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RiskPACC

INTEGRATING RISK PERCEPTION AND ACTION TO ENHANCE CIVIL PROTECTION-CITIZEN INTERACTION

REPORT ON KNOWLEDGE EXCHANGE

Deliverable D3.8

Dissemination Level: Public

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ABOUT RISKPACC

Increasingly complex and interconnected risks globally highlight the need to enhance individual and collective disaster resilience. While there are initiatives to encourage citizen participation in creating a resilient society, these are typically fragmented, do not reach the most vulnerable members of the communities, and can result in unclear responsibilities for building disaster resilience.

New technologies can also support preparedness and response to disasters, however, there is limited understanding on how to implement them effectively. Awareness of risks and levels of preparedness across Europe remain low, with gaps between the risk perceptions and actions of citizens and between the risk perceptions of citizens and Civil Protection Authorities (CPAs).
The RiskPACC project seeks to further understand and close this Risk Perception Action Gap (RPAG). Through its dedicated co-creation approach, RiskPACC will facilitate interaction between citizens and CPAs to jointly identify their needs and develop potential procedural and technical solutions to build enhanced disaster resilience. RiskPACC will provide an understanding of disaster resilience from the perspective of citizens and CPAs, identifying resilience building initiatives and good practices led by both citizens (bottom-up) and CPAs (top-down). Based on this understanding, RiskPACC will facilitate collaboration between citizens, CPAs, Civil Society Organisations, researchers and developers through its six (6) case studies, to jointly design and prototype novel solutions.

The “RiskPack” toolbox/package of solutions will include a framework and methodology to understand and close the RPAG; a repository of international best practice; and tooled solutions based on new forms of digital and community-centred data and associated training guidance. RiskPACC consortium comprised of CPAs, NGOs, associated organisations, researchers and technical experts will facilitate knowledge sharing and peer-learning to close the RPAG and build disaster resilience.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 101019707

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Executive Summary

D3.8 outlines the key outcomes and objectives of the T3.6 "Case Study Knowledge Exchange" initiative aimed at enhancing the exchange of knowledge and best practices between Civil Protection Authorities (CPAs) and their respective communities.

Three KEEs were held in different regions, accommodating the six case studies of the project, in Paris, in Padova and in Rafina, where participants from various backgrounds collaboratively exchanged ideas and perceptions. These events served as a critical platform for:

- Knowledge Synthesis: Highlighting effective solutions and addressing challenges identified in local workshops of Lab Phases I and II held during the first two years of the project.
- Collaborative Strengthening: Facilitating new connections among participants and enhancing collaborations for effective civil protection measures.
- Continual Improvement: Informing ongoing and future initiatives both within and outside the project by focusing on lessons learned and best practices.

The events focused on five main areas: the overview of lab activities, progress updates on technical solutions, solutions inside and outside RiskPACC, lessons learned, and challenges encountered during the workshops.

The KEEs emphasized structured dialogue sessions and interactive exercises which provided a platform for participants to:

- Engage in discussions addressing issues raised in local workshops, ensuring that participant voices were heard and valued.
- Collaborate on developing best-practice solutions to the problems identified during the exchanges.
- Establish a collaborative action plan with mechanisms for sustained dialogue, ensuring that insights and solutions can be carried forward beyond the events.

Overall, the D3.8 Case Study Knowledge Exchange fostered the ground for sharing ideas and establishing ongoing collaboration between CPAs and their communities. The outcomes of these exchanges are intended to enhance resilience, inform future initiatives and promote a culture of continuous improvement and innovation in civil protection practice, emphasising the critical role of collaboration in effectively managing risk and enhancing community preparedness.

