(Grant Agreement 101093921)

HORIZON-MISS-2021-CLIMA-02-05 - Local engagement of citizens in the co-creation of societal transformational change for climate resilience

Deliverable D3.2 – Refined and updated framework to co-evaluate citizen and stakeholder engagement methodologies

WP3 – Living Digital Environment for Knowledge Co-Production

December 2023

This project has received funding from the European Union's Horizon Europe Research and Innovation Actions under grant agreement No 101093921

Document History

Deliverable Title	Deliverable D3.2 - Refined and updated framework to co-evaluate citizen and stakeholder engagement methodologies
Brief Description	This report (D3.2) presents the AGORA evaluation framework designed to assess citizen engagement processes in climate change adaptation. This was done through an iterative co-production process engaging civil society organizations, academia, and policymakers. The AGORA evaluation framework focuses on four impact pathways – relevant knowledge and action, just representation and participation, mutual learning, and improved collaboration.
WP number	3
Lead Beneficiary	SEI HQ
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Deliverable Due Date	31/12/2023
Actual Delivery Date	17/12/2023
Nature of the Deliverable	Report
Dissemination Level	Public

Version	*Date*	*Contributors*	*Comment*
1	April 2023	SEI HQ	Review of reviews
2	May 2023	AGORA consortium	Delphi round 1
3	June 2023	SEI HQ, SEI Oxford, and CMCC	ECCA2023 workshop[1]
4	June 2023	AGORA consortium	Delphi round 2
5	September 2023	AGORA consortium	Delphi round 3
6	October 2023	SEI HQ and SEI Oxford	Adaptation Futures workshop[2]
7	November 2023	UNIGE, IIASA, and SEI Oxford	Internal review
8	November 2023	SEI HQ	Updated version
9	December 2023	SEI HQ	Final submission

[1] Workshop organized at the European Climate Change Adaptation (ECCA) 2023 conference. ECCA is a biennial European conference on climate change adaptation.
[2] Workshop organized at the Adaptation Futures conference 2023 (AF2023). AF is a biennual international conference on climate change adaptation.

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10	December 2024	SEI HQ	Glossary added

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Glossary

Term	Definition
Climate services	Relevant, credible, and accessible to users, acknowledges uncertainty, is communicated through a user-specific format, and is timely for user needs. It is developed by users and producers through tailored interaction, while building trust, and increasing users' capacity for using the service and understanding the issue at hand. The service delivers benefits to the user and supports better decision-making for adaptation
Co-benefit	A positive effect that a policy or measure aimed at one objective has on another objective, thereby increasing the total benefit to society or the environment. Co-benefits are also referred to as ancillary benefits.
Co-Creation	Collaboratively creating outputs like tools or policy recommendations. A process that can add value and increase innovative potential through intentional experience design
Co-defined	To articulate the implicit and explicit meaning of a particular term together with one or more people, in this case climate change adaptation strategies, policies or actions.
Co-design	To create ways in which challenges can be addressed together with one or more people, implementing different methodologies and/or approaches such as lateral thinking to propose innovative solutions to current pressing climate change related issues. It may also include devising effective and sustainable problem-solving techniques and strategies directly applicable to the challenges that need to be addressed.
Co-develop	To determine the best manner to satisfy the requirements for an expected output together with one or more people or organizations. This includes evaluating baseline requirements and consider all potential alternatives to solve a particular climate risk or impact challenge.
Co-explore	Explore the perspectives of key actors within co-production processes to assess the challenges and opportunities faced and describe this idea to capture the process through which boundaries might be actively subverted through sustained engagement between the origins of multiple, diverse perspectives.
Co-evaluation	To validate potential solutions or partial solutions to a particular challenge or issue jointly with one or more people. This implies considering available information, processes and how adequate the solution is in meeting the needs and expectations of stakeholders.
Co-management	Co-regulation and co-management give the right to participants to be directly included in designing, revising or reviewing regulations and risk management measures, rule-making processes or programmes for monitoring risks.
Co-production	"Iterative and collaborative processes involving diverse types of expertise, knowledge and actors to produce context-specific knowledge and pathways towards a sustainable future" (Norström, et al., 2020:183).

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Executive Summary

This report (D3.2) presents the AGORA evaluation framework designed to assess citizen engagement processes in climate change adaptation.

The evaluation framework was developed through an iterative co-design process engaging civil society organizations, academia, and policymakers. This was done through a review of scientific literature, three-round Delphi study, and two interactive workshop sessions.

The AGORA Evaluation Framework provides a comprehensive approach to monitoring, evaluation, and learning in citizen engagement processes pertaining to climate change adaptation. It evaluates four impact pathways:

1. **Relevant knowledge and action –** where the citizen engagement process produces knowledge and action aligning with the local context, policy priorities, and social dynamics, and enjoy support and acceptance among citizens, decision makers, researchers, and other stakeholders.
2. **Just representation and participation –** where the citizen engagement process amplifies marginalized voices and enables equal? participation of citizens and other stakeholders.
3. **Mutual learning –** where the citizen engagement process enables citizens, decision makers, researchers, and other stakeholders to learn from one another.
4. **Improved collaboration –** where the citizen engagement process builds, develops, or improves partnerships based on trust and respect among citizens, decision makers, researchers, and other stakeholders.

Each impact pathway consists of outcomes and activities. To evaluate progress, each activity and outcome is defined by an evaluative rubric. The rubrics are structured as detailed Likert scales explaining different levels of achievement – unacceptable, acceptable, and optimal. Each level of performance is accompanied by a descriptive text that defines what is considered unacceptable, acceptable, and optimal in relation to that specific activity or outcome.

As a next step, we seek to test the evaluation framework in practice to identify areas for improvement. Feedback from users and practitioners will play a crucial role in fine-tuning the evaluation framework to align with emerging best practices.

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1 Introduction

1.1 Background

This report is part of the EU-funded Horizon Europe project **AGORA – A Gathering place to cO-design and co-cReate Adaptation**. The project aims to support communities and regions participating in the Mission on Adaptation to Climate Change[3] by leveraging and advancing best practices to effectively engage citizens and stakeholders in adaptation decision-making and action.

The AGORA project engages citizens and stakeholders in four pilot regions across Europe – Germany, Sweden, Italy, and Spain (see Table 1 for an overview). The pilot regions adopt the Tandem framework to implement a transdisciplinary knowledge integration process in which citizens, decision makers, researchers, and other stakeholders come together to co-design context-tailored adaptation policies and solutions (Daniels et al., 2020). The Tandem Framework consists of a series of phases and questions that help to identify and engage stakeholders, establish shared goals, co-produce adaptation solutions, and monitor, evaluate, and learn. It is designed as a non-prescriptive guide for collaborative and iterative learning, and can, therefore, be adapted in light of changing contexts. Focus lies on the process rather than its products as a way to prompt trust building, new relationships and networks, and capacity development.

Table 1: Pilot regions overview

Location	*Adaptation issue*	*Stakeholders*
Dresden, Germany	Heatwaves and heavy rainfall	City council, academia, civil society organisations, and private sector.
Malmö, Sweden	Social vulnerability during urban heatwaves	The county administrative board, municipality, private sector, academia, civil society organizations, and citizen representatives.
Rome, Italy	Vulnerability in urban settlements, water, ecosystems, agriculture, socio-economic system, health, cultural heritage, networks and infrastructures	Academia, governments and decision makers, civil society, local communities, and private sector.
Zaragoza, Spain	Heatwaves, flooding, and wildfires, and their impact on biodiversity, natural resources, and vulnerable groups	Technicians, experts and researchers, representatives from the institutional and political spheres, private sector, social and environmental organizations, and citizens.

As one of its key outputs, the AGORA project is co-creating an interactive online space, named the *Digital AGORA*, to provide access to key resources for capacity building to enable social learning and knowledge sharing. Amongst other resources, the Digital AGORA will host two digital academies aiming to strengthen citizen resilience against climate disinformation and ease the access to open-source climate data.

[3] The Mission on Adaptation to Climate Change focuses on supporting EU regions, cities and local authorities in their efforts to build resilience against the impacts of climate change.

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1.2 Aim

This report (D3.2) presents an evaluation framework for citizen engagement processes in climate change adaptation (hereinafter adaptation). The evaluation framework will later be tested and refined in pilot regions as part of WP2 (task 2.3) as well as the Digital AGORA (task 3.3). This report draws from insights collected in task 3.2, further explained in Text box 1.

Text box 1: Task 3.2 description

Task 3.2: Develop an evaluation framework to assess the value, effectiveness and impact of citizen and stakeholder engagement methodologies: This task will engage citizens, civil society, academics, experts, and policymakers to co-produce a framework to evaluate the effectiveness of citizen and stakeholder engagement processes and methods that will be applied in WP2 (Task 2.3). Based on these inputs and the application of the Tandem guidance, and inputs from diverse stakeholders, a tailored framework will be developed in each of the four pilot regions (building on local communities established in Task 2.1). This semi-structured approach will enable more systematic, comparative analysis and synthesis of findings. The framework will evaluate the extent to which, for example, power relations are tackled in different citizen and stakeholder engagement methods due to the degree to which this can impact participatory processes in a non-equitable way and result in socially unjust outcomes. Lessons will be drawn from stakeholders (Task 3.1) to inform the final, refined evaluation framework. Once applied in Task 2.3, this task will iteratively incorporate feedback on the evaluation of methods and tools to further develop recommendations regarding good practice in citizen and stakeholder engagement methods. The online 'colonnades' (Task 3.3) will be used to build relationships and alliances between clusters of cities/stakeholders facing similar climate risks/challenges/contexts, to support evaluation activities with these stakeholders. This will provide feedback on the application of the framework (Task 2.3) to the Digital AGORA to improve and refine it (Task 3.3), as well as provide further recommendations for the tools and methods evaluated.

To fulfil this task description, the evaluation framework should i) integrate criteria and indicators, ii) build on insights from citizens, civil society, academics, experts, and policymakers, and iii) address issues linked to power, equity, and justice. The evaluation framework should allow for comparison across time and space.

The AGORA evaluation framework targets a broad audience with an interest in citizen engagement and adaptation regardless of their level of expertise and experience in monitoring, evaluation, and learning. To achieve this, we strived for developing a user-friendly design and instructions that guides users through the evaluation process step-by-step. Technical jargon and complex language were kept to a minimum.

1.3 Structure of the report

After this introductory section, we proceed with clarifying the evaluation purpose, approach, and philosophy. We then introduce our methodology – a review of scientific literature, three-round Delphi study, and two interactive workshop sessions. Thereafter, we give an overview of the iterative design process and its results. Lastly, we present the final evaluation framework and provide our conclusions.

2 Evaluation purpose, approach, and philosophy

Citizen engagement refers to the "process by which stakeholders influence decisions which affect them" (Hughes, 1998, p. 3). In theory, citizen engagement can strengthen awareness (Lazoroska & Palm, 2019),

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build social capital (Mahajan et al., 2022), increase stakeholder agency and self-efficacy (Revez et al., 2022), bring about social justice (Leyden et al., 2017), and ensure public acceptance of? (Kumpu, 2022). However, empirical work on citizen engagement in adaptation policy and planning remains limited (Geekiyanage et al., 2021; Hügel & Davies, 2020; Samaddar et al., 2015; Uittenbroek et al., 2019; van der Vegt, 2018). Moreover, attempts to evaluate citizen engagement in relation to adaptation are rare and recent (Hurlbert & Gupta, 2015; Samaddar et al., 2015; Sherman & Ford, 2014). Some frameworks exist for evaluating citizen engagement (see for example Chase & Levine, 2016; Rowe & Frewer, 2013; Shahid et al., 2022), but few are specifically designed to assess citizen engagement in adaptation decision-making and action.

There is little agreement on what such evaluation should look like among scholars (Falanga & Ferrão, 2021; Hügel & Davies, 2020; Rowe & Frewer, 2004). Metrics of success remain undefined, largely due to the terminological ambiguity and normative assumptions that characterize citizen engagement and its allied terms, for example, public participation, collaborative governance, and civic dialogue (Rosener, 1978). Citizen engagement is operationalized in a variety of ways and underpinned by various aims, assumptions, and conceptualizations (Adler & Goggin, 2005), in the end hindering the formulation of agreed frameworks and indicators for evaluating its success and effectiveness.

How to evaluate citizen engagement in adaptation? To answer this question, many epistemological and methodological choices must be made. Evaluations may be constructivist or positivist, rely on external or internal evaluators, assess the process or its outcomes, and take place before, during, or after an intervention (Englund et al., 2022; Ernst, 2019; Fazey et al., 2014; Reed et al., 2021). In addition, evaluations can assess different facets of an intervention – its *input* (financial, human, and material resources put into the process), *activities* (actions to transform inputs to outputs and outcomes), *outputs* (tangible products), *outcomes* (short-term or medium-term effects), and *impacts* (long-terms effects emerging after the project life cycle) (OECD, 2013).

In its simplest form, evaluation refers to "the process of determining the merit, worth, and value of things" (Scriven, 1991, p. 53). There are two strands of evaluation inquiry – i) *accountability-oriented evaluation* assessing whether commitments are being delivered as promised and ii) *evaluation for learning* identifying areas for improvement. In practice, tensions arise between accountability and learning as they draw on different ontological underpinnings, which, naturally, have implications for methodological choices (Armytage, 2011; Reinertsen et al., 2022). Accountability-oriented evaluations tend to be summative, i.e., implemented by an external evaluator at the end of an intervention to assess its overall merit. Learning-oriented evaluations tend to be formative, i.e., implemented by an embedded evaluator throughout the project cycle to enable learning and improvement (Balthasar, 2011; Patton, 1996; Scriven, 1991).

Quantitative, positivist, and summative approaches dominate evaluation practices, in which complex social processes are transformed into numerical measures – such as the number of participants attending an event (Thomas, 2000). However, these approaches fail to capture the broad array of outcomes and impacts emerging from citizen engagement processes (Englund et al., 2022; Fazey et al., 2014; Karcher et al., 2021), such as strengthened partnerships and trust, improved institutional and individual capacities, and enriched decision-making (André et al., 2021, 2023; Daniels et al., 2020). Many outcomes and impact are intangible, i.e., difficult to evaluate using quantitative metrics (Norström et al., 2020). Consequently, citizen engagement is far more complex than some evaluation frameworks allow (Thomas, 2000).

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In light of this discussion, we develop learning-oriented evaluation framework. Per definition, citizen engagement is a people-centric process more concerned with learning than accountability (Kilvington, 2010). Evaluation for learning establishes tight feedback loops through continuous monitoring, which allows the implementation process to adjust as new information is learnt (Patton, 2010). This provides an opportunity for the citizen engagement process to be refined and optimized iteratively, ultimately increasing its effectiveness and efficiency.

Iterative learning requires rapid and real-time feedback (Patton, 2010), to check whether the citizen engagement process is achieving its goals. In this context, evaluating what falls within the sphere of control is a valuable input for learning and improvement. This sphere allows for direct control, thus making it possible to re-evaluate and adjust the implementation process to better position it for influence and impact (McLean et al., 2022).

3 Methods

To develop an evaluation framework, we carried out an iterative co-design process (see Figure 1). The process started with a review of scientific literature anchoring the evaluation framework in the latest scientific evidence. This was followed by a three-round Delphi study gathering inputs from the AGORA consortium. The evaluation framework was further validated among researchers and practitioners through interactive sessions at two international adaptation conferences.

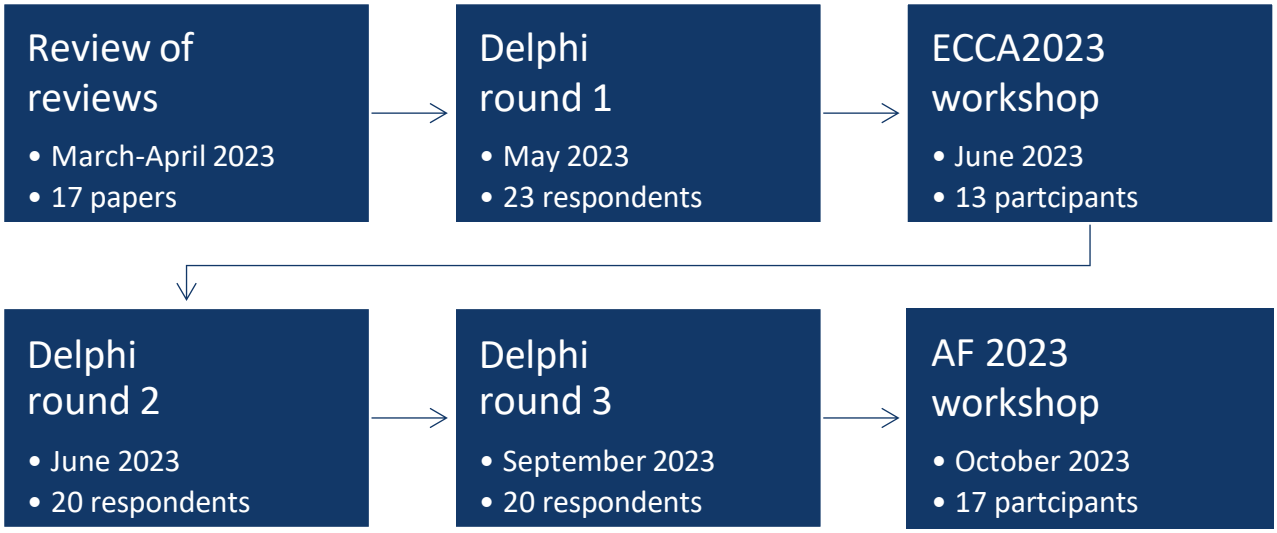

Figure 1: Evaluation framework development timeline.

3.1 Review of scientific literature

To ensure a sound scientific evidence-base, a review of scientific literature was conducted for a rapid synthesis of citizen engagement in climate risk decision-making processes (Smith et al., 2011). For this purpose we adopted the systemic review approach proposed by Dawkins et al. (2019, adopted from Haddaway et al., 2015). This approach consisted of the following steps:

1. Develop a review protocol outlining the review questions, search strategy, selection criteria, and screening and synthesis process.

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2. Perform the literature search on multiple databases.
3. Screen search results against the selection criteria.
4. Code the selected documents.
5. Describe the process to ensure transparency and repeatability.

A specific method, “review of reviews” (Smith et al., 2011), was used to build our initial version of the AGORA evaluation framework by mapping citizen engagement in climate risk decision-making processes.

A Boolean search string was applied capturing all possible synonyms related to citizen engagement. The search was limited to review articles in English, and the period 2015-2022 reflecting the Paris Agreement, a paradigm shift in global climate action.

A pilot search was conducted to check whether the search string retrieved key papers known among the authors (Hegger et al., 2017; Hügel & Davies, 2020). We removed the terms stakeholder engagement and similar as they produced an unmanageable amount of results on the literature databases. At the end, we used the search string presented in Text box 2.

