Deliverable D1.3 – Consultation report

WP1 – Framework for local and regional climate risk assessment

Grant Agreement 101093864

Version 1.0 | June 2024

HORIZON-MISS-2021-CLIMA-02-01 - Development of climate change risk assessments in European regions and communities based on a transparent and harmonised Climate Risk Assessment approach

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Document Information

Deliverable Title	Consultation report
Brief Description	This deliverable reflects on a) the inputs from members of the Community of Practice (established in task T1.1) regarding their applications, needs and best practices in conducting CRA and b) the feedback on the intermediate CLIMAAX CRA Framework that was gathered from pilot regions and experts. Their needs, suggestions, comments, and doubts significantly helped in shaping the current version of the CRA Framework.
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Lead Beneficiary	International Institute of Applied Systems Analysis (IIASA)
Author(s)	Bachmann, M., Mozzi, G., Serrao, D., Pal., J., Niazkar, M.
Reviewer(s)	Stuparu, D., Kirr, J., Tänzler, D.
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1.0	20.06.24	Stuparu, D., Kirr, J., Tänzler, D.	Inclusion of comments and suggestions from final review targeting language, expression, graphs; clarification of some concepts. Final version to be submitted.

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Abbreviations and acronyms

Abbreviation / acronym	Description
CoP	Community of Practice
CRA	Climate Risk Assessment
CRM	Climate Risk Management
EEA	European Environmental Agency
EGU	European Geosciences Union
FSTP	Financial Support for Third Parties
IPCC	Intergovernmental Panel on Climate Change
JRC	Joint Research Centre
P2R	Pathways2Resilience; an EU Horizon Project on building climate resilience for regions

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Executive Summary

The CLIMAAX Framework aims to build a standardized yet flexible and inclusive methodology for Climate Risk Assessment (CRA). As such, external consultation is crucial to ensure the validity and applicability of the developed approach. This deliverable (D1.3) presents an overview of on-the-ground applications, needs, and best practices together with feedback on the intermediate draft results of the CLIMAAX CRA Framework.

To gather relevant insights and considerations, members of the Community of Practice (practitioners) were surveyed about principles, technical choices, participatory practices, major bottlenecks as well as best practices in their experience conducting CRA (Section 2). Additionally, feedback on the intermediate draft version of the CLIMAAX CRA Framework was collected from CLIMAAX pilot regions (Section 3) and experts (Section 4). Their insights, suggestions, comments, and needs have significantly shaped the CLIMAAX CRA Framework.

The most important topics discussed during this consultation targeted the framework's flexibility, standardisation, clarity, and usability, as well as a supporting contextualisation of the risk quantification results (in the CLIMAAX case estimated through the risk workflows and contextualised by the CLIMAAX Framework), the scenarios' selection, and the importance of inclusion and participatory processes. The CLIMAAX pilot regions especially emphasized the value of sharing examples, highlighting the need for engagement in the CoP as well as future work in supporting and synthesising the Framework and risk workflow application.

With a commitment to continuous improvement and stakeholder engagement, the framework is at this stage well-positioned to conduct extensive yet flexible CRAs. Thus, it can support the effective design and implementation of CRM strategies and plans across Europe, fostering resilience and preparedness in the face of climate change.

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1 Introduction

The Framework for Climate Risk Assessment (CRA; see CLIMAAX Deliverable 1.4[1]) aims at providing standardized flexibility, inclusivity, and harmonization for a common approach that suits all CLIMAAX regions and resonates with experiences at relevant scales of analysis and decision-making. A user-based CRA should meet relevance, applicability, and recipient needs to ensure bottom-up consensus on good practice and recommended approaches for analysis. For this purpose, existing frameworks and both grey and peer-reviewed literature were reviewed comprehensively (see Deliverable 1.2) and have greatly informed the intermediate version of the CLIMAAX CRA Framework. It is important to include further practical insights and knowledge from practitioners on the ground. Input from the CoP established in Task 1.1, the CLIMAAX Pilot Regions, as well as other expert feedback, therefore play a key role in further shaping the Framework.

The Community of Practice (CoP) consists of key stakeholders involved in CRA, including pilot regions, cascading fund recipients [2], and members from related networks and projects. While in the first phase of the project, the focus lies on leveraging the CoP to develop an inclusive and effective CRA Framework (and risk workflows), in the second phase, emphasis will shift to expanding the CoP and applying the CLIMAAX Handbook in various regions. As the CLIMAAX project grows, the CoP will include broader participation from initiatives like MIP4Adapt and other EU sister projects such as ARCADIA and DesirMED, fostering collaboration and knowledge sharing across diverse groups.

This deliverable (D1.3) summarizes applications, best practices, and needs of the CoP, applications of the intermediate Framework by the CLIMAAX pilot regions, as well as feedback received from experts. It is organized as follows: Section 2 describes the results of the consultation from the CoP. This consultation was conducted through a questionnaire aimed at collecting information on four main sections: *Principles, Technical Choices, Participatory Practices,* and *Bottlenecks and Best Practices*. The questions were structured to gather information on CRA for all these aspects across Europe, interrogating about current practices, common challenges and bottlenecks, and best practices. The survey was addressed to the CLIMAAX pilot regions, to the applicants of the Financial Support for Third Parties (FSTP) Open Call and posted on the EC Futurium platform within the Mission Adaptation Community of Practice.

Section 3 then focuses on the feedback collection and implementation by the CLIMAAX pilots. Subsequently, the expert feedback is reported in Section 4, specifically from the European Environment Agency (EEA), the Joint Research Center (JRC), Tecnalia as a partner from the CLIMAAX sister project Pathways2Resilience (P2R), as well as feedback from the CLIMAAX presentation at the IPCC Scoping meeting in Riga (April 17, 2024), and a poster presentation at the European Geosciences Union General Assembly (EGU24; April 19, 2024).

Section 5 summarizes the outcomes of the consultations and provides an outlook for the CLIMAAX CRA Framework.

[1] https://www.climaax.eu/public-deliverables/
[2] https://www.climaax.eu/fstp-open-call/

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2 Applications, needs and best practices of the Community of Practice

As part of Task 1.1. and with the goal of assessing current practices on CRA in Europe, a questionnaire (see Annex I) was disseminated to the CoP to gather insights on *Principles*, *Technical Choices*, *Participatory Practices*, *Bottlenecks and Best Practices*.

The survey was forwarded to the CLIMAAX pilot regions, the applicants of the Financial Support for Third Parties (FSTP) of the 1st Open Call, and posted on the EC *Futurium* platform[3] within the Mission Adaptation Community of Practice[4]. Participation to the survey was anonymous and in compliance with the EU GDPR[5] regulations. The results from this survey are based on 32 participants, with the composition of the agencies of the respondents presented in Figure 1. Some responses from the survey are reported in Annex II (due to the high volume of the responses, responses to open questions were not included).

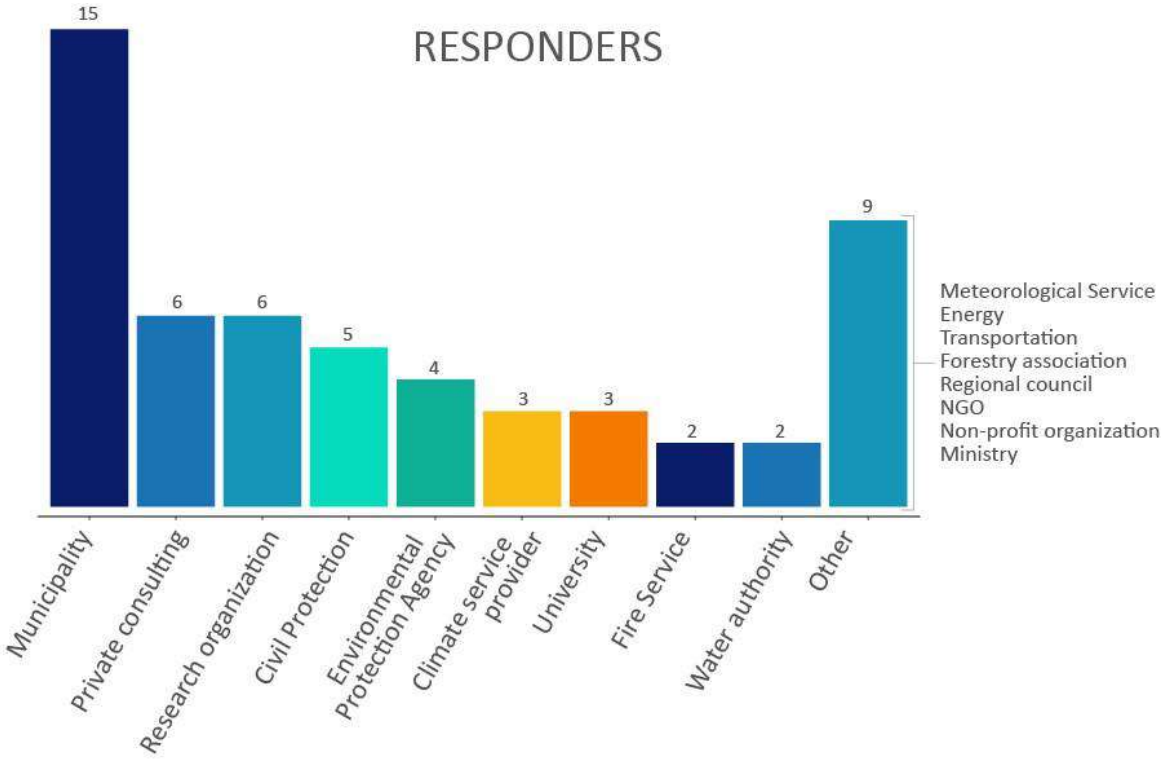

Figure 1: Type of agency of the responders.

[3] EU platform dedicated to Europeans to discuss policies https://futurium.ec.europa.eu/en
[4] https://futurium.ec.europa.eu/en/eu-mission-adaptation-community
[5] General Data Protection Regulation Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC http://data.europa.eu/eli/reg/2016/679/oj

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2.1 Principles

The questionnaire responses reflected a strong commitment among participants to integrate key principles into their processes. Stakeholder involvement, equity, and social sustainability emerge as fundamental values, underscoring a collective focus on inclusive decision-making. Furthermore, scientific methodologies and technical studies are prioritised for robust risk assessments, highlighting a commitment to evidence-based approaches. Transparency, inclusivity, and adherence to national standards are recurrent themes, with concerted efforts to ensure accessibility of results and meaningful engagement with stakeholders. Precautionary measures and strategic spending for prevention are deeply ingrained, reflecting a proactive stance towards risk mitigation.