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Glossary and Acronyms

Term	Definition/Description
AR	Augmented Reality
CAFO	Ceska Asociace Hasicskych Dustojniku Sdruzeni (Czech Association of Fire Officers)
CBRN	Chemical, biological, radiological and nuclear
CDP	Commune di Padova
CPA	Civil Protection Authority
CPR	Cardiopulmonary Resuscitation
D3.5	Report Lab Phase I
D3.6	Report Lab Phase II
D4.4	RiskPACC Collaborative Framework
D4.6	Training Material
DoA	Description of the Action
DRM	Disaster Risk Management
DRR	Disaster Risk Reduction
Efus	The European Forum for Urban Security
IBZ	Service Public Federal Interieur
ICCS	Institute Of Communication And Computer Systems
ISAR	I.S.A.R. Germany Stiftung gGmbH
KEE	Knowledge Exchange Event
KEMEA	Center for Security Studies (Kentro Meleton Asfaleias)
MDA	Magen David Adom in Israel
MoE	Municipality of Eilat
MRP	Municipality of Rafina-Pikermi
NGO	Non – governmental organisation
POA	Plan of action
RPAG	Risk Perception - Action Gap
OSM	OpenStreetMap
T4.4	Development of training material
UHI	Urban heat islands
USTUTT	University of Stuttgart
UT	University of Twente
VGI	Volunteered Geographic Information
WP3	Co-Creation Lab & Stakeholder Integration
WP4	Framework Development
WP6	Impact generation through peer-learning, field testing and knowledge capitalisation
WP8	Dissemination, Exploitation and Communication
WUI	Wildland-urban interfaces

TABLE 1: GLOSSARY AND ACRONYMS

1 INTRODUCTION

1.1 Overview

Deliverable D3.8 serves as a vital component of RiskPACC's overarching goal to enhance the exchange of knowledge and best practices between Civil Protection Authorities (CPAs) and their respective communities. Recognising the importance of collaborative learning and data generation, this deliverable focuses on facilitating meaningful discussions about existing solutions and case study methodologies used by different partners within the project.

The main objective of T3.6 "Case Study Knowledge Exchange" was to bring together all the project partners in structured meetings, hosted by the case study providers, where individual approaches to community challenges were presented and explored. This collaborative environment not only allowed participants to share their successes and hurdles but also fostered a broader understanding of the strategies employed within RiskPACC, as well as solutions in the external environment. By promoting dialogue on related challenges and opportunities, D3.8 seeks to uncover insights that can drive innovation and improvement in community practices.

Three participative Knowledge Exchange Events (KEEs) were held in three different locations, where the six different case study providers from different regions across Europe presented and discussed their key findings of the local workshops carried out within the two first years of the project, as well as concerns for improvement. The events were designed under an overarching structure to ensure a cohesive framework with consistency, documentation and reporting of discussions while accommodating local nuances of the case studies requirements under the directions given by KEMEA.

These KEEs have served as an important focal point for gathering community input and fostering collaboration, with associated partners also encouraged to participate and contribute to the advancement of knowledge that will be fruitful in closing the Risk Perception - Action Gap (RPAG).

Through the valuable insights presented in this deliverable, enhancement of the capabilities of CPAs and the cultivation of a vibrant community of practice that thrives on shared experiences and collective learning is expected.

1.2 Structure of the deliverable

This document includes the following chapters:

Chapter 1: Introduction
This chapter provides an overview of the deliverable, outlining its basic description and scope, as well as the overarching objectives of T3.8.

Chapter 2: Designing the KEEs
This chapter provides the main scope of the KEEs, including the methodology followed in their planning and implementation.

Chapter 3: Knowledge Exchange Events' Overview
This chapter provides a concise summary of the development of the three KEEs, detailing the target audience and key methodologies used in all events.

Chapter 4: Insights from Case Study Providers
This chapter outlines the objectives and the key findings from the case study providers presented during the KEEs.

Chapter 5: Analysis of Discussion Sessions
This chapter explores the analyses that emerged from the discussion sessions and provides a detailed examination of the conceptual and technological tools that have been developed within the project.

