent different aspects of the concept.
4. Establish the hierarchy among the ideas, keywords, topics. Identify the central ideas and their subcategories.
5. Create a visual map placing the main concept at the centre and connect it to the related keywords, ideas and topics using arrows.
6. Label the connections between the building blocks of the map to indicate the nature of their relationships (e.g., cause and effect, similarity, hierarchy).
7. Share the concept map with others for feedback. Engage in conversations to deepen understanding, identify missing links, or explore new connections.

STRENGHTS	WEAKNESSES
• It fosters critical thinking skills. • It makes easier to understand complex information. • It helps to organise and structure participant´s knowledge. • Participants collaborate in exchanging ideas and perspectives. • Flexibility in adding and modifying relationships and understanding of the concept, accommodating changes. • The perspective of individuals is not lost but integrated within the groups	• Time consuming process when dealing with particularly complex concepts. • Risk of oversimplification complex ideas and relationships and of overlooking details and nuances. • No standardized format which may lead to difficulty in comparing different maps. • Risk of not capturing the broader contextual factors that influence the concept. • The map is clear and significant for its creators, but it may be confusing to the outsiders.

REFERENCE TO CASE STUDIES/PAPER(s) ANALYSED IN THE LITERATURE REVIEW	SUPPORTIVE MATERIALS
(Kulatunga et al., 2014)	Miro Groupwisdom

Table 8: Concept mapping

Problem tree

PROBLEM TREE			
MODE OF COMMUNICATION	**GEOGRAPHICAL SCALE**	**SKILLS/RESOURCES REQUIRED**	**GROUP SIZE**
Online In person	Local Regional National	• Basic understanding of the problem addressed. • Facilitator	1-5 5-25

BRIEF DESCRIPTION	**OBJECTIVES**
A visual representation of causes and effects of an issue.	Understand the factors that contribute to the problem and supporting the identification of interventions and solutions.

PROCESS

1. Identify the problem to address. This should be specific and clear.
2. Brainstorm and identify the causes that contribute to the problem.
3. Determine the cause-effect relationships between the identified causes and the main problem.
4. Further break causes down into sub-causes: the underlying factors that contribute to the main causes.
5. Brainstorm and identify the potential effects of the problem.
6. Create a visual representation of the problem tree, with the main problem at the top, the causes and sub-causes branching out below, and the effects ramifying above. Use boxes to represent each element and arrows to indicate the relationships. If necessary, label the arrows to provide more information about the relationship.
7. Review and validate the problem tree with experts. Consider their input and make any necessary adjustments.

STRENGHTS	**WEAKNESSES**
• Identifying the root causes it helps targeting interventions at the sources (i.e., not addressing symptoms only).	• Risk of oversimplification. • The identification of causes and effects may be influenced by participants' subjectivity, biases, or limited understanding of the problem. • The prevalence of quantitative over qualitative data may limit the accuracy of the analysis.
REFERENCE TO CASE STUDIES/PAPER(s) ANALYSED IN THE LITERATURE REVIEW	**SUPPORTIVE MATERIALS**
(Rahman et al., 2018) (Mercer et al., 2010)	Tool 14: problem tree

Table 9: Problem tree

Decision Tree

DECISION TREE			
MODE OF COMMUNICATION	**GEOGRAPHICAL SCALE**	**SKILLS/RESOURCES REQUIRED**	**GROUP SIZE**
Online In person	Local Regional National	• Understanding of the problem • Overview about potential solutions • Knowledge about resources available	1-5 5-25

BRIEF DESCRIPTION	**OBJECTIVES**
A visual representation of different choices, potential outcomes, and associated probabilities	Analyze decision scenarios and identify the optimal course of action. Support decision-making and planning.

PROCESS

1. Define the specific decision you need to make.
2. Identify all the available options or alternatives for the decision. These options should be mutually exclusive.
3. Identify the criteria that are relevant for evaluating the different options. These criteria should be measurable.
4. Assign weights to each criterion to indicate their relative importance. This helps prioritize the criteria and ensures that they are appropriately considered in the decision-making process.
5. Evaluate each option against the criteria. Use a scoring system to assess how well each option performs on each criterion.
6. Calculate scores for each option by multiplying the assigned weight of each criterion by the rating or score given to that option on that criterion. Sum up the scores for each option to obtain a total score.
7. Based on the calculated scores, identify the option with the highest total score. This option is considered the best choice according to the established criteria.
8. Review and validate the decision tree with relevant stakeholders (e.g., experts). Consider their input and make any necessary adjustments.

STRENGHTS	**WEAKNESSES**
• Multiple perspectives are incorporated into the decision-making process. • Visualization helps to understand and communicate complex decisions. • Factors that influence the decisions are transparent and this foster trust. • Trade-offs and consequences of different options are evaluated.	• Risk of oversimplification: criteria may not ture the complexity of the real-world • Assignments scores to criteria and option is subjective, this could lead to bias. • Uncertainty and risks associated with options may not be captured. • Limited flexibility: it is difficult to adapt to new emerging factors.
REFERENCE TO CASE STUDIES/PAPER(s) ANALYSED IN THE LITERATURE REVIEW	**SUPPORTIVE MATERIALS**
(Thaler et al., 2022)	Decision Matrix Democratic Dialogue (pg 130-131)

Table 10: Decision tree

SWOT analysis

SWOT ANALYSIS

MODE OF COMMUNICATION	GEOGRAPHICAL SCALE	SKILLS REQUIRED	GROUP SIZE
Online In person	Local Regional National	• Basic understanding of the concept explored.	1-5 5-25

BRIEF DESCRIPTION	OBJECTIVES
A diagram that identifies strengths and weaknesses, as well as opportunities and threats, related to climate change and disaster risks.	Recognize the resources and capabilities that can be leveraged to enhance resilience and respond to climate related risks. Identify limitations, gaps and vulnerabilities that need to be addressed to improve CCA and DRR Explore the external factors that can enhance CCA and DRR. Explore external challenges that can pose obstacles to CCA and DRR.

PROCESS

1. Define the purpose of the SWOT analysis, such as assessing the community's resilience to climate change impacts or identifying strengths and weaknesses in disaster preparedness.
2. Identify the internal factors (Strengths and Weaknesses):
   a. Strengths: Identify the community's internal assets, resources, and capabilities that provide an advantage in dealing with climate-related risks and disasters.
   b. Weaknesses: Identify the internal limitations, gaps, and vulnerabilities that may hinder the community's ability to adapt and respond effectively.
3. Identify the external factors (Opportunities and Threats):
   a. Opportunities: Explore external factors and opportunities that can enhance the community's resilience, such as funding opportunities, policy support, technological advancements, or partnerships.
   b. Threats: Assess external challenges and potential hazards, such as increasing climate impacts, socio-economic changes, or other risks that could negatively impact the community.
4. Gather relevant data and information through research, interviews, surveys, and consultations with community members, stakeholders, and experts.
5. Analyze the collected data to identify and document the key factors in each category.
6. Evaluate and prioritize the identified factors based on their importance and impact.
7. Present the findings in a SWOT matrix, which visually displays the internal and external factors in a grid format.
8. Interpret the SWOT analysis results, understanding the relationships between the factors, and identifying potential synergies or trade-offs.
9. Involve key stakeholders, community members, and local authorities in reviewing and validating the analysis results.

10. Regularly monitor the progress of the action plans and update the SWOT analysis periodically to reflect changes in the community's resilience and risk landscape.

STRENGHTS	**WEAKNESSES**
• A straightforward framework that is accessible to both experts and non-experts. • It considers both positive and negative aspects providing a comprehensive overview.	• Lack of quantification can make it difficult to prioritize and compare different factors. • The assessment can be biased by participants subjective opinions. • The focus on present circumstances may not adequately account for future uncertainties.
REFERENCE TO CASE STUDIES/PAPER(s) ANALYSED IN THE LITERATURE REVIEW	**SUPPORTIVE MATERIALS**
(Rahman et al., 2018)	Impact Alliance User´s guide

Table 11: SWOT analysis

Mapping

MAPPING			
MODE OF COMMUNICATION	**GEOGRAPHICAL SCALE**	**SKILLS REQUIRED**	**GROUP SIZE**
Online In person	Local Regional National	• Basic knowledge of the territory. • Basic understanding of the topic being addressed. • Specific skills depending on the mapping techniques chosen (e.g, GIS).	1-5 5-25

BRIEF DESCRIPTION	**OBJECTIVES**
A spatial representation that uses a map to localize and visualize resources, ecosystem services, vulnerabilities, risks and hazards within a specific territory.	Support identification of priority areas for planning and designing interventions. Gain a common understanding of issues. Facilitate communication, fostering discussion and supporting participants in understanding and comparing information.

PROCESS

1. Define the purpose of the mapping exercise and determine the specific themes to be mapped (e.g., hazards, vulnerabilities, resources, or ecosystem services)
2. Choose the most suitable mapping techniques such as Geographic Information Systems (GIS) software, or traditional mapping methods like drawing.
3. Brainstorm and identify information to be included in the map.
4. Organize and analyze the collected information to identify patterns, relationships, and spatial distributions.
5. Use the gathered information and analysis to create the map. Choose appropriate symbols, colors, and scales to convey the information.
6. Integrate inputs from participants with data and information from other sources (e.g., scientific studies, local knowledge). This may involve using other tools to collect these data.
7. Share the maps and findings with the experts to verify the accuracy of the information. Incorporate their feedback and make necessary revisions.
8. Share the final maps and findings with relevant stakeholders, decision-makers, and the wider community.
9. Monitor and update the maps as new data and information become available.

STRENGHTS	**WEAKNESSES**
• It can cover multiple topics at ones thus being time efficient. • Shows the relationship between geographical features and the topic.	• Official maps that could be used as a blueprint could reflect administrative boundaries and may not represent the community.