Text box 2: Search string

TITLE-ABS-KEY ("citizen participation" OR "stakeholder inclusion" OR "interactive decision making" OR "deliberative engagement" OR "civil dialogue" OR "joined-up government" OR "deliberative democracy" OR "interactive governance" OR "citizen engagement" OR "citizen involvement" OR "public participation" OR "public involvement" OR "public engagement" OR "citizen science" OR "collaborative governance" OR "cross-sector partnerships" OR "adaptive co-management" OR "co-produc*" OR "co-design*" OR "stakeholder dialogue") AND (LIMIT-TO (PUBYEAR , 2022) OR LIMIT-TO (PUBYEAR , 2021) OR LIMIT-TO (PUBYEAR , 2020) OR LIMIT-TO (PUBYEAR , 2019) OR LIMIT-TO (PUBYEAR , 2018) OR LIMIT-TO (PUBYEAR , 2017) OR LIMIT-TO (PUBYEAR , 2016) OR LIMIT-TO (PUBYEAR , 2015)) AND (LIMIT-TO (DOCTYPE , "re")) AND (LIMIT-TO (LANGUAGE , "English"))

The search string was applied to Scopus and Web of Science. We retrieved 2,529 documents from Scopus and 2,265 from Web of Science, which were extracted and uploaded to Rayyan (an online tool for systemic reviews). After removal of duplicates, 3,427 documents remained.

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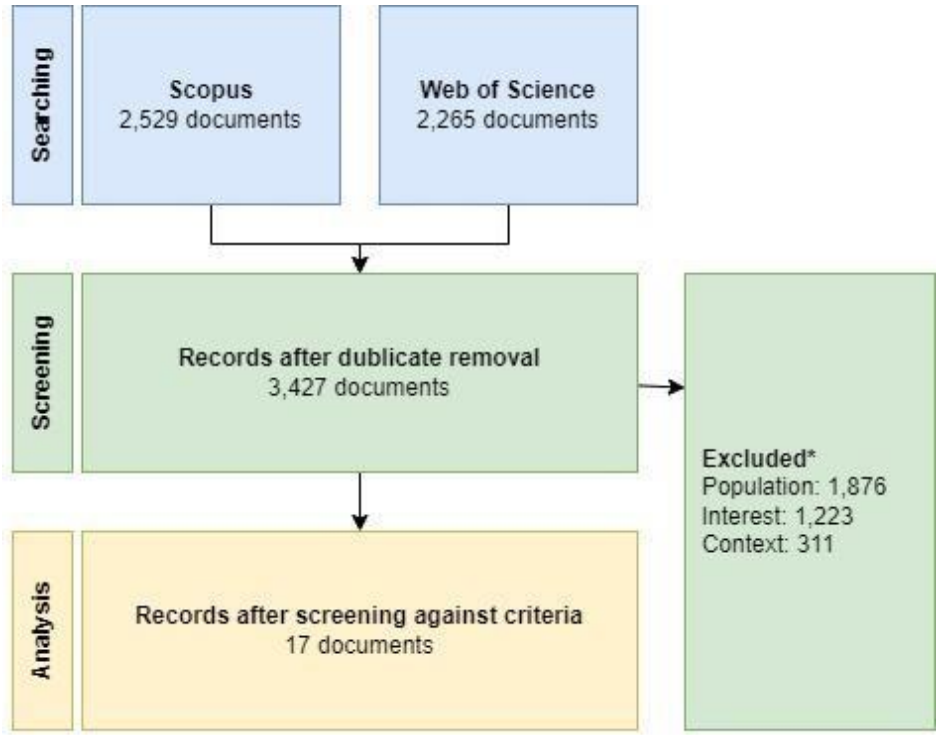

Figure 2: Results of the document selection process (adapted from Haddaway et al., 2015)

To select documents, we identified selection criteria by drafting a 'Population, Interest, Context' (PICo) framework reflecting the overarching aim of the literature review (see Table 2 for an overview) (Lockwood et al., 2015). First, we specified which actors were of interest, namely citizens. Studies focusing on stakeholder engagement were excluded due to the conceptual difference between citizens and stakeholders. While citizens indeed can be stakeholders, stakeholder is a wider concept, representing an organized interest and/or affected party, whether governmental or non-governmental, for example, government agency, advocacy group, private sector, academia, media or civil society organization. Aa citizen is an inhabitant of a particular area/region, and citizens encompass the general public regardless of the interests they may represent. Second, the phenomenon of interest was defined. In this context, we included studies exploring citizen participation in climate risk decision-making or adaptation. This allowed us to gather inputs from a wider spectrum of studies, while maintaining a focus on climate risk management wherein adaptation is one strategy among others. Studies exploring the participation of citizens in research were excluded. Third and last, we specified which type of studies were of interest. More specifically, we included review articles written in English and published between 2015-2022.

Table 2: PICo framework for eligibility criteria

Population	*Phenomenon of interest*	*Context*
Citizens	Active participation in climate risk decision-making or adaptation	Review articles in English, published 2015-2022

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One author screened titles and abstracts against the criteria in Rayyan. Full-text screening was applied to publications when it was impossible to decide on the title and abstract alone. In total, 17 papers were included for analysis (see Figure 2 for an overview). A list of included papers is presented in Appendix 1.

The publications were thereafter screened at full text. Selected documents were coded using a qualitative approach in which descriptive text was noted under each code (see Appendix 2 for an overview). First, metadata was extracted including the title, author, publication year, and DOI. We also noted the problem context being addressed (e.g. adaptation, climate risk management, risk governance, etc.). We proceeded with mapping good practices and challenges found in the documents against common result chain[4] components: input, activities, outputs, outcomes, and impacts. Special attention was paid to external factors influencing the citizen participation process (e.g., political will, governance structures, previous experience, etc.).

To synthesize the findings, a new table was constructed for each result chain code in Microsoft Excel. Each code was deconstructed into sub-themes. Data was clustered into classes of similar objects, which revealed patterns of good practices and challenges. These were reformulated into short and concise evaluation criteria (results are presented in section 4.1).

3.2 Delphi study

The Delphi study served as the core of our research design, as it is an effective method for co-developing frameworks in areas which are inherently uncertain and value-laden (see for example Rikkonen et al., 2021; Van Schoubroeck et al., 2022; Willi et al., 2018). In short, a Delphi study engages a group of experts in a controlled and iterative feedback process organized around a series of anonymous surveys. After each round, responses are analyzed and summarized. This summary is shared in the next round, in which experts can further refine their responses (Beiderbeck et al., 2021; Powell, 2003).

Purposive sampling was applied to select respondents. The Delphi survey was shared with the AGORA consortium to draw on their extensive knowledge and expertise. The respondents represented eight European countries: Sweden, Italy, United Kingdom, Spain, Germany, Switzerland, Greece, and Estonia of which 65% represented academia, 13% represented the private sector, and 22% represented non-governmental organizations. In terms of educational background, the respondents represented both natural and social sciences. Of the 42 invited respondents, 23 respondents participated in the first round, 20 respondents participated in the second round, and 20 respondents participated in the third and final round.

We conducted a three-round Delphi study after which consensus was achieved. The surveys were administrated during online workshops as an attempt to maximize the response rate. The workshops started with a recap of the Delphi study process, followed by a summary of the findings from the previous survey. Respondents then filled out the survey independently. After this, the respondents were invited back for a full group discussion to share additional feedback. The workshops were documented through careful notetaking, followed by preliminary analysis of the results.

3.2.1 Delphi survey first round

The first round had a dual purpose – to define successful citizen engagement and reduce the number of criteria found in the literature. To fulfill the former, we formulated an open-ended question: *What do you*

[4] A result chain is a commonly used tool in monitoring and evaluation to link inputs, activities, outputs, outcomes, and impacts in a logical sequence.

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think is the goal of engaging citizens in climate adaptation decision-making and action? Respondents were then asked to rank the criteria found in the literature against a five-point Likert-scale (strongly agree, agree, disagree, strongly disagree, or I don't know). The full questionnaire is presented in Appendix 3.

Content analysis was used to summarize the qualitative data. In an initial stage, we highlighted words and phrases that conveyed key messages in the textual data. It resulted in an initial list of codes. The textual data was reviewed again but this time against the pre-determined list of codes. At this point, some new codes emerged. The final list of codes was formulated into evaluative criteria. We synthesized the quotes by highlighting their key words, which were summarized into a clear and concise statement representing different outcomes emerging from citizen engagement processes.

The quantitative data was analysed using descriptive statistics in Microsoft Excel. First, the Likert-scale responses were transformed into numerical values (strongly agree=4, agree=3, disagree=2, strongly disagree=1, and I don't know=0). We calculated the mean value for each criterion to identify criteria around which there was consensus. In line with previous research (Green et al., 1999), we equated consensus with an 80% agreement among respondents in this case a mean value of 3,2.

3.2.2 Delphi survey second round

The second Delphi round aimed to further refine the list of criteria. There were three questions for each criterion (see Appendix 4 for the full questionnaire):

1. How important is this outcome for citizen engagement processes? (10-point Likert scale).
2. How easy is the criterion to understand? (10-point Likert scale).
3. Is there anything you would like to change, point out or comment on? (Open-ended question).

The analysis began with summarizing the Likert-scale questions in Microsoft Excel. Using descriptive statistics, we calculated mean values to examine around which criteria there was consensus (defined as 80% agreement among respondents according to Green et al., 1999). Consequently, criteria with a mean value below 8 were omitted. We proceeded with synthesizing the textual data obtained from the open-ended question and workshop discussion. For each criterion, we synthesized the survey responses and made adjustments as suggested.

3.2.3 Delphi survey third round

In the third round, we shared a draft of the preliminary evaluation framework for the respondents to provide their feedback. The respondents could critically comment and reflect on the evaluation framework by making changes in the document and using the comment function. Respondents were also asked three questions:

1. What do you like about the evaluation framework?
2. What can be improved in the evaluation framework?
3. Are there any missing criteria or indicators?

The responses were analyzed by first transferring the feedback into a single document. Using an inductive approach, the feedback was grouped into emerging themes. Subsequently, we refined the evaluation framework in response to this feedback.

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3.3 Workshops – ECCA 2023 and Adaptation Futures 2023

We organized two joint WP3 workshops at two international adaptation conferences: European Climate Change Adaptation Conference (ECCA) 2023 and Adaptation Futures 2023. The workshops aimed to provide input to the Digital AGORA, Digital Academies, and AGORA evaluation framework and thereby contribute to all tasks in WP3. Both workshops applied the World Café method, in which participants rotate between different tables to discuss different topics (Löhr et al., 2020). In this section, we describe workshop content relevant to the AGORA evaluation framework. For more information about the other topics, see D3.1 for a summary of the findings.

The first workshop took place at ECCA 2023, in Dublin, Ireland. In total, around 45 participants joined the workshop representing both science and practice of which 13 participated in the discussion around monitoring, evaluation, and learning. Based on concerns arising from the Delphi study, the aim was to gather inspiration on how to operationalize the outcome criteria in practice. For this purpose, we listed the outcome criteria on a blank flipchart. The participants discussed indicators and criteria for evaluating citizen engagement, methods and tools for operationalizing the criteria, and other emerging concerns. We asked the participants to add sticky notes to the flipchart to document their discussion. After the session, we analysed the data by summarizing the notes and flipcharts, and integrating main points into the AGORA evaluation framework.

The second workshop was held at the Adaptation Futures (AF) Conference 2023, in Montreal, Canada. In total, 17 participants joined the discussion who represented researchers, decision makers, and practitioners. The aim was to validate the evaluation framework among an audience external to the project. First, participants co-explored their envisioned impacts for citizen engagement in adaptation by adding sticky-notes to a blank flipchart. They then brought the flipchart to the next table, at which they engaged in a discussion on the methods for measuring the progress made in attaining these impacts. Following the session, we clustered the data into emerging themes. We triangulated the findings with the evaluation framework for validating purposes.

4 Towards an evaluation framework

In this section, we provide a transparent account of the iterative design process and its results. The findings are presented in a chronological order to show how the evaluation framework evolved over time (see Figure 1 for a timeline).

4.1 Findings from the review of scientific literature

The 17 studies included for full-text analysis (see Appendix 1) covered a variety of topics including adaptation, crisis and climate communication, nature-based solutions, disaster preparedness, resilience, risk-informed urban transformations, disaster vulnerability, and risk governance.

In total, we identified 115 criteria for evaluating citizen engagement in the literature (see Table 3 for an overview). There was an uneven distribution of criteria across the OECD result chain (input=8, activities=58, outcomes and impacts=35, external context=14). Outcomes and impacts were merged due to their significant overlaps. No criterion represented outputs, which could indicate that intangible outcomes and impacts were perceived as more important than the end product.

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Table 3 Findings from the review of scientific literature

Result chain	*Theme*	*Criteria with corresponding references (references available in Appendix 1)*
Input	Input	Experienced and skilled facilitator (2, 7, 10-11, 13-14, 16), financial resources (2, 4-8, 10-12, 14-16), stakeholder skills and experience (4, 7, 10, 14, 16), available time (4-5, 7, 10-11, 14), pre-existing networks and social capital (2, 14, 17) stakeholder norms, values, and worldviews (1-2, 4, 7, 9-11, 14), stakeholders' previous experience of climate risks (1-2, 6), pre-existing stakeholder fatigue (10)
Activities	Preparation	Written or oral agreements (1), well-defined process (7-8, 10, 15)
	Communication	Make use of visuals (1-2, 5), present information in an appropriate format (1, 8, 10), regular communication (6), two-way communication (7, 12, 14), avenues for communication (social media, mass media, etc) (3, 5, 7-9, 12), ensure transparent communication (3, 6, 10-11, 12, 17)
	Incentives	Highlight co-benefits for stakeholders (1, 4-5), understand stakeholders' motivation (5, 8-9), understand and manage stakeholders' expectations (3, 5, 7, 10, 15), create incentives for stakeholders (1, 7-8, 10)
	Roles and responsibilities	Set clear roles and responsibilities (14-15), define expectations and levels of participation (7), try to mobilize social movements (2), share power and responsibilities (1, 4, 6, 8, 10-11), level of engagement (inform, consult, involve, collaborate or empower) (2, 7-8, 10-12, 14)
	Stakeholder representation	Combine lay and expert knowledge (1-2, 4-12, 14-15, 17), everyone´s input is equal (1, 6, 13), number of stakeholders (5, 7), interdisciplinary and cross-sector approach (4, 6, 9-12, 14-17), legitimate process (10, 13-14), fair procedures and representation (2, 6-7, 10, 17), involve the disadvantaged and marginalized (4, 7-8, 10, 12-15), involve those affected by a decision (10, 15), ensure accountability (3, 7, 10, 17)
	Process	Challenge assumptions (2, 14, 17), co-explore context (2, 5-7, 9-10, 12, 15), joint problem framing and objectives (2-3, 5-7, 9-11, 13-14, 16-17), conflict resolution (5), capacity development and knowledge sharing (3, 5-7-10, 12, 14, 17), co-design context-specific solutions (2, 5-7, 9-10, 12, 17), risk analysis of process and proposed solutions (6), citizens collect data (3, 6-7, 10-12), consensus-making (6-7, 10), formal and informal exchanges (10), dispel misinformation (7), assess and manage power dynamics (2, 7-8, 10-12, 14), networking (7)
	Involvement	Engage stakeholders early in the process (5, 11, 14, 17), long-term stakeholder engagement (6-7, 10-11), continuity of participation and multiple events (3, 5-6, 8-11, 13, 15), actor initiating the process (1, 3-4), stakeholder involvement from the beginning to end (4, 7, 13)

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	Accessibility	Appropriate time and place (7, 10, 12), appropriate level of required attendance and commitment (7, 10, 12), possibility for online/offline participation (11), process adapted to context (10), safe and playful space for debate (10, 12-14, 16)
	Monitoring and evaluation	Perform a benchmark assessment (16), monitoring and evaluation framework (2-3, 6-8, 12-14, 16), encourage flexibility (6-8, 10-12), encourage iterative learning (6-7, 10-12, 15), encourage learning by doing (6, 10), encourage reflexivity (9, 13-14, 15)
Outcomes and impacts	Learning	Strengthened awareness (1-2, 4, 7-8, 10, 13, 17), social learning (1-2, 4-9, 10-12, 14, 17), enhanced skills and capacity (1, 3, 5, 7-8, 10, 12-14, 16), knowledge creation and improved problem understanding (2, 4-6, 9-10, 12-13, 15-16), understanding one's own and others' perspectives (8, 10, 14), improved information flows (7, 9, 15)
	Social capital	New or improved relationships (1-2, 7, 10, 12-13, 16), strengthened trust (2-4, 6, 8, 10-11, 14, 17), social cohesion and sense of belonging (5, 10-13), reduced/increased conflict (2, 6-7, 10-11, 14-15, 17), community solidarity (15), bridge silos (2)
	Perceptions of outcome	Public acceptance (2, 4-6, 9-12, 14-15, 17), perceived legitimacy (2, 4, 7-8 10-11, 14, 17), perceived societal value (3), perceived effectiveness (8, 10-11), stakeholder ownership (7, 10-11, 15), useful and salient knowledge (4, 6, 9)
	Individual change	Changes in behavior and lifestyle (2, 7-8), changes in norms and attitudes (2, 8-9, 14), increased commitment to action (7-8, 16), increased stakeholder agency and self-efficacy (5, 9, 12-13, 15), increased well-being (3), mainstreaming climate action into other activities (1, 9)
	Justice and power	Power redistribution and empowerment (2-4, 7-8, 12-14, 17), increased/reduced inequalities (2, 4, 8, 13-14), increased/reduced justice (4-5, 8, 11), redistribution of expertise (2), increased/reduced vulnerability (4, 13)
	Decision-making and solutions	Meet long-term objectives and stakeholder needs (different examples are suggested in the literature e.g. resilience, increased biodiversity, and transformational change) (1, 4-5, 8, 10-13, 15-16), improved and robust decision-making (2, 8, 11, 14, 17), sustained engagement and support (2, 5-6, 9-10, 13-15), contextual and innovative solutions (10-13, 15), scale-up solution (8), new possibilities for change (7)
External context	External context	Governance structure (2, 5, 8, 10-13, 15), policy and legislation (4, 6, 11, 13, 17), political support (5, 8), departmental silos (6, 7, 11), power structures (4, 7, 9, 13-15), gender norms (13), conflicting political interests (4, 6, 10-11,

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		13), market forces (10), previous research (6), disruptions (7, 14) historical legacy (10, 17), uncertainty (14, 17), housing tenure (3)

4.2 Findings from the Delphi survey: Round 1

In the first Delphi round, we aimed to reduce the number of criteria found in the literature. In the analysis, 17 themes were identified from the open-ended question which were translated to evaluation criteria. We compared the 17 criteria to the literature to explore similarities and differences. In total, the 17 criteria represented 61 of the 115 criteria found in the literature. The other 54 criteria were omitted.

Outcome criterion 1: Citizens are empowered to take control over their own future and engage in adaptation processes

In the open-ended question, five respondents considered empowerment an important outcome. As formulated by one respondent: "*The goal is to ensure that citizens have the agency and power to manage their surroundings*". Along these lines, another respondent expressed the desire to "*empower communities to take control of their own future*".