Upon analysing the level of principle implementation (see Figure 2, left panel [6]), it becomes evident that priority is predominantly given to transparency, precaution, quality, and rigor. In contrast, social aspects, such as inclusivity and social justice, receive comparatively less emphasis, except for equity ranking third. This observation prompts a deeper exploration into the underlying factors shaping prioritisation strategies, emphasising the need to actively promote participatory practices within the framework.

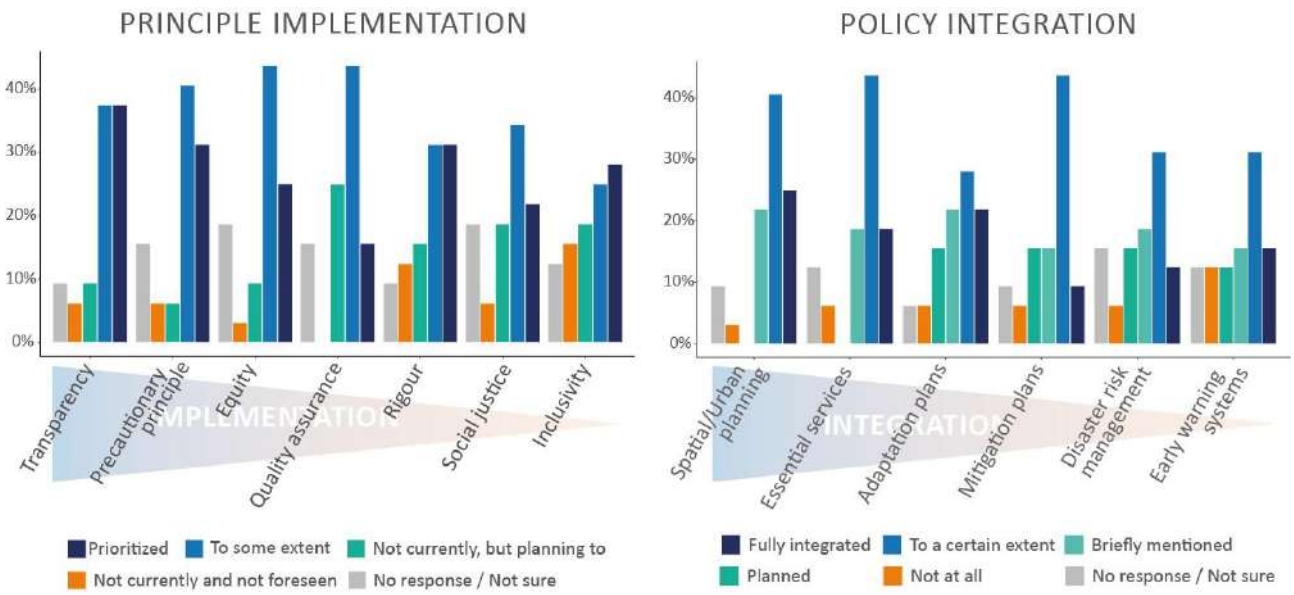

Figure 2: Guiding principles (left panel) and policy integration (right panel). The principles and policies on the horizontal axes are ordered in decreasing order based on their reported levels of implementation and integration, respectively. The ranking is determined by total points assigned to implementation summed from each respondent (-1 to 3, with -1 meaning "Not currently and not foreseen," 0 for no response or "Not sure," 1 for "Not currently but planning to," 2 for "To some extent," and 3 for "Prioritized") and integration (scored similarly to implementation, ranging from -1 to 4).

[6] The principles on the horizontal axis are ordered in decreasing order based on their reported levels of implementation, which are ranked according to the sum of points assigned by each responder (-1 to 3, with -1 meaning "Not currently and not foreseen," 0 for no response or "Not sure," 1 for "Not currently but planning to," 2 for "To some extent," and 3 for "Prioritized").

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In examining the integration of CRA into local and regional policies (see Figure 2, right panel [7]), a significant integration can be observed within spatial and urban planning, alongside with adaptation plans and essential services (e.g., food, water, transportation, health). Furthermore, mitigation plans demonstrate merely partial integration with CRA. It is concerning that respondents indicate less integration of CRA within disaster risk management plans and early warning systems. Whether this observation stems from an actual lack of integration or respondents' unawareness, it underscores the need for increased attention and enhancement of integration efforts. The developed framework should address the integration of CRA, especially within disaster risk management frameworks and early warning systems, to ensure comprehensive resilience strategies.

[7] The policies on the horizontal axis are ordered similarly as the principle implementation (i.e., in decreasing order based on their reported levels of integration, with points assigned from -1 to 4).

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2.2 Technical choices

Respondents were asked about the priority of different hazards in their community and the relevance for their CRA, including the time horizon of their assessment. We summarised results in Figure 3, where the hazard rank ("Importance" column) is calculated as the sum of points for each hazard from the respondents ("Not relevant" and "Not sure" were assigned 0 points, "Low" was assigned 1 point, "Medium" 2 points, and "High" 3 points). As depicted in Figure 3, heatwaves and cold waves achieved the highest priority among all hazards, followed by drought and heavy rain/pluvial flooding. Since each region may encounter different types of hazards depending on their location, overall, flood is the most important hazard if different types of floods are combined, i.e., pluvial flood, riverine flood, and coastal flood.

On average, 31% of respondents reported integrating both current and future scenarios into their CRA for various hazards, while 25% of respondents based their assessments solely on current conditions. Notably, 44% of respondents did not include historical data in their CRA, with the exclusion rates varying significantly by hazard type, ranging from 19% for pluvial floods to 78% for tropical-like cyclones.

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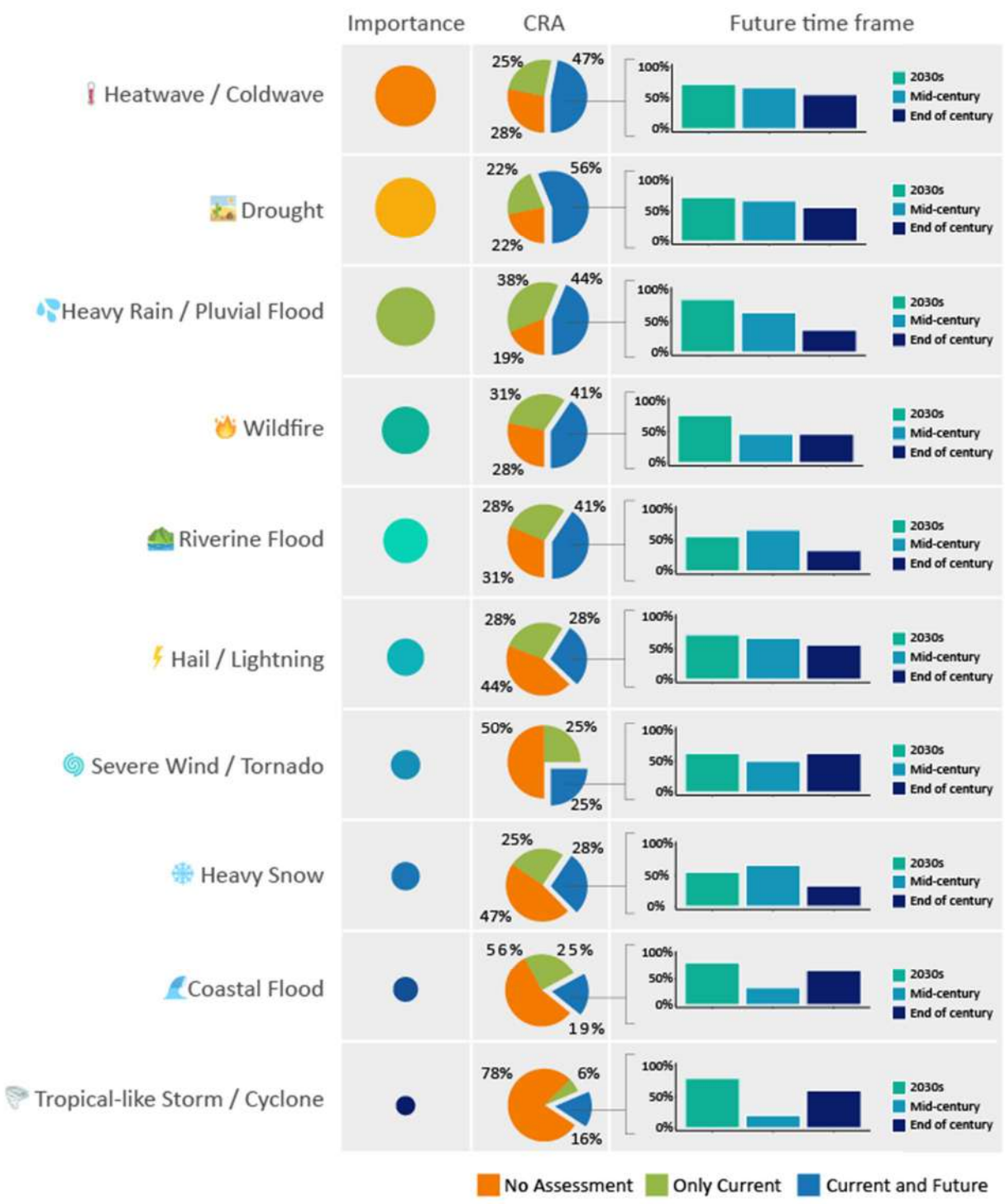

Figure 3: Summary of hazards importance and Inclusion in CRA by respondents. In the "Importance" column, size and color of the circles represent hazard ranks based on the priority level indicated by the respondents (i.e., a blue, small circle indicates low importance, meaning a low occurrence/priority among the respondents). The "CRA" column depicts whether respondents have included the specific hazard in their CRA (with an orange slice indicating exclusion) and whether they analysed only current conditions (green slice) or included future scenarios as well (blue slice). The "Future Time Frame" column represents the time horizons analysed in their CRA by those who included both current and future conditions.