REFERENCE TO CASE STUDIES/PAPER(s) ANALYSED IN THE LITERATURE REVIEW	**SUPPORTIVE MATERIALS**
(Liu et al., 2018)	Urban vulnerability mapping

Table 12: Mapping

Trend analysis (Calendars, Timelines)

TREND ANALYSIS

MODE OF COMMUNICATION	GEOGRAPHICAL SCALE	SKILLS REQUIRED	GROUP SIZE
Online In person	Local Regional National	• Facilitator. • Familiarity with the geographical area under investigation	1-5 5-25

BRIEF DESCRIPTION	OBJECTIVES
A chart that helps explore weather patterns and natural events, social and economic trends, public events and seasonal activities within a specific community and geographical setting. It provides a representation of seasonal variations in activities and periods of stress or scarcity.	Visualise periods of community vulnerability, risks and living habits. Anticipate environmental, climate and socioeconomic patterns. Identify coping strategies and best suitable periods to implement a DRR/CCA strategy. Plan activities and make informed decisions.

PROCESS

1. Discuss and decide the period that the analysis will cover and its starting point. Determine time intervals (e.g., months, seasons) and elements to monitor (e.g., hazards, weather, social activities).
2. Brainstorm and discuss information and experiences regarding the selected elements:
   a. List and document the various activities that occur during each time interval. These activities can include agricultural practices, harvesting, fishing.
   b. Discuss and document weather patterns, climate variations, and natural events that occur during each time interval, such as rainfall, temperature changes, storms, or wildlife behaviour.
   c. Consider the social and economic aspects that are influenced by the time intervals, such as market trends, tourism, employment opportunities, or seasonal migration.
3. Using the gathered information, create a visual representation of the analysis. This can be in the form of a chart, a timeline, or a calendar-style diagram, where each time interval is represented along with the associated activities, weather patterns, and other relevant information.
4. Share the draft calendar with the other stakeholders and experts for review and validation. Incorporate their feedback and make necessary revisions.

STRENGHTS	WEAKNESSES
• The calendar reflects local context and needs, thus fostering community ownership and supporting informed decision-making.	• Information relies on local knowledge which might not align with scientific data. • Climate change bring uncertainty, which can lead to shifts in patterns thus making difficult to do accurate predictions.

REFERENCE TO CASE STUDIES/PAPER(s) ANALYSED IN THE LITERATURE REVIEW	SUPPORTIVE MATERIALS
(Gustafson et al., 2018)	

Table 13: Trend analysis

Cost-benefit analysis

COST-BENEFIT ANALYSIS

MODE OF COMMUNICATION	GEOGRAPHICAL SCALE	SKILLS REQUIRED	GROUP SIZE
In person	Local Regional National	• Basic understanding of the concept explored. • An expert may help to better identify costs/benefits and assign values	1-5 5-25

BRIEF DESCRIPTION	OBJECTIVES
A process used to compare the economic benefits against the costs of an option (e.g., an adaptation option). Costs might be costs of planning, preparing for, facilitating, and implementing adaptation measures, including transition costs, while benefits might be the avoided damage costs or the accrued benefits following the adoption and implementation of adaptation measures.	Support the rank and selection of the options among alternatives.

PROCESS

1. Identify and list all possible alternatives or options to achieve the defined objectives (e.g., adaptation options to reach an adaptation objective).
2. Establish a baseline (i.e., the situation without the adaptation intervention) and the project-line (i.e., the situation with successful implementation of the adaptation option) to determine costs/benefits by comparing the two situations.
3. For each alternative, identify and quantify all relevant costs and benefits over specific time periods. Account for both direct and indirect costs and benefits, and for economic/environmental/social costs and benefits.
4. Assign monetary values to both costs and benefits to enable direct comparison. Some benefits may be difficult to quantify in monetary terms, and in such cases, methods like contingent valuation or willingness-to-pay can be used.
5. Compare the aggregated costs and benefits, considering the time value of money (i.e., costs and benefits need to be discounted at a chosen rate to properly calculate their present value). Choose between three indicators of whether options are efficient:
   a. Net present value (NPV): the difference between the total costs and the total benefits. NPV should be greater than zero for an option to be acceptable.
   b. Benefit-cost ration (BCR): the ratio of the benefits to the costs. BCR should be greater than 1 for the option to be acceptable.
   c. Internal rate of return (IRR): the discount rate that make the NPV equal to zero. The higher an option´s IRR, the more desirable it is.
6. Assess the impact of changes in key assumptions or variables on the cost-benefit results to understand the robustness of the analysis.

7. Compare the NPV/BCRs/IRRs of different alternatives and select the one with the highest positive NPV/BCR/IRR, indicating the most economically viable option.
8. Continuously monitor the project's performance and periodically review the cost-benefit analysis to ensure its accuracy and relevance over time.

STRENGHTS	WEAKNESSES
• A standardized method for evaluating options. • It supports a rational decision-making since it is based on a quantitative analysis. • It incorporates the time value of money, allowing the comparison of costs and benefits over time. • It encourages to embrace a long-term perspective	• It is difficult to express in monetary terms social and environmental costs/benefits. • It is morally questionable to assign monetary value to some factors (e.g., human lives) or to discount future benefits. • CBA does not address equity considerations related to the distribution of costs and benefits among communities/members of community. • Choosing a discount rate is subjective and impact the result of the analysis.
REFERENCE TO CASE STUDIES/PAPER(s) ANALYSED IN THE LITERATURE REVIEW	**SUPPORTIVE MATERIALS**
(Ensor et al., 2018) http://unfccc.int/resource/docs/publications/pub_nwp_costs_benefits_adaptation.pdf	Template

Table 14: Cost-benefit analysis

Matrix

MATRIX

MODE OF COMMUNICATION	GEOGRAPHICAL SCALE	SKILLS REQUIRED	GROUP SIZE
In person Online	Local Regional National	• Basic understanding of the concept explored.	1-5 5-25

BRIEF DESCRIPTION	OBJECTIVES
A table that visualizes in rows and columns the vulnerabilities of a system to various hazards/risks. It involves identifying different components of vulnerabilities and evaluating their sensitivity to specific hazards. Note: This type of matrix can also be utilized to assess factors other than vulnerability, such as resilience, preferred options, and more.	Help to understand how different factors contribute to overall vulnerability of a system. Aid in prioritizing interventions and adaptation strategies.

PROCESS

1. Identify the specific hazards or risks that are relevant to the system being assessed. This could include natural disasters like floods, hurricanes, or droughts.
2. Identify the key elements of the system that may be vulnerable to the identified hazards. These components can include physical infrastructure, natural resources, socio-economic factors, and community characteristics.
3. Organize the vulnerability scores in a matrix format, with the components listed on one axis and the hazards on the other axis.
4. Assess the vulnerability of each component to the identified hazards. This involves analyzing and discussing its exposure to the hazard, its sensitivity to damage, and its ability to cope with the impact.
5. Assign scores or rankings to each component based on its vulnerability to each hazard. This can be done using numerical scales, colors, or symbols (e.g., “0” or “green” – no impact – to “5” or “red” – very important impact-).
6. Analyze the vulnerability matrix to identify areas of high vulnerability. Use this information to prioritize adaptation and mitigation strategies.
7. Review the vulnerability matrix with other stakeholders and experts and gather feedback. Revise and update the matrix as needed based on input.

STRENGHTS	WEAKNESSES
• It presents complex data in a visually accessible format.	• It involves a subjective judgment, leading to potential biases. • Availability and quality of data may affect the accuracy of the assessment. • It may not fully capture interactions and feedback loops between different components,

	leading to a fragmented understanding of vulnerabilities. • It does not account for future changes and uncertainties.
REFERENCE TO CASE STUDIES/PAPER(s) ANALYSED IN THE LITERATURE REVIEW	**SUPPORTIVE MATERIALS**
(Khadka et al., 2018; Lopes et al., 2022; Rahman et al., 2018; Wesche & Armitage, 2014)	

Table 15: Matrix

Multicriteria analysis (MCA)

MCA

MODE OF COMMUNICATION	GEOGRAPHICAL SCALE	SKILLS/RESOURCES REQUIRED	GROUP SIZE
In person	Local Regional National	• Basic understanding of the concept explored. • An expert may help to better identify criteria and data, and assign scores and weights.	1-5 5-25

BRIEF DESCRIPTION	OBJECTIVES
A tool to display and organise information that can be used to assess and understand, according to the needs: • Vulnerabilities and resilience to specific risks or hazards. • Adaptation options The MCA produces as an output a relative quantification of the total risk and total resilience in a specific area, or a relative effectiveness of alternative adaptation measures.	An overview of climate hazard risk and resilience capacity. Identification of resources that increase resilience and elements that increase vulnerability. Identification of most critical areas of vulnerability. Identification of adaptation options and their pros/cons. Enhancing of the community capacity to identify and understand vulnerabilities, resilience, and adaptation opportunities. A baseline for monitoring changes in vulnerabilities over time; this allows the evaluation of the effectiveness of CCA/DRR interventions.

PROCESS

1. Define the scope of the matrix:
   a. Identify the key hazards/risks that the community is facing or may face in the future.
   b. Identify the CCA options available.
2. Identify the criteria against which a risk or an adaptation option will be assessed.
   a. Identify the components of vulnerability (e.g., pasture growth, biodiversity, water capacity).
   b. Identify the components of resilience (e.g., infrastructures, economic wealth, governance framework) that are the resources and capacities to cope with impacts.
   c. Identify criteria to evaluate the CCA options (e.g., cost-effectiveness, technical feasibility, environmental impacts, social equity).
3. Collect data and information about the criteria identified. Use a combination of qualitative and quantitative data sources.
4. Designing a matrix with the identified hazards/risks or CCA options as rows and the vulnerability/resilience components or CCA option criteria as columns. The matrix is to be populated with the assessment results for each hazard/risk or CCA option following the steps below.