Outcome criterion 2: Citizens influence adaptation decisions that affect them

Procedural justice was highlighted by six respondents. As expressed by one respondent "*citizens´ engagement has a crucial role in fostering and strengthening democracy and social justice*". Another respondent further defined procedural justice as "*taking into consideration the opinions of citizens in actions that directly affect them*".

Outcome criterion 3: Just, equal, and equitable adaptation outcomes

According to four respondents, citizen engagement can accelerate social justice and equality. One respondent wished to "*reduce social and cultural inequalities between citizens*". Other respondents called for "*just and equitable climate policies*" and "*more sustainable, equitable and effective outcomes*", ultimately ensuring that no one is left behind.

Outcome criterion 4: Citizens own the adaptation process and its outcomes

Two respondents mentioned local ownership. In this context, one respondent said that citizens should "*own the aspects connected to climate adaptation*".

Outcome criterion 5: Context-tailored adaptation that integrates local/citizen needs and values

Being the most popular, this criterion was mentioned by 12 respondents. In the words of one respondent:

> "*Citizens´ knowledge, competences and needs are central to the design and implementation of adaptation policies. In my opinion, citizens´ engagement in climate adaptation decision-making and action leads to the development of policies tailored and shaped by local needs and values*".

Accordingly, citizen engagement is a tool for "*considering citizens' perspectives, needs, and priorities and incorporating their knowledge, values, and concerns into decision-making processes*" in the end ensuring societal relevant adaptation policy and action. As expressed by one respondent, citizen engagement can "*amplify the relevance of the issue".*

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Outcome criterion 6: Citizens take responsibility for actively participating in and contributing to adaptation in their communities

Active participation was mentioned by five respondents. For example, one respondent considered citizens as agents of change: "*citizens should learn that they are first actors and not just spectators*". In other words, citizen engagement can build a sense of civic responsibility. As noted by one person: "*Involving citizens in decision-making processes makes them more motivated and responsible*".

Outcome criterion 7: Citizens, researchers, and decision-makers mutually learn and share knowledge

According to seven respondents, citizen engagement can trigger mutual learning. Although some respondents wished for citizen engagement to yield mutual learning, most considered citizen engagement as a one-way learning experience wherein citizens gain knowledge about adaptation. For example: "*Citizens will partake in the ongoing debate between different actors and specialists and therefore will have a more comprehensive understanding of the experts' opinions as well as the limitations of the proposed actions*". There is a focus on knowledge dissemination, as illustrated by the following statements "*Disseminate knowledge-based and reliable information on climate change*" and "*Show the citizens and their communities how this decision-making works".*

Outcome criterion 8: Adaptation outcomes strengthen societal resilience and adaptive capacity

Three respondents considered societal resilience an important outcome. The textual data was riddled with buzzwords – including adaptive capacity, resilience, preparedness, and risk awareness. No further explanation or definition was provided.

Outcome criterion 9: New networks and partnerships emerge from the citizen engagement process

In the open-ended question, three respondents considered new networks and partnerships as an important outcome. In this vein, one respondent called for "*social capital*". Similarly, the other respondents wanted to "*build networks /partnerships*" and "*encourage community collaboration*".

Outcome criterion 10: Citizens have an increased awareness on adaptation issues, solutions, co-benefits, and costs

There were seven respondents who highlighted awareness as a desirable outcome. For example, one respondent said that citizen engagement "*is also important for increasing awareness of climate adaptation activities*". Topics included: "*climate adaptation topics, issues and solutions*", "*costs and benefits associated with adaptation actions*", and "*the interaction of climate with any aspect of the socio-economic system*"**.**

Outcome criterion 11: Citizens change their norms and behaviour

Three respondents argued that citizen engagement processes could trigger changes in norms and behaviour. For example: "*[citizen engagement] inspire and produce tangible changes in citizens' minds and habits"* and "*[citizen engagement is] a good tool to bring about behavioural changes by being part of the decision-making process from the very beginning*".

Outcome criterion 12: Citizens accept and support the adaptation outcome

According to two respondents, citizen engagement could generate public support for adaptation policy and action. As formulated by one individual: "*decisions in the field of climate adaptation will be based on a co-design approach and thus well accepted by the people*".

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Outcome criterion 13: Adaptation outcomes produce co-benefits such as societal well-being

One respondent considered co-benefits a desirable outcome, arguing "*that the process will overall increase desirable societal values. If "well" designed/conducted and not instrumentalized to follow a certain political agenda, I do believe it is a necessary and desirable part of policy processes and societal overall wellbeing*".

Outcome criterion 14: Adaptation outcomes yield long-lasting impacts beyond the project lifetime

Two respondents argued that citizen engagement creates conditions needed for sustaining change after a project is completed. According to one of them: "*in this way, good actions will last beyond the project lifetime*".

Outcome criterion 15: Effective and feasible adaptation outcomes

As many as seven respondents argued that citizen engagement could lead to "*more effective adaptation*". Citizen engagement could also bring about feasibility. One of them expressed this in terms of: "*appropriate solutions which work locally*".

Outcome criterion 16: Adaptation outcomes are scientifically valid

One respondent wished for citizen engagement processes to yield scientifically valid adaptation outcomes. We found no criterion in the literature supporting this criterion. We, however, decided to keep it for the next round to allow for unexpected insights to emerge.

Outcome criterion 17: The citizen engagement process continually responds and adapts to changing circumstances and emerging needs

Lastly, iterative learning was important to one respondent who stressed "*the ability of the engagement process to respond and adapt to changing circumstances and emerging needs*".

4.3 Findings from the ECCA 2023 workshop

This workshop aimed to gather inputs from stakeholders and experts on indicators for evaluating citizen engagement processes. Figure 3 shows the results from the World Café discussions, further described below.

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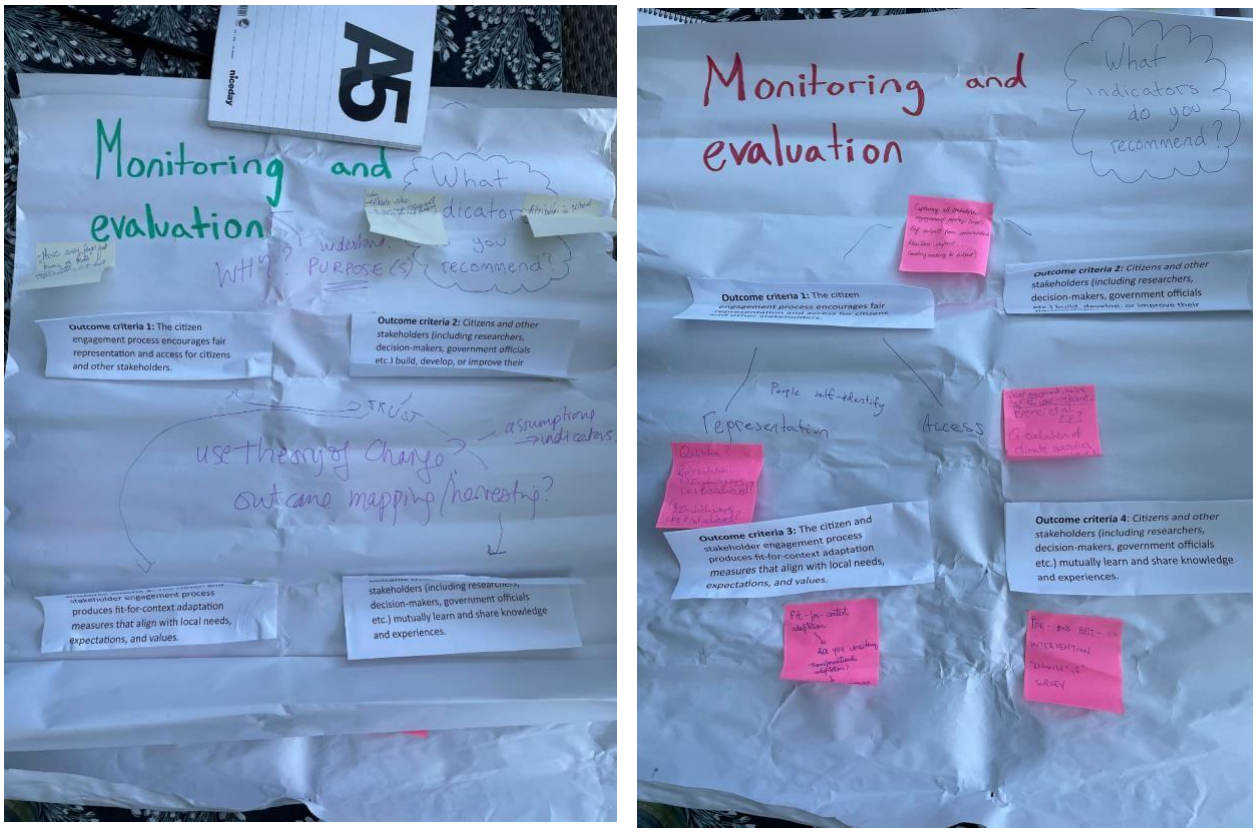

Figure 3 ECCA2023 workshop findings

The workshop participants recommended developing a theory of change to identify evaluation indicators. In short, theory of change is a logic model seeking to explain why a desired change is expected to occur. Developing a theory of change begins with identifying long-term goals and then working backwards to figure out what is needed to achieve the desired change. Assumptions are noted as the process progresses (van Es et al., 2015). Following this advice, we developed a theory of change using the outcomes identified during the second Delphi round. We worked our way backwards by mapping the outcomes against activities and strategies found in the Tandem framework and review of research literature.

Further, participants noticed that measuring the intangibles require innovative approaches that goes beyond counting "*bums on seats*". It was suggested to take a qualitative approach based on a nominal scale with descriptive texts for each indicator, as also done in the RQ+ framework developed by the International Development Research Centre (IDRC). Along these lines, it was suggested breaking the outcome criteria into smaller units that are easier to measure. From this input, we created ranking scales for each indicator. The rubrics are structured as detailed Likert scales explaining different levels of achievement – unacceptable, acceptable, and very good. Each level of performance is accompanied by a descriptive text that defines what is considered unacceptable, acceptable, and very good in relation to the indicator. This provides an opportunity to evaluate intangible outcomes and activities, and allows for comparison across time and space. An example is shown in Table 4.

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Table 4: Ranking scale example

Citizens and other stakeholders have an equal opportunity to participate in the adaptation decision-making process.		
Unacceptable	Acceptable	Very good
1 2	3 4	5 6
Far from everyone affected by a decision is invited to provide input to that decision, and disadvantaged and marginalized groups are underrepresented. Citizens and other stakeholders lack understanding of the local decision-making process and struggle to access it.	Some affected by a decision are invited to provide input to that decision, and disadvantaged and marginalized groups are somewhat represented. Citizens and other stakeholders have an understanding of the local decision-making process and have the means to access it, however, a few knowledge and capacity gaps remain.	Those affected by a decision are invited to provide input to that decision, and disadvantaged and marginalized groups are well represented. Citizens and other stakeholders have a strong understanding of the local decision-making process and have the means to access it.

During discussions on the purpose of the evaluation, participants called for clarifying the aims of the evaluation framework before proceeding any further. It was suggested using a formative approach that seeks to enhance contribution to change by answering questions such as: How can we do better? Where is improvement needed? This led us to think about the evaluation purpose, approach, and philosophy, which resulted in the development of Section 2.

4.4 Findings from the Delphi survey: Round 2

In the second round, we aimed to further refine the list of criteria. We began with 17 criteria for evaluating citizen engagement from the first round, which were merged into four overarching criteria around justice, partnerships, relevance, and learning (see Figure 4). The respondents suggested to drop the six criteria (see Table 5). The full evaluation framework after the second Delphi round is provided in Appendix 5.

Table 5: Dropped criteria after Delphi round 2

Criteria	*Justification*
Citizens own the adaptation process and its outcomes.	Respondents argued that ownership is an ambiguous concept. At times, stakeholder ownership can cause citizen responsibilization. It is also unclear whether full or partial ownership is required, or whether a sense of ownership is enough. It is unclear how ownership works in practice, and when it is taking place. It also scored low for clarity and importance.
Citizens take responsibility for actively participating in and contributing to adaptation in their communities.	Respondents believed that the criterion overlapped with other criteria. It also received a low score in importance.

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Citizens change their norms and behaviour.	Respondents suggested dropping the criterion as some citizen engagement process might have other aims rather than changing norms and behaviours.
Citizens accept and support the adaptation outcome.	Respondents noted that citizen engagement processes should prompt political debate rather than silence it through consensus-making and public acceptance.
Adaptation outcomes produce co-benefits such as societal well-being	The criterion scored low in importance.
Adaptation outcomes build on reliable scientific evidence.	Respondents noted that adaptation can take place without building on scientific knowledge and studies. It also scored low in importance.

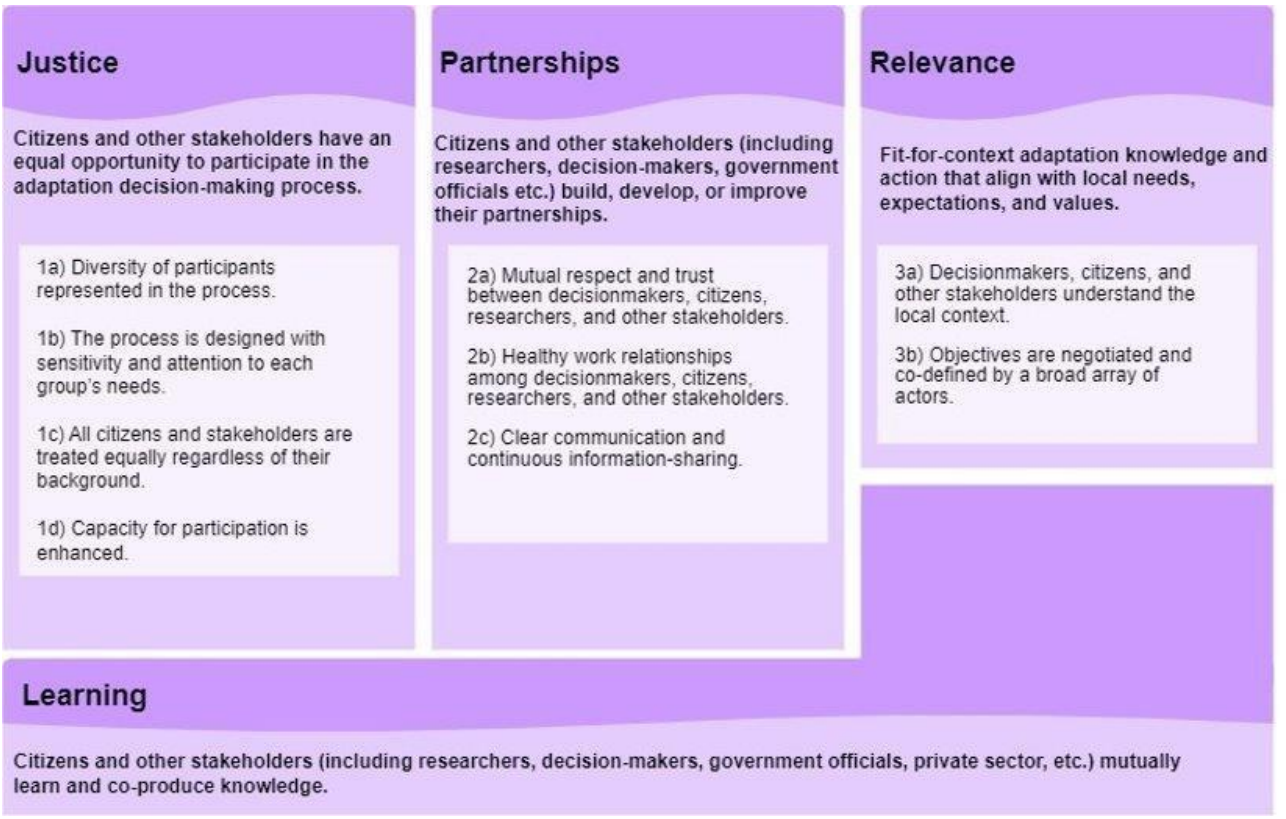

Figure 4 Preliminary theory of change and evaluation framework.

Outcome criterion 1: Justice

Based on the responses in the second round, we merged the following three criteria due to significant overlaps:

- Citizens are empowered to control their own future and engage in adaptation process.
- Citizens influence adaptation decisions that affect them.
- Just, equal, and equitable adaptation outcomes.

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In the second round, it was noted that concepts such as justice, empowerment and influence are ambiguous. There was a need for further clarification. Respondents raised questions regarding the type of empowerment and influence, as well as how it could be measured. One person missed values linked to neutrality, fairness, voice, and transparency.

Two themes representing justice emerged during the second round. First, respondents considered representation an important component of justice. In the open discussion, it was suggested to add a criterion on representation to ensure that stakeholders affected by a decision can provide an input to that particular decision. Second, respondents considered participation as an important component of justice. In the survey, one respondent noted that justice concerns the ability to participate in decision-making: "*It is (…) about designing a process that enables marginalised voices to participate insofar as they would ideally like to / sufficiently to ensure distinct voices are heard*".

Based on this discussion, we formulated the following criterion: **Citizens and other stakeholders have an equal opportunity to participate and contribute to the adaptation decision-making process.** To operationalize this criterion, we developed an indicator looking at representation, participation, and contribution in adaptation decision-making and action. The principles of neutrality, fairness, and voice were integrated hereunder, whereas transparency was incorporated under outcome criterion 2. While developing a theory of change, we identified three process criteria:

1a) Diversity of participants represented in the process
1b) The process is designed with sensitivity and attention to each group's needs.
1c) All citizens and stakeholders are treated equally regardless of their background.

Outcome criterion 2: Partnerships

In the second round, we merged the following criteria as respondents considered them overlapping:

- New networks and partnerships emerge from the citizen engagement process.
- Adaptation outcomes strengthen societal resilience and adaptive capacity.

Most respondents suggested clarifying what was meant by societal resilience and adaptive capacity. One respondent suggested to define societal resilience as a process:

> "*I am wondering whether we mean adaptation outcomes or process. In my view, the process itself strengthens societal resilience, in this case we'd better replace outcomes with process. On the contrary, if we mean the result of the process, then I think we should add positive to outcomes, as societal resilience would be strengthened by a good result. This is why I would go for process, as independently from the outcomes it reinforces community collaboration and perception of common action*".

From this perspective, the engagement process can increase societal resilience by strengthening partnerships and collaboration. This insight enabled us to reduce societal resilience into one of its core components, partnerships, as collaboration is key for enabling transformative learning across different stakeholder groups. We understand this is a gross simplification, however, partnerships and collaboration are the dimension of resilience which the AGORA citizen engagement process is most likely to influence. The process and its impacts on partnerships lies in our sphere of control and can be monitored and evaluated without having the issue of attribution. It also corresponds well to process-centric approaches like the Tandem framework

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(Bharwani et al., manuscript submitted for publication; Daniels et al., 2020). In the open discussion, it was claimed to be unrealistic to expect the AGORA citizen engagement process having major impact on societal resilience considering the limited time and resources at hand. In other words, the citizen engagement process can be successful despite not having a major impact on societal resilience.