Chapter 6: Practical Implementation of the Framework Flowmap
Here, the main results of the implementation of the Framework Flowmap that was tested during the final KEE are presented. The design of the Flowmap was based on all the findings and solutions within the project. This chapter aims to integrate a holistic perspective on methodology to inform strategic guidance using the tools developed within the RiskPACC project.

Chapter 7: Conclusions and Recommendations
The final chapter summarises the key findings of the document and offers recommendations for potential solutions beyond the RiskPACC initiative.

1.3 Relation to other Work Packages

D3.8 encapsulates the key findings and insights derived from the workshops conducted during Lab Phases I and II across the six case studies of the project that are fully described in D3.5 and D3.6. Since this public document is intended for a wide audience, in particular CPAs, and since D3.5 and D3.6 are confidential documents, to provide a more cohesive knowledge to the reader, the main objectives and results of the case studies that were presented in the KEEs are also presented here but not in the same detail.

In addition, D3.8 maintains a strong link with WP4 by providing participants with a comprehensive overview of the concepts tested in the various workshops. It is also linked to WP5, as it includes the entire development of the project's technological tools.

Moreover, the report engages with the WP6 audience, as partners from the Efus network participated in all three KEEs, providing valuable feedback based on their experiences and sharing expertise with the RiskPACC partners.

2 DESIGNING THE KNOWLEDGE EXCHANGE EVENTS

This chapter contains the methodology used in designing and implementing the KEEs. It provides an overview of the case studies' key insights and tools that were presented and discussed within the KEEs, and the methodology used for the different sessions.

2.1 Scope of KEEs

The KEEs were designed to facilitate dialogue and sharing of experiences stemming from the workshops of Labs of Phase I and II from all six case studies.

The events focused on five main areas: the preview of lab activities, progress updates on technological solutions, solutions within and out of RiskPACC, lessons learned, and challenges encountered during the workshops.

- Preview of labs of Phase I and II that involved:
  - Detailed descriptions of the structure and focus of each lab.
  - The alignment of the initial goals with the overarching project objectives.
  - The involvement of the key stakeholders and their roles.
- Valuable lessons learned from the Lab sessions:
  - Findings that were highlighted during the discussions and activities.
  - Perspectives gained from diverse groups of participants, including CPAs, volunteers, and citizens.
  - Recommendations for future explorations based on positive outcomes and innovative practices.
- Progress and updating of the technological solutions included:
  - Demonstrations.
  - Updating through the different stages of the Labs.
  - Feedback from participants on the effectiveness and usability of the proposed solutions.
- Challenges encountered during preparation and implementation that included:
  - Open discussion of technological, logistical, and operational obstacles encountered during the planning, preparation and conduction of the workshops.
  - Insights into participant engagement and knowledge retention difficulties.
  - Recommendations for future initiatives and useful strategies to overcome challenges.
- Knowledge Exchange on issues raised in the workshops included:
  - Structured discussions focusing on recurring themes and issues highlighted by participants.
  - Knowledge sharing to develop best-practice solutions to the raised issues.
  - Creation of a collaborative action plan or follow-up mechanisms for sustained dialogue beyond the events.

2.2 Methodology

2.2.1 Structure of the KEEs

According to the Description of Action (DoA), six workshops should be implemented, one in each case study region. However, due to otherwise much higher travel costs, organisational efforts, and carbon emissions, it was agreed through collaborative discussions to combine two workshops in one event. I.e., three KEEs were implemented, each featuring two case studies. To enhance convenience and encourage participation, these events were strategically combined with other project-related activities, such as the 3rd Awareness Workshop in Paris and the RiskPACC Plenary Meeting in Padova.

The schedule of the workshops is shown in Table 2.