5. Assign weight to each criterion based on its importance in determining vulnerability/resilience or in achieving the objective of adaptation.
6. Analyze the data collected and rank:
   a. score each hazard/risk against vulnerability and resilience components using a numerical scale (e.g., 0 to 5).
   b. score each CCA options against each criterion using a numerical scale (e.g., 0 to 5).
7. Derive the overall value multiplying the scores for each risk/hazard or CCA options by the corresponding criterion weights and calculate the weighted scores for each risk/hazard or CCA option.
8. Only for the risks/hazards MCA: assess the frequency of the hazard/risk and assign a score (i.e., the exposure).
9. Find the total score:
   a. for hazard/risk: calculate the total value of each risk by following this process: sum the weighted scores for each vulnerability component; multiply the result for the score assigned to the exposure. Divide the result for the sum of the weighted scores of each resilience component.
   b. for CCA options: sum up the weighted scores for each CCA option to obtain the total score.
10. Analyze the matrix to identify major risk, and priority areas of concern where vulnerabilities are most significant or best CCA options.
11. Share the matrix findings with other stakeholders and experts to ensure its accuracy and completeness and seek feedback and validation from stakeholders to confirm the results.
12. Regularly review and update the matrix to reflect changes in the community's vulnerabilities and to adjust interventions as needed.

STRENGHTS	**WEAKNESSES**
• It enables consistent and systematic comparison of different options. • An alternative option if it is not possible to estimate the monetary value of factors (such as in the CB analysis).	• Assigning scores and wights is subjective: the results may differ according to who is involved in the exercise. • Need of sufficient supporting data to be effective. • The conversion of complex and intangible criteria into quantifiable metrics may lead to oversimplification.
REFERENCE TO CASE STUDIES/PAPER(s) ANALYSED IN THE LITERATURE REVIEW	**SUPPORTIVE MATERIALS**
(Karina Barquet & Lydia Cumiskey, 2018)	A manual

Table 16: Multicriteria analysis

7.2.1.2. Interactive simulations

Serious Game

SERIOUS GAME

MODE OF COMMUNICATION	GEOGRAPHICAL SCALE	SKILLS REQUIRED	GROUP SIZE
Online In person	Local Regional National	• Basic CC and disaster risk literacy • Basic digital literacy	1-5 5-25 >25

BRIEF DESCRIPTION	OBJECTIVES
Game used for purposes other than entertainment that simulates different scenarios and decision-making processes that allow players to explore the consequences of their choices and actions in a safe and controlled environment.	Improve knowledge and foster social learning. Provide familiarity with the issues at stake. Raise awareness

PROCESS

1. Identify the specific learning objectives and target audience.
2. Create a game design document outlining the game's concept, mechanics, rules, and objectives. Determine the game's storyline and gameplay elements that align with the learning objectives.
3. Develop the content and educational material that will be integrated into the serious game.
4. If the game is online: choose the appropriate technology platform and tools for developing the serious game. Consider factors like accessibility, user interface, and compatibility with target devices.
5. Create a prototype of the serious game to test its mechanics and functionality. Gather feedback from potential users to make necessary improvements.
6. Design and create the graphics, animations, and audio elements needed for the game. Otherwise, practitioners might select among existing serious games the one that fits best their needs.
7. Make a debriefing after the game to discuss player experiences.

STRENGHTS	WEAKNESSES
• Enable autonomous and active learning. • Capture and convey complex concepts to participants. • Participants can test and explore a range of elements (e.g., the consequences of a policy or of inaction). • Participants can gain practical experience in a risk-free environment. • Involve underrepresented groups, such as children and young adults.	• Risk of the “inadequate simplification of real-world complexity” trap. • Developing high-quality serious games can be costly and time consuming. • Using a serious game that already exists may not fits the specific case requirements.

REFERENCE TO CASE STUDIES/PAPER(s) ANALYSED IN THE LITERATURE REVIEW	SUPPORTIVE MATERIALS

(Flood et al., 2018) https://www.nytimes.com/2023/04/21/nyregion/earth-day-energetic-game.html https://journals.sagepub.com/doi/10.1177/1046878112452639	Financial Times Climate game Red Cross Games for a new climate

Table 17: Serious game

Demonstration and Mock drill

DEMONSTRATION AND MOCK DRILL			
MODE OF COMMUNICATION	**GEOGRAPHICAL SCALE**	**SKILLS/RESOURCES REQUIRED**	**GROUP SIZE**
In person	Local	• Trainers and facilitators. • Adequate facilities and equipment to recreate the scenario.	1-5 5-25 >25

BRIEF DESCRIPTION	**OBJECTIVES**
Practical exercises to simulate scenarios and test the effectiveness of CCA and/or DRR strategies. Participants go through the steps they would take during a real disaster event or participate in showcase of the proper use of techniques related to risk reduction and adaptation.	To enhance participants understanding and confidence with potential hazards, as well as with risk management, or adaptation, equipment, technologies, and techniques. To build resilience and enhance the community´s capacity to respond effectively to climate related risks and disasters.

PROCESS

1. Define the specific goals of the demonstration or mock drill. Determine what aspects of CCA or DRR you want to showcase or test through the exercise.
2. Develop a detailed plan for the demonstration or drill, including the scenario, timeline, roles of participants, and required resources.
3. Conduct a pre-drill briefing to explain the purpose, and rules of the demonstration or mock drill to all participants.
4. Run the demonstration or mock drill according to the pre-planned scenario. Monitor and observe the participants' responses and actions during the exercise.
5. After the exercise, facilitate a debriefing session to discuss the outcomes and lessons learned. Encourage participants to share their experiences and insights.

STRENGHTS	**WEAKNESSES**
• Hands-on training and experience. • Help to identify gaps in emergency response plans. • Foster collaboration and relationships among participants.	• Resource intensive. • Risk of oversimplify the real scenarios.

REFERENCE TO CASE STUDIES/PAPER(s) ANALYSED IN THE LITERATURE REVIEW	**SUPPORTIVE MATERIALS**
(Chan et al., 2017; Clissold & McNamara, 2020; Gladfelter, 2018; Yang, 2020)	Role plays

Table 18: Demonstration and mock drill

7.2.1.3. Group Interactions

Meeting

MEETING

MODE OF COMMUNICATION	GEOGRAPHICAL SCALE	SKILLS/RESOURCES REQUIRED	GROUP SIZE
Online In person	Local Regional National	• Basic understanding of the topic discussed	1-5 5-25 >25

BRIEF DESCRIPTION	OBJECTIVES
A formal gathering where members of the community conversate to exchange opinions and debate.	To understand the community´s needs, perspective, etc. around a topic. To discuss a topic and gather inputs about it. To select the preferred alternative.

PROCESS

1. Determine the purpose of the meeting (e.g., discussing a specific issue, understanding the community´s need and perspectives, selecting the preferred way forward).
2. Choose a suitable date, time, and venue for the meeting that is convenient for community members. Ensure the location is easily accessible and well-equipped.
3. Create a detailed agenda outlining the topics to be discussed, the order of presentations or discussions, and allotted time for each agenda item.
4. Send out invitations to community members well in advance. Utilize various communication channels, such as flyers, social media, community boards, and word of mouth.
5. Prepare any materials, presentations, or resources that will be needed during the meeting.
6. Designate a skilled facilitator to lead the meeting.
7. Start the meeting with a welcome, introductions of attendees, and an overview of the agenda and meeting goals.
8. Present relevant information or updates and encourage open discussions among community members. Provide opportunities for questions and clarifications.
9. If applicable, involve the community in making decisions or gathering input on specific matters. Ensure that everyone's voice is heard.
10. Allow time for community members to provide feedback, share ideas, and express concerns.
11. Consider using interactive activities, group discussions, or breakout sessions to actively engage community members.
12. Summarize the main points discussed, reiterate any decisions made, and thank participants for their contributions.
13. Outline any next steps, future meetings, or opportunities for continued engagement. Assign responsibilities for follow-up tasks if necessary.
14. Allow time at the end of the meeting for informal networking and socializing among community members.
15. Take notes or minutes of the meeting to document key discussions, decisions, and action items.
16. Share meeting minutes and outcomes with participants and ensure that any agreed-upon actions are carried out.

17. Gather feedback from attendees to assess the effectiveness of the meeting and identify areas for improvement.

STRENGHTS	WEAKNESSES
• It helps sharing information among participants simultaneously. • Real-time feedback can be obtained. • Collective brainstorming can lead to innovative solutions. • Interactions among participants foster connections and build a sense of community	• Not all community members may attend, leading to potential exclusion of certain groups. • Scheduling conflicts may prevent some individuals from attending, particularly those with work or family commitments. • Achieving a truly representative sample of community members can be challenging, leading to biased discussions. • Unstructured discussions can lead to inefficiency and may not result in tangible outcomes. • Participants may lack the necessary expertise to fully understand complex issues. • Meetings can sometimes devolve into one-way information dissemination without meaningful dialogue or interaction. • Power dynamics (e.g., meetings can be dominated by outspoken individuals), or external influences, may shape the direction of discussions and decisions.
REFERENCE TO CASE STUDIES/PAPER(s) ANALYSED IN THE LITERATURE REVIEW	**SUPPORTIVE MATERIALS**
(Chowdhooree et al., 2020)	WorldCafe OpenSpace

Table 19: Meeting

Discussion/Seminar

DISCUSSION/SEMINAR

MODE OF COMMUNICATION	GEOGRAPHICAL SCALE	SKILLS/RESOURCES REQUIRED	GROUP SIZE
Online In person	Local Regional National	• Expert panelists	>25

BRIEF DESCRIPTION	OBJECTIVES
A structured conversation about a specific topic amongst a group of experts (i.e., the panelists) in front of an audience (i.e., the community). The panelists and the audience interact (e.g., questions and answers sessions).	To engage in discussions regarding the chosen topic and offer diverse viewpoints and insights. To enhance understanding and knowledge about the topic, while avoiding imposition of a singular perspective, thereby allowing participants to independently form their opinions based on the information shared.