Respondents suggested clarifying what was meant by networks, and specifying the actors involved in establishing these networks. It was also suggested to include new and improved networks.

Based on this input, we formulated the following criterion: **Citizens and other stakeholders (including researchers, decision-makers, government officials etc.) build, develop, or improve their partnerships.** This criterion was operationalized through an indicator looking at whether stakeholders are interested in continuing their collaboration in the future. In our theory of change, we identified three process criteria around trust, personal connections, and transparent communication:

2a) Mutual respect and trust between decisionmakers, citizens, researchers, and other stakeholders.
2b) Healthy work relationships among decisionmakers, citizens, researchers, and other stakeholders.
2c) Clear communication and continuous information-sharing

Outcome criterion 3: Relevance

The respondents found major overlaps between the following criteria, which were merged into one:

- Context-tailored adaptation that integrates local/citizen needs and values.
- Effective and feasible adaptation outcomes.
- The citizen engagement process continually responds and adapts to changing circumstances and emerging needs.
- Adaptation outcomes yield long-lasting impacts beyond the project lifetime (reformulated as a process criterion)

The respondents perceived the terms effectiveness and feasibility as ambiguous, and wondered whether we were referring to the effectiveness of the process itself or its outcomes. One individual suggested to further clarify what was meant by local/citizen needs and values *"…what types of needs and values otherwise it becomes very similar to the first few - based on spatial or temporal scale or level of adaptation needs etc?*".

Based on this discussion, we formulated the following criterion: **Fit-for-context adaptation measures that align with local needs, expectations, and values.** This criterion was operationalized through an indicator assessing if the process and its outcomes are aligned with the local context, political priorities, cultural preferences, and social dynamics. We identified two process criteria in our theory of change:

3a) Decisionmakers, citizens, and other stakeholders co-explore the decision-making context.
3b) Objectives are negotiated and co-defined by a broad array of actors.

Outcome criterion 4: Learning

In the second round, the respondents considered the following criteria overlapping:

- Citizens, researchers, and decision-makers mutually learn and share knowledge.
- Citizens have an increased awareness on adaptation issues, solutions, co-benefits, and costs.

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These criteria were merged into the following criterion: **Citizens and other stakeholders (including researchers, decision-makers, government officials, private sector, etc.) mutually learn.** Respondents recommended including additional stakeholder groups in the criterion, more specifically the private sector and government officials. When formulating a theory of change, we found considerable overlaps between learning and other criteria being evaluated. Consequently, we chose to make learning a cross-cutting criterion. This meant that instead of having its own ranking scale or sub-criteria, learning became a byproduct emerging when fulfilling the other evaluation criteria. An overview is provided in Table 6.

Table 6: Criteria dropped after the second Delphi round.

Outcome criterion	*Connections to learning*
Outcome criterion 1: Justice	This outcome criterion links to learning as it integrates knowledge as a form of citizen empowerment, ultimately enhancing their capacity for participation. Moreover, researchers must learn about which stakeholders to engage and their needs regarding time, place, methods, and outputs.
Outcome criterion 2: Partnerships	This outcome criterion links to learning as participants must learn about one another's perspectives and interests in order to build strong partnerships. Furthermore, learning is needed to foster a shared understanding of key concepts among involved parties, thereby ensuring effective communication.
Outcome criterion 3: Relevance	This outcome criterion links to learning as participants must learn about the local vulnerability context in order to produce fit-for-context adaptation knowledge and action. In addition, learning by doing plays a critical role in adaptive management.

4.5 Findings from the Delphi survey: Round 3

The third and last round aimed at validating the evaluation framework among the respondents. All in all, the respondents validated the suggested outcomes and activities. There were some suggestions for improving the framework structure which can be summarized as follows:

- Reorganize the ranking scale
- Operationalize learning
- Differentiate between activities and outcomes
- Separate indicators
- Develop an introductory text
- Add indicators
- Go beyond gender
- Clarify assumptions
- Other feedback

From this input, we refined the evaluation framework. In sum, the evaluation framework consisted of four impacts that were derived from the previous formulated outcome criteria and eight outcomes contributing to these impacts. In addition, 17 activities were specified representing good practices in citizen engagement. Outcomes and activities were paired with a refined ranking scale explaining three levels of achievement –

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unacceptable, acceptable, and optimal. An example is provided in Table 7. The full evaluation framework after the third Delphi round is provided in Section 5.

Table 7: Example of ranking scale after third Delphi round.

Impact 3: Citizens, decision makers, researchers, and other stakeholders learn and co-produce knowledge.		
Outcome 3.1 – Citizens, decision makers, researchers, and other stakeholders have knowledge about key topics.		
Unacceptable	*Acceptable*	*Optimal*
Citizens, decision makers, researchers, and other stakeholders have major knowledge gaps in relation to the issue, potential solutions, and their associated impacts.	Citizens, decision makers, researchers, and other stakeholders have some knowledge about the issue, potential solutions, and their associated impacts, however, some gaps persist.	Citizens, decision makers, researchers, and other stakeholders have knowledge about the issue, potential solutions, and their associated impacts.
Activity 3.1.1 – Identify learning areas		
Unacceptable	*Acceptable*	*Optimal*
A small group of researchers explores capacity gaps, without input from citizens and other stakeholders. Different groups and their particular needs are not considered.	A small group of researchers explores the capacity gaps, which are validated by citizens and other stakeholders. Different groups and their particular needs are somewhat considered.	Citizens, decision makers, researchers, and other stakeholders co-explore capacity gaps taking into consideration different groups and their particular needs.
Activity 3.1.2 – Address knowledge gaps		
Unacceptable	*Acceptable*	*Optimal*
Knowledge gaps are not addressed.	Knowledge gaps are addressed through a one-size fit all approach at one-off training events.	Knowledge gaps are continuously addressed through experiential learning exercises (e.g., role plays, art, serious games, and hands-on exercises).

Reorganize the ranking scale

In the survey, it was suggested to reorganize the ranking scale. Some respondents found the mix of numerical and qualitative values confusing. As noted by one respondent:

> *"Using both "unacceptable" and the numeric scale "1 / 2" for evaluation is a bit confusing. It's unclear how to differentiate between the various levels: 1 or 2 for unacceptable, 3 or 4 for acceptable, and 5 or 6 for very good. While it's clear that 6 is better than 5, it can be challenging to determine whether something falls into the 5 or 6 category during evaluation"*.

Suggestions for improving the ranking scale were numerous. Some respondents proposed aligning the numerical and qualitative values: "*I wonder if it could be simpler to just have 1,2,3, however we will lose some nuance*". Others suggested including instructions on how to use the ranking scale before introducing the framework: "*Another way of doing this would be to simply explain with words at the beginning of the questionnaires how to judge the nuances*". Some respondents recommended rephrasing the category "very good" to "*optimal option*", "*best case scenario*", or "*ideal*". Lastly, one respondent suggested adding a "*not applicable*" option.

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Two respondents warned against quantifying the indicators, in particular aggregating them into a single numerical value. In the words of the respondents:

> "*We understand the desire for quantifying the answers, but please do not then take the step of conflating the different factors or assuming that they are equally important (i.e. strongly suggest against a universal score either for the evaluation overall or for each of the overall criteria)".*

From this feedback, we drafted instructions explaining how to operationalize the evaluation framework and ranking scale. The instructions clarify that the framework could and should be adapted to fit specific contexts, meaning that criteria and indicators can be added or omitted as needed. We also removed the numerical values, not only to prevent confusion but also to avoid users aggregating their findings into a single numerical value. "Very good" was reformulated into "optimal".

Operationalize learning

In the third round, we identified a need to better operationalize learning. For example, one respondent considered that "*the cross-cutting criterion Learning, it is not clear how it affects the overall questionnaire since it applies to all the other outcome and process criteria*". Another respondent asked if "*it is the sum of all other scores or how do we know that learning occurs?*".

To clarify this, respondents suggested adding indicators and ranking scales assessing learning. One respondent asked whether there "*should be any indicator considered for the Learning criterion?*". Similarly, another respondent reflected "*whether it would be possible to add a ranking scale for the Learning criterion*".

As a response, we added indicators and ranking scales designed to assessing whether learning is occurring. This process involved reshuffling indicators rather than identifying new ones. We added one outcome – "citizens, decision makers, researchers, and other stakeholders have knowledge about key topics". Two activities were added under this outcome, namely i) identify learning areas and ii) address knowledge gaps.

Differentiate between activities and outcomes

Respondents wished to better disentangle activities and outcomes. As one person explained:

> "*Some of the criterion description are on the process/methods (e.g. meeting organized, facilitator engage…) and others are on the "results" (good connections between SH [stakeholders], SH share a common understanding of key concepts…); I think we need to standardise around the activities and methods used to ensure negative/positive outcomes*".

Another respondent visualized the difference between activities and outcomes (see figure 5).

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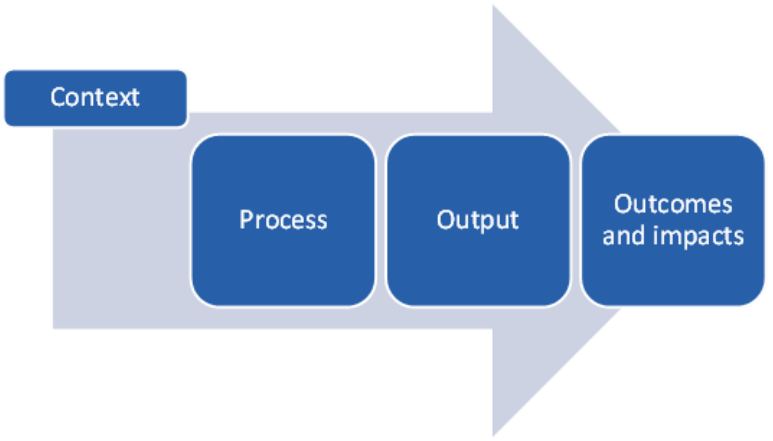

We added this graphic, because sometimes had difficulties seeing what belonged to process or output (or outcome). We see the 'output' as the end-point of the process [e.g., number of people invited, adaptation strategy, etc.]. The outcomes and impacts are more the effects related to the presence of that output (e.g., behavioural change, learning, improvement of the ecosystem).

Figure 5: Input from respondents in third Delphi round

This led us to reorganize the evaluation framework as follows: Each outcome was reformulated as impacts. For each impact, one or more outcomes were identified. We thereafter assigned activities for all outcomes except one. For the most part, we reshuffled and reformulated already existing indicators. However, two indicators were added to fill gaps in the framework identified during the analysis:

- Citizens, decision makers, researchers, and other stakeholders have a sense of buy-in
- Allocate roles and responsibilities

Separate indicators

In the third round, respondents found it confusing when including multiple outcomes/activities in the same box. As one respondent described:

> "*The inclusion of several indicators within one box can be confusing for participants as there may be cases where criteria are graded differently against each indicator. For instance, in the case of 3a) Decisionmakers, citizens, and other stakeholders understand the local context, there can be significant differences in the understanding of the local context between decisionmakers, citizens and other stakeholders*".

This led us to reorganize the evaluation framework ensuring that each box covered a single outcome or activity. For example, one box included indicators for both adapting time and place, methods and platforms, and outputs to stakeholder needs. These were split into three different boxes to enable their individual assessment.

Develop an introductory text

Another recommendation emerged in the third Delphi round, namely adding an introductory text to guide users in applying the evaluation framework. In the words of one respondent:

> "*The structure of the questionnaire could be explained a bit more (evaluate if an initial paragraph before the questionnaire could be a good option). This to avoid confusion and a clearer comprehension of the structure of the questionnaire before starting to fill it*".

From this input, we drafted an introductory text to introduce the evaluation framework, outlining its purpose and operationalization (see Section 5). The introductory text included three sections: An introduction

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clarifying aims and scope, followed by a brief overview of the framework and its structure. The final section describes the operationalization of the evaluation framework, providing future users with a descriptive five-step guide.

Add indicators

Respondents found some indicators missing from the evaluation framework. Three new indicators were suggested, all of which were added to the evaluation framework as they were also found among the 115 criteria identified during the literature review (see Table 8).

Table 8: Suggestions on new indicators

Suggested indicator	*Illustrative quote*
Active participation	"Something specific that I think could be important, but I don't exactly know where to locate it (…): - Unacceptable: A significant portion of participants remains silent during meetings due to discomfort and self-censorship, with only a few actively contributing. - Acceptable: A balance is achieved between participants who speak up and those who remain silent, possibly due to varying comfort levels with engagement. - Very good: Every participant seizes the opportunity and demonstrates confidence in actively participating in discussions, offering valuable inputs".
Incentives for participation	"I would consider the inclusion of an additional criterion (or an additional indicator within 1d) about any incentives provided to the citizens and communities aiming to motivate even the more vulnerable to take part in climate adaptation activities".
Clarifying expectations	"I think here or maybe somewhere else the clarification of the expectations might be missing. E.g., informing citizens and other stakeholders about what it is expected from them for this process, and being transparent also by informing them also what they will get out of this process (to avoid misunderstandings, e.g., participants thinking that all what has been discussed or agreed as important measures will be implemented)".

Go beyond gender

In the third round, it was suggested to consider other socially excluded groups in addition to marginalized genders. All in all, respondents suggested adding the following intersecting identities: age, disability, ethnicity, income, religion and belief, language, and sexual orientation. One respondent suggested to reflect around social diversity in relation to the problem being addressed:

> "*Could be changed maybe to, "is not (or it is) demographically representative of the affected group(s)" - maybe if the decision is about maternity care, maybe that is not the aspect to consider, but e.g., different family structures to be represented".*

Based on this feedback, we broadened the indicators assessing representation extending beyond gender to also include other marginalized groups. We also clarified that involved stakeholders should reflect the demographic diversity of the affected group(s).

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Other feedback

In addition to the major changes outlined above, respondents provided recommendations improving overall phrasing and grammar. From this input, we made the following changes:

- We clarified what is meant by the word “process” (AGORA process, adaptation decision-making process, etc.).
- To enhance readability, we enclosed examples in brackets.
- We have reorganized the order in which the impact areas are presented to create a better reading flow.
- Instead of referring to "partnerships" we use the word "collaboration".
- We clarified the indicator on identifying relevant stakeholders.
- We use “knowledge about” instead of “good understanding” as participation is not determined by the cognitive dimension of understanding.
- We ensured that the terminology describing different stakeholder groups aligned throughout the framework.
- We removed the following indicators due to overlaps, including personal connections, frequent meetings, avoidance of biases or discrimination, means to access the decision-making process, and negotiation of communication channels.

4.6 Findings from the Adaptation Futures 2023 workshop

This workshop aimed to validate the evaluation framework with a broader audience. To do so, we asked participants what impacts they were looking for when engaging citizens and stakeholders in adaptation and how these impacts could be measured. Results are shown in Figure 6.

Figure 6: Adaptation Futures Conference session

All in all, the workshop findings validated the evaluation framework. The participants mentioned all impacts found in the evaluation framework without having it as a point of reference, namely: new networks, mutual learning, sustained impact, social justice, local buy-in and support, and improved knowledge base.

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The participants also identified some impacts which were not included in the evaluation framework. However, we decided not to make any changes to the evaluation framework based on this input. Some of the suggested impacts fall outside the scope of the AGORA project although relevant for other citizen engagement processes, such as improving emergency services, reducing climate anxiety, stopping climate change, among others. Moreover, we also decided to exclude public acceptance as a criterion since respondents in the second Delphi round already noted that citizen engagement processes should prompt political debate rather than silence it through consensus-making and public acceptance.

5 The AGORA evaluation framework

The AGORA evaluation framework presented in this section has been developed for application, testing and validation in the four AGORA pilot regions. As such, it serves as a first draft of the framework that will feed into the Digital AGORA for an external audience, with the aim to foster learning in citizen engagement processes pertaining to adaptation. Figure 7 provides an overview of the evaluation framework and its components. The AGORA evaluation framework provides a semi-structured approach enabling group reflection around the engagement process and its achievements, providing insights around the following questions:

1. How has the citizen engagement process evolved thus far?
2. What outcomes and impacts are emerging?
3. In what ways can the citizen engagement process improve?
4. What strengths and weaknesses can be identified?

The AGORA evaluation framework is designed to evaluate the *collaborative process* itself rather than its end products, making it well-suited for evaluating process-centric engagement endeavours (see for example Carter et al., 2019; Daniels et al., 2020; Vincent et al., 2018).

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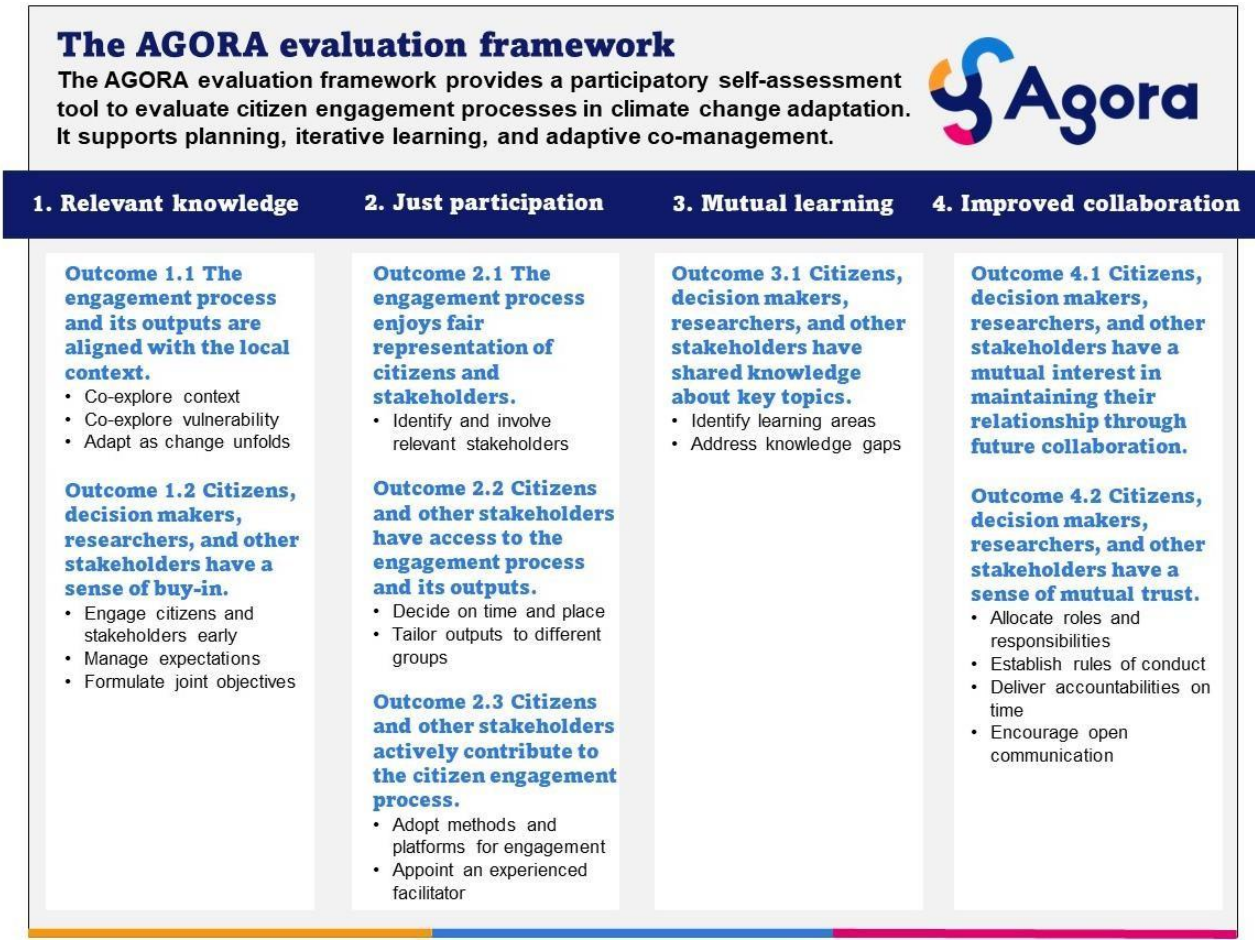

Figure 7: The AGORA evaluation framework outlines four impact pathways, further elaborated into outcomes and the activities needed for achieving these.