KEE	Date	Place	Partners
1	14 December 2023	Paris, France	**ISAR IBZ**
2	22 February 2024	Padova, Italy	**CAFO CDP**
3	22 May 2024	Rafina, Greece	**MRP MDA/MoE**

Table 2: KEEs' schedule

The event was structured into two segments. The first segment focused on showcasing the case studies, while the second segment moved to an in-depth discussion on various topics that participants deemed significant for exploration.

In the opening segment, KEMEA presented a concise overview of the key findings set to be shared during the KEEs, including a brief description of the conceptual tools' functionalities. Following, the case study leaders presented the main outcomes derived from their workshops, pointing to the objectives and conclusions shedding light on both the usefulness and potential of the conceptual and technological tools employed throughout the two lab phases. Next, the technological partners involved in these case studies, as well as the conceptual tools' developers, delivered their presentations.

The second segment went down into an in-depth discussion of both the tools presented and risk awareness resources. Participants were separated into groups to explore potential solutions, both within the project and externally. Details regarding the methodology used for conducting these discussion sessions will be elaborated in the subsequent chapters.

In KEE #3, a new third section was introduced to incorporate elements from various project tools, which were also integrated into the workshops of Labs of Phases I and II. This section featured a strategy developed from the training materials in WP4 based on the modules of the RiskPACC Collaborate Framework, drawing on insights gained from the WP3 workshops and the first two KEEs. More details about the key findings of this session are given in Chapter 5.

2.2.2 CASE STUDIES' INSIGHTS AND TOOLS

The project includes six case studies driven by different partners from different regions, CAFO (Czech Republic), CDP (Italy), IBZ (Belgium), ISAR (Global), MDA & MoE (Israel), and MRP (Greece).