PROCESS

1. Choose a relevant and engaging topic.
2. Invite knowledgeable and diverse panelists who can provide different viewpoints on the chosen topic.
3. Appoint a skilled moderator who can facilitate the discussion.
4. Determine the format of the discussion, such as opening statements by panelists, moderated discussion, and audience Q&A.
5. Share the topic with panelists in advance so they can prepare their thoughts and talking points.
6. Advertise the panel discussion to attract an audience or invite the specific audience you want to participate.
7. Arrange the venue (depending on the format, it could be an auditorium or a Zoom event), and any necessary materials (e.g., a brief introductory video about the topic).
8. The moderator introduces the panelists, provides context for the discussion, and sets the ground rules.
9. Each panelist delivers a brief opening statement or presentation.
10. The moderator leads the conversation, poses questions, and facilitates a dynamic exchange of ideas among panelists.
11. Plan some time for audience engagement. E.g., the moderator opens the floor to audience questions and comments, allowing for an interactive and participatory experience.
12. Each panelist offers concluding remarks.
13. Summarize key points made during the discussion and highlight the main takeaways for the audience.
14. Allow time for networking and informal discussions among panelists and attendees.
15. Consider sharing additional resources related to the topic or continuing the conversation through online platforms or future events.
16. Record the panel discussion, if possible, for future reference or sharing.

STRENGHTS	WEAKNESSES

• It provides a range of viewpoints on a topic, and critical thinking. • It fosters deep understanding, in-depth exploration of complex subjects. • Participants can connect with experts and peers, fostering networking and potential collaboration	• The selection of participants may be unbalanced (e.g., lack of diversity), leading to a biased discussion that reinforce existing perspectives rather than encouraging new insights. • Dominant panelists may overshadow others. • Audience questions may be restricted, limiting direct engagement and diverse input.
REFERENCE TO CASE STUDIES/PAPER(s) ANALYSED IN THE LITERATURE REVIEW	**SUPPORTIVE MATERIALS**
(I. Campos et al., 2016; Marchezini et al., 2017)	

Table 20: Discussion/Seminar

7.2.1.4. Public engagement events

Lesson

LESSON

MODE OF COMMUNICATION	GEOGRAPHICAL SCALE	SKILLS/RESOURCES REQUIRED	GROUP SIZE
Online In person	Local Regional National	• Experts with disseminators skills.	10-25 >25

BRIEF DESCRIPTION	OBJECTIVES
A meeting characterized by presentations and lectures provided by experts to the community´s members.	Deepening understanding about a topic. Introducing the community to a new topic. Fostering capacity building and learning (i.e., improving knowledge).

PROCESS

1. Define the purpose of the meeting and the specific objectives you aim to achieve. Determine what knowledge or information the community members should gain from the presentations and lectures.
2. Identify the relevant topics that align with the community's interests and needs. Invite experts who are knowledgeable and experienced in these topics.
3. Choose a suitable date, time, and location for the meeting. Ensure that the venue can accommodate the expected number of participants and has the necessary equipment for presentations.
4. Create a detailed program schedule that includes the order of presentations and allocated time slots. Allow time for Q&A sessions after each presentation.
5. Use various communication channels to inform the community about the meeting. This may include posters, flyers, social media, local newspapers, and community networks.
6. On the day of the meeting, ensure that everything is set up and ready. Introduce each speaker, keep track of time, moderate Q&A sessions, and facilitate smooth transitions between presentations.
7. Engage the audience by encouraging them to ask questions and interact with the speakers. This can create a more dynamic and informative atmosphere.
8. After the meeting, collect feedback from participants to assess their satisfaction and gather insights for improvement.
9. Share any relevant materials or resources from the meeting with the community members. Consider organizing follow-up activities, such as workshops or further discussions, to continue building on the presented topics.

STRENGHTS	WEAKNESSES
• Participants have the opportunity to learn from experts. • It allows for dissemination of information to a large audience in a relatively short amount of time.	• The flow of information is predominantly one-way, from the speaker to the audience, limiting opportunities for open dialogue and leading to passive engagement. • The content and pace of presentations may not cater to individual learning preferences or specific needs of all participants.

• Participants can connect with both experts and fellow community members, fostering networking.	• The selection of topics and presenters may introduce biases or limit exposure to diverse viewpoints and expertise.
REFERENCE TO CASE STUDIES/PAPER(s) ANALYSED IN THE LITERATURE REVIEW	**SUPPORTIVE MATERIALS**
(Figueiredo & Perkins, 2013)	

Table 21: Lesson

Information desk

INFORMATION DESK			
MODE OF COMMUNICATION	**GEOGRAPHICAL SCALE**	**SKILLS/RESOURCES REQUIRED**	**GROUP SIZE**
In person	Local Regional National	• Knowledgeable staff	>25

BRIEF DESCRIPTION	**OBJECTIVES**
A designed space where individuals can seek and receive assistance and guidance on a specific topic.	To provide members of the community with accurate and relevant information.

PROCESS

1. Determine the purpose and scope of the information desk.
2. Choose a suitable location that is easily accessible, and decide the opening times (e.g., workdays, evenings, weekends)
3. Determine the resources, materials, and staff needed.
4. Recruit and train knowledgeable staff or volunteers to man the information desk
5. Prepare relevant brochures, pamphlets, maps, or other informational materials and gather any necessary equipment, such as a table, chairs, banners.
6. Welcome visitors, listen actively to inquiries and respond with accurate information.
7. Collect feedback from visitors to assess their satisfaction and identify areas for improvement.

STRENGHTS	**WEAKNESSES**
• Besides conveying information to the community, it may also include additional functions (e.g., collecting citizens opinions and proposal about the ongoing plan). • An accessible tool for those who prefer face-to-face interactions or may not be tech-savvy. • Visitors can receive tailored information based on their specific needs. • In-person interaction allow for immediate clarification of doubts and allow to address follow-up questions. • Meeting experts face-to-face can enhance trust and credibility.	• Limited capacity to handle many inquiries simultaneously. • It may not be accessible to all community members, e.g., those who are unable to attend the event, or are not available during the opening times. • It requires dedicated staff or volunteers, materials, and a physical space, which can be resource-intensive to set up and maintain. • Information provided may be influenced by the perspectives and knowledge of the staff/volunteers, leading to potential inconsistencies in the quality of information.

REFERENCE TO CASE STUDIES/PAPER(s) ANALYSED IN THE LITERATURE REVIEW	**SUPPORTIVE MATERIALS**
An urban laboratory	

Table 22: Information desk

Public hearing

PUBLIC HEARING

MODE OF COMMUNICATION	GEOGRAPHICAL SCALE	SKILLS/RESOURCES REQUIRED	GROUP SIZE
Online In person	Local Regional National		>25

BRIEF DESCRIPTION	OBJECTIVES
A formal event organized by the authorities and public institutions when members of the community are invited to review the planning document and voice their opinions.	To inform the community about a plan and to explain it. To collect comments and proposals.

PROCESS

1. Determine the purpose, identify the topic to be discussed and the desired outcomes.
2. Set a date, time, and location for the hearing. Develop a clear agenda and guidelines for participation.
3. Promote the event through various channel (e.g., local newspapers, websites, and social media platforms) and invite community members, experts and authorities.
4. Arrange for a suitable venue and set it up.
5. Develop a structured agenda that outlines the sequence of events for the hearing. Identify speakers who will present on the topic, including experts, officials, and community members.
6. Appoint a facilitator to ensure that the hearing remains focused, and orderly.
7. Provide each speaker with a designated amount of time to present their perspectives, findings, or concerns.
8. Open the floor to the public for questions, comments, and testimonials. Allow participants to express their views on the topic. Ensure that each participant has an opportunity to speak.
9. Record the proceedings of the public hearing. Keep detailed notes of the discussions, questions, and comments. This documentation is important for transparency and accountability.
10. After the public hearing, review the feedback, comments, and suggestions received from participants. Analyze the input to inform decision-making or further actions. Consider issuing a report summarizing the hearing's outcomes.
11. Communicate the results of the public hearing to the broader community, stakeholders, and decision-makers.
12. Share any decisions or actions that will be taken based on the input received.

STRENGHTS	WEAKNESSES
• Providing a platform for decision-makers to explain their plans, it promotes accountability and trust. • It promotes a democratic governance, allowing communities to engage in civic activities.	• Influence on decision-makers may vary as they may not always take the public's input into account. Dialogue may be superficial and token. • A limited range of participants may lead to underrepresentation of certain groups.