5.1 Framework structure

The AGORA evaluation framework provides a comprehensive approach to monitoring, evaluation, and learning in citizen engagement processes related to adaptation. Conceptually, the framework is structured around activities (actions to transform inputs to outputs and outcomes), outcomes (short-term or medium-term effects), and impacts (long-term effects). It builds on four pathways to impact, elaborated below, which are further specified into outcomes and activities.

1. **Relevant knowledge and action –** knowledge and action align with the local context, policy priorities, and social dynamics, and enjoy support and acceptance among citizens, decision makers, researchers, and other stakeholders.
2. **Just participation –** voices and participation of citizens and other stakeholders including the marginalized and disadvantaged are bolstered.
3. **Mutual learning –**citizens, decision makers, researchers, and other stakeholders learn from one another.
4. **Improved collaboration –** partnerships are based on trust and respect among citizens, decision makers, researchers, and other stakeholders.

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To evaluate progress, each activity and outcome is defined by an evaluative rubric (see Table 9). The rubrics are structured as detailed Likert scales explaining different levels of achievement – unacceptable, acceptable, and optimal. Each level of performance is accompanied by a descriptive text that defines what is considered unacceptable, acceptable, and optimal in relation to the specific activity or outcome.

Table 9: The AGORA evaluation framework ranking scale explaining different levels of achievement – unacceptable, acceptable, and optimal – for all impacts, outcomes, and activities.

Impact 1: Relevant knowledge Contextual adaptation knowledge and action that align with local needs, expectations, and values.		
Outcome 1.1 – The engagement process and its outputs are aligned with the local context		
Unacceptable	*Acceptable*	*Optimal*
The outputs misalign with the local context, political priorities, cultural preferences, and social dynamics.	The outputs somewhat align with the local context, political priorities, cultural preferences, and social dynamics.	The outputs align with the local context, political priorities, cultural preferences, and social dynamics (e.g., supports ongoing policy initiatives such as adaptation strategy, resource allocation, or local political agenda).
Activity 1.1.1 – Co-explore context		
Unacceptable	*Acceptable*	*Optimal*
A small group of researchers explores the context, without input from citizens and other stakeholders.	A small group of researchers explores the context, which is validated by citizens and other stakeholders.	Citizens, decision makers, researchers, and other stakeholders continuously co-explore the context (e.g., the decision-making context, socio-economic situation, ongoing initiatives, and power dynamics).
Activity 1.1.2 – Co-explore vulnerability		
Unacceptable	*Acceptable*	*Optimal*
A small group of researchers explores local needs and vulnerabilities, without input from citizens and other stakeholders.	A small group of researchers explores local needs and vulnerabilities, which is validated by citizens and other stakeholders.	Citizens, decision makers, researchers, and other stakeholders co-explore local needs and vulnerabilities which may not be climate-related (e.g., socio-economic challenges such as poverty, housing crowding, and psychosocial distress).
Activity 1.2.3 – Adapt as change unfolds		
Unacceptable	*Acceptable*	*Optimal*
The engagement process remains rigid and unresponsive to changing circumstances, emerging needs, and windows of opportunity, causing missed chances for improvement and innovation.	The engagement process somewhat adapts to changing circumstances, emerging needs, and windows of opportunity, causing missed chances for improvement and innovation.	The engagement process continually responds and adapts to changing circumstances, emerging needs, and windows of opportunity.
Outcome 1.2 – Citizens, decision makers, researchers, and other stakeholders have a sense of buy-in		
Unacceptable	*Acceptable*	*Optimal*
Citizens, decision makers, researchers, and other stakeholders	Citizens, decision makers, researchers, and other stakeholders	Citizens, decision makers, researchers, and other stakeholders

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have conflicting interests as regards the engagement process and its aim.	somewhat share a vested interest, but some hesitation remains.	share a vested interest in the engagement process (e.g., citizens and stakeholders are willing to invest their time, advocate for the process in their networks, and express their support).
Activity 1.2.1 – Engage citizens and stakeholders early		
Unacceptable	*Acceptable*	*Optimal*
Citizens and other stakeholders enter late in the engagement process or not at all.	Citizens and other stakeholders enter in the middle of the engagement process and stay involved throughout its duration.	Citizens and other stakeholders enter the engagement process from an early stage and stay involved throughout its duration – including marginalized and disadvantaged groups.
Activity 1.2.2 – Manage expectations		
Unacceptable	*Acceptable*	*Optimal*
Expectations are misaligned.	Expectations are somewhat aligned.	Expectations around goals, capacities, outputs, and resources are aligned.
Activity 1.2.3 – Formulate joint objectives		
Unacceptable	*Acceptable*	*Optimal*
Objectives are determined top-down without input from citizens and other stakeholders.	Objectives are determined top-down and thereafter validated by citizens and other stakeholders.	Objectives are negotiated and co-defined by citizens, decision makers, researchers, and other stakeholders.

Impact 2: Just participation

Citizens, decision makers, researchers, and other stakeholders have an equal opportunity to participate and voice concerns in the adaptation decision-making and action.

Outcome 2.1 – The engagement process enjoys a fair representation of affected groups.		
Unacceptable	*Acceptable*	*Optimal*
The citizen engagement process does not reflect the demographic diversity of affected groups.	The citizen engagement process somewhat reflects the demographic diversity of affected groups, however, some groups remain excluded.	The citizen engagement process reflects the demographic diversity of the affected groups including disadvantaged and marginalized (e.g. ethnic, religious, or linguistic minorities, persons with disabilities, low-income individuals, sexual and gender minorities, youths and elderly, among others).
Activity 2.1.1 – Identify and involve relevant stakeholders		
Unacceptable	*Acceptable*	*Optimal*
Participants are engaged on an ad-hoc basis, and far from being demographically representative of affected group(s).	Participants are engaged through an one-off selection activity.	Participants are engaged through a participatory and iterative selection process.
Outcome 2.2 – Citizens and other stakeholders have access to the engagement process and its outputs		
Unacceptable	*Acceptable*	*Optimal*

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The engagement process and its outputs are not accessible for citizens and stakeholders.	The engagement process and its outputs are accessible for some citizens and stakeholders.	The engagement process and its outputs are accessible for most citizens and stakeholders – including disadvantaged and marginalized groups.
Activity 2.2.1 – Decide on time and place		
Unacceptable	*Acceptable*	*Optimal*
Time and place are not adapted to citizen and stakeholder needs.	Time and place are somewhat adapted to citizen and stakeholder needs, however, some barriers remain.	Time and place are adapted to citizen and stakeholder needs (e.g., meetings take place outside office hours, childcare is provided, meeting venue close to public transport, and meeting venue accessible for mobility aid users).
Activity 2.2.2 – Tailor outputs to different groups		
Unacceptable	*Acceptable*	*Optimal*
Outputs are standardized for all groups without consideration for their particular needs, and difficult for some to understand, (e.g., reports are lengthy and use scientific jargon).	Outputs are somewhat tailored to different groups and needs, however, some weaknesses remain.	Outputs are tailored to different groups and needs, and communicated in accessible and user-friendly formats (e.g., plain language, easy-use layout, and local language(s)).
Outcome 2.3 - Citizens and other stakeholders participate actively in the engagement process		
Unacceptable	*Acceptable*	*Optimal*
A significant portion of participants remains silent during meetings due to discomfort and self-censorship, with only a few participants actively contributing.	A balance is achieved between participants who speak up and those who remain silent, however, varying comfort levels with engagement remain.	Every participant seizes the opportunity and demonstrates confidence in actively participating in discussions.
Activity 2.3.1 – Adopt methods and platforms for engagement		
Unacceptable	*Acceptable*	*Optimal*
Methods and platforms are not adapted to different groups and needs.	Methods and platforms are somewhat adapted to different groups and needs, however, some weaknesses remain (e.g., difficult to understand content, text-heavy PowerPoint presentations, and non-color-blind friendly palette for visualizations).	Methods and platforms are adapted to different groups and needs on demand basis (e.g., one-on-one meetings for shy people and in-person meetings for the digital illiterate).
Activity 2.3.2 – Appoint an experienced facilitator		
Unacceptable	*Acceptable*	*Optimal*
No facilitator is appointed.	A facilitator is appointed but lacks experience or resources to guide and support the engagement process towards its objectives.	An experienced facilitator is appointed to guide and support the engagement process towards its objectives, manage power imbalances, and enable equal opportunities to contribute.

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Impact 3: Mutual learning

Citizens, decision makers, researchers, and other stakeholders learn, exchange, and co-produce knowledge.

Outcome 3.1 – Citizens, decision makers, researchers, and other stakeholders have shared knowledge about key topics.

Unacceptable	*Acceptable*	*Optimal*
Citizens, decision makers, researchers, and other stakeholders have major knowledge gaps in relation to the issue, potential solutions, and their associated impacts.	Citizens, decision makers, researchers, and other stakeholders have some knowledge about the issue, potential solutions, and their associated impacts, however, some gaps persist.	Citizens, decision makers, researchers, and other stakeholders have shared knowledge about the issue, potential solutions, and their associated impacts.

Activity 3.1.1 – Identify learning areas

Unacceptable	*Acceptable*	*Optimal*
A small group of researchers explores capacity gaps, without input from citizens and other stakeholders. Different groups and needs are not considered.	A small group of researchers explores capacity gaps, which are validated by citizens and other stakeholders. Different groups and needs are somewhat considered.	Citizens, decision makers, researchers, and other stakeholders co-explore capacity gaps taking into consideration different groups and needs.

Activity 3.1.2 – Address knowledge gaps

Unacceptable	*Acceptable*	*Optimal*
Knowledge gaps are not addressed.	Knowledge gaps are addressed through a one-size fits all approach at one-off training events.	Knowledge gaps are continuously addressed through experiential learning exercises (e.g., role plays, art, serious games, and hands-on exercises).

Impact 4: Improved collaboration

Citizens, decision makers, researchers, and other stakeholders build, develop, or improve their collaboration.

Outcome 4.1 – Citizens, decision makers, researchers, and other stakeholders have a mutual interest in maintaining their relationship through future collaboration

Unacceptable	*Acceptable*	*Optimal*
Citizens, decision makers, researchers, and other stakeholders have very low interest in longer-term collaboration.	Citizens, decision makers, researchers, and other stakeholders have a mutual interest in longer-term collaboration without letting it evolve into concrete plans.	Citizens, decision makers, researchers, and other stakeholders make concrete plans for longer-term collaboration (e.g., planning for new projects, applying for new funding, or signing contractual agreements).

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Outcome 4.2 – Citizens, decision makers, researchers, and other stakeholders have a sense of mutual trust.		
Unacceptable	*Acceptable*	*Optimal*
Citizens, decision makers, researchers, and other stakeholders consider other individuals within the group as unreliable.	Citizens, decision makers, researchers, and other stakeholders hold some reservations whether all individuals within the group act with a commitment to the collective good.	Citizens, decision makers, researchers, and other stakeholders believe that all individuals within the group act with a commitment to the collective good.
Activity 4.2.1 – Allocate roles and responsibilities		
Unacceptable	*Acceptable*	*Optimal*
Citizens, decision makers, researchers, and other stakeholders do not understand their roles and responsibilities.	Citizens, decision makers, researchers, and other stakeholders somewhat understand their roles and responsibilities.	Citizens, decision makers, researchers, and other stakeholders have a strong understanding of their roles and responsibilities.
Activity 4.2.2 – Establish rules of conduct		
Unacceptable	*Acceptable*	*Optimal*
Citizens, decision makers, researchers, and other stakeholders fail to establish ground rules for engagement.	Citizens, decision makers, researchers, and other stakeholders establish ground rules for engagement, however, the ground rules are not always respected.	Citizens, decision makers, researchers, and other stakeholders establish ground rules for engagement, which are respected throughout the engagement process.
Activity 4.2.3 – Deliver accountabilities on time		
Unacceptable	*Acceptable*	*Optimal*
Citizens, decision makers, researchers, and other stakeholders fail to deliver on their responsibilities and commitments.	Citizens, decision makers, researchers, and other stakeholders fulfill their responsibilities, however, there are delays in the delivery of commitments.	Citizens, decision makers, researchers, and other stakeholders fulfill their responsibilities and deliver on their commitments in a timely manner.
Activity 4.2.4 – Encourage open communication		
Unacceptable	*Acceptable*	*Optimal*
Communication lacks transparency, and some participants turn to unreliable sources for information.	Communication is somewhat timely and transparent, however, some weaknesses persist (e.g., outputs are delayed and workshop invitations are shared last minute).	Communication is timely and transparent (e.g., meeting notes are circulated and workshop invitations are shared in a timely manner).

5.2 Using the AGORA Evaluation Framework

The AGORA evaluation framework is a participatory self-assessment tool in which participants are offered the opportunity to reflect upon the engagement process and its achievements to identify areas for

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improvement. The framework provides a basis for group reflection, acting as a conduit for conversation between different participants. The rating per se is less important than the group reflection around it.

The AGORA evaluation framework is operationalized in five cyclical steps, shown in Figure 8. Unlike one-time evaluations, this framework offers a process-centric and iterative approach for monitoring, evaluation, and learning. In practice, this means that the framework is applied at multiple occasions to track change as it evolves over time. It builds on the assumption that citizen engagement processes are ever-evolving, therefore, requiring continuous feedback in response to changing conditions.

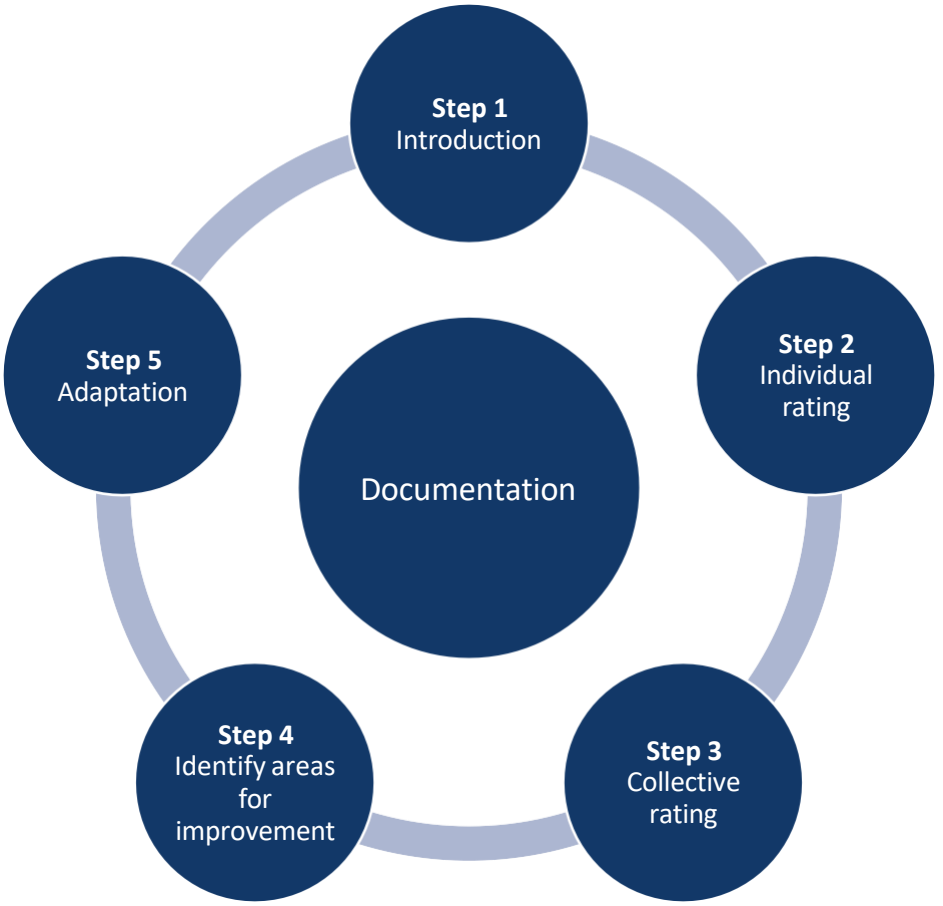

Figure 8: Primary activities in the AGORA evaluation framework

Implementing the AGORA evaluation framework is best done as a reflective process, in which those involved in the citizen engagement process meet to reflect upon the process. It is critical to carefully document the process to track change over time.

To allow for iterative learning, the evaluation framework needs to be applied at multiple points in time. The evaluation framework can be used as a checklist, enabling rapid feedback on whether the process remains on track. It is, however, recommended to have multiple evaluation workshops at different points in time to allow for in-depth group reflection. These workshops should build on earlier insights, in order for participants to discover potential changes in performance and areas for further improvement.

Step 1 – Introduction

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The workshop starts with a short presentation for participants to familiarize themselves with the AGORA evaluation framework. Key concepts should be explained. This is followed by a Questions & Answers for participants to ask clarifying questions. Participants are encouraged to make changes to the framework to make it a better fit for their context. Perhaps an outcome or activity is irrelevant in their context, while others might be missing.

Step 2 – Individual rating

In this step, the facilitator hands out the evaluation framework, and asks the participants to rate the different impact pathways on their own. Each outcome and activity is rated on a three-point scale (unacceptable, acceptable, and optimal).

This exercise is for participants to have the opportunity to express their opinion without being influenced by others in the group. It allows all participants to contribute to the assessment, even in situations where one individual is blocking or dominating the group discussion.