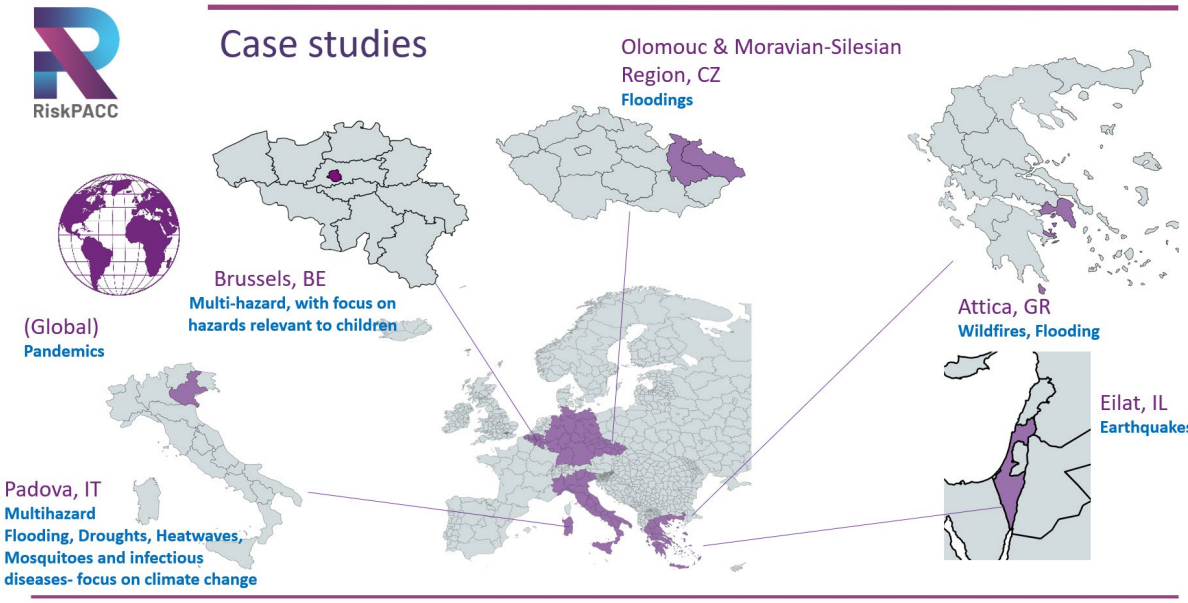

FIGURE 1: RISKPACC CASE STUDIES

Within the project, a series of technological and conceptual tools were designed in order to be tested within the local workshops of each case study. Thereby, five technological tools have been developed to meet different objectives and needs. The basic idea was set by the technology providers, but they adapted it to meet the needs of the case studies and the user requirements of both CPAs and participants, finalising it in the light of the feedback from their testing within the workshops (see D3.5, D3.6). In total, five technological tools have been created: Aeolian app, PublicSonar, Hermes, Thermal Comfort Tracker and MappingDamage tool, with the details given in Figure 2.

Augmented Reality (AR) mobile application aiming to enhance preparedness and response to natural and human-made hazards.	Web-based risk communication platform able to address the communication challenges faced during emergencies	Cloud-based online application, analysing millions of online interactions per day, able to detect incidents early on and maintain situational awareness	Aims to complement satellite pre-disaster and post-disaster maps, using crowdsourced information. The MappingDamage app takes input from the open mapping volunteer platform OpenStreetMap (OSM).	Provides valuable insight of citizen perceptions and adaptive behavior during heatwaves from the surveys
Aeolian AR	**Hermes**	**PublicSonar**	**MappingDamage**	**Thermal Comfort Tracker**

FIGURE 2: RISKPACC'S TECHNOLOGICAL TOOLS

In the same direction, four conceptual tools were developed to improve communication and facilitate discussions between CPAs and their audiences (Figure 3), i.e. nudging, co-creation methodology, participatory mapping, and risk communication exercises (detailed in D4.5). Nudging served to enhance one-way communication, while participatory mapping and risk communication exercises were designed as ice-breaking activities, promoting two-way communication and encouraging interaction among participants (Figure 4).