	• Participants may not always have the necessary expertise to fully understand complex issues, leading to uninformed opinions. • Arguments based on emotions may lead to the community to express opinions based on sentiment rather than evidence. • The political agenda may influence the hearing.
REFERENCE TO CASE STUDIES/PAPER(s) ANALYSED IN THE LITERATURE REVIEW	**SUPPORTIVE MATERIALS**
Pittsburgh's Citizen Participation Plan	Citizens' juries

Table 23: Public hearing

7.2.1.5. Performing arts

Theatre

THEATRE

MODE OF COMMUNICATION	GEOGRAPHICAL SCALE	SKILLS/RESOURCES REQUIRED	GROUP SIZE
In person	Local	• Experts in performing arts as facilitators	5-25

BRIEF DESCRIPTION	OBJECTIVES
A form of performance that promote active engagement, collaboration, and dialogue among participants to depict the experience of a real or fictional event.	To enable the community to reflect on potential disasters´ impacts, vulnerabilities, and adaptive strategies. To empower individuals to voice their concerns, ideas, and solutions. To foster social cohesion. To cope with disasters and changes, and to sense-making

PROCESS

1. The project team discuss with the performing arts experts, who will help facilitate the activities, the aim of the performance and of its setting up.
2. Discuss with the community which are the most relevant issues connected to climate change and disaster risk that affect/concern community´s members.
3. Analyze and prioritize issues of concern and decide which issue could be the best to transform into a script. Make sure to incorporate personal stories, experiences, and perspectives of community members.
4. Create a narrative structure that communicates the message effectively and develop characters. Design the sets, costumes, and props. This could be done with the support of theatre experts, artists, etc.
5. The script could include a moment of so called “spect-actorship”: after the first round of play is completed, the actors invite the audience to interact. People can come to the stage, take up the role of characters, and show how they would have behaved differently. This shift in the narrative helps to include also other perspectives, to challenge the predominant narrative and to put forward alternative solutions.
6. Assign roles and responsibilities to the community´s members. This means choosing who within the community is going to actively take part in the performance, and who will be part of the audience.
7. Conduct regular workshops and rehearsals to train participants in acting, improvisation, and other theatrical techniques.
8. Promote the performance and disseminate information about the date of the event. Make sure to highlight the uniqueness and distinctive features of this performance (e.g., set up by the community, aimed at processing information, feelings and experiences connected to climate change and disaster risks).

9. Stage the theatre performance for the audience.
10. Host a post-performance discussion or Q&A session to engage the audience in dialogue about the themes and messages that emerged in the play.
11. Gather feedback from both participants and the audience to assess the impact and effectiveness of the performance.
12. Consider ways to make the best of the momentum generated by the performance, such as organizing follow-up workshops, events, or community initiatives.
13. Remember to document the entire process, from workshops to performance, through photographs, videos, and written accounts.
14. Share the experience and outcomes with the community and other interested parties.

STRENGHTS	**WEAKNESSES**
• It enables participants to break free from their traditional roles and to embrace different perspectives. • New behaviors and new kind of relationships can be exercised. • Participants feel freer to think creatively and this help to imagine alternatives.	• Time and resources intensive • Ensuring that the intended messages are effectively communicated can be a challenge, limiting the communication and rising awareness purposes of the performance.
REFERENCE TO CASE STUDIES/PAPER(s) ANALYSED IN THE LITERATURE REVIEW	**SUPPORTIVE MATERIALS**
(Figueiredo & Perkins, 2013; Gladfelter, 2018)	

Table 24: Theatre

Songs and oral histories

SONGS AND ORAL HISTORIES

MODE OF COMMUNICATION	GEOGRAPHICAL SCALE	SKILLS/RESOURCES REQUIRED	GROUP SIZE
In person	Local		1-5 5-25 >25

BRIEF DESCRIPTION	OBJECTIVES
A form of expression based on using the voice (with or without music/melodies) as an expression tool and to share narratives.	To cope with disaster and changes, and to support sense-making. To empower individuals to voice their concerns, ideas, needs, and perspectives. To foster social cohesion. To convey local and intergenerational knowledge (e.g., about past events, or about how to respond to changes/disasters).

PROCESS

1. Assess the community's knowledge, perceptions, and needs related to disaster risk and climate change.
2. Determine the key messages to convey through songs and oral histories. These could include preparedness or response strategies, community unity, future scenarios.
3. Collaborate with community members, local artists, and storytellers to co-create the songs/oral histories. This could be done organizing workshops to guide the creative process. Facilitate discussions to encourage participants to reflect on the messages and consider their own experiences.
4. Make sure to incorporate local stories, anecdotes, and experiences to make the content relatable and authentic. This could be done by including within the process traditional storytellers, elders, and cultural experts to ensure cultural sensitivity and accuracy.
5. In case of a song: collaborate with musicians to compose and arrange the melody. Ensure that the melodies resonate with the community's musical traditions.
6. Record the songs/oral histories with community members. In case of a song, use local instruments and vocal styles to maintain authenticity.
7. Document these songs/oral histories through audio recordings, transcriptions, and translations, as needed.
8. Develop engaging performances that incorporate the songs and oral histories. This could involve traditional performances, modern interpretations, or a combination of both.
9. Stage public performances within the community, local schools, and other relevant venues. Consider also using digital platforms, local radio stations, and community gatherings to disseminate the songs and oral histories to a wider audience.

10. Collect feedback from community members and audiences to assess the effectiveness of the songs and oral histories in conveying messages and raising awareness. Use feedback to make improvements and adaptations as necessary.
11. Integrate the songs and oral histories into ongoing educational and awareness programs related to disaster risk management and climate change adaptation.

STRENGHTS	WEAKNESSES
• It creates a sense of belonging which in turn motivates action and community self-efficacy. • It fosters place-attachment and identity. • It particularly fits the community cultural context and traditions, making the message more relatable. • It supports the transfer of traditional knowledge from older to younger generations.	• Complex concepts may be challenging to convey effectively. • If not translated effectively, it may not properly communicate the intended message. • Misinterpretation can occur if content is not clear or if listeners infer unintended messages. • Changing attitudes and behaviors may require sustained follow-up efforts.
REFERENCE TO CASE STUDIES/PAPER(s) ANALYSED IN THE LITERATURE REVIEW	**SUPPORTIVE MATERIALS**
(Figueiredo & Perkins, 2013; Goulding et al., 2018; Sutton et al., 2022) Health Songs International	

Table 25: Songs and Oral histories

Citizen Science

CITIZEN SCIENCE

MODE OF COMMUNICATION	GEOGRAPHICAL SCALE	SKILLS/RESOURCES REQUIRED	GROUP SIZE
Online In person	Local Regional National	• Basic digital literacy (in case the use of devices is required) • Professional scientist to work with participants	>25

BRIEF DESCRIPTION	OBJECTIVES
A collaborative approach to scientific research where members of the community contribute to data collection and analysis alongside professional scientists.	Increase scientific literacy and enhance public understanding of CC and DR. Promote public engagement and raise awareness. Increase the spatial and temporal coverage of data by overcoming traditional scientific research limitations in terms of resources, manpower and access to remote areas.

PROCESS

1. Define the objectives of the citizen science project, including the research questions, data needed, and the desired outcomes.
2. Develop a well-structured project plan that outlines the data collection methods, study area, data quality control measures, and timelines.
3. Attract and recruit citizen scientists from the target communities. Provide appropriate training and resources to ensure participants are equipped with the necessary skills and knowledge for data collection.
4. Conduct data collection activities following the guidelines. Regularly communicate with participants to address any issues or questions that arise during the process.
5. Implement mechanisms to validate and verify the collected data to ensure its accuracy and reliability. This may include cross-checking data against established standards or using multiple data sources.
6. Analyze the collected data to draw conclusions that address the research questions.
7. Share the findings with the participants and other stakeholders and engage in open discussions to encourage feedback and interpretation of the results.

STRENGHTS	WEAKNESSES
• Collection of vast amounts of data. • Local citizens often possess unique knowledge about their environment, contributing to collect unique insight and data.	• Accuracy and reliability of data collected may vary, leading to potential data quality issue. • Participants may not be representative of the entire population: selection bias. • Resources intensive in terms of ensuring proper training to participants, essential to maintain data integrity.

	• Robust organization is required to coordinate and manage many volunteers. • Ethical concerns related to privacy, consent, and data ownership.
REFERENCE TO CASE STUDIES/PAPER(s) ANALYSED IN THE LITERATURE REVIEW	**SUPPORTIVE MATERIALS**
(Bhawra et al., 2021 ; Wolff et al., 2021) Citizen science DRR	

Table 26: Citizen science

7.2.1.6. Funds

Participatory budgeting

PARTICIPATORY BUDGETING

MODE OF COMMUNICATION	GEOGRAPHICAL SCALE	SKILLS/RESOURCES REQUIRED	GROUP SIZE
In person	Regional Local	• Basic literacy with policy planning and financing help proposing feasible proposals.	>25

BRIEF DESCRIPTION	OBJECTIVES
A process where community members can participate in decision-making and allocation of public funds to sustain initiatives within their local area.	Promoting transparency and accountability in public spending. Empowering community members and enhancing community collaboration. Addressing local need and priorities. Fostering a sense of ownership and responsibility.

PROCESS

1. Define the objectives of the participatory budgeting process and establish a clear timeline.
2. Raise awareness about the process through various communication channels, such as social media, posters, and local newspapers.
3. Invite community members to submit project ideas that address local needs and priorities.
4. Facilitate workshops or meetings where community members collaborate to refine and develop the submitted project proposals. Ensure that these proposals are feasible, have clear goals, and align with the available budget.
5. Organize a voting process where community members have the opportunity to vote for their preferred projects from the list of developed proposals. This can be done through in-person voting events, online platforms, or a combination of both.
6. Select the projects that received the highest number of votes, ensuring that the selected projects fit within the allocated budget.
7. Review the project with experts and authorities to ensure alignment with criteria of effectiveness, social justice, efficiency, and feasibility, and to evaluate the impacts.
8. Work with relevant authorities and agencies to implement the chosen projects. Provide regular updates to the community about the progress of each project.
9. Documentation and Reporting: Document the entire participatory budgeting process, including project proposals, voting results, implementation details, and outcomes. Share this information with the community and other stakeholders.

STRENGHTS	WEAKNESSES
• Increased civic engagement, transparency, and accountability.	• Time-consuming and resource-intensive, requiring efforts to organize meetings, educate participants.