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When respondents considered climate change scenarios, the most assessed time horizon was reported to be the 2030s for almost all the investigated hazards. The longest future time horizon (i.e., the end of the century) was the least studied, except for severe wind and tornadoes, coastal floods, and tropical-like storms and cyclones, where mid-century was less investigated. Regarding the choice of climate change scenarios (Error! Reference source not found.), the two dominant scenarios were RCP4.5 and RCP8.5, with RCP4.5 being most investigated for the 2030s horizon and RCP8.5 for the end of the century, respectively. This reflects the tendency of those involved in CRA to plan adaptation strategies based on the most probable baseline scenario (RCP4.5) and the worst-case scenario (RCP8.5). However, it is important to note that until mid-century most scenarios do not show a clear difference between their risk outcomes, thus making scenario selection more important for long-term CRA.

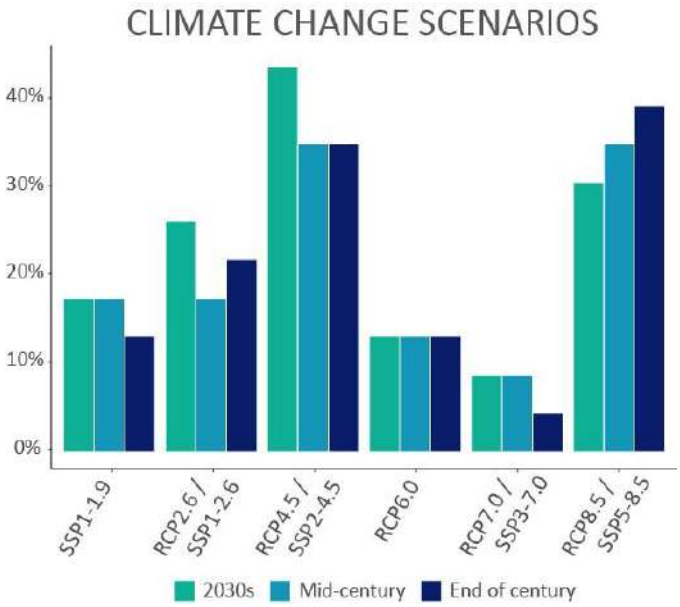

Figure 4: Use of climate change scenarios by respondents.

Almost 50% of respondents reported including multi-hazard risk assessment in their CRA. Those who did assess multiple hazards highlighted various combinations, such as drought and wildfire, heavy rain and flash floods, or drought and heatwaves. Some respondents described addressing compounding hazards in adaptation plans or through rough assessments at the city level but emphasised the need for more detailed regional or neighbourhood-level evaluations. Several respondents indicated the usefulness of CRA tools, potentially like the CLIMAAX Handbook with risk workflows, for conducting targeted, granular CRA. Others mentioned methodologies incorporating cross-correlation methods and impact chains, or the integration of sequential and interconnected risk mapping. Conversely, some respondents explicitly stated that they did not consider multi-hazard assessments, often citing reasons, e.g., lack of proper climate risk mitigation strategies or inadequate communication within their organisations.

Less than 30% of respondents considered cascading impacts and risks in their CRA. Those who did, highlighted specific sectors such as the energy sector where high temperatures may have cascading effects on the electric grid, or where changes in precipitation are expected to affect hydropower production and storage. Some respondents emphasised the need for deeper evaluations to understand cascading consequences and interdependencies across various sectors and systems. This inevitably includes involving stakeholders from different sectors to identify vulnerabilities and opportunities for collaboration. Others noted that their methodologies account for vulnerabilities and exposures both separately and comprehensively, identifying synergies and mitigation consequences. However, several respondents did not deeply analyse cascading risks, often due to challenges in assessing cascading risks, but also jurisdictional limitations or the exclusion of certain sectors, like tourism and industry, from their assessments.

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2.3 Participatory practices

Respondents were asked about their engagement with different stakeholders at various stages of CRA, including co-design, collaboration, consultation, and information (Figure 5). Almost half of the respondents indicated a collaboration process with research institutions (referred to as experts in the CLIMAAX CRA Framework), which overall appear to be the most engaged stakeholders. Decision-makers, regional authorities, and civil protection agencies were also reported to have a good level of engagement during the most active stages. In contrast, stakeholders, such as citizens, local authorities, and vulnerable groups, were less involved in the CRA process, denoting a certain difficulty of integrating the participation process at the local scale. Vulnerable groups, in particular, were

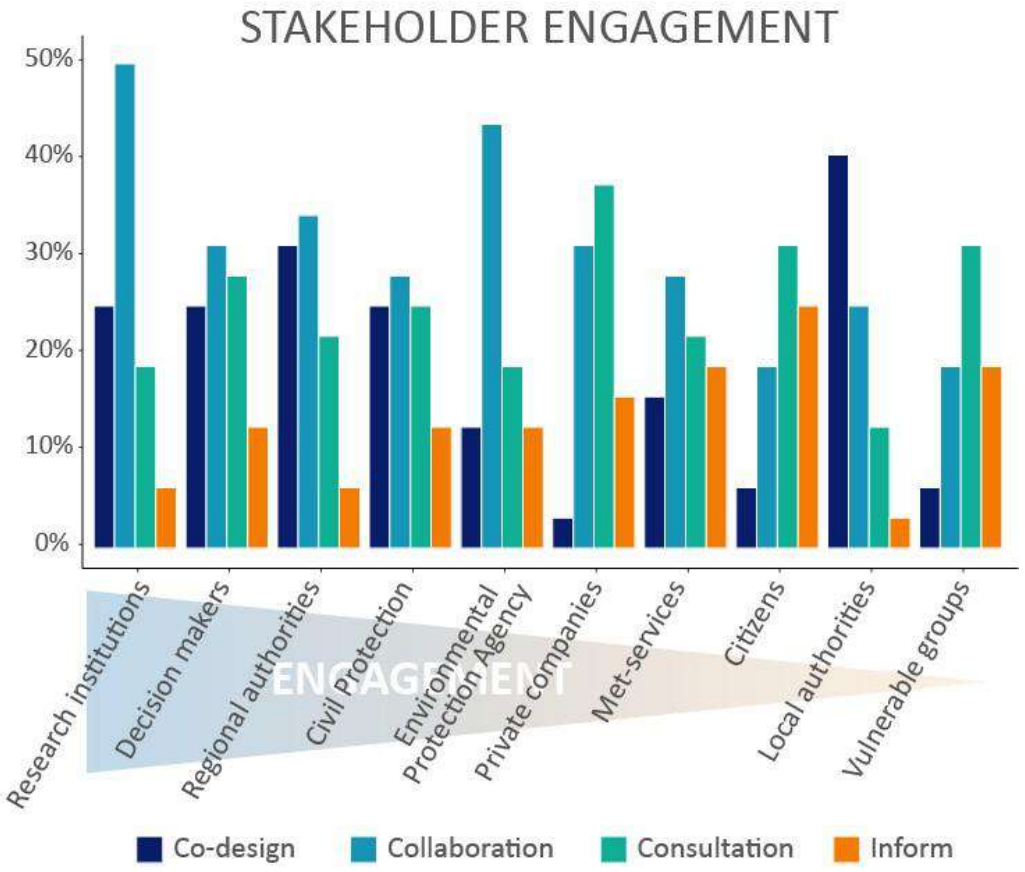

Figure 5: Stakeholder engagement. Stakeholders are ordered (decreasing order from left to right) based on the level of engagement reported by the responders.

the most excluded, primarily participating only in the consultation and information stages.

Based on the survey responses, the most effective approaches identified for engaging stakeholders in CRA include in-person workshops, public meetings, and social media interactions. These methods allow for direct engagement, enabling stakeholders to express opinions and provide valuable feedback to administration.

In-person workshops were highlighted as particularly effective due to their interactive nature, allowing for deeper discussions and immediate feedback. Public meetings were also praised for providing

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opportunities for face-to-face expression of opinions and concerns, fostering engagement and collaboration. Social media was noted for its accessibility and reach, making it an effective tool for disseminating outcomes and gathering broader feedback.

Moreover, smaller group meetings were cited as efficient, with active participants sharing information within their networks. This cascade effect maximizes engagement while minimizing resource expenditure.

Challenges in stakeholder engagement were reported, including difficulty involving emergency services and securing resources in municipalities. Communication barriers, stakeholder fatigue, and differing interests were also mentioned as obstacles. Overcoming such challenges often requires targeted outreach, emphasizing mutual benefits, and navigating diverse opinions to achieve meaningful consensus.

Responses emphasised the importance of involving all relevant parties in decision-making through working groups and local action involvement for effective co-design and two-way learning in climate action initiatives. They recommended sharing experiences and good practices from previous projects to enhance mutual understanding. Respondents also suggested conducting workshops to co-create climate solutions and considering legislative support to formalise co-design processes, ensuring flexibility and scientific legitimacy while valuing stakeholder input. This collaborative approach was seen as vital for promoting community resilience in climate risk management (CRM) efforts.

2.4 Major bottlenecks

A section of the survey was dedicated to inquiring respondents about the major challenges encountered during the CRA process. Figure 6 presents the bottlenecks encountered in the CRA process identified by respondents. According to the survey results, six out of seven most common issues are related to technical aspects, particularly pertaining to data management and analysis (data quality, scarcity, and the challenge of selecting appropriate future climate scenarios) and to a lack of capacity, including insufficient training, specifically on CRA and a deficit in technical skills. These findings underscore the critical need for acquiring knowledge about available data, methods, and tools to enhance the accuracy and efficacy of risk assessment processes. Interestingly, stakeholder participation was reported as the least challenging aspect of the CRA process. Based on the information provided in the previous section, this may be attributed to either the lower prioritization of stakeholder engagement in CRA or the perception that the technical aspects of CRA are significantly more challenging in comparison.