Step 3 – Collective rating and reflection

In the third step, the facilitator brings back the participants to full group discussion asking them to rate the impact pathways as a group. The facilitator should prompt discussion to explore whether the participants share the same ratings, and subsequently, discuss why these differences exist. Participants are encouraged to bring up potential unexpected impacts and external influences.

Step 4 – Identify areas for improvement

In this step, the facilitator zooms into the areas that have received low ratings, encouraging participants to discuss how this could be improved. While the framework offers some suggestions, participants are encouraged to bring forth alternative improvement ideas that could be better suited to their specific contexts.

Step 5 – Adaptation

In the final step, the knowledge gathered through evaluation is applied through an iterative process, building on previous workshop results (see details in Figure 8 above) to improve the citizen engagement process. This might involve revising specific activities, reallocating resources, or reconsidering the overall engagement approach.

6 Conclusions

This report (D3.2) has aimed to present an evaluation framework developed for citizen engagement processes in climate change adaptation. The AGORA evaluation framework provides a structured, yet flexible, approach for assessing citizen engagement processes across contexts, thus facilitating comparisons across time and space. It enables systematic monitoring, evaluation, and learning, by identifying strengths, weaknesses, and areas for improvement in engagement initiatives. It can capture positive and negative outcomes, tangible and intangible effects as well as expected and unexpected consequences.

To develop the AGORA evaluation framework, we adopted an explorative co-production process harnessing creative inputs from primary academia but also civil society, experts, and policymakers from across Europe. The iterative steps in the methodology allowed for the evaluation framework to evolve as feedback was

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gathered and integrated. This continuous learning process allowed us to gradually refine the evaluation framework, and thereby improve its quality and validity.

There are, however, limits to our research approach. The success of a Delphi study is dependent on its respondents, in this case the AGORA consortium which represents a rather homogenous group with similar experiences and values. Over half of the respondents represented academia, whereas few represented citizens and practitioners. This might have introduced potential biases, although mitigated by triangulation of the Delphi findings with the scientific literature and the two external workshops. Importantly, some clear advantages of a homogenous group of experts are the opportunity for consensus building and obtaining expert opinion from people with in-depth insights in citizen engagement and adaptation issues. This will then be operationalised in the four pilot regions for empirical grounding and validation. Nonetheless, some criteria found in the literature remain missing in the final evaluation framework. For example, justice is reduced into procedural-related aspects whereas other dimensions are omitted. Excluding these criteria does not dimmish their importance, but rather it reflects the scope of the AGORA project. If others intend to use the AGORA evaluation framework, we recommend adapting it to the local context by integrating criteria as needed.

This report adds to the growing body of research evaluating effectiveness in citizen engagement initiatives, while also paving the way to a learning-oriented evaluation framework that appraises both the process and its outcomes. Further empirical testing is, however, needed to ensure practical feasibility. This will be done in AGORA tasks 1.2 and 2.3, in which the framework will be applied to assess citizen engagement processes. The AGORA evaluation framework will consequently be updated and refined based on insights from its practical application, ensuring that it is aligned with emerging good practices.

Moving forward, we wish to make the AGORA evaluation framework accessible to a broader audience. To achieve this, we plan to present the framework in a user-friendly format for publication on the Digital AGORA platform. The aim is to develop an interactive tool for users from diverse backgrounds, thus allowing citizens and other stakeholders to hold engagement processes accountable for delivering on their promises.

7 References

Adler, R. P., & Goggin, J. (2005). What Do We Mean By “Civic Engagement”? *Journal of Transformative Education*, *3*(3), 236–253. https://doi.org/10.1177/1541344605276792

André, K., Gerger Swartling, Å., Englund, M., Petutschnig, L., Nyadzi, E. M. N. A. N., Milde, K., Lückerath, D., Cauchy, A., Botnen Holm, T., Hanssen Korsbrekke, M., Bour, M., & Rome, E. (2023). Improving stakeholder engagement in climate change risk assessments: Insights from six case studies in Europe. *Frontiers in Climate*, *5*. https://doi.org/10.3389/fclim.2023.1120421

André, K., Järnberg, L., Gerger Swartling, Å., Berg, P., Segersson, D., Amorim, J. H., & Strömbäck, L. (2021). Assessing the Quality of Knowledge for Adaptation–Experiences From Co-designing Climate Services in Sweden. *Frontiers in Climate*, *3*, 1–12. https://doi.org/10.3389/fclim.2021.636069

Armytage, L. (2011). Evaluating aid: An adolescent domain of practice. *Evaluation*, *17*(3), 261–276. https://doi.org/10.1177/1356389011410518

Balthasar, A. (2011). Critical Friend Approach: Policy Evaluation Between Methodological Soundness, Practical Relevance, and Transparency of the Evaluation Process. *German Policy Studies*, *7*(3), 187–231.

Beiderbeck, D., Frevel, N., von der Gracht, H. A., Schmidt, S. L., & Schweitzer, V. M. (2021). Preparing, conducting, and analyzing Delphi surveys: Cross-disciplinary practices, new directions, and advancements. *MethodsX*, *8*, 101401. https://doi.org/10.1016/j.mex.2021.101401

This project has received funding from the European Union’s Horizon Europe Research and Innovation Actions under grant agreement No 101093921

Bharwani, S., Gerger Swartling, Å., André, K., Santos, T., Salamanca, A., Biskupska, N., Takama, T., Järnberg, L., & Lui, A. (manuscript submitted for publication). Insights and updates from three diverse case studies using the Tandem framework to co-design climate services. *Climate Services*.

Carter, S., Steynor, A., Vincent, K., Visman, E., & Waagsaether, K. (2019). *Co-production of African weather and climate services.* [Manual]. Future Climate for Africa and Weather and Climate Information Services for Africa. https://futureclimateafrica.org/coproduction-manual

Chase, S. K., & Levine, A. (2016). A framework for evaluating and designing citizen science programs for natural resources monitoring. *Conservation Biology*, *30*(3), 456–466. https://doi.org/10.1111/cobi.12697

Daniels, E., Bharwani, S., Gerger Swartling, Å., Vulturius, G., & Brandon, K. (2020). Refocusing the climate services lens: Introducing a framework for co-designing "transdisciplinary knowledge integration processes" to build climate resilience. *Climate Services*, *19*, 1–15. https://doi.org/10.1016/j.cliser.2020.100181

Dawkins, E., André, K., Axelsson, K., Benoist, L., Swartling, Å. G., & Persson, Å. (2019). Advancing sustainable consumption at the local government level: A literature review. *Journal of Cleaner Production*, *231*, 1450–1462. https://doi.org/10.1016/j.jclepro.2019.05.176

Englund, M., André, K., Gerger Swartling, Å., & Iao-Jörgensen, J. (2022). Four Methodological Guidelines to Evaluate the Research Impact of Co-produced Climate Services. *Frontiers in Climate*, *4*. https://doi.org/10.3389/fclim.2022.909422

Ernst, A. (2019). Research techniques and methodologies to assess social learning in participatory environmental governance. *Learning, Culture and Social Interaction*, *23*, 1–17. https://doi.org/10.1016/j.lcsi.2019.100331

Falanga, R., & Ferrão, J. (2021). The evaluation of citizen participation in policymaking: Insights from Portugal. *Evaluation and Program Planning*, *84*, 101895. https://doi.org/10.1016/j.evalprogplan.2020.101895

Fazey, I., Bunse, L., Msika, J., Pinke, M., Preedy, K., Evely, A. C., Lambert, E., Hastings, E., Morris, S., & Reed, M. S. (2014). Evaluating knowledge exchange in interdisciplinary and multi-stakeholder research. *Global Environmental Change*, *25*, 204–220. https://doi.org/10.1016/j.gloenvcha.2013.12.012

Geekiyanage, D., Keraminiyage, K., & Fernando, T. (2021). Mapping participatory methods in the urban development process: A systematic review and case-based evidence analysis. *Sustainability*, *13*(16), 8992. https://doi.org/10.3390/su13168992

Green, B., Jones, M., Hughes, D., & Williams, A. (1999). Applying the Delphi technique in a study of GPs' information requirements. *Health & Social Care in the Community*, *7*(3), 198–205. https://doi.org/10.1046/j.1365-2524.1999.00176.x

Haddaway, N. R., Woodcock, P., Macura, B., & Collins, A. (2015). Making literature reviews more reliable through application of lessons from systematic reviews. *Conservation Biology*, *29*(6), 1596–1605. https://doi.org/10.1111/cobi.12541

Hügel, S., & Davies, A. R. (2020). Public participation, engagement, and climate change adaptation: A review of the research literature. *WIREs Climate Change*, *11*(4), e645. https://doi.org/10.1002/wcc.645

Hughes, R. (1998). *Environmental impact assessment and stakeholder involvement* (Environmental Planning Issues) [11]. IIED. https://www.iied.org/sites/default/files/pdfs/migrate/7789IIED.pdf

Hurlbert, M., & Gupta, J. (2015). The split ladder of participation: A diagnostic, strategic, and evaluation tool to assess when participation is necessary. *Environmental Science & Policy*, *50*, 100–113. https://doi.org/10.1016/j.envsci.2015.01.011

Karcher, D. B., Cvitanovic, C., Colvin, R. M., Van Putten, I. E., & Reed, M. S. (2021). Is this what success looks like? Mismatches between the aims, claims, and evidence used to demonstrate impact from knowledge exchange processes at the interface of environmental science and policy. *Environmental Science & Policy*, *125*, 202–218. https://doi.org/10.1016/j.envsci.2021.08.012

Kilvington, M. (2010). *Building Capacity for Social Learning in Environmental Management* [PhD thesis, Lincoln University]. https://learningforsustainability.net/kilvington/Kilvington_PhD_Chapter8.pdf

This project has received funding from the European Union's Horizon Europe Research and Innovation Actions under grant agreement No 101093921

Kumpu, V. (2022). What is Public Engagement and How Does it Help to Address Climate Change? A Review of Climate Communication Research. *Environmental Communication - A Journal of Nature and Culture*, *16*(3), 304–316. https://doi.org/10.1080/17524032.2022.2055601

Lazoroska, D., & Palm, J. (2019). Dialogue with property owners and property developers as a tool for sustainable transformation: A literature review. *Journal of Cleaner Production*, *233*, 328–339. https://doi.org/10.1016/j.jclepro.2019.06.040

Leyden, K. M., Silke, R., Slevin, A., Grey, T., Hynes, M., & Frisbaek, F. (2017). Public and Stakeholder Engagement and the Built Environment: A Review. *Current Environmental Health Reports*, *4*, 267–277. https://doi.org/10.1007/s40572-017-0159-7

Lockwood, C., Munn, Z., & Porritt, K. (2015). Qualitative research synthesis: Methodological guidance for systematic reviewers utilizing meta-aggregation. *JBI Evidence Implementation*, *13*(3), 179. https://doi.org/10.1097/XEB.0000000000000062

Löhr, K., Weinhardt, M., & Sieber, S. (2020). The "World Café" as a Participatory Method for Collecting Qualitative Data. *International Journal of Qualitative Methods*, *19*. https://doi.org/10.1177/1609406920916976

Mahajan, S., Helbing, D., Hausladen, C. I., Argota Sánchez-Vaquerizo, J., & Korecki, M. (2022). Participatory resilience: Surviving, recovering and improving together. *Sustainable Cities and Society*, *83*, 103942. https://doi.org/10.1016/j.scs.2022.103942

McLean, R., Ofir, Z., Etherington, A., Acevedo, M., & Feinstein, O. (2022). *Research Quality Plus (RQ+)—Evaluating Research Differently*. International Development Research Centre.

Norström, A. V., Cvitanovic, C., Löf, M. F., West, S., Wyborn, C., Balvanera, P., Bednarek, A. T., Bennett, E. M., Biggs, R., de Bremond, A., Campbell, B. M., Canadell, J. G., Carpenter, S. R., Folke, C., Fulton, E. A., Gaffney, O., Gelcich, S., Jouffray, J.-B., Leach, M., … Österblom, H. (2020). Principles for knowledge co-production in sustainability research. *Nature Sustainability*, *3*(3), 182–190. https://doi.org/10.1038/s41893-019-0448-2

OECD. (2013). *Development results. An overview of results measurement and management.* [Briefing note]. OECD.

Patton, M. Q. (1996). A world larger than formative and summative. *Evaluation Practice*, *17*(2), 131–144. https://doi.org/10.1016/S0886-1633(96)90018-5

Patton, M. Q. (2010). *Developmental Evaluation: Applying complexity concepts to enhance innovation and use*. Guilford Press.

Powell, C. (2003). The Delphi technique: Myths and realities. *Journal of Advanced Nursing*, *41*(4), 376–382. https://doi.org/10.1046/j.1365-2648.2003.02537.x

Reed, M., Ferré, M., Martin-Ortega, J., Blanche, R., Lawford-Rolfe, R., Dallimer, M., & Holden, J. (2021). Evaluating impact from research: A methodological framework. *Research Policy*, *50*(4), 104147. https://doi.org/10.1016/j.respol.2020.104147

Reinertsen, H., Bjørkdahl, K., & McNeill, D. (2022). Accountability versus learning in aid evaluation: A practice-oriented exploration of persistent dilemmas. *Evaluation*, *28*(3), 356–378. https://doi.org/10.1177/13563890221100848

Revez, A., Dunphy, N., Harris, C., Rogan, F., Byrne, E., McGookin, C., Bolger, P., Ó Gallachóir, B., Barry, J., Ellis, G., O'Dwyer, B., Boyle, E., Flood, S., Glynn, J., & Mullally, G. (2022). Mapping emergent public engagement in societal transitions: A scoping review. *Energy, Sustainability and Society*, *12*(1), 2. https://doi.org/10.1186/s13705-021-00330-4

Rikkonen, P., Lauttamäki, V., Parkkinen, M., Varho, V., & Tapio, P. (2021). Five transition pathways to renewable energy futures—Scenarios from a Delphi study on key drivers and policy options. *European Journal of Futures Research*, *9*(1), 14. https://doi.org/10.1186/s40309-021-00185-0

Rosener, J. B. (1978). Citizen Participation: Can We Measure Its Effectiveness? *Public Administration Review*, *38*(5), 457–463. https://doi.org/10.2307/975505

This project has received funding from the European Union's Horizon Europe Research and Innovation Actions under grant agreement No 101093921

Rowe, G., & Frewer, L. (2004). Evaluating Public Participation Exercises: A Research Agenda. *Science, Technology and Human Values*, *29*(4). https://doi.org/10.1177/0162243903259197

Rowe, G., & Frewer, L. (2013). Public Participation Methods: A Framework for Evaluation. *Science, Technology & Human Values*, *25*(1). https://doi.org/10.1177/016224390002500101

Samaddar, S., Yokomatsu, M., Dayour, F., Oteng-Ababio, M., Dzivenu, T., Adams, M., & Ishikawa, H. (2015). Evaluating Effective Public Participation in Disaster Management and Climate Change Adaptation: Insights From Northern Ghana Through a User-Based Approach. *Risk, Hazards & Crisis in Public Policy*, *6*(1), 117–143. https://doi.org/10.1002/rhc3.12075

Scriven, M. (1991). *Evaluation Thesaurus*. SAGE.

Shahid, A., Lalani, I. N., Rosgen, B. K., Sept, B. G., Longmore, S., Parsons Leigh, J., Stelfox, H. T., & Fiest, K. M. (2022). A scoping review of methods to measure and evaluate citizen engagement in health research. *Research Involvement and Engagement*, *8*(1), 72. https://doi.org/10.1186/s40900-022-00405-2

Sherman, M., & Ford, J. (2014). Stakeholder engagement in adaptation interventions: An evaluation of projects in developing nations. *Climate Policy*, *14*(3), 417–441. https://doi.org/10.1080/14693062.2014.859501

Smith, V., Devane, D., Begley, C. M., & Clarke, M. (2011). Methodology in conducting a systematic review of systematic reviews of healthcare interventions. *BMC Medical Research Methodology*, *11*(1), 15. https://doi.org/10.1186/1471-2288-11-15

Thomas, L. (2000). "Bums on Seats"; or "Listening to Voices": Evaluating widening participation initiatives using participatory action research. *Studies in Continuing Education*, *22*(1), 95–113. https://doi.org/10.1080/713695716

Uittenbroek, C. J., Mees, H. L. P., Hegger, D. L. T., & Driessen, P. P. J. (2019). The design of public participation: Who participates, when and how? Insights in climate adaptation planning from the Netherlands. *Journal of Environmental Planning and Management*, *62*(14), 2529–2547. https://doi.org/10.1080/09640568.2019.1569503

van der Vegt, R. G. (2018). A literature review on the relationship between risk governance and public engagement in relation to complex environmental issues. *Journal of Risk Research*, *21*(11), 1–18. https://doi.org/10.1080/13669877.2017.1351466

van Es, M., Guijt, I., & Vogel, I. (2015). *Hivos ToC Guidelines: Theory of Change Thinking in Practice. A Stepwise Approach.* Hivos. https://hivos.org/document/hivos-theory-of-change/

Van Schoubroeck, S., Vermeyen, V., Alaerts, L., Van Acker, K., & Van Passel, S. (2022). How to monitor the progress towards a circular food economy: A Delphi study. *Sustainable Production and Consumption*, *32*, 457–467. https://doi.org/10.1016/j.spc.2022.05.006

Vincent, K., Daly, M., Scannell, C., & Leathes, B. (2018). What can climate services learn from theory and practice of co-production? *Climate Services*, *12*, 48–58. https://doi.org/10.1016/j.cliser.2018.11.001

Willi, Y., Pütz, M., & Müller, M. (2018). Towards a versatile and multidimensional framework to analyse regional governance. *Environment and Planning C: Politics and Space*, *36*(5), 775–795. https://doi.org/10.1177/2399654418760859

This project has received funding from the European Union's Horizon Europe Research and Innovation Actions under grant agreement No 101093921