• It can help address social inequalities by giving voice to marginalised members of the community. • It may lead to innovative proposal. • It fosters collaboration and trust among community members. • It fosters local investment as public money are invested back to the community.	• Not all community members may participate, potentially leading to unequal representation and biased outcomes. • Participants might not have the necessary expertise to make informed decisions about budget allocations. • More influential participants might dominate discussions. • The scope of projects can be restricted by the overall availability of funds. • Authorities may resist the use of the public budget to finance community´s proposals.
REFERENCE TO CASE STUDIES/PAPER(s) ANALYSED IN THE LITERATURE REVIEW	**SUPPORTIVE MATERIALS**
Helsinki participatory budgeting (Ahn et al., 2023)	Online platform

Table 27: Participatory budgeting

Monetary saving group

MONETARY SAVING GROUP

MODE OF COMMUNICATION	GEOGRAPHICAL SCALE	SKILLS/RESOURCES REQUIRED	GROUP SIZE
In person	Local	• Basic finance literacy	1-5 5-25

BRIEF DESCRIPTION	OBJECTIVES
A community purse that acts as an informal financial mechanism that allows members to save and borrow money with no or low interests rate.	Promoting savings and enabling access to credit for members. Fostering a sense of mutual support and cooperation within the community.

PROCESS

1. Hold an initial meeting to explain the concept of the saving group.
2. Discuss the purpose, rules, and responsibilities.
3. Decide on the group's size, frequency of meetings, and contribution amounts.
4. At each meeting, members contribute their predetermined amount.
5. Once the group has built up sufficient savings,

a. the total contribution may be given to one member, usually on a rotational basis. The rotation continues until each member has received the lump sum.

b. Or members can request loans for various purposes.

6. Maintain accurate records of contributions, rotations, and member participation.
7. Decide on a portion of the contributions to be set aside as an emergency fund. This fund can be used for unexpected expenses or to support members in times of need.
8. Some groups may decide to charge a small interest on loans or may invest the pooled funds to generate profits.
9. Establish a democratic decision-making process. Regularly discuss and decide on any changes to the group's rules, contributions, or operations.
10. Provide financial literacy and management training to members to ensure responsible handling of loans, savings, and overall group finances.

STRENGHTS	WEAKNESSES
• Fosters local investment as money are invested back to the community. • Reduces dependence on the mainstream economic system. • Provides access to resources for individuals who may not have access to formal banking systems. • Can adapt to the specific needs and preferences of the community, allowing for flexible savings and loan terms.	• The amount of savings available within the group may be limited, restricting the size of loans that can be provided. • Loans may not be repaid, leading to financial strain on the group and potential conflicts among members. • Monetary saving groups may lack access to financial expertise, insurance, and regulatory protections.

• Members can earn interest on their savings or through profit-sharing from invested funds. • Offers opportunities for financial education.	• Differences in financial goals, priorities, and expectations among members can lead to disagreements and conflicts. • Members may have limited options for investing their savings, resulting in lower returns.
REFERENCE TO CASE STUDIES/PAPER(s) ANALYSED IN THE LITERATURE REVIEW	**SUPPORTIVE MATERIALS**
(Ajulo et al., 2020; Archer, 2016; Bott & Braun, 2019)	

Table 28: Monetary saving group

7.2.2. Qualitative/quantitative methods

8.2.2.1 Information gathering

Focus group

FOCUS GROUP

MODE OF COMMUNICATION	GEOGRAPHICAL SCALE	SKILLS/RESOURCES REQUIRED	GROUP SIZE
Online In person	Local Regional National	• Understanding of the topic	1-5 5-25

BRIEF DESCRIPTION	OBJECTIVES
In-depth interviews to a group of individuals who share common interests and characteristics, aiming to explore specific topics or issues.	To gather in-depth insights, opinions, attitudes and experiences in order to generate high-quality data that can inform decision-making.

PROCESS

1. Determine the research objectives, identify the target group, and define the specific topics/questions to be discussed.
2. Prepare the roadmap/guide for the facilitator.
3. Select and invite participants.
4. Conducting the focus group:
   a. Introduction: Start by explaining the purpose of the focus group and setting the ground rules for the discussion.
   b. Warm-up: Begin with an icebreaker activity (e.g., general questions) to help participants feel comfortable and encourage open participation.
   c. Topic discussion: Follow the facilitator roadmap to guide the discussion (participants share their experiences, opinions, and perspectives).
   d. Probing: Encourage participants to elaborate on their responses, ask follow-up questions, and facilitate a discussion.
   e. Time management: Ensure that the discussion stays on track and all planned topics or questions are covered within the allocated time.
   f. Closing: Summarize the main points discussed.
5. Record the focus group session, either through audio or video recording or note-taking.
6. Transcribe and analyse the data collected from the focus group, identifying key themes, patterns, and insights.
7. Summarize the findings from the focus group in a report highlighting the main points discussed and providing recommendations or conclusions based on the data collected.

STRENGHTS	WEAKNESSES
• Dynamic discussion and group interactions are facilitated, supporting group interactions and allowing participants to build upon each other´s ideas.	• Findings may not be generalized. • Certain participants may dominate the discussion, preventing other from expressing their ideas fully.

• Participants´ opinions are explored in-depth, generating high-quality qualitative data. • Participants can provide real-time feedback, allowing for exploration and immediate clarification. • Additional insights can be observed from non-verbal cues. • Flexibility: structure and duration can be adapted to the research needs and objectives.	• Participants may be influenced by social pressure and provide answers that align with the social norms rather than with their thoughts. • The facilitator may influence the discussion. • Resource expensive: recruitments, logistics, analysis of data, etc.
REFERENCE TO CASE STUDIES/PAPER(s) ANALYSED IN THE LITERATURE REVIEW	**SUPPORTIVE MATERIALS**
(Kulatunga et al., 2014)	

Table 29: Focus group

Interviews

INTERVIEWS

MODE OF COMMUNICATION	GEOGRAPHICAL SCALE	SKILLS/RESOURCES REQUIRED	GROUP SIZE
Online In person	Local Regional National	• A skilled interviewer.	0-5 5-25 >25

BRIEF DESCRIPTION	OBJECTIVES
A purposeful conversation between two or more individuals requiring the interviewer to pose questions to the interviewee. Interviews may be structured (i.e., standardised questions), unstructured (i.e., non-standardised questions) or semi-structured. Interviews can take various forms (e.g., face-to-face meetings, phone and video calls, or written exchanges).	To gain insights into habits, attitudes, opinions, needs, etc from the interviewees on a specific topic.

PROCESS

1. Define the purpose of the interview, identify the individuals to interview, and decide on the interview format (in-person, phone, video, etc.).
2. Develop a list of questions or topics you want to cover. For structured interviews questions may be closed-ended, while for unstructured interviews questions should be open, encouraging interviewees to share their opinions and experiences.
3. Prepare any necessary materials, such as consent forms or interview guides.
4. Reach out to the interviewees to explain the purpose of the interview and request their participation.
5. Schedule a suitable date, time, and location for the interview.
6. Conducting the interview: begin by introducing yourself and explaining the purpose of the interview. Create a comfortable environment for the interviewee. Go through the interview guides.
7. Follow up on interesting/important points with probing questions.
8. If the interviewee gives consent, record the interview, and take detailed notes.
9. The interview length is recommended within 45-60 min.
10. Transcribe of summarize the interview.
11. Adhere to ethical guidelines and standards.

STRENGHTS	WEAKNESSES
• In-depth exploration of a topic. • Questions can be adapted in real-time based on the interviewee´s responses.	• Interviews are influenced by the interviewee's perspective and the interviewer's biases and questioning style, potentially leading to subjective results. • Interviews typically involve a small number of participants, limiting the generalizability of findings.

	• Interviewees may be hesitant to share sensitive or personal information due to concerns about privacy. • In multilingual contexts, interpreters may introduce challenges in accurately conveying nuances of meaning.
REFERENCE TO CASE STUDIES/PAPER(s) ANALYSED IN THE LITERATURE REVIEW	**SUPPORTIVE MATERIALS**
(Van Aalst et al., 2008; Whitney et al., 2017)	

Table 30: Interviews

Questionnaires

QUESTIONNAIRES

MODE OF COMMUNICATION	GEOGRAPHICAL SCALE	SKILLS/RESOURCES REQUIRED	GROUP SIZE
Online In person	Local Regional National	• Statistical skills to interpret the results.	>25

BRIEF DESCRIPTION	OBJECTIVES
A structured document containing a set of pre-defined questions (multiple-choice or open-ended) related to the research topic. Questionnaires can be in various formats (e.g., paper-based forms, online surveys, or interviews where the interviewer reads out the questions and records the responses).	To gather standardized data from a larger sample of participants. To gather information on attitudes, opinions, and demographic characteristics of participants.

PROCESS

1. Outline the purpose of the questionnaire: what information you seek to gather.
2. Create a list of well-structured and concise questions. Use a mix of closed-ended (multiple choice, yes/no) and open-ended (free text) questions.
3. Test the questionnaire on a small group of participants to identify any issues with wording, clarity, or formatting. Make necessary adjustments based on their feedback.
4. Determine the target audience for the questionnaire and how you will reach them (e.g., email, social media, in-person).
5. Distribute the questionnaire to the participants. This can be done online (through survey platforms like Google Forms) or in print.
6. Collect responses from participants and ensure that the data is stored securely.
7. Analyze the collected data using statistical methods and interpret results to draw meaningful conclusions that address your research objectives.
8. Summarize the findings and use charts and graphs to present the data.
9. Ensure that the questionnaire respects ethical guidelines, such as obtaining informed consent from participants, ensuring privacy, and addressing any potential biases.
10. Seek feedback from experts on the questionnaire design, analysis, and interpretation to enhance the quality of your research.