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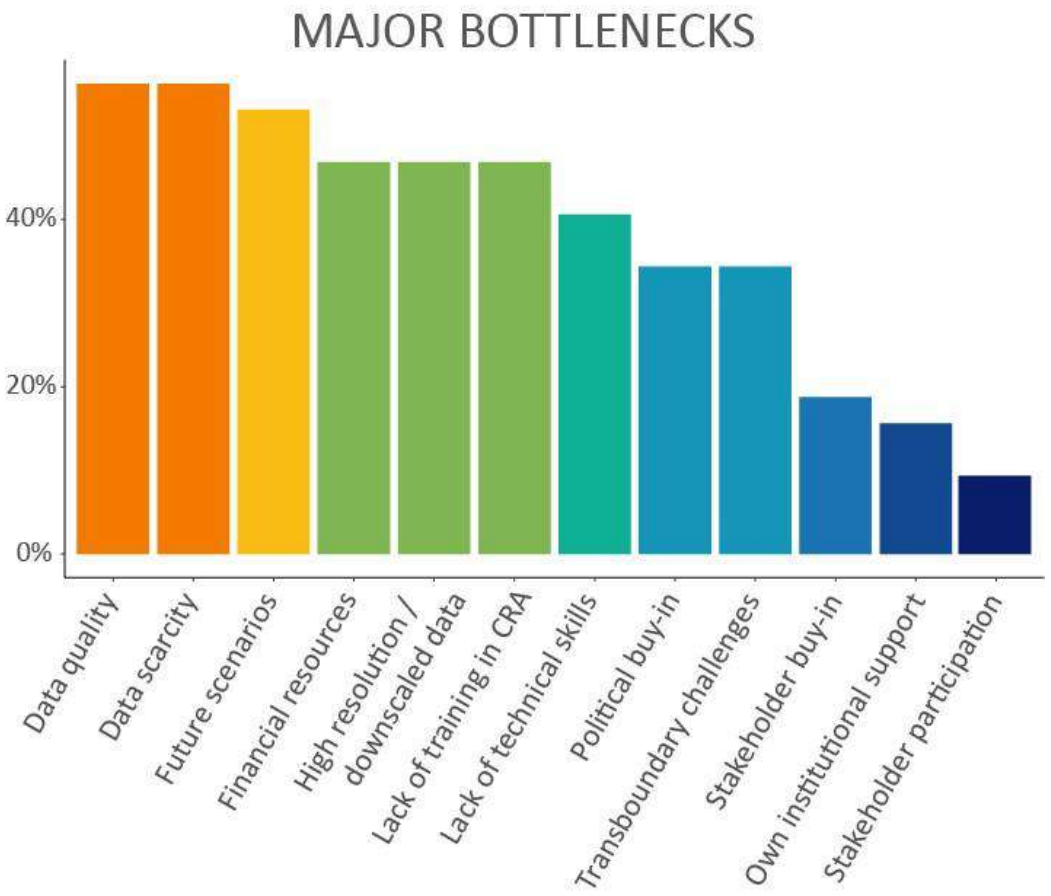

Figure 6: Bottlenecks and challenges reported by responders.

The survey included an open-ended section where respondents were invited to describe what additional resources or support would have benefited them in their CRA. In this section, respondents highlighted the necessity for continuous improvement in risk assessment methodologies due to the dynamic nature of climate change and its interactions with other sectors. Close cooperation and knowledge exchange with organisations and projects worldwide were emphasised as crucial for gaining a better understanding of climate risks and effective risk reduction strategies. Furthermore, there is a strong interest in engaging experts to organise and conduct collaborative CRAs, facilitating mutual learning and knowledge sharing among stakeholders.

2.5 Best practices

In the final part of the survey, respondents were invited to share best practices they found particularly relevant and effective in their CRA. For instance, improved communication among municipal departments has proven instrumental in raising awareness about climate change, resulting in an uptake in climate-related actions and interventions. Tailoring risk assessments directly to the specific socio-economic and environmental conditions of a given territory, presented in an understandable manner as a management tool, encourages both city management and residents to actively

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engage with the findings. Furthermore, involving local agents and citizens in the process fosters improvement and progress across various sectors. Additionally, thorough documentation of data collection and processing steps ensures the availability of datasets for future iterations, promoting data consistency and quality improvement over time. The principle of 'learning by doing' underscores the importance of hands-on experience and continuous learning in refining CRA methodologies.

2.6 Implications for the CLIMAAX CRA Framework

Only 20% of respondents reported having followed an existing framework in their CRA. This number emphasizes the urgent need for a user-friendly, accessible, and flexible CRA Framework which, however, builds on state-of-the-art knowledge and practise. The responses highlighted some major characteristics that the framework should have:

Data Accessibility: Incorporating access to extensive and localised data into the framework design was emphasised.

Technical Support: Providing technical support and fostering collaboration with experts to streamline the use of best practices within the framework were considered important.

Guidance for integration: Providing guidance for the integration of the framework into Climate Risk Management (CRM) strategies and plans as well as early warning systems was identified as a crucial aspect. Further, interest was expressed regarding guidance and practices for participatory processes.

Flexibility: Designing a flexible framework that allows adaptation to local contexts, both within EU countries and beyond, was underlined as essential.

In summary, a combination of enhanced data access, expert partnerships, targeted technical support, and flexible framework design would significantly improve the effectiveness and standardisation of CRA.

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3 Application of the intermediate CLIMAAX Framework by Pilots

To validate and make sure that the CLIMAAX CRA Framework meets on-the-ground needs, the intermediate framework draft was presented and discussed online with the five CLIMAAX pilot regions. For feedback collection, structured word documents were sent where the regions were asked to describe their CRA journey throughout a) the conceptual background – *principles, technical choices, participatory processes* – and b) the five operational steps *Scoping, Risk Exploration, Risk Analysis, Key Risk Assessment, Monitoring & Evaluation*. The pilot regions could draw on guiding questions prepared for the respective steps to translate the issues that users might face in a more tangible setting. The guiding questions are available as an annex of D1.4 Climate Risk Assessment Framework[8].

Overall, the pilot regions agreed with the structure and logic behind the CLIMAAX Framework and emphasized its standardised flexibility, which allows the use of both the Framework and risk workflows according to user needs. This flexibility was particularly valued as it accommodates varying local contexts and requirements, making the Framework widely applicable across different regions. The pilots appreciated the comprehensible array of steps outlined in the Framework. They found the structured approach helpful for systematically preparing for CRA and for contextualizing the results derived from the CLIMAAX risk workflows (*Risk Analysis*). Additionally, the pilots highlighted the Frameworks' focus on participatory processes as beneficial, which however remains a challenge in real world implementation.

Generally, the pilot regions expressed their interest in shared examples. This will be facilitated by uploading relevant answers to the guiding questions that have been worked out by the pilot regions to the CLIMAAX Handbook and thus sharing them with applicants from the FSTP call or generally people and entities interested in applying the CLIMAAX CRA Framework. Successful CLIMAAX applicants will be encouraged to join the CoP to share their experiences, challenges, and successes (e.g., through guiding questions) to facilitate learning and collective improvement.

More specific feedback from the pilots concerned the two operational Framework steps *Risk Exploration* and *Key Risk Assessment*. Firstly, for *Risk Exploration* some pilots communicated that this step might present some challenges. This difficulty arises as it includes an initial screening of risks, followed by the selection of relevant workflows and scenarios – all of which have important implications for the outcome of the CRA. While there is no definitive right or wrong, this process profits from being rigorously informed by the scoping step and should thus have clear objectives, combined with a wide knowledge of the region/municipality. The selection of climate change scenarios was also reported to be a potential source of difficulty, as it requires knowledge of the underlying scenario assumptions along with an estimation or knowledge about decision-makers needs and their risk aversion. In any case, the Framework and Handbook allow for an iterative repetition or going

[8] https://www.climaax.eu/public-deliverables/

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back-and-forth between the steps and can thus include important insights which might have been missed initially.

Secondly, in the pilot region feedback, it was communicated that conducting the *Key Risk Assessment* was difficult without being able to fully apply the risk workflows (*Risk Analysis*) as the CLIMAAX Handbook and workflows were available only as an intermediate version. However, applying the risk workflows is essential for a comprehensive evaluation, and its absence made it difficult for pilot regions to evaluate this step effectively. The same applied to the fifth CLIMAAX Framework step *Monitoring & Evaluation*.

Furthermore, some pilot regions indicated that the guiding questions provided were not entirely clear and required revision or additional clarification. It is important to acknowledge that the guiding questions may not be universally applicable to all regions and municipalities due to the diversity of issues and unique circumstances they may face. Therefore, while clarification and adjustment to the guiding questions are necessary, a one-size-fits-all approach is not feasible. Customization and flexibility are essential to ensure the guiding questions are relevant and effective for addressing the specific challenges of each region.

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4 Expert Feedback

To validate the CLIMAAX Framework and to understand how experts perceive our followed approach, the same intermediate framework version that was sent to the CLIMAAX pilot regions was shared for feedback with the three expert organizations on CRA, the European Environment Agency, the Joint Research Center, and Tecnalia, a partner institute within the Pathways2Resilience project. Further feedback was collected from the CLIMAAX presentation at the 7th IPCC scoping meeting on the 17th of April in Riga, Latvia, as well as from the European Geosciences Union Conference 2024 on the 19th of April in Vienna, Austria. The following sections dive deeper into the feedback that was provided to the CLIMAAX Framework team and summarizes the most important feedback points that were raised from the respective experts/event.

4.1 European Environment Agency (EEA)

The EEA is sharing a common goal with the CLIMAAX consortium: Ensuring climate adaptation and resilience on a regional and local level, thus aligning with the EU Mission Adaptation (European Commission, 2021). Building on previous exchange between the CLIMAAX Framework team and the EEA regarding feedback of the Regional Adaptation Support Tool (RAST)[9], the EEA has provided substantial feedback on the CLIMAAX Framework. Their feedback delineated that the CLIMAAX Framework makes a commendable effort to summarize the complex process of climate risk assessment at local and regional levels. Additionally, there were five further main feedback points summarized in Table 1.

Table 1. Most important feedback points from the EEA with answer and/or reference of implementation.