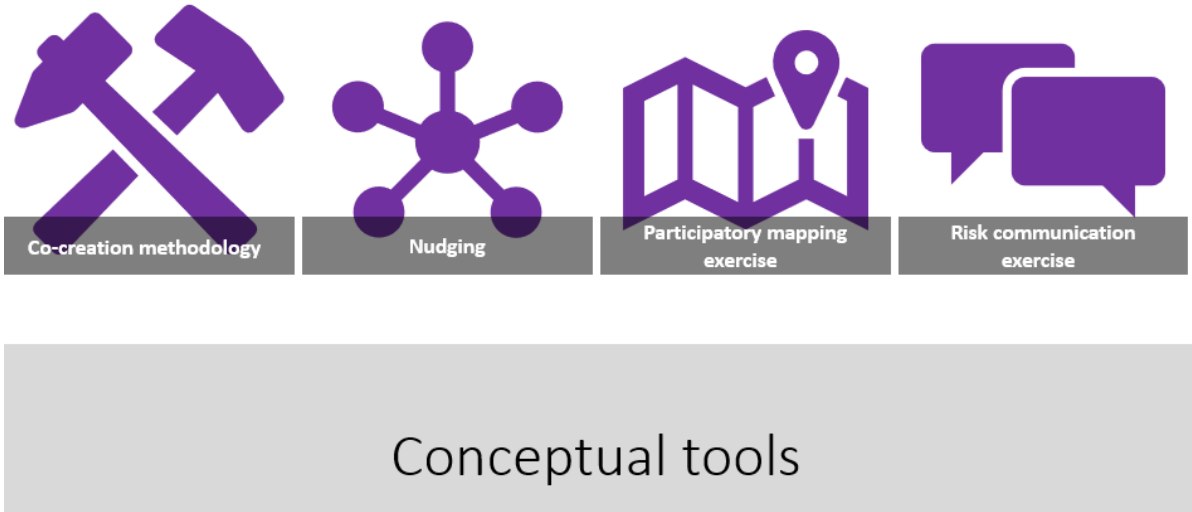

FIGURE 3: RISKPACC'S CONCEPTUAL TOOLS

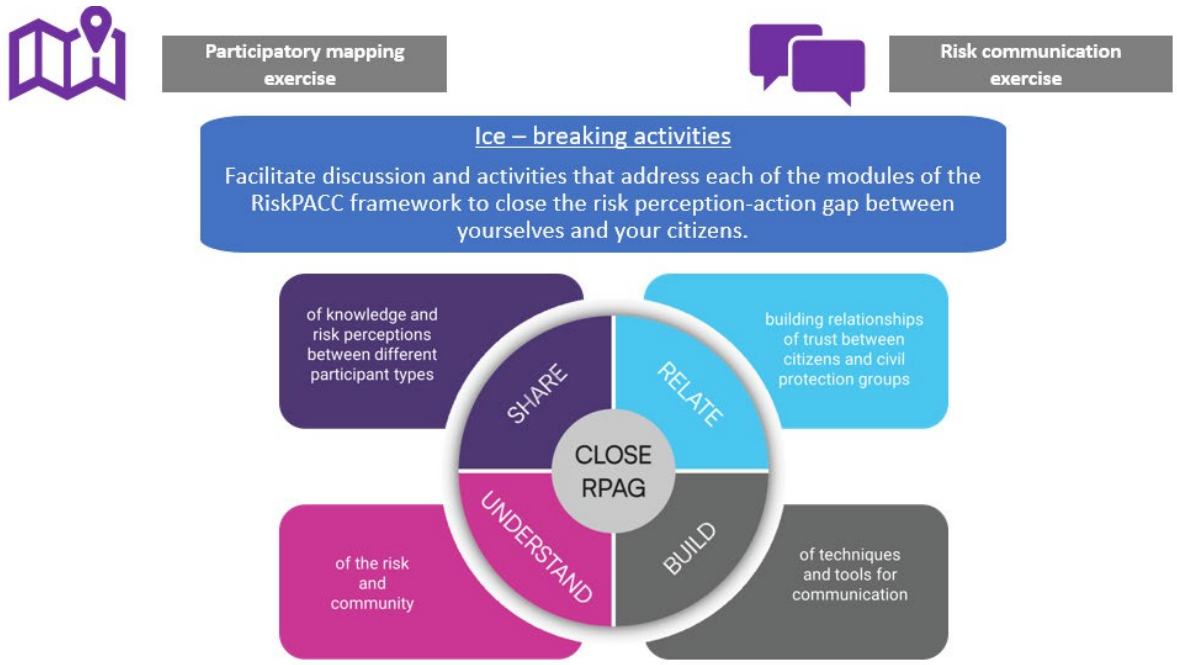

FIGURE 4: PARTICIPATORY AND RISK COMMUNICATION EXERCISE AIM

To enhance collaboration and create a conducive environment for all stakeholders involved, a co-creation methodology was established to guide the design and implementation of these workshops. In total, three workshops in two phases per study case were held.

- Lab phase I featured a single workshop per case study dedicated to introducing the RiskPACC project to the audience and gathering user requirements for the development of technological tools.
- Lab phase II consisted of two workshops per case study divided into two parts. The first part focused on testing conceptual tools, while the second part involved the evaluation of technological tools (In some case studies like MRP and MDA/ MoE more local workshops were conducted in this phase, as described in detail in Chapter 4).

Each case study pursued distinct objectives, examining different hazards and targeting various groups. The tools used were specifically designed to meet the unique objectives and interests articulated by the technology partners from the outset. This ensured that the tools were not only relevant but also effectively addressed the objectives of each case study to help close the RPAG. Similarly, the conceptual tools were tailored to the needs of the partners and their specific objectives, which facilitated fruitful discussions. Detailed findings from Lab Phases I and II can be found in documents D3.5 and D3.6.

In Table 3, the key points of each case study are presented.