STRENGHTS	WEAKNESSES
• It allows for quantitative analysis and statistical comparisons of responses. • The standardized format reduces the biases introduced by the interviewers. • It can reach many participants quickly. • If anonymity is preserved, respondents may feel more comfortable in expressing their opinions.	• Risk of low response rate. • Closed-ended questions may limit participants' ability to express complex thoughts and the collection of rich qualitative data and insights. • Once a questionnaire is distributed, it's challenging to modify or clarify questions in real-time based on participant feedback.

	• If the sample is not representative of the target population, the results may not be generalizable.
REFERENCE TO CASE STUDIES/PAPER(s) ANALYSED IN THE LITERATURE REVIEW	**SUPPORTIVE MATERIALS**
(Bojovic et al., 2015 ; Lasage et al., 2015; Lopes et al., 2022)	

Table 31: Questionnaires

7.2.2.2. Observation

Transect walks

TRANSECT WALK

MODE OF COMMUNICATION	GEOGRAPHICAL SCALE	SKILLS/RESOURCES REQUIRED	GROUP SIZE
In person	Local	• Basic knowledge of the area. • Familiarity with the issue under investigation. • Support from experts.	1-5 5-25

BRIEF DESCRIPTION	OBJECTIVES
A field data collection method that involves walking along a predefined path through a specific area and making observations and recordings to explore local conditions.	Collect information on various aspect of the area, such as physical infrastructure, social dynamics, and environmental conditions. Information supports the elaboration of maps or diagrams. Support site selection for interventions.

PROCESS

1. Define the objectives of the transect walk.
2. Select the area and the route for the transect walk based on the specific focus of your assessment (e.g., community vulnerabilities, environmental changes).
3. Develop data collection tools, such as notebooks, cameras, GPS devices, and maps.
4. Brief the team members on the objectives, methodology, and safety precautions of the transect walk.
5. Provide guidance on data collection techniques, such as observation, note-taking, photography, and conversations with community members.
6. Conduct the Transect Walk: start walking along the predetermined path, systematically observe and record various features, engage with locals encountered along the way, asking questions and gathering local knowledge and insights, take photographs or videos to visually document key findings.
7. Record detailed observations, measurements, and notes in data collection tools.
8. Create diagrams, or maps to visualize the collected data.
9. Review and organize the collected data for analysis; identify patterns, trends, and key findings related to the objectives of the transect walk.
10. Interpret the data in the context of climate change adaptation and disaster risk reduction.

STRENGHTS	WEAKNESSES
• Data collected are often real-time, providing up to date information. • Supports contextual understanding of community needs, leading to better targeted interventions.	• Data collected may be subjective and influenced by individual perceptions, potentially leading to inconsistencies in observations. • May not cover all aspects of CCA and DRR comprehensively, as it relies on observations made

• Opportunity to leverage local knowledge to better understand local conditions. • Data are geographically contextualised. • Helps to triangulate the data collected through other tools.	during specific periods and may miss long-term trends. • A small or biased sample may not accurately reflect the entire community's situation. • Ethical Considerations: ensuring privacy and obtaining informed consent from community members. • Data collected may not always be accurate or verifiable, especially when relying solely on qualitative observations.
REFERENCE TO CASE STUDIES/PAPER(s) ANALYSED IN THE LITERATURE REVIEW	**SUPPORTIVE MATERIALS**
(Rahman et al., 2018; Van Aalst et al., 2008; Van Riet & Van Niekerk, 2012)	

Table 32: Transect walks

Field visits

FIELD VISIT

MODE OF COMMUNICATION	GEOGRAPHICAL SCALE	SKILLS/RESOURCES REQUIRED	GROUP SIZE
In person	Local	• Basic knowledge of the area. • Familiarity with the issue/topic. • Support from experts.	1-5 5-25

BRIEF DESCRIPTION	OBJECTIVES
Purposeful trip to a specific location to collect data, engage with locals, and gain a deeper understanding of the context.	Gather firsthand information, observe conditions, and gain insights related to topics.

PROCESS

1. Define the objectives of the field visit.
2. Identify the specific locations to be visited based on the objectives, and determine the logistics (e.g., transportation, accommodations, and necessary permits.
3. Assemble a team if needed and assign roles and responsibilities.
4. Contact local authorities to inform them about the visit and seek their input.
5. Schedule meetings or interviews with key community informants or experts who can provide valuable insights.
6. Prepare methods for data collection, such as surveys, interviews, and measurements.
7. Collect both qualitative and quantitative data, focusing on the specific aspects relevant to your objectives (e.g., environmental conditions, community vulnerabilities, infrastructure, etc.).
8. Take photographs, videos, and notes to document your findings.
9. Engage with locals to understand their perspectives, challenges, and needs.
10. Organize and categorize the collected data for analysis.
11. Cross-check information with multiple sources to ensure accuracy and reliability.

STRENGHTS	WEAKNESSES
• Collect firsthand and real-time data, ensuring accuracy and authenticity. • Being on site allows a deeper understanding of the local contexts. • Facilitated direct engagement with local communities, enabling meaningful interactions, and building trust. • Gathering data from the field helps gaining a holistic perspective.	• Only a small geographic area or a specific point in time can be cover, leading to incomplete data. • Resource-intensive: time, funding, and logistical arrangements. • Data collected may be influenced by the researcher's bias or interpretation. • The presence of researchers could influence the behavior and responses of community members, affecting the authenticity of the data.

REFERENCE TO CASE STUDIES/PAPER(s) ANALYSED IN THE LITERATURE REVIEW	SUPPORTIVE MATERIALS
(Lasage et al., 2015; Restrepo et al., 2018)	

Table 33: Field visit

Town watching

TOWN WATCHING

MODE OF COMMUNICATION	GEOGRAPHICAL SCALE	SKILLS/RESOURCES REQUIRED	GROUP SIZE
In person	Local	• Basic knowledge of the area • Familiarity with the issue under investigation • Support from experts	1-5 5-25

BRIEF DESCRIPTION	OBJECTIVES
A field data collection method that involves community members to observe and record changes and conditions in a specific area over time.	Collect information on various aspect of the area, such as physical infrastructure, social dynamics, and environmental conditions. It is particularly useful for identifying changes. Information supports the elaboration of trend analysis. Support site selection for interventions.

PROCESS

1. Determine the specific aspects of the community to observe, such as vulnerable areas, climate-related risks, or disaster preparedness measures.
2. Explain the purpose of town watching to participants.
3. Provide training to participants on data collection techniques, observation skills, and ethical considerations.
4. Organize the town watching event and divide participants into teams if necessary. During the activity, observe and document relevant information, such as infrastructure conditions, natural resources, climate-related hazards, and community responses to disasters.
5. Use cameras, smartphones, GPS devices, or mapping tools to record and document the observations accurately.
6. Interact with community members during town watching to gather additional insights, validate observations, and understand local perspectives.
7. After the town watching activity, analyze the collected data to identify trends, vulnerabilities, and potential risks faced by the community. Draw conclusions and highlight areas that may require intervention or support.
8. Prepare a comprehensive report of the town watching findings, including visuals like photographs and maps. Share the report with relevant other interested parties to foster understanding and collaboration.

STRENGHTS	WEAKNESSES
• Data collected are often real-time, providing up to date information. • Supports contextual understanding of community needs, leading to better targeted interventions.	• Data collected may be subjective and influenced by individual perceptions, potentially leading to inconsistencies in observations. • May not cover all aspects of CCA and DRR comprehensively, as it relies on observations

• Opportunity to leverage local knowledge to better understand local conditions. • Data are geographically contextualised. • Helps to triangulate the data collected through other tools.	made during specific periods and may miss long-term trends. • A small or biased sample may not accurately reflect the entire community's situation. • Ethical Considerations: ensuring privacy and obtaining informed consent from community members. • Data collected may not always be accurate or verifiable, especially when relying solely on qualitative observations.
REFERENCE TO CASE STUDIES/PAPER(s) ANALYSED IN THE LITERATURE REVIEW	**SUPPORTIVE MATERIALS**
(Samaddar et al., 2022)	

Table 34: Town watching

8. Conclusions

This deliverable focuses on the design of community-based participatory approaches aimed at effectively engaging communities in decision-making processes within the domains of Disaster Risk Reduction and Climate Change Adaptation. The fundamental premise driving Task 4.1 (TS3, WP4) and subsequent deliverable is the necessity for strategies aimed at mitigating climate-related disaster risks and facilitating climate adaptation to be collaboratively developed with the communities directly impacted by natural disasters or those at risk of climate change impacts.

CB approaches for inclusive decision-making processes for DRR and CCA offer several benefits. First, by actively involve community members who possesses local knowledge about their environment, vulnerabilities, and resilience aspects, as well as coping strategies that are already in place, it becomes possible to make strategies more contextually relevant and effective. Moreover, since CB approaches involve the community in designing and implementing DRR and CCA strategies, the resulting initiatives are more likely to address its needs and priorities, and to meet its interests. This strengthens the relevance of the interventions. By engaging diverse community members, considering factors such as gender, age, ethnicity and socioeconomic backgrounds, a CB approach also promotes inclusivity and help ensure that the needs that the decision-making process consider are those of all community members. Involving communities in decision-making also fosters a sense of ownership and empowerment, leading to greater commitment in implementing the strategies. Therefore, there is greater opportunity for the success and sustainability over time of the strategy itself. A more proactive engagement in risk reduction and adaptation activities is also fostered by the fact that CB approaches increase the community´s risk perception, capacities, and skills. CB approaches enhances the community´s resilience and adaptive capacity to respond to climate-related disasters and changes. To conclude, participatory approaches for inclusive decision-making build trust among community´s members and between communities and external stakeholders, including government agencies and public institutions, NGOs, and researchers. Trust is crucial for effective cooperation and the successful implementation of DRR/CCA strategies. Indeed, participatory processes help to strengthen social bonds within communities and between communities and other externals, which, in turns, enhance community resilience and the community´s capacity to respond to disasters and to the impacts of climate change.