Feedback (EEA)	Answer/implication for framework
Overall presentation: Good balance between simplifying concepts and use of technical language. However, the technical language may still pose challenges – depending on the target audience.	The CLIMAAX Framework was planned to be written in a concise, however demanding format that ensures clarity while maintaining a high standard of detail and rigor necessary for thorough understanding and implementation. While the target audience of the CLIMAAX Framework are technical experts and a surrounding team with knowledge on the region/municipality, it was important to find a balance between oversimplification and excessive demand. The CRA Framework version in the CLIMAAX Handbook will, however, differ from the deliverable

[9] https://climate-adapt.eea.europa.eu/en/mission/knowledge-and-data/regional-adaptation-support-tool

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Feedback (EEA)	Answer/implication for framework
	Framework version in terms of scope, detail, and readability.
Before you start: The definition page is appreciated.	To make it easier for applicants to understand concepts and theory it was/is important to establish a common understanding of risk and its components.
Conceptual background: Lack of actively integrating social justice aspects in CRA (and generally principles)	Social justice/just resilience is a central principle in the conceptual background of our CRA. The conceptual background should inform the operational framework steps throughout the CRA process. We emphasized the role of social justice/just resilience in the *Scoping* and *Key Risk Assessment* as well as *Monitoring & Evaluation* step, provided reference to an EEA report and underlined that social justice/just resilience aspects, as well as principles, should continuously be reflected in the CRA process – most importantly around participatory processes and events. However, the implementation of this will remain up to the communities.
Conceptual background: Importance of local knowledge is highlighted but practicalities of how to achieve it is missing.	Local knowledge is indeed an important aspect and comes into action by facilitating participation and exchange with local stakeholders. However, it is up to the communities how much participation and local knowledge is desired (depending on situations, issues, climate-related risks, stakeholder/priority group landscapes and especially resources). Additionally to the standard methods described in the participatory processes we therefore added reference of a paper delving into “participatory GIS mapping” and the approach of “triangulation” (Hermans *et al.*, 2022).
Implementation examples needed.	While the Framework deliverable itself does not yet have implemented examples, the

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Feedback (EEA)	Answer/implication for framework
	CLIMAAX Handbook will contain a) regional examples of our pilot regions and b) selected answers to the guiding questions. It is also in discussion to link the applicant communities in their journey throughout the CRA process.

4.2 Joint Research Centre (JRC)

Several experts from the JRC have contributed to an abundant, detailed feedback by sharing their expertise and insights on the intermediate CLIMAAX Framework draft. Overall, the JRC seemed to be in accordance with the logic, structure and content, thus affirming its alignment with known standards and good practices. Therefore, the feedback shared led to our assumption that the document provides a good basis for more detailed CRA method(s). Further, important feedback points are listed in Table 2.

Table 2. Most important feedback points from the JRC with answer and/or reference of implementation.

Feedback (JRC)	Answer/implication for framework
Scoping: Several aspects of a table outlining time, data and expertise effort needed for a CRA confusing.	Although the table adapted from Zebisch *et al. (*2023) provides potentially relevant information for users, we agree that the information provided may add more confusions as e.g. terms and structures don't fully align. We therefore decided to take the table out and only reference it.
Risk Analysis: Unclarities in this step, describing the process of risk quantification through workflow application, e.g. description of risk products, their differences, and outputs	The *Risk Analysis* text was revised, and its wording was improved.
Risk Analysis: Specification and contextualisation of event-based climate storyline approach.	As indicated in the text, event-based climate storylines are a complementary approach that can be harnessed if quantitative data is missing. Instead, the approach puts emphasis on qualitative aspects of risk understanding. Specifications have been made.
Key Risk Assessment: Clarification needed for high/medium/low risk profile.	Clarification added together with a table showcasing applications of risk evaluation as

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Feedback (JRC)	Answer/implication for framework
	a participatory process (experts/non-experts) resulting in relevant risk profiles.

4.3 P2R Project (Tecnalia)

Tecnalia, a partner in the Pathways2Resilience (P2R) project, brings in relevant expertise in climate risk assessment through, among other, their work on climate risk assessment as critical component of P2R as well as the Regions4Climate (R4C) project, where they also focus on establishing a comprehensive climate risk assessment for participating regions. Generally, the idea of the CLIMAAX Framework very much aligns with their idea of the R4C framework and will be referenced within the P2R resilience journey. Further feedback is presented in Table 3.

Table 3. Most important feedback points from Tecnalia with answer and/or reference of implementation.

Feedback (Tecnalia)	Answer/implication for framework
Conceptual background: Inclusion of principles	It is difficult to make sure that the principles are sustainably included in the application of the CRA Framework. Communities can decide where to put priority for their respective CRA. Besides that, as the principles make part of the conceptual background of the CRA Framework, they are important to consider in the *Scoping* and *Monitoring & Evaluation* step. The latter also aims at an evaluation of the actual implementation of principles as ideally set in the *Scoping* phase.
Risk Identification: Prioritisation technique examples (e.g. participatory workshops, multi criteria analysis (MCA) or other screening tools) could provide a benefit to the text.	With participatory processes as central to the operational framework steps, we now indicated possibilities of doing so e.g. in-person group workshops, group meetings, discussion rounds or other types of meetings and interactions that a region considers beneficial. However, other assessment methods such as MCA were not included as they cover decision making in CRM and thus go beyond CRA.
Risk Analysis/Key Risk Assessment: Tecnalia suggests better alignment with e.g. EUCRA, UK CCRA3, most importantly regarding the framing and connection of Risk Analysis and Risk Evaluation.	The structure of the CLIMAAX project (with Framework and risk workflows) required a different approach in this sense as the quantitative Risk Analysis step applied through risk workflows, is detached from the Key Risk Assessment step. This step has a clear focus on the (qualitative) evaluation of the Risk Analysis outcome.

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Feedback (Tecnalia)	Answer/implication for framework
	While indeed, the Key Risk Assessment step is a risk evaluation process, we decided to opt for a different wording to being able to account for key and less urgent risks emerging from the six risk workflows (which ideally are all being implemented).
CRA to CRM: Unclarities regarding how P2R and CLIMAAX will come together to ensure seamless translation of CRA into CRM.	As a CRA without subsequent CRM and a CRM without prior CRA have limited effect, CLIMAAX and P2R are naturally sister projects. Both project frameworks, the CLIMAAX CRA Framework as well as the P2R Regional Resilience Journey, provide linkages to the respective other. Besides a monthly meeting already taking place between core partners of the two projects, the CLIMAAX project it is envisaged to dive deeper into this in WP7 - Synthesis and scaling up, where pilot communities will also be working on CRM options according to their CRA results.

4.4 Feedback from CLIMAAX-IPCC meeting Riga

The CLIMAAX project was presented and discussed as part of an evening event at the *IPCC Scoping Meeting* happening on the 17th of April 2024 in Riga, Latvia. The presentation of the CLIMAAX CRA Framework, with its operational steps and conceptual background, was followed by the Latvian pilot region going into more detail on how the CLIMAAX CRA can be applied, thus showcasing the translation of the CLIMAAX Handbook into real-world application.

The main feedback point of the succeeding discussion merely referred to the issue of global upscaling of the project, as the proper application of the CLIMAAX CRA Framework on regional and local level significantly depends on the availability of data. Therefore, those communities with the most need for assessing climate risks (i.e., least developed, and developing countries), may have difficulties applying workflows such as CLIMAAX is providing as they are in urgent need of downscaled, regional data. However, regional and local communities may still profit from a theoretical Framework application – especially considering the conceptual background or the *Scoping* step for setting the scene. Additionally, non-quantitative assessment of climate-related risks (e.g. through methods such as event-based storylines indicated in D1.4; also see Sillmann *et al.*, 2021; van den Hurk *et al.*, 2023) may temporarily cover the gap of data shortage.

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4.5 EGU 2024

The CLIMAAX CRA Framework was presented on a poster at the European Geosciences Union Conference 2024 on the 19th of April in Vienna, Austria (Figure 7). Many interested participants who sought active engagement immediately recognized the inviting design of the Framework as one of the main reasons why they were interested in knowing more about the poster and project. This first, positive feedback was then followed by further general feedback about the structure of the Framework, noting that it was quite logically and clearly organized.

Many EGU attendees were especially interested in the functioning of the CLIMAAX Handbook with the respective risk workflows. One expert, being a landslide specialist, expressed his view on the urgent need for the inclusion of a "landslide workflow". This was feedbacked to the main people in charge of the CLIMAAX risk workflow development.

Figure 7. The CLIMAAX CRA Framework poster presented at the EGU Conference on the 19th of April 2024 in Austria, Vienna. Credit: CLIMAAX Consortium.

Finally, some discussions drifted towards the topic of scenario selection, which is an important aspect of the technical choices within the conceptual background of the Framework. While some people expressed their endorsement of specific climate scenarios, others vowed for a broader scenario range to compare results. This was important feedback and shifted the momentum of scenario guidance focusing on the decision of *one* scenario to be used in a respective risk workflow to a more comparative approach using 2-3 scenarios, which is also generally standard practice.

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5 Summary and Outlook

The feedback from the CoP, pilot regions, and expert consultations has been instrumental in refining and enhancing the CLIMAAX CRA Framework. This iterative process has ensured that the framework is not only theoretically sound but also practically applicable to meet the diverse needs of various communities.

The main highlights regarding the framework included:

Flexibility and Standardization: The feedback gathered shows the importance and urgent need of a framework that is both standardised and flexible. In response, the final CLIMAAX CRA Framework provides a standardised set of steps, procedures and approaches which ideally allow for identification of CRM entry points. The structure, operational steps, conceptual background, and guiding questions aim at ensuring that the framework is universally applicable yet customisable to specific regional contexts.

Clarity and Usability: Pilot regions noted challenges in understanding some of the guiding questions and steps, particularly in the *Risk Exploration* and *Key Risk Assessment* phases. To address this, we have revised the guiding questions. However, regions and communities may still be confronted with questions they cannot provide answers to due to a variety of reasons such as e.g., differing levels of expertise, or heterogeneity of interests and focus points. Additionally, supplementary explanatory materials have been developed to assist users in navigating the more complex steps (Technical Guidance Annex in D1.4 or FAQ that will be developed during the project).

Comprehensive Tool Integration: The need for complete implementation of the CLIMAAX risk workflows was emphasised, especially for the *Risk Analysis* and *Monitoring & Evaluation* steps. This need will be addressed by a proper alignment between the CRA Framework and workflows through the CLIMAAX Handbook providing insights in case studies and examples from pilot regions to illustrate best practices. Further, the guiding questions help to contextualize risk outcomes from the risk workflows and therefore bring together bottom-up needs with top-down requirements.