Appendix 1 – Literature included in the review of scientific literature

1. Hegger, D., Mees, H., Drissen, P. and Runhaar, H. (2017). The Roles of Residents in Climate Adaptation: A systematic review in the case of the Netherlands. *Environmental policy and governance*. 27(4), 226-350. doi:10.1002/eet.1766
2. Hügel, S. and Davies, A.R. (2020). Public participation, engagement, and climate change adaptation: A review of the research literature. *WIREs Climate Change*. 11(4). doi:10.1002/wcc.645
3. Capolupon, N., Piscopo, G. and Annarumma, C. (2019). Value co-creation and co-production in the interaction between citizens and public administration A systematic literature review. *Kybernetes*. 49(2). 313-331. doi:10.1108/K-07-2018-0383
4. Cattino, M. and Reckien, D. (2021). Does public participation lead to more ambitious and transformative local climate change planning? *Current opinion in environmental sustainability*. 52. 100-110. doi:10.1016/j.cosust.2021.08.004
5. Ferreira, V., Barreira, A.P., Antunes, D. and Panagopoulos, T. (2020). Stakeholders' Engagement on Nature-Based Solutions: A Systematic Literature Review. *Sustainability*. 12(2). doi:10.3390/su12020640
6. Galappaththi, E., Falardeau, M., Harris, L., Rocha, J. and Moore, J.S (2022). Resilience-based steps for adaptive co-management of Arctic small-scale fisheries. *Environmental research letters*. 17(8). doi:10.1088/1748-9326/ac7b37
7. Geekiyanage, D., Keraminiyage, K. and Fernando, T. (2021). Mapping participatory methods in the urban development process: A systematic review and case-based evidence analysis. *Sustainability*. 13(16). doi:10.3390/su13168992
8. Khatibi, F.S., Dedekorkut-Howes, A., Howes, M. and Torabi, E. (2021) Can public awareness, knowledge and engagement improve climate change adaptation policies? *Discover sustainability.* 2(1). doi:10.1007/s43621-021-00024-z
9. Kumpu (2022). What is Public Engagement and How Does it Help to Address Climate Change? A Review of Climate Communication Research. Environmental communication: A journal of nature and culture. 16(3). 304-316. doi:10.1080/17524032.2022.2055601
10. Lazoroska, D. and Palm, J. (2019). Dialogue with property owners and property developers as a tool for sustainable transformation: A literature review. *Journal of cleaner production*. 233. 328-339. doi:10.1016/j.jclepro.2019.06.040
11. Leyden, K.M., Silke, R., Slevin, A., Grey, T., Hynes, M. and Frisbaek, F. (2017). Public and Stakeholder Engagement and the Built Environment: a Review. *Built Environment and Health*. 4(3). 267-277. doi:10.1007/s40572-017-0159-7
12. Mahajan, S., Helbing D., Hausladen C.I., Argota Sánchez-Vaquerizo J. and Korecki M. (2022). Participatory resilience: Surviving, recovering and improving together. *Sustainable cities and society*. 83. doi:10.1016/j.scs.2022.103942
13. Mansfield, R., Batagol, B. and Raven, R. (2021). "Critical Agents of Change?": Opportunities and Limits to Children's Participation in Urban Planning. *Journal of planning literature*. 36(2). 170-186. doi:10.1177/0885412220988645
14. Romsdahl, R.J. (2020). Deliberative framing: opening up discussions for local-level public engagement on climate change. Climate change. 162. 145-163. doi:10.1007/s10584-020-02754-x

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15. Revez, A., Mullally G., Dunphy N., Harris C., Rogan F., Byrne E., McGookin C., Bolger P., Ó Gallachóir B., Barry J., Ellis G., O'Dwyer B., Boyle E., Flood S., and Glynn J. (2022). Mapping emergent public engagement in societal transitions: a scoping review. *Energy, sustainability, and society*. 12(2). doi:10.1186/s13705-021-00330-4
16. Ryan, B., Johnston, K.A., Taylor, M. and McAndrew R. (2020). Community engagement for disaster preparedness: A systematic literature review. International journal of disaster risk reduction. 49. doi:10.1016/j.ijdrr.2020.101655
17. Van der Vegt, R.G. (2018). A literature review on the relationship between risk governance and public engagement in relation to complex environmental issues. *Journal of risk research*. 21(11). 1-18. doi:10.1080/13669877.2017.1351466

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Appendix 2 – Coding framework

Table 10: Coding framework

Codes		*Description*
Basic information	ID	Numerical value
	Author(s)	Descriptive text
	Title	Descriptive text
	Year	Descriptive text
	DOI	Descriptive text
	Problem context	Descriptive text (climate change adaptation, disaster vulnerability, urban resilience, etc)
Result chain	Input	Descriptive text describing the financial, human, and material resources put into the process
	Activity	Descriptive text describing the actions to transform inputs to outputs and outcomes
	Output	Descriptive text describing the tangible products emerging from the process
	Outcome	Descriptive text describing the short-term or medium-term effects emerging from the process
	Impact	Descriptive text describing the long-terms effects emerging after the project life cycle
Other information	Other	Other information which may be of relevance

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Appendix 3 – First Delphi round

AGORA Evaluation framework for citizen engagement

Thank you for taking the time to answer this survey that is part of AGORA project task 3.2 – develop an evaluation framework to assess the value, effectiveness, and impact of citizen and stakeholder engagement methodologies. The goal of this survey is to reduce the number of criteria found in the literature into a set of criteria fit for evaluating citizen engagement in climate change adaptation. The survey is expected to take around 30 minutes.

Informed consent

Your participation is completely voluntary. The answers will be analyzed, synthesized, and reported in deliverable 3.2 and possibly in other related scientific publications. Your name and contact details will be visible for the SEI-HQ team only. All information you supply will be held in confidence, and your name will not appear in any reports.

In the case of any questions, feel free to contact Mathilda Englund, Research Associate at SEI.

Name

E-mail address

I have read the information above, and I hereby agree to participate in the study.
[ ] Yes
[ ] No

Background information

What country are you located in?

What is your academic background?

What type of organization do you represent?
[ ] Research institute or university
[ ] Private enterprise
[ ] Non-governmental organization
[ ] Public sector
[ ] Other (please specify)

For how many years have you worked with citizen and stakeholder engagement?

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[ ] Less than one year
[ ] 1-5 years
[ ] 6-10 years
[ ] More than ten years

Introductory question

What do you think is the goal of engaging citizens in climate adaptation decision-making and action? Please answer in 1-5 sentences.

Outcome (1/6)

Outcome refers to the effects emerging from the citizen engagement process.

In your view, how relevant are the following criteria for evaluating citizen engagement in climate adaptation decision-making and action?

	Strongly disagree	Disagree	Agree	Strongly agree	I don't know
Strengthened awareness	[ ]	[ ]	[ ]	[ ]	[ ]
Collective learning	[ ]	[ ]	[ ]	[ ]	[ ]
Enhanced skills and capacity	[ ]	[ ]	[ ]	[ ]	[ ]
Knowledge creation and improved problem understanding	[ ]	[ ]	[ ]	[ ]	[ ]
Understanding one's own and others' perspectives	[ ]	[ ]	[ ]	[ ]	[ ]
Improved information flows	[ ]	[ ]	[ ]	[ ]	[ ]

Outcome (2/6)

Outcome refers to the effects emerging from the citizen engagement process.

In your view, how relevant are the following criteria for evaluating citizen engagement in climate adaptation decision-making and action?

	Strongly disagree	Disagree	Agree	Strongly agree	I don't know

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New or improved relationships	[ ]	[ ]	[ ]	[ ]	[ ]
Strengthened trust among involved actors	[ ]	[ ]	[ ]	[ ]	[ ]
Social cohesion and sense of belonging	[ ]	[ ]	[ ]	[ ]	[ ]
Reduced/increased conflict	[ ]	[ ]	[ ]	[ ]	[ ]
Community solidarity	[ ]	[ ]	[ ]	[ ]	[ ]
Bridged silos	[ ]	[ ]	[ ]	[ ]	[ ]

Outcome (3/6)
Outcome refers to the effects emerging from the citizen engagement process.

In your view, how relevant are the following criteria for evaluating citizen engagement in climate adaptation decision-making and action?

	Strongly disagree	**Disagree**	**Agree**	**Strongly agree**	**I don't know**
Public acceptance	[ ]	[ ]	[ ]	[ ]	[ ]
Perceived legitimacy among the public	[ ]	[ ]	[ ]	[ ]	[ ]
Perceived societal value among the public	[ ]	[ ]	[ ]	[ ]	[ ]
Perceived effectiveness among the public	[ ]	[ ]	[ ]	[ ]	[ ]
Stakeholder ownership	[ ]	[ ]	[ ]	[ ]	[ ]
Useful knowledge for the public	[ ]	[ ]	[ ]	[ ]	[ ]

Outcome (4/6)

Outcome refers to the effects emerging from the citizen engagement process.

In your view, how relevant are the following criteria for evaluating citizen engagement in climate adaptation decision-making and action?

	Strongly disagree	**Disagree**	**Agree**	**Strongly agree**	**I don't know**
Power redistribution and empowerment	[ ]	[ ]	[ ]	[ ]	[ ]
Increased/reduced inequalities	[ ]	[ ]	[ ]	[ ]	[ ]

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Increased/reduced justice	[ ]	[ ]	[ ]	[ ]	[ ]
Redistrubtion of expertise	[ ]	[ ]	[ ]	[ ]	[ ]
Increased/reduced vulnerability	[ ]	[ ]	[ ]	[ ]	[ ]

Outcome (5/6)

Outcome refers to the effects emerging from the citizen engagement process.

In your view, how relevant are the following criteria for evaluating citizen engagement in climate adaptation decision-making and action?

	Strongly disagree	Disagree	Agree	Strongly agree	I don't know
Changes in behaviour and lifestyle	[ ]	[ ]	[ ]	[ ]	[ ]
Changes in norms and attitudes	[ ]	[ ]	[ ]	[ ]	[ ]
Increased commitment to action	[ ]	[ ]	[ ]	[ ]	[ ]
Increased stakeholder agency and self-efficacy	[ ]	[ ]	[ ]	[ ]	[ ]
Increased well-being	[ ]	[ ]	[ ]	[ ]	[ ]
Mainstreaming climate action into other activtities	[ ]	[ ]	[ ]	[ ]	[ ]

Outcome (6/6)

Outcome refers to the effects emerging from the citizen engagement process.

In your view, how relevant are the following criteria for evaluating citizen engagement in climate adaptation decision-making and action?

	Strongly disagree	Disagree	Agree	Strongly agree	I don't know
Meet long-term objectives and stakeholder needs (different examples are suggested in the literature e.g. resilience, increased biodiversity, and transformational change)	[ ]	[ ]	[ ]	[ ]	[ ]
Improved and robust decision-making	[ ]	[ ]	[ ]	[ ]	[ ]
Sustained engagement and support	[ ]	[ ]	[ ]	[ ]	[ ]

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Contextual and innovative solutions	[ ]	[ ]	[ ]	[ ]	[ ]
Scale-up solution	[ ]	[ ]	[ ]	[ ]	[ ]
New possabilities for change	[ ]	[ ]	[ ]	[ ]	[ ]

Input (1/1)

The resources put into the citizen engagement process

In your view, how relevant are the following criteria for evaluating citizen engagement in climate adaptation decision-making and action?

	Strongly disagree	Disagree	Agree	Strongly agree	I don't know
Facilitator's skills and experience	[ ]	[ ]	[ ]	[ ]	[ ]
Financial resources for citizen engagement process	[ ]	[ ]	[ ]	[ ]	[ ]
Stakeholders' skills and experience in climate change adaptation	[ ]	[ ]	[ ]	[ ]	[ ]
Avaliable time for engagement	[ ]	[ ]	[ ]	[ ]	[ ]
Pre-existing networks and social capital among stakeholders	[ ]	[ ]	[ ]	[ ]	[ ]
Stakeholder norms, values, and worldviews	[ ]	[ ]	[ ]	[ ]	[ ]
Stakeholders' previous experience of climate risks	[ ]	[ ]	[ ]	[ ]	[ ]
Pre-existing stakeholder fatigue (exhaustion among stakeholders)	[ ]	[ ]	[ ]	[ ]	[ ]

Process (1/9)

Activities to support the citizen engagement process.

In your view, how relevant are the following criteria for evaluating citizen engagement in climate adaptation decision-making and action?

	Strongly disagree	Disagree	Agree	Strongly agree	I don't know

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Written or oral agreement between involved actors	[ ]	[ ]	[ ]	[ ]	[ ]
Well-defined process and activities	[ ]	[ ]	[ ]	[ ]	[ ]

Process (2/9)

Activities to support the citizen engagement process.

In your view, how relevant are the following criteria for evaluating citizen engagement in climate adaptation decision-making and action?

	Strongly disagree	Disagree	Agree	Strongly agree	I don't know
Use visuals when communicating	[ ]	[ ]	[ ]	[ ]	[ ]
Present information in an appropriate format	[ ]	[ ]	[ ]	[ ]	[ ]
Regular communication	[ ]	[ ]	[ ]	[ ]	[ ]
Two-way communication	[ ]	[ ]	[ ]	[ ]	[ ]
Avenues for communication (social media, mass media etc.)	[ ]	[ ]	[ ]	[ ]	[ ]
Transparent communication of both good and bad information being shared in a way that allows all to see the why behind the words	[ ]	[ ]	[ ]	[ ]	[ ]

Process (3/9)

Activities to support the citizen engagement process.

In your view, how relevant are the following criteria for evaluating citizen engagement in climate adaptation decision-making and action?

	Strongly disagree	Disagree	Agree	Strongly agree	I don't know

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Highlight co-benefits for stakeholders	[ ]	[ ]	[ ]	[ ]	[ ]
Understand stakeholder's motivation	[ ]	[ ]	[ ]	[ ]	[ ]
Understand and manage stakeholders' expectations	[ ]	[ ]	[ ]	[ ]	[ ]
Create incentives for stakeholders to participate	[ ]	[ ]	[ ]	[ ]	[ ]

Process (4/9)

Activities to support the citizen engagement process.

In your view, how relevant are the following criteria for evaluating citizen engagement in climate adaptation decision-making and action?

	Strongly disagree	Disagree	Agree	Strongly agree	I don't know
Set clear roles and responsibilities	[ ]	[ ]	[ ]	[ ]	[ ]
Define expectations and levels of participation	[ ]	[ ]	[ ]	[ ]	[ ]
Try to mobilize social movements	[ ]	[ ]	[ ]	[ ]	[ ]
Share power and responsabilities	[ ]	[ ]	[ ]	[ ]	[ ]
Level of engagement (inform, consult, involve, collaborate, empower)	[ ]	[ ]	[ ]	[ ]	[ ]

Process (5/9)

Activities to support the citizen engagement process.

In your view, how relevant are the following criteria for evaluating citizen engagement in climate adaptation decision-making and action?

	Strongly disagree	Disagree	Agree	Strongly agree	I don't know
Combine lay and expert knowledge	[ ]	[ ]	[ ]	[ ]	[ ]
Everyone's input is equal	[ ]	[ ]	[ ]	[ ]	[ ]
Number of stakeholders	[ ]	[ ]	[ ]	[ ]	[ ]

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Interdisciplinary and cross-sector approach	[ ]	[ ]	[ ]	[ ]	[ ]
Legitimate process	[ ]	[ ]	[ ]	[ ]	[ ]
Fair procedures and representation	[ ]	[ ]	[ ]	[ ]	[ ]
Involve the disadvantaged and marginalized	[ ]	[ ]	[ ]	[ ]	[ ]
Involve those affected by a decision	[ ]	[ ]	[ ]	[ ]	[ ]
Ensure accountable decision-makers	[ ]	[ ]	[ ]	[ ]	[ ]

Process (6/9)

Activities to support the citizen engagement process.

In your view, how relevant are the following criteria for evaluating citizen engagement in climate adaptation decision-making and action?

	Strongly disagree	**Disagree**	**Agree**	**Strongly agree**	**I don't know**
Engage stakeholders early in the process	[ ]	[ ]	[ ]	[ ]	[ ]
Long-term stakeholder engagement	[ ]	[ ]	[ ]	[ ]	[ ]
Continuity of participation and multiple events	[ ]	[ ]	[ ]	[ ]	[ ]
Actor initiating the process	[ ]	[ ]	[ ]	[ ]	[ ]
Stakeholder involvement from the beginning to the end	[ ]	[ ]	[ ]	[ ]	[ ]

Process (7/9)

Activities to support the citizen engagement process.

In your view, how relevant are the following criteria for evaluating citizen engagement in climate adaptation decision-making and action?

	Strongly disagree	**Disagree**	**Agree**	**Strongly agree**	**I don't know**
Challenge assumptions	[ ]	[ ]	[ ]	[ ]	[ ]
Co-explore context	[ ]	[ ]	[ ]	[ ]	[ ]

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Joint problem framing and objectives	[ ]	[ ]	[ ]	[ ]	[ ]
Conflict resolution	[ ]	[ ]	[ ]	[ ]	[ ]
Capacity development and knowledge sharing	[ ]	[ ]	[ ]	[ ]	[ ]
Co-design context specific solutions	[ ]	[ ]	[ ]	[ ]	[ ]
Citizens collect data	[ ]	[ ]	[ ]	[ ]	[ ]
Consensus-making	[ ]	[ ]	[ ]	[ ]	[ ]
Formal and informal exchanges	[ ]	[ ]	[ ]	[ ]	[ ]
Prevent disinformation and misinformation	[ ]	[ ]	[ ]	[ ]	[ ]
Assess and manage power dynamics	[ ]	[ ]	[ ]	[ ]	[ ]
Networking	[ ]	[ ]	[ ]	[ ]	[ ]

Process (8/9)

Activities to support the citizen engagement process.

In your view, how relevant are the following criteria for evaluating citizen engagement in climate adaptation decision-making and action?

	Strongly disagree	**Disagree**	**Agree**	**Strongly agree**	**I don't know**
Appropriate time and place	[ ]	[ ]	[ ]	[ ]	[ ]
Appropriate level of required attendance and commitment	[ ]	[ ]	[ ]	[ ]	[ ]
Possibility for online/offline participation	[ ]	[ ]	[ ]	[ ]	[ ]
Process adapted to context	[ ]	[ ]	[ ]	[ ]	[ ]
Safe and playful space for debate	[ ]	[ ]	[ ]	[ ]	[ ]

Process (9/9)

Activities to support the citizen engagement process.

In your view, how relevant are the following criteria for evaluating citizen engagement in climate adaptation decision-making and action?

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	Strongly disagree	Disagree	Agree	Strongly agree	I don't know
Perform a benchmark assessment	[ ]	[ ]	[ ]	[ ]	[ ]
Monitoring and evaluation framework	[ ]	[ ]	[ ]	[ ]	[ ]
Encourage flexability	[ ]	[ ]	[ ]	[ ]	[ ]
Encourage iterative learning	[ ]	[ ]	[ ]	[ ]	[ ]
Encourage reflextivity	[ ]	[ ]	[ ]	[ ]	[ ]

Context (1/1)

External factors affecting the citizen engagement process.

In your view, how relevant are the following criteria for evaluating citizen engagement in climate adaptation decision-making and action?

	Strongly disagree	Disagree	Agree	Strongly agree	I don't know
Governance structure	[ ]	[ ]	[ ]	[ ]	[ ]
Policy and legislation	[ ]	[ ]	[ ]	[ ]	[ ]
Political support	[ ]	[ ]	[ ]	[ ]	[ ]
Departmental silos	[ ]	[ ]	[ ]	[ ]	[ ]
Power structures	[ ]	[ ]	[ ]	[ ]	[ ]
Gender norms	[ ]	[ ]	[ ]	[ ]	[ ]
Conflicting political intrests	[ ]	[ ]	[ ]	[ ]	[ ]
Market forces	[ ]	[ ]	[ ]	[ ]	[ ]
Previous research	[ ]	[ ]	[ ]	[ ]	[ ]
Historical legacy	[ ]	[ ]	[ ]	[ ]	[ ]
Uncertainty	[ ]	[ ]	[ ]	[ ]	[ ]
Housing tenure	[ ]	[ ]	[ ]	[ ]	[ ]
Disruptive event	[ ]	[ ]	[ ]	[ ]	[ ]

Closing questions

Would you like to add any criteria? If yes, please list below.