To draft comprehensive guidelines that inform practitioners about the necessary steps to implement a CB approach for designing strategies in CCA and DRR, we initiated a literature review encompassing both scientific peer-reviewed papers and grey literature resources. This extensive review extended beyond the mere examination of CB approaches; it encompassed the broader domains of enhancing trust dynamics essential for mitigating disaster risks and evaluating the effectiveness of CB approaches during and post-implementation. In addition to unveiling overarching patterns within CB approaches as analysed in the literature, including geographical locations, scope of application, involved community types (place, practice, or interest), and diverse sectors addressed (ranging from civil protection planning and early warning systems to integrated CCA-DRR planning, agricultural production, nature-based solutions, and green infrastructures), the literature review also shed light on the specific tools predominantly employed

to engage communities. By doing so, it further elucidated the phases of the CCA/DRR policy cycle where community involvement is both feasible and significant, along with varying levels of participation and degrees of engagement.

Among the various results, the literature review revealed that a CB approach, while often associated with active and inclusive community participation, does not always guarantee meaningful community´s members engagement. Several factors can create barriers to effective engagement, including power dynamics that may silence community voices, limited availability of resources to support participation efforts, rigid institutional structures that resist change, as well as practical and ideological constraints that influence the willingness and ability of community members to participate.

In the realm of CB approaches, the literature review showed that various tools and methods are available, each tailored to specific contexts and objectives. Their suitability depends on factors such as the phase of the DRR/CCA cycle in which they are applied, the goals they aim to accomplish (e.g., hazard assessment, vulnerability analysis, strategy development, implementation, or evaluation), and the extent of community inclusion. Additionally, the degree of community participation can vary, ranging from merely being informed to active involvement, consultation, and co-design of strategies, offering a spectrum of engagement possibilities. Understanding these nuances is crucial for effectively implementing CB approaches and fostering meaningful community participation in DRR and CCA initiatives.

As regard the dimension of trust, the literature underscores its critical role in enhancing preparedness and resilience to natural hazards across various phases, including prevention, protection, mitigation, response, and recovery. Trust, both in local and national entities, is identified as a fundamental element for individuals to navigate uncertainty, understand risks, and process uncertainties effectively. During the prevention, preparedness, and response phases, interdependencies among national agencies and organizations, facilitated through face-to-face dialogues and collaborative culture, significantly contribute to community trust. Efforts are made to engage communities in emergency preparedness, involving various strategies such as information dissemination, volunteer enlistment, and public deliberations, discussions, and debates. Collaborations and partnerships are established to tailor disaster responses to specific community needs and address resource gaps. Effective communication, creating common meanings and understandings, is closely linked to community trust. In the response phase, social cohesion facilitated by community trust plays a pivotal role in coordinating group-level actions with individual-level health consequences. Trust also impacts access to emergency information, knowledge of community resources, and assistance during disasters, affecting perceptions of community preparedness. Capacity-building programs aim to strengthen trust among communities, NGOs, and governments, vital for effective partnerships. In the recovery phase, managing relationships between disaster-affected and neighbouring populations is crucial, as mismanagement can weaken trust and social cohesion. Hence, institutions must skilfully navigate the recovery process without eroding community trust. In summary, the literature highlights the multifaceted importance of community trust at various levels, emphasizing its role in bolstering the public preparedness system for managing natural hazards.

The literature review´s results served as the cornerstone for constructing a conceptual framework which illustrates the fundamental elements that underlie a CB approach and the interrelationships between these components. Consequently, the resulting guidelines are a tangible manifestation of this conceptual framework, translating theoretical insights into practical, actionable steps for practitioners seeking to implement a CB approach in the realms of CCA and DRR, evaluate its effectiveness, and strengthening trust dynamics. The conceptual framework and the guidelines are not only the outcomes of the literature review but are also informed by our prior expertise in participatory methodologies for involving communities in policy design.

The conceptual framework places the community at the center, whether it is of place, interest, or practice. The community is at the core because it is a fundamental prerequisite for developing and then implementing effective strategies for climate change adaptation and the reduction of risks from natural extreme events. The role of the community is that of an active actor fully engaged in decision-making processes in the field of CCA and DRR. What enables the community to act is its capacity to achieve an objective and, above all, to realize its potential (i.e., community agency). However, this is influenced both by the external context to which the community belongs and by the community's own characteristics. A dimension of particular importance that affects community agency is trust, both among the community members themselves and between the community and external actors, such as institutions or governmental and non-governmental agencies. The approach through which the community impacts decision-making processes is that of participatory processes. A participatory process is characterized by several distinctive aspects, among which the most relevant are the level of involvement of community members, the level of inclusion, the tools and methods used, and its degree of flexibility. A participatory process results in outputs, outcomes, and impacts. Outputs are the tangible and immediate results of the participatory process (e.g., the creation of a community-based disaster preparedness plan). Outcomes are the short to medium-term changes that result from the outputs and represent the actual impact of the processes on the community (e.g., an increase in residents' knowledge about disaster response procedures). Impact is the long-term effect (e.g., a reduction in damage during natural disasters). However, a participatory process is fully concluded only when an evaluation of its effectiveness is conducted to assess whether community participation has been meaningful and not merely symbolic, and whether it has yielded results in terms of vulnerability reduction and increased resilience.

Consistent with this conceptual framework, the guidelines outline the steps to be followed when implementing a CB approach, right from its initial stages through to the discussion and incorporation of community proposals into policies. The process of involving the community begins by assessing the suitability of the CB approach within the social context and considering the legal and institutional framework. Once it is determined that the approach is viable, preparations for community participation can commence. This entails forming a working group responsible for managing community involvement and establishing primary objectives. Additionally, decisions must be made regarding the extent of community participation. At this stage, the target community is identified, contacted, and engaged in discussions to assess the appropriateness of initiating a CB approach. Once the community is onboard, the next step involves collaboratively designing the participatory activities with community members,

including the selection of activities and tools tailored to the phase of the policy formulation process. These preparatory steps are essential prerequisites for the success of participatory tools, thereby allowing the community to contribute effectively and provide valuable inputs for the development of policies. Once the preparatory phase is concluded, the phase in which all decisions are implemented commences. The community is involved according to predefined schedules and methods, and participatory activities are executed. The process concludes with the writing of a report presenting the outcomes of the participatory process, which are then integrated into the formulation of policies and strategies for CCA and DRR.

In terms of strengthening community trust, it is advisable to implement certain measures during each phase of the DRR policy cycle. In the prevention phase, it is essential to enhance community capacities and knowledge regarding prevention programs. During the preparedness phase, community members should participate in information-sharing sessions alongside community leaders and local authorities. In the response phase, it is not only crucial for authorities to communicate prompt actions for managing natural disasters, but community members should also have the opportunity to actively engage in emergency management activities in line with their capacities and resources. Lastly, during the recovery phase, it is important for the community to receive regular updates on the progress of the natural disaster management plan.

The guidelines conclude with steps to assess the effectiveness of the CB approach, focusing on both community participation and its impacts on CCA and DRR. The evaluation process is participative, actively involving the community and allowing them to provide feedback at every stage. Initially, a Monitoring and Evaluation team is formed, selected by the community, the group responsible for the CB approach, and potentially local authorities. Before initiating monitoring and evaluation, it's essential to determine what to monitor, develop relevant indicators, and decide on data collection methods and timing. Once the evaluation and monitoring plan is established, data collection takes place, followed by analysis and discussion to gain insights into indicator performance relative to CB approach objectives. The final phase entails preparing an evaluation and monitoring report, which is then shared with the community members, stakeholders, decision-makers, and the group overseeing the CB approach's implementation. Additionally, it is integrated into the planning of future CB approaches.

Some of the steps foresee the community´s involvement through the request of its inputs in the form of providing information or consult or co-design, or by providing the community with information. To assist the community´s involvement it has been developed a list of tools and a series of toolcards – to explain the tools - that practitioners can use. Tools are divided between these that belong to participatory methods (such as Workshops, Interactive simulations, Group meetings, etc.), and these that belong to qualitative/quantitative methods (such as Information gathering and Observation). Moreover, in order to assist in selecting the most appropriate tool to use, it has also been designed a matrix listing the tools and the dimensions that impact on the selection of the tool: the degree of participation that is sought, the group siye, the form of communication (online/in person), and the phase of the policy cycle, in this case of the DRR/CCA strategy design (assessment, design implementation, and monitor).

Some of the steps involve engaging the community by soliciting their input, either through information provision, consultation, or co-design, or by providing information to the community. To facilitate community involvement, we have developed a toolbox and a set of tool cards to explain the activities that practitioners can implement. These tools are categorized into two groups: participatory methods (such as workshops, interactive simulations, group meetings, etc.) and qualitative/quantitative methods (including information gathering and observation). Furthermore, to assist in selecting the most suitable tool, we have created a matrix that lists the tools and the dimensions influencing tool selection: the desired level of participation, group size, communication format (online/in-person), and the phase of the policy cycle, specifically for DRR/CCA strategy design (assessment, design implementation, and monitoring).

Practitioners seeking to design a bottom-up CCA and DRR strategy involving the community will find valuable support in the steps outlined in this deliverable, as well as in the Tool Matrix and Tool Cards. These guidelines are tailored to ensure meaningful community participation, which entails soliciting input from the community and integrating it into the policy design cycle. By doing so, practitioners can enhance the relevance and effectiveness of their strategies, ultimately leading to more resilient and disaster-ready communities.

9. References

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