Inclusivity and Participatory Processes: The feedback underscored the importance of involving a wide range of stakeholders in the CRA process with more practical attention needed for the inclusion of principles as well as local knowledge. The final framework version corroborates the importance of stakeholder engagement, emphasising the roles of local authorities, vulnerable groups, and citizens. This participatory approach is designed to foster greater community buy-in and ensure that the assessments are rooted in local realities.

Scenario Selection and Risk Communication: Selecting appropriate climate change scenarios was identified as a complex task. The final framework provides more detailed guidance on scenario selection, pointing out decision-maker needs and risk aversion considerations. Depending on time horizon considerations and resource availabilities, communities may profit from comparing risk outcomes from several climate scenarios instead of selecting one.

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Continuous Engagement, Training and Capacity Building: Even after the publication of this deliverable and the Framework (D1.4[10]), ongoing insights, best practices and emerging challenges will subsequently be evaluated and included in the CLIMAAX Handbook to keep the framework updated. A robust monitoring and evaluation mechanism will be established to assess the framework's implementation across different regions. This will help identify areas for further refinement and ensure that the framework delivers tangible benefits in enhancing climate resilience.

To support the widespread adoption of the framework, we will develop comprehensive workshops with the recipients of the FSTP funds. These will be aimed at building the capacity of local authorities, decision-makers, and other stakeholders to effectively implement the CRA processes.

Collaboration and Knowledge Sharing: Within CLIMAAX, we will foster collaboration and knowledge sharing among regions using the CLIMAAX framework. Interested communities may engage in sharing experiences, challenges, and successes (e.g., through guiding questions) thus deepening the CoP to learn from each other and drive collective improvement.

In conclusion, the consideration of feedback has significantly contributed to strengthening the CLIMAAX CRA Framework and to giving it its final shape. With a commitment to continuous improvement and stakeholder engagement, the framework is at this stage well-positioned to conduct extensive, yet flexible CRAs and can thus support effective CRM strategies and plans across Europe, fostering resilience and preparedness in the face of climate change.

[10] https://www.climaax.eu/public-deliverables/

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Annex I: CLIMAAX Climate Risk Assessment Questionnaire

About CLIMAAX

CLIMAAX is an EU Mission Adaptation project that aims to support European regions and communities to better adapt to climate change, including disaster risk reduction and management, and build longterm resilience. CLIMAAX is built on three main pillars: 1) the development of a standardized regional Climate Risk Assessment (CRA) framework formed on current community experience and best practices; 2) a toolbox that integrates local data with European and global data to facilitate CRAs; and 3) financial support for at least 50 regions to participate in the project and execute CRAs in their local context.

About this survey

We are currently undertaking the first pillar of our project, striving to create an inclusive and effective regional CRA framework. It is intended for those who have been involved in preparing weather- and climate-related risk assessments. For this purpose, we are seeking your invaluable input and expertise to help shape a framework that not only includes general principles but also provides practical guidance for those conducting CRAs and reflects the collective knowledge of our community. You are invited to share this survey with others whom you believe are qualified and experienced in risk assessment.

By means of this survey, we aim to learn how risk assessments are currently conducted across European regions, including best-practices and obstacles. This is also a first step in building a CLIMAAX Community of Practice, and we hope for your continued engagement and participation in upcoming activities and discussions. The survey is structured around the three main parts of the regional CRA Framework: principles, technical choices, and inclusive practices.

About your response

⏳ The expected time of completion is around 30 minutes, depending on how much you elaborate on your answers.

🤔 If you feel uncomfortable writing in English, feel free to answer in the language that is most convenient for you.

⚠ We understand that you may not be aware of some of the answers to the survey questions or may prefer not to share certain information. All questions are optional, and you have the choice to remain anonymous. ⚠

Information disclosure

The information gathered in this survey will be aggregated and may be included as part of our project deliverables, the CLIMAAX website, and in scientific publications. You have the option to remain anonymous in your responses.

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On behalf of the CLIMAAX team, we thank you in advance for your participation in fostering the goals of the CLIMAAX project and the regional CRA Framework. You can find more information about the CLIMAAX project on our website: www.climaax.eu.

Questionnaire

Introduction
Q1.1 What type of agency do you work for? Check all that apply. Civil Protection, Mereorological Service, Water authority, Fire Service, Environmental protection agency, Public Health, Energy, Transportation, Municipality, University, Research organization, Climate service provider, Private consulting, Other (please specity)
Q1.2 What sector(s) do you work with? Check all that apply. Water Management, Agriculture, Fisheries, Forestry, Coastal Areas, Insurance & Finance, Energy, Infrastructure & Transport, Health, Disaster Risk Reduction, Tourism, Biodiversity, Spatial & Urban Planning, Migration & Displacement, Mining, Industry, Other (please specity)
Q1.3 Please briefly describe the role of the team/unit/department in which you work.
Q1.4 What kind of skills does your team hold? [Little or none / Basic / Intermediate / Advanced] Climate change science, Climate risk concept, Climate risk management, Geographical Information Systems (GIS), Modeling, Statistical analysis, Programming, Gridded data analysis (Raster, NetCDF, etc), In-situ/station observation data analysis (precipitation, temperature, stream gauges, etc), Remote sensing/satellite data analysis (Sentinel, Landsat, SRTM), Stakeholder engagement, Communication & Outreach
Q1.4 What kind of skills does your team hold? [Little or none / Basic / Intermediate / Advanced] Climate change science, Climate risk concept, Climate risk management, Geographical Information Systems (GIS), Modeling, Statistical analysis, Programming, Gridded data analysis (Raster, NetCDF, etc), In-situ/station observation data analysis (precipitation, temperature, stream gauges, etc), Remote sensing/satellite data analysis (Sentinel, Landsat, SRTM), Stakeholder engagement, Communication & Outreach
Q1.5 Please list any other relevant skills not included in the previous question that you consider important for risk assessments.

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Principles

Q2.1 Does your region or community consider the following principles when preparing a risk assessment?

[Prioritized / To some extent / Not currently but planning to / Not currently and not foreseen / Not sure]
Social justice, Equity, Quality assurance, Rigorous scientific/technical methodology, Transparency, Inclusivity, Precautionary principles

Q2.2 For the principles that selected "Yes" or "Planned" in the previous question, could you briefly explain how they are, or are planned to be, incorporated into the process?

Q2.3 Governance & Policy Integration: Is your risk assessment information integrated into any of the following?

[Not at all / Briefly mentioned / To a certain extent / Fully integrated Planned / Not sure]
Disaster risk management, Early warning systems, Adaptation plans, Mitigation plans, Spatial / urban planning, Essential services

Q2.4 If you considered any additional principles in your risk assessment that were not mentioned in the previous questions, please list them along with a brief description of how they were integrated.

Technical Choices

Q3.1 Please prioritize the weather and climate hazards in terms of importance to your region or community.

[Not relevant / Low / Medium / High / Not sure]
Severe Wind, Tornado, Tropical-like Storm/Cyclone, Heatwave/ Coldwave, Hail / Ice / Storm / Lightning, Heavy Snow, Coastal Flood, Riverine Flood, Heavy Rain/Pluvial Flood, Drought, Wildfire, Other

Q3.2 For what time period do you assess hazards? Check all that apply, and leave blank those that don't.

[Hystorical or current / 2030s / mid-century / end of century]
Severe Wind, Tornado, Tropical-like Storm/Cyclone, Heatwave/ Coldwave, Hail / Ice / Storm / Lightning, Heavy Snow, Coastal Flood, Riverine Flood, Heavy Rain/Pluvial Flood, Drought, Wildfire, Other

Q3.3 Multi-hazard Risk Assessment: Did you consider compounding hazards occurring at the same time or after each other? If so, please briefly describe how.

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Q3.4 Did you consider cascading consequences and risks across sectors and systems? If so, please briefly describe how.

Q3.5 Did you integrate how climate response measures (e.g., adaptation and mitigation) into your risk assessment? This could include co-benefits and/or adverse effects of response measures. If yes, please briefly describe how.

Data and models

Q4.1 Please list the sources of hazard datasets (e.g., flood, heatwave) available for your risk assessment. These could include global, EU, national, and local datasets. If possible, please share links.

Q4.2 Please list the sources of exposure datasets (e.g., building stock, exposed economic value, services, resources and infrastructure) available for your risk assessment. These could include global, EU, and national, and local datasets. If possible, please share links.

Q4.3 Please list the sources of vulnerability datasets (e.g., demographics, level of education, income, health) available for your risk assessment. These could include global, EU, and national, and local datasets. If possible, please share links.

Q4.4 Please indicate the climate change scenarios of interest to your work in assessing future risk (SSP = Shared Socioeconomic Pathway; RCP = Representative Concentration Pathway). Check all that apply, and leave blank those that do not or that you are not aware of.

[Hystorical or current / 2030s / mid-century / end of century]
SSP1-1.9, RCP 2.6 / SSP1-2.6, RCP 4.5 / SSP2-4.5, RCP-6.0, RCP 7.0 / SSP3-7.0, RCP 8.5 / SSP5-8.5, Other

Q4.5 Please indicate whether assessing future risk in terms of the global warming levels (GWL compared to preindustrial temperatures) is of interest for assessing future risk. Check all that apply, and leave blank those that do not or that you are not aware of.

GWL 1.5 degrees C, GWL 2.0 degrees C, GWL 3.0 degrees C, Other (Please specify)

Q4.6 If you are using climate change scenarios and/or GWLs in risk assessment, how did you make your choice and how did you address uncertainty, if at all?

Q4.7 Are any of the following models used for your risk assessment that you are aware of?

Hydrologic / Hydrodynamic, Agriculture, Wildfire, Ecological, Global climate models (e.g., CMIP5/6), Statistically downscaled climate models, Dynamically downscaling climate models (e.g., CORDEX), Decision-making, Other (Please specify)

Q4.8 Please briefly describe how you apply these models to explore impacts and risk.