Case studies	Participation	Region	Hazard	Target group	Technological tools	Conceptual tools
UC1	**CAFO**	Olomouc & Moravian-Silesian Region, Czech Republic	Flooding	General citizens	Aeolian app PublicSonar app	Participatory mapping Risk communication exercise
UC2	**CDP**	Padova, Italy	Flooding, Droughts, Heatwaves, Mosquitoes and infectious diseases-focus on climate change	General citizens	PublicSonar Hermes app Thermal Comfort Tracker Tool	Participatory mapping Risk communication exercise
UC3	**IBZ**	Brussels, Belgium	General, with a focus on hazards relevant to children	Teachers-children	-	Participatory mapping Use of IBZ's BE-Ready material
UC4	**ISAR**	Global	Global pandemic	General citizens	PublicSonar app	Nudging
UC5	**MDA/ MOE**	Eilat, Israel	Earthquake	Volunteers	Aeolian app Hermes app	Risk communication exercise tailored for volunteers
UC6	**MRP**	Attica, Greece	Forest fires Flooding	Elderly population Young children Volunteers	Aeolian app MappingDamage	Participatory mapping Risk communication exercise

TABLE 3: CASE STUDIES KEY INSIGHTS

The technological and conceptual tools used, as well as the target audiences, were critical factors in choosing which case studies would collaborate to present together and in which KEE. This selection was driven by specific shared characteristics. Both CAFO and CDP cases utilised identical conceptual activities, while MDA/MoE and MRP centred their efforts around volunteer groups as a crucial reference point. In contrast, IBZ and ISAR diverged by testing entirely different conceptual tools. Notably, IBZ did not incorporate any technological tools, whereas ISAR utilised only one, contrary to the rest case studies that used various tools involved in the study.

2.2.3 COLLABORATION WITH CASE STUDY PARTNERS

For two months before each KEE, bilateral meetings were conducted with the case study leaders. During these discussions, logistics and key elements to be included in each case study presentation were thoroughly reviewed. Additionally, a template outlining essential guidelines and highlighting the main points to be presented was provided to the partners for their reference and guidance. Of course, case study leaders adapted the presentations to their own needs.

In order to ensure consistency in the results that would be presented, it was requested that presentations were to be completed a few days before, so that the questions that would be included in the discussion sessions could be completed accordingly.

2.2.4 DISCUSSION SESSIONS METHODOLOGY

The discussion sessions aimed to foster the exchange of knowledge regarding the strengths and weaknesses of case study techniques and tools, while also offering solutions and recommendations for enhancing their effectiveness in future strategies.

The development of the questionnaires was a collaborative effort among the scientific partners involved in the case studies. Each KEE featured tailored questions that aligned with the specific previous presentations, promoting more constructive discussions. This approach ensured that while partners were well-versed in their own case studies, they could also engage with insights from others. Additionally, it supported the participation of Efus cities, many of whom were encountering the project for the first time.

In order to facilitate the discussions and the exchange of knowledge, participants were divided into groups of 6-7 individuals. The methodology of how the participants would be separated into groups varied from KEE to KEE. In KEE #1, groups were primarily categorised by country and language. In KEE #2 groups, the separation was random, with one group consisting of two participants collaborating remotely. In KEE #3, the groups were formed relating to the hazards of their concern.

Time was allocated for them to discuss among themselves and formulate their answers to the questions posed. Each group chose a notetaker in order to fill in the answers and to guide the discussion when needed. Once the discussions were complete, each group shared their findings with the entire assembly. An analysis of all the insights from the discussion sessions can be found in Chapter 5.

2.3 The Flowmap of RiskPACC Framework Implementation

Since some topics had already been addressed in earlier KEEs, this additional session of the Framework Flowmap implementation provided an opportunity for collaborators to explore other project tools, such as the RiskPACC Framework.