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Is there anything else you would like to say, point out or comment on?

End of survey.

Thank you for participating.

Appendix 4 – Second Delphi round

AGORA Evaluation framework for citizen engagement - Delphi Round 2 Questionnaire

Thank you for participating in the Delphi Round 2 Questionnaire. We have consolidated your responses in the first round into a list of 17 criteria for evaluating citizen engagement. In this questionnaire, we ask you to review our interpretation of the criteria, and provide suggestions on areas for improvement. The questionnaire is expected to take around 30 minutes.

Please enter your name.

Criterion 1

Some respondents considered **citizen empowerment** a desirable outcome. Based on their input, we drafted the following criterion: **Citizens are empowered to take control over their own future and engage in adaptation processes**.

How important is this outcome for the AGORA citizen engagement process?

1	2	3	4	5	6	7	8	9	10

How easy is the criterion to understand?

1	2	3	4	5	6	7	8	9	10

Is there anything you would like to change, point out or comment on?

Criterion 2

Some respondents considered **procedural justice** a desirable outcome. Based on their input, we drafted the following criterion: **Citizens influence adaptation decisions that affect them**.

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How important is this outcome for the AGORA citizen engagement process?

1	2	3	4	5	6	7	8	9	10

How easy is the criterion to understand?

1	2	3	4	5	6	7	8	9	10

Is there anything you would like to change, point out or comment on?

Criterion 3

Some respondents considered **distributional justice** a desirable outcome. Based on their input, we drafted the following criterion: **Just, equal, and equitable adaptation outcomes**.

How important is this outcome for the AGORA citizen engagement process?

1	2	3	4	5	6	7	8	9	10

How easy is the criterion to understand?

1	2	3	4	5	6	7	8	9	10

Is there anything you would like to change, point out or comment on?

Criterion 4

Some respondents considered **local ownership** a desirable outcome. Based on their input, we drafted the following criterion: **Citizens own the adaptation process and ist outcomes.**

How important is this outcome for the AGORA citizen engagement process?

1	2	3	4	5	6	7	8	9	10

How easy is the criterion to understand?

1	2	3	4	5	6	7	8	9	10

Is there anything you would like to change, point out or comment on?

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Criterion 5

Some respondents considered **context-tailored adaptation** a desirable outcome. Based on their input, we drafted the following criterion: **Context-tailored adaptation that integrates local/citizen needs and values.**

How important is this outcome for the AGORA citizen engagement process?

1	2	3	4	5	6	7	8	9	10

How easy is the criterio to understand?

1	2	3	4	5	6	7	8	9	10

Is there anything you would like to change, point out or comment on?

Criterion 6

Some respondents considered **civic responsibility** a desirable outcome. Based on their input, we drafted the following criterion: **Citizens take responsibility for actively participating in and contributing to adaptation in their communities**.

How important is this outcome for the AGORA citizen engagement process?

1	2	3	4	5	6	7	8	9	10

How easy the criterion to understand?

1	2	3	4	5	6	7	8	9	10

Is there anything you would like to change, point out or comment on?

Criterion 7

Some respondents considered **mutual learning** a desirable outcome. Based on their input, we drafted the following criterion: **Citizens, researchers, and decision-makers mutually learn and share knowledge.**

How important is this outcome for the AGORA citizen engagement process?

1	2	3	4	5	6	7	8	9	10

How easy is the criterion to understand?

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1	2	3	4	5	6	7	8	9	10

Is there anything you would like to change, point out or comment on?

Criterion 8

Some respondents considered **societal resilience** a desirable outcome. Based on their input, we drafted the following criterion: **Adaptation outcomes strengthen societal resilience and adaptive capacity.**

How important is this outcome for the AGORA citizen engagement process?

1	2	3	4	5	6	7	8	9	10

How easy is the criterion to understand?

1	2	3	4	5	6	7	8	9	10

Is there anything you would like to change, point out or comment on?

Criterion 9

Some respondents considered **new networks** a desirable outcome. Based on their input, we drafted the following criterion: **New networks and partnerships emerge from the citizen engagement process**.

How important is this outcome for the AGORA citizen engagement process?

1	2	3	4	5	6	7	8	9	10

How easy is the criterion to understand?

1	2	3	4	5	6	7	8	9	10

Is there anything you would like to change, point out or comment on?

Criterion 10

Some respondents considered **awareness** a desirable outcome. Based on their input, we drafted the following criterion: **Citizens have an increased awareness on adaptation issues, solutions, co-benefits, and costs.**

How important is this outcome for the AGORA citizen engagement process?

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1	2	3	4	5	6	7	8	9	10

How easy is the criterion to understand?

1	2	3	4	5	6	7	8	9	10

Is there anything you would like to change, point out or comment on?

Criterion 11

Some respondents considered **changes in norms and behavior** a desirable outcome. Based on their input, we drafted the following criterion: **Citizens change their norms and behavior**.

How important is this outcome for the AGORA citizen engagement process?

1	2	3	4	5	6	7	8	9	10

How easy is the criterion to understand?

1	2	3	4	5	6	7	8	9	10

Is there anything you would like to change, point out or comment on?

Criterion 12

Some respondents considered **public acceptance** a desirable outcome. Based on their input, we drafted the following criterion: **Citizens accept and support the adaptation outcome**.

How important is this outcome for the AGORA citizen engagement process?

1	2	3	4	5	6	7	8	9	10

How easy is the criterion to understand?

1	2	3	4	5	6	7	8	9	10

Is there anything you would like to change, point out or comment on?

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Criterion 13

Some respondents considered **co-benefits** a desirable outcome. Based on their input, we drafted the following criterion: **Adaptation outcomes produce co-benefits such as societal well-being**.

How important is this outcome for the AGORA citizen engagement process?

1	2	3	4	5	6	7	8	9	10

How easy is the criterion to understand?

1	2	3	4	5	6	7	8	9	10

Is there anything you would like to change, point out or comment on?

Criterion 14

Some respondents considered **long-lasting impact** a desirable outcome. Based on their input, we drafted the following criterion: **Adaptation outcomes yield long-lasting impacts beyond the project lifetime**.

How important is this outcome for the AGORA citizen engagement process?

1	2	3	4	5	6	7	8	9	10

How easy is the criterion to understand?

1	2	3	4	5	6	7	8	9	10

Is there anything you would like to change, point out or comment on?

Criterion 15

Some respondents considered **effectiveness** a desirable outcome. Based on their input, we drafted the following criterion: **Effective and feasible adaptation outcomes**.

How important is this outcome for the AGORA citizen engagement process?

1	2	3	4	5	6	7	8	9	10

How easy is the criterion to understand?

1	2	3	4	5	6	7	8	9	10

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Is there anything you would like to change, point out or comment on?

Criterion 16

Some respondents considered **scientific validity** a desirable outcome. Based on their input, we drafted the following criterion: **Adaptation outcomes build on reliable scientific evidence.**

How important is this outcome for the AGORA citizen engagement process?

1	2	3	4	5	6	7	8	9	10

How easy is the criterion to understand?

1	2	3	4	5	6	7	8	9	10

Is there anything you would like to change, point out or comment on?

Criterion 17

Some respondents considered **iterative learning** a desirable outcome. Based on their input, we drafted the following criterion: **The citizen engagement process continually responds and adapts to changing circumstances and emerging needs**.

How important is this outcome for the AGORA citizen engagement process?

1	2	3	4	5	6	7	8	9	10

How easy is the criterion to understand?

1	2	3	4	5	6	7	8	9	10

Is there anything you would like to change, point out or comment on?

End of survey.

Thank you for participating.

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Appendix 5 – Evaluation framework after second Delphi round

<table>
<tr><th colspan="4">Aim: Citizens and other stakeholders have the capacity to manage climate risks in their local communities.</th></tr>
<tr><td rowspan="11">Cross-cutting criterion: Learning

Citizens, researchers, and other stakeholders mutually learn and co-produce knowledge.</td><td colspan="3">Outcome criterion 1: Justice</td></tr>
<tr><td colspan="3">Citizens and other stakeholders have an equal opportunity to participate in the adaptation decision-making process.</td></tr>
<tr><td>Unacceptable</td><td>Acceptable</td><td>Very good</td></tr>
<tr><td>1 2</td><td>3 4</td><td>5 6</td></tr>
<tr><td>Far from everyone affected by a decision is invited to provide input to that decision, and disadvantaged and marginalized groups are underrepresented.

Citizens and other stakeholders lack understanding of the local decision-making process and struggle to access it.</td><td>Some affected by a decision are invited to provide input to that decision, and disadvantaged and marginalized groups are somewhat represented.

Citizens and other stakeholders have an understanding of the local decision-making process and have the means to access it, however, a few knowledge and capacity gaps remain.</td><td>Those affected by a decision are invited to provide input to that decision, and disadvantaged and marginalized groups are well represented.

Citizens and other stakeholders have a strong understanding of the local decision-making process and have the means to access it.</td></tr>
<tr><td colspan="3">Process criteria</td></tr>
<tr><td colspan="3">1a) Diversity of participants represented in the process</td></tr>
<tr><td>Unacceptable</td><td>Acceptable</td><td>Very good</td></tr>
<tr><td>1 2</td><td>3 4</td><td>5 6</td></tr>
<tr><td>There is no stakeholder mapping nor selection process and participants are invited on an ad-hoc basis. Only a few stakeholder groups are represented. The process has an unequal gender representation.</td><td>Participants are selected through stakeholder mapping, however, some key stakeholder groups are missing. The process has a balanced gender representation. The process has a somewhat balanced gender representation.</td><td>Participants are selected through robust and iterative stakeholder mapping, and different stakeholder groups are represented, including local communities and citizens, academia, governments and decision-makers, civil society, private sector and investors, and media. The</td></tr>
</table>

			process has a balanced gender representation.
	1b) The process is designed with sensitivity and attention to each group's needs.		
	Unacceptable	Acceptable	Very good
	1 2	3 4	5 6
	Time and place are not adapted to citizen and stakeholder needs. Methods and platforms are not adapted to different groups and their specific needs. Outputs from the process are standardized for all groups without consideration for their special needs, and difficult for some to understand, e.g., reports are lengthy and use scientific language.	Time and place are somewhat adapted to citizen and stakeholder needs, however, some barriers remain, e.g., meetings take place during office hours, limited accessible transportation options, and meeting venue lacks ramps or elevators. Methods and platforms are somewhat adapted to different groups and their specific needs, however, some weaknesses remain, e.g., text-heavy PowerPoint presentations and non-color-blind friendly palette for visualizations. Outputs from the process are somewhat tailored to different groups and their needs, however, some weaknesses remain.	Time and place are adapted to different groups and their specfic needs, e.g., meetings take place outside office hours to accommodate for people working during the day, meeting venue close to public transport, and meeting venue accessible for mobility aid users. Methods and platforms are adapted to different groups and their specific needs, e.g., one-on-one meetings for shy people and in-person meetings for the digital illiterate. Outputs from the process are tailored to different groups and their needs, and communicated in accessible and user-friendly formats, e.g., plain language, easy-use layout, and local language(s).
	1c) All citizens and stakeholders are treated equally regardless of their background.		
	Unacceptable	Acceptable	Very good
	1 2	3 4	5 6
	The citizen engagement process suffers from biases, and preferential treatment and discrimination occur based on	The citizen engagement process is unbiased, but there are some indications that preferential treatment or discrimination might occur based on	The citizen engagement process is unbiased, and no preferential treatment or discrimination occurs based on

	gender, ethnicity, sexual orientation, age, disability, etc. No independent facilitator is appointed to address power imbalances, resulting in unequal opportunities for participants to contribute.	gender, ethnicity, sexual orientation, age, disability, etc. An independent facilitator is appointed but inexperienced in managing power imbalances and making sure that all participants have an equal opportunity to contribute.	gender, ethnicity, sexual orientation, age, disability, etc. An independent facilitator is appointed to manage power imbalances and make sure that all participants have an equal opportunity to contribute.
	1d) Capacity for participation is enhanced.		
	Unacceptable	Acceptable	Very good
	1 2	3 4	5 6
	A small group of researchers explores capacity gaps, without input from citizens and other stakeholders. Different groups and their specific needs are not considered. Capacity gaps are not addressed.	A small group of researchers explores the capacity gaps, which are validated by citizens and other stakeholders. Different groups and their specific needs are somewhat considered. addressed through a one-size fit all approach at one-off training events.	Decisionmakers, citizens, researchers, and other stakeholders co-explore capacity gaps taking into consideration different groups and their specific needs. Capacity gaps are continuously addressed through experiential learning exercises, e.g., role plays, art, serious games, and hands-on exercises.
	Outcome criterion 2: Partnerships		
	Citizens and other stakeholders (including researchers, decision-makers, government officials etc.) build, develop, or improve their partnerships.		
	Unacceptable	Acceptable	Very good
	1 2	3 4	5 6
	Decisionmakers, citizens, researchers, and other stakeholders have no interest in longer-term collaboration.	Decisionmakers, citizens, researchers, and other stakeholders have a mutual interest in longer-term collaboration.	Decisionmakers, citizens, researchers, and other stakeholders make concrete plans for longer-term collaboration, e.g., planning for new projects, applying for

			new funding, or signing contractual agreements.
	Process criteria		
	2a) Mutual respect and trust between decisionmakers, citizens, researchers, and other stakeholders.		
	Unacceptable	Acceptable	Very good
	1 2	3 4	5 6
	Decisionmakers, citizens, researchers, and other stakeholders fail to establish ground rules for engagement, and create an unsafe environment where participants feel uncomfortable and discouraged from expressing their opinions or concerns openly. Decisionmakers, citizens, researchers, and other stakeholders fail to deliver on their responsibilities and commitments.	Decisionmakers, citizens, researchers, and other stakeholders establish ground rules for engagement, however, the ground rules are not always respected. Participants show little interest in understanding each other's perspectives and interests. Decisionmakers, citizens, researchers, and other stakeholders fulfill their responsibilities, however, there are delays in the delivery of commitments.	Decisionmakers, citizens, researchers, and other stakeholders establish ground rules for engagement, and create a safe and respectful environment in which participants seek to understand each other's perspectives and interests. Decisionmakers, citizens, researchers, and other stakeholders fulfill their responsibilities and deliver on their commitments in a timely manner.
	2b) Healthy work relationships among decisionmakers, citizens, researchers, and other stakeholders.		
	Unacceptable	Acceptable	Very good
	1 2	3 4	5 6
	Weak or non-existent personal connections between participants. Ad-hoc meetings and opportunities to keep decisionmakers, citizens and other stakeholders informed, in which there is low attendance.	Good personal connections between some of the participants. Ongoing meetings and opportunities for decisionmakers, citizens, and other stakeholders to provide their input, however, attendance is low.	Strong personal connections between most participants. Frequent meetings and opportunities for decisionmakers, citizens, and other stakeholders to provide their input, in which there is a consistent high attendance.
	2c) Clear communication and continuous information-sharing.		

	Unacceptable	Acceptable	Very good
	1 2	3 4	5 6
	Decisionmakers, citizens, researchers, and other stakeholders have conflicting and differing understandings of key concepts. Technical terminology is widespread. Communication and information-sharing channels are not agreed upon, leading to confusion and miscommunication. Communication strategies are not adapted to different groups and their special needs. Communication lacks transparency, and some participants turn to gossiping for information sharing.	Decisionmakers, citizens, researchers, and other stakeholders share a common understanding of key concepts, however, some confusion persists. Technical terminology is common. Communication and information-sharing channels are decided upon late in the process. Communication strategies somewhat consider different groups and their specific needs, however, some weaknesses persist. Communication is somewhat timely and transparent, however, some weaknesses persist, e.g., outputs are delayed and workshop invitation are shared last minute. Communication strategies are somewhat adapted to different groups and their specific needs, however, some weaknesses persist.	Decisionmakers, citizens, researchers, and other stakeholders have a common understanding of key terminology, e.g., climate change adaptation, vulnerability, and justice. Technical terminology is avoided. Communication and information-sharing channels are collectively negotiated and decided upon early on. Communication strategies consider different groups and their specific needs, e.g., face-to-face communication, social media, online meetings, and emails. Communication is timely and transparent, e.g., meeting notes are circulated and workshop invitations are shared in a timely manner.
	Outcome criterion 3: Relevance		
	Fit-for-context adaptation knowledge and action that align with local needs, expectations, and values.		
	Unacceptable	Acceptable	Very good
	1 2	3 4	5 6

	The process and its outcomes misalign with the local context, political priorities, cultural preferences, and social dynamics. The process makes little contribution towards a local policy priority.	The process and its outcomes somewhat align with the local context, political priorities, cultural preferences, and social dynamics. The process makes some contribution towards a local policy priority.	The process and its outcomes align with the local context, political priorities, cultural preferences, and social dynamics. The process makes an important contribution towards a local policy priority, e.g., supports ongoing policy initiatives such as adaptation strategy, resource allocation, or local political agenda.
	Process criteria		
	3a) Decisionmakers, citizens, and other stakeholders understand the local context.		
	Unacceptable	Acceptable	Very good
	1 2	3 4	5 6
	A small group of researchers explores the context, without input from citizens and other stakeholders. A small group of researchers explores local vulnerability, without input from citizens and other stakeholders.	A small group of researchers explores the context, which is validated by citizens and other stakeholders. A small group of researchers explores local vulnerability context, which is validated by citizens and other stakeholders.	Decisionmakers, citizens, researchers, and other stakeholders continuously co-explore the context to reach a common understanding of, e.g., the decision-making context, socio-economic situation, ongoing initiatives, and power dynamics. Decisionmakers, citizens, researchers, and other stakeholders co-explore differentiated vulnerabilities which may not be climate-related, e.g., socio-economic challenges such as poverty, housing crowding, and psychosocial distress.

	3b) Objectives are negotiated and co-defined by a broad array of actors.		
	Unacceptable	Acceptable	Very good
	1 2	3 4	5 6
	Citizens and other stakeholders are involved late in the process, and expectations are misaligned. Objectives are determined solely by researchers, without input from citizens and other stakeholders. The process remains rigid and unresponsive to changing circumstances, emerging needs, and windows of opportunity, causing missed chances for improvement and innovation.	Citizens and other stakeholders are involved in the middle of the process, and expectations are somewhat aligned. Objectives are determined by researchers and thereafter validated by citizens and other stakeholders. The process somewhat adapts its objectives to changing circumstances, emerging needs, and windows of opportunity, causing missed chances for improvement and innovation.	Citizens and other stakeholders are involved early on – including marginalized and disadvantaged groups – to manage and align expectations around goals, capacities, and resources. Compromises are made if necessary. Objectives are negotiated and co-defined by a broad array of actors, including decisionmakers, citizens, researchers, and other stakeholders. The process continually responds and adapts its objectives to changing circumstances, emerging needs, and windows of opportunity.