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Participatory practices
Q5.1 Stakeholder engagement: How were the following involved in your risk assessment? [Inform, Consultation, Collaboration, Co-design] Civil Protection, Environmental protection agency, Weather / meteorological service, Policymakers / Decision makers, Local authorities, Regional authorities, Private companies / organizations, Universities / Research institutions, Citizens, Sectors, Vulnerable groups, Other
Q5.2 Which, if any, of the following approaches were used to consult stakeholders? Public meetings / hearings / workshops, Meetings, Focus groups, Interviews, Questionnaires and surveys, Opinion polls, Other (Please specify)
Q5.3 Which, if any, of the following approaches were used to involve, collaborate and empower stakeholders? Consensus workshops, Task forces, Advisory boards and committees, Citizen panels or town halls, Third party boundary organisations (e.g., consultancies), Other (Please specify)
Q5.4 Which, if any, of the following approaches were used to inform stakeholders? Public meetings, Briefings, News media, Public presentations, Info kiosks, Hotlines, Social media, Websites, Arts and entertainment, Other (Please specify)
Q5.5 Which approaches did you find most effective in engaging stakeholders? Please explain why you found them successful and how you evaluated their effectiveness.
Q5.6 Did you face any challenges or obstacles in engaging stakeholders? If yes, please describe them and how they were overcome, if at all.
Q5.7 Can you share any insight on how to implement a co-design and two-way learning process?

Bottlenecks and best practices
Q6.1 Did you follow any existing framework for your risk assessment? If yes, please insert them below. If not, please share some information on the steps that you followed.
Q6.2 Monitoring, evaluation, improvement: Briefly describe how you monitor, evaluate and update your risk assessment, or expect to.
Q6.3 Bottlenecks: Do you encounter any challenges related to the following aspects in undertaking your risk assessment?

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Data scarcity, Data accuracy / quality, Future scenarios, High resolution / downscaled data, Transboundary challenges (political, administrative, geographical, etc.), Lack of training in risk assessment, Lack of technical skills, Own institutional support, Financial resources, Political buy-in, Stakeholder buy-in, Stakeholder participation, Other (Please specify)
Q6.4 As examples of best practices, please share what worked well in your risk assessment.
Q6.5 Please expand on any significant challenges faced in performing your risk assessment and how they were overcome.
Q6.6 How could you have benefitted from additional information and/or support in performing your risk assessment?
Q6.7 Please provide any additional information that would help in the design of a standardised regional climate risk assessment framework in the context of the EU Mission Adaptation and CLIMAAX.

Privacy statement

Dear Participant,

The data provided through this form will be processed by CMCC, as data Controller and partner of the CLIMAAX Project. The personal data collected through the form will be processed to carry out scientific research in connection with the project and to subscribe you to the CLIMAAX Community of Practice (allowing you to receive our newsletter, information and uptakes about the Project).

The legal basis for data processing is Article 6, paragraph 1, letter a) of the GDPR (consent of the data subject). It should be noted, however, that the responder is free to decide whether to provide or not the requested data, as there is no legal obligation to provide them.

In compliance with the provisions of Article 5, paragraph 1, letter e) of Regulation (EU) 2016/679, the data will be kept by the Controller for a period not exceeding the time necessary to achieve the purposes for which the data was collected and subsequently processed; after that all data will be anonymized and/or deleted. The results of this survey may be published in a strictly anonymous and/or aggregate form and in any case in a manner that does not make the data subject identifiable. All data will be disclosed and processed only by the authorized personnel of the Controller and its projectâ€™s partners. Your data will not be transferred abroad to countries or international organizations outside the European Union that do not guarantee an adequate level of protection.

For further information regarding the processing of your rights and to learn about your rights and how to exercise them, we invite you to read the complete CMCCâ€™s privacy policy, available here. Please note that you are entitled to request the removal of any personal information we retain about you at any point in the future. To exercise this right or to lodge a complaint concerning the processing of your personal data, please direct your communication to info@climaax.eu.

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We confirm that we do not engage in automated decision-making processes, including profiling, and all personal data collected through this form is obtained directly from you, without involvement from any other organization. The contact information of the Projectâ€™s coordinator are available at the following link. We confirm that we do not engage in automated decision-making processes, including profiling, and all personal data collected through this form is obtained directly from you, without involvement from any other organization.

* I've read the privacy policy in compliance with article 13 of the GDPR and I consent to the processing of my personal data

Community of Practice

CLIMAAX Community of Practice is a network that brings together all those involved and interested in the activities of the CLIMAAX project. As a member, you would have the opportunity to exchange your experiences and methodologies related to CRAs and gain insights from others' experiences, as well as, provide valuable feedback on aspects such as the design of the CRA framework, the project handbook, and the functionality of the toolbox.

Throughout the survey, we did not request any personal information. But if you would like to participate in our Community of Practice, we ask you to provide your email address and/or institution name.

Please note that this information will not be published. Any time in the future, you will be able to remove any personal information by sending a request to info@climaax.eu.

If you choose not to provide your information now, but change your mind in the future, please feel free to contact us at callforevidence@climaax.eu. In any case, all information will be deleted after the project ending (December 2026).

For which country did you perform your risk assessment?
For which city, region, or community did you perform your risk assessment?
Are you interested in becoming a part of our CLIMAAX Community of Practice? [Yes / No /Not sure, I need more information]
If you agree to the mentioned terms and would like to join the Community of Practice, please enter your organization's name and your email address.
Have you applied to our 1st CLIMAAX Open Call for cascading funds? Public bodies and non-profit legal entities are eligible to apply for funding of up to € 300,000. [Yes, my entity applied / No, we did not apply to the 1st Call, but we are interested in applying to the 2nd Call (July 2024) / No, we are not interested and/or eligible]

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Thank you for taking the time to participate in our CLIMAAX Risk Assessment Survey! Your contribution is invaluable and greatly appreciated. 🙏

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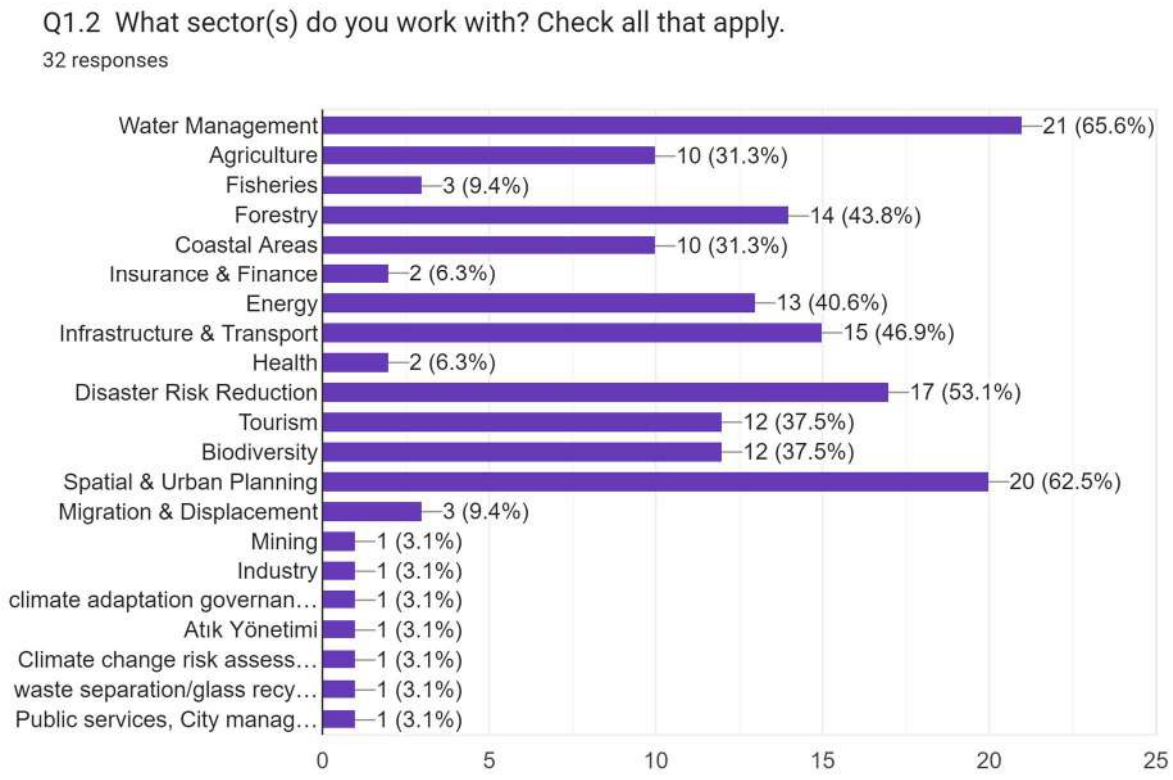
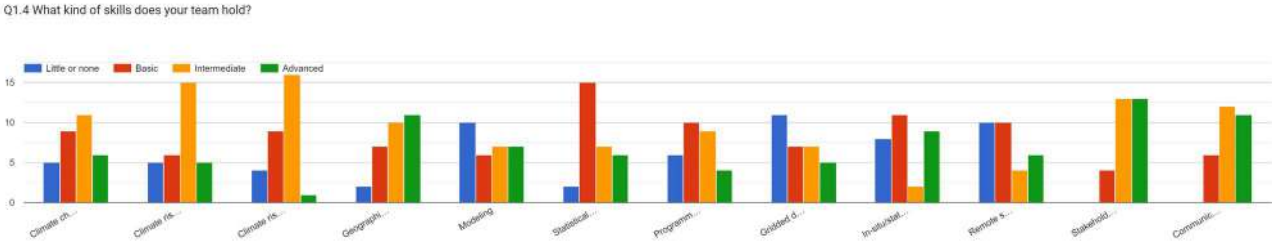
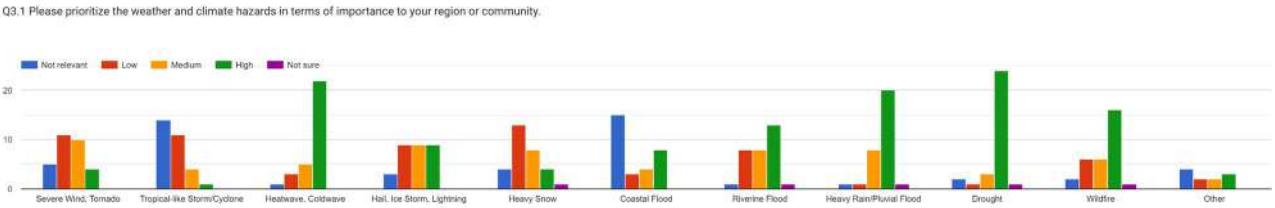
Annex II: Additional responses from the CRA Questionnaire







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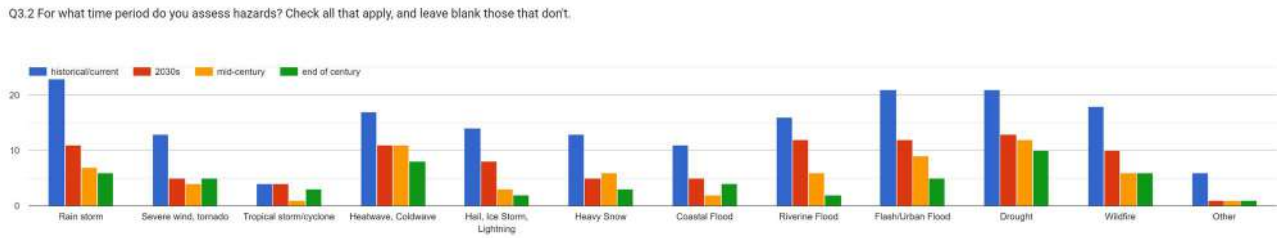
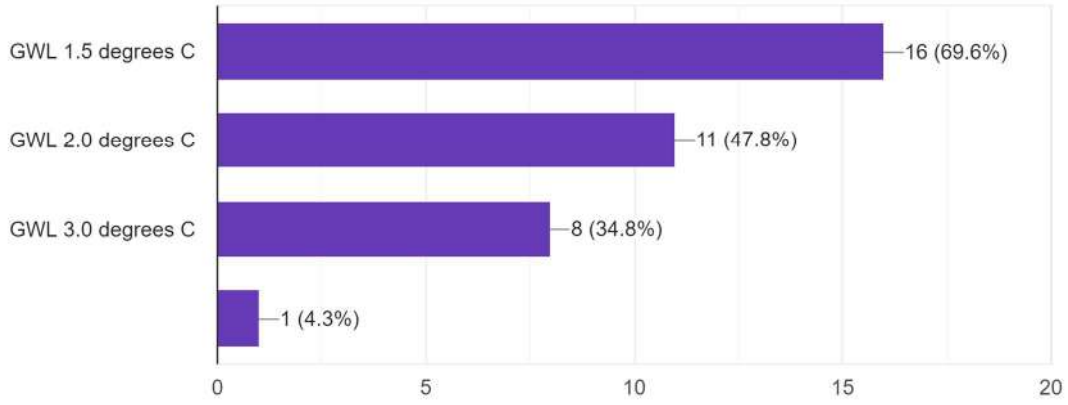


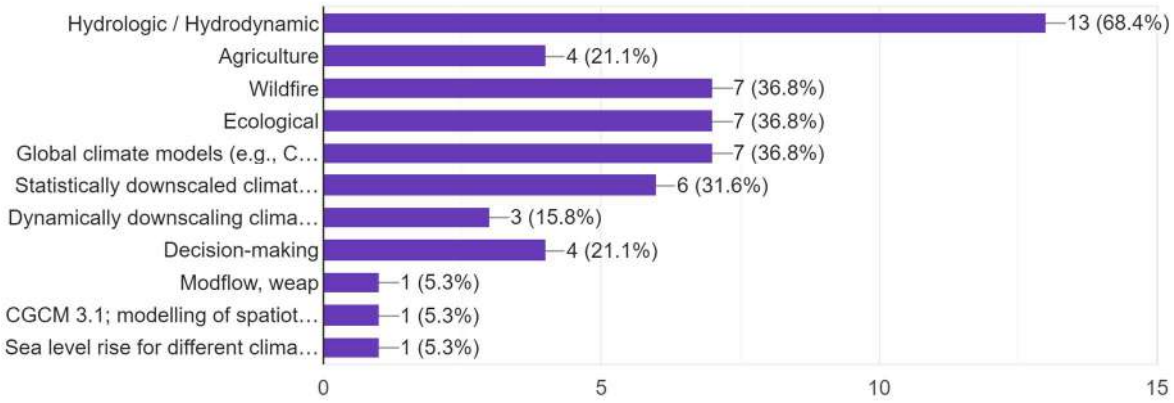
Q4.5 Please indicate whether assessing future risk in terms of the global warming levels (GWL compared to preindustrial temperatures) is of intere...ank those that do not or that you are not aware of.

23 responses



Q4.7 Are any of the following models used for your risk assessment that you are aware of?

19 responses



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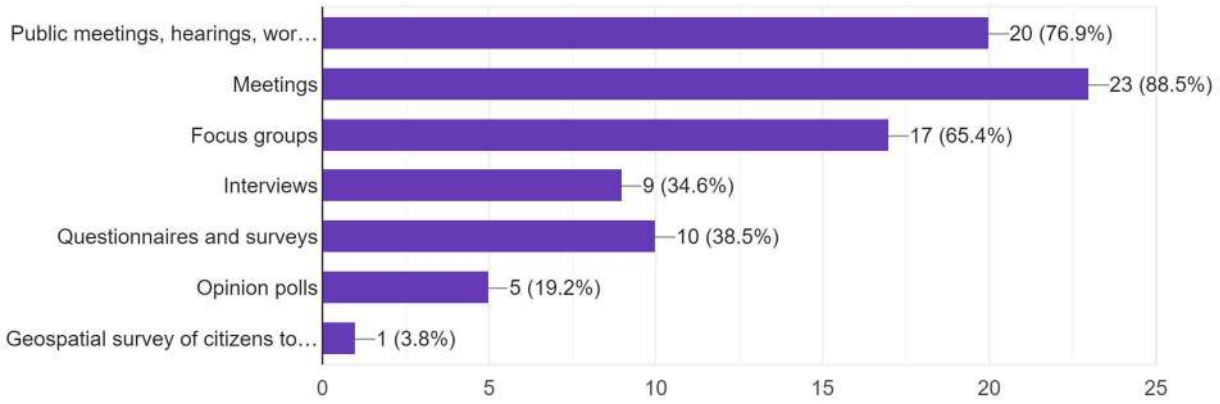
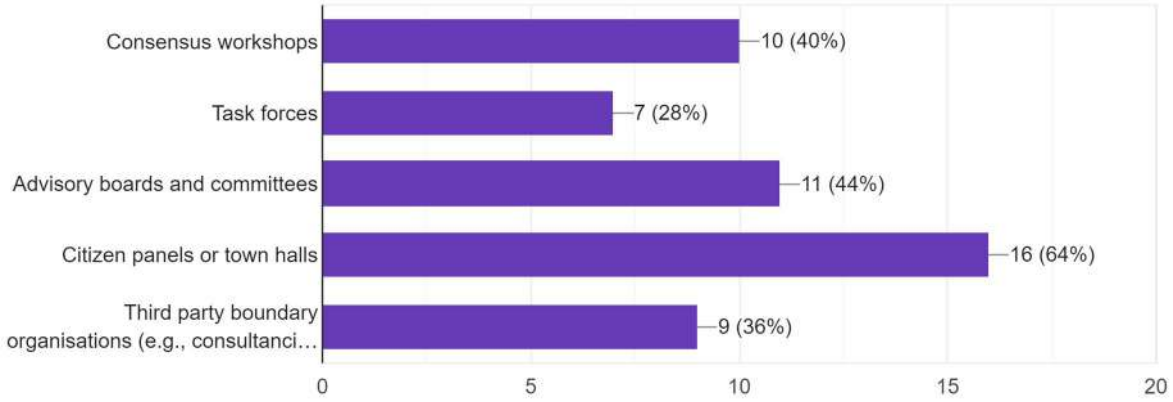
Q5.2 Which, if any, of the following approaches were used to consult stakeholders?

26 responses



Q5.3 Which, if any, of the following approaches were used to involve, collaborate and empower stakeholders?

25 responses



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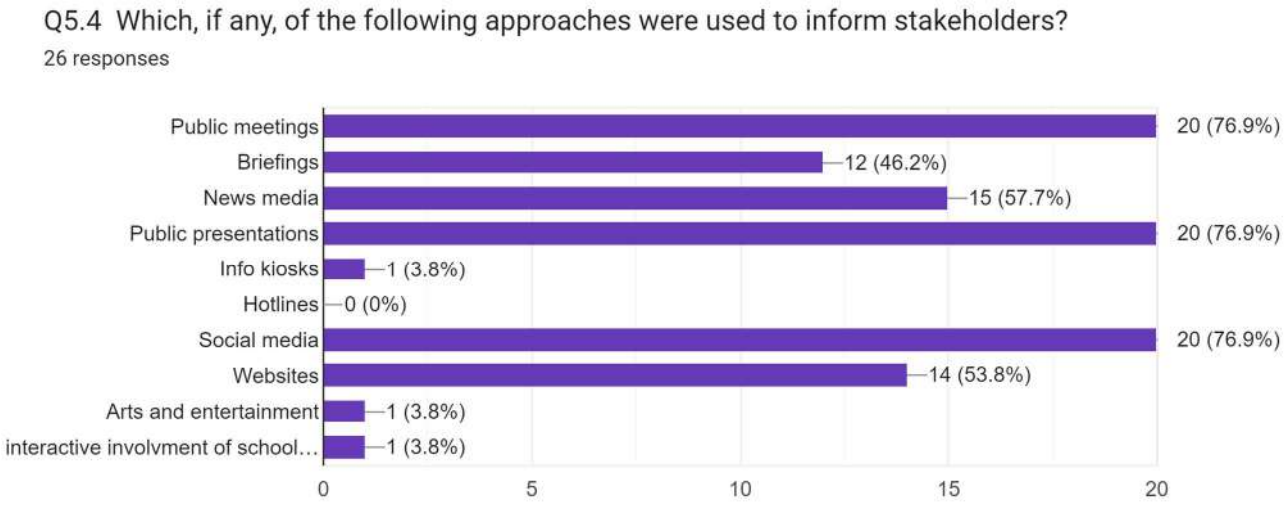

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