The Flowmap was created under the scope of the training material of T4.4, integrating all the concepts and tools that were created throughout the project that were mainly tested in the WP3 workshops. Previous KEEs had already allowed participants to test all the tools developed under the umbrella of Framework, so it was a challenge as a final step to test how all these diverse tools could collaborate and be part of a holistic communication strategy.

Groups were once again divided into three groups, relating to the diverse phases of the risk management cycle, pre-, during- and post-disaster groups. Creating a hypothetical scenario and a focus on a hazard of their concern, it was asked from them, by following the steps of the exercise, to define their potential problems and the involved stakeholders, and finally to build a communication strategy with RiskPACC and external tools.

For the implementation of the exercise, a DIN A0 printed document of the Flowmap was provided to the participants, with additional room to be able to fill in their notes.

Guidance was provided to them during the whole session. When completing, all three groups shared their results with the entire assembly, which are detailed in Chapter 6.

3 OVERVIEW OF KEES

This chapter describes the main structure of the KEEs, gives details about the sessions that were held, analyses the synthesis of the attendees and provides information on the logistics of the events.

3.1 KEE #1 - Paris

The first KEE was held in Paris on the 14th of December 2023, featuring IBZ and ISAR as the first two case studies presented. Although there were no case studies from France, the 3rd Awareness Workshop of WP8, which took place the day before, offered a valuable opportunity to coincide with. This arrangement allowed the Efus cities of WP6 to participate in both events, giving them a first insight into the deeper outcomes and tools used in the RiskPACC project.

3.1.1 STRUCTURE

The event was organized into three sessions. The first session kicked off with a presentation on ISAR, which as a global case study related to COVID-19 more familiar to the participants, served to break the ice for the KEEs.

This case study uniquely integrated the conceptual tool of Nudging, and the scientific leader from USTUTT highlighted its relevance and adaptability in relation to the current case study in a presentation following the case study overview. Although the agenda indicated that the PublicSonar presentation would follow, it was ultimately omitted, since the tool had already been presented during the Awareness Workshop the day before, including an interactive exercise.

In the second session, the IBZ partner presented the key findings of its case study. Since this particular study did not involve any tested technological tools, additional time was allocated for a more in-depth exploration of IBZ's BE-Ready material. This provided an excellent opportunity for participants to engage with new resources that they hadn't encountered before. The session concluded with a discussion tailored specifically to the IBZ case study, rounding out the day's activities.

The third session was intended to include a Framework discussion. However, due to some partners needing to leave and the extended time spent on the previous discussion, it was decided to postpone this session until the next KEE.

The key findings and objectives of the case studies are given in the following Chapter 4.

The agenda of the 1st KEE is given in following Table 4.

14th December - 1st Knowledge Exchange Event		
Time	**Title**	**Presenter**
9:30 - 10:00	**Welcome - Registration**	
10:00 - 10:15	**Introduction to the 1st Knowledge Exchange Event**	Christina Gatsogianni, KEMEA
	Session 1: ISAR Use Case	
10:15 - 10:35	**ISAR Use Case**	Constanze Bünner, ISAR
10:35 - 10:50	**Nudging tool**	Jeannette Annies, USTUTT
10:50 - 11:05	**PublicSonar tool**	Jesse Manning, PublicSonar
11:05 - 11:20	**Coffee Break**	
11:20 - 12:50	**Discussion Session - ISAR**	Christina Gatsogianni, KEMEA
12:50 - 13:45	**Lunch break**	-
	Session 2: IBZ Use Case	
13:45 - 14:15	**IBZ Use Case**	Dominique Maris, ISAR
14:15 - 15:45	**Discussion Session - IBZ**	Christina Gatsogianni, KEMEA
15:45 - 16:00	**Coffee Break**	
	Session 3: Framework and conclusions	
16:00 - 16:30	**Framework Overview**	Femke Mulder, UCL
16:30 – 16:45	**Wrap-up Conclusions**	Christina Gatsogianni, KEMEA

TABLE 4: AGENDA – KEE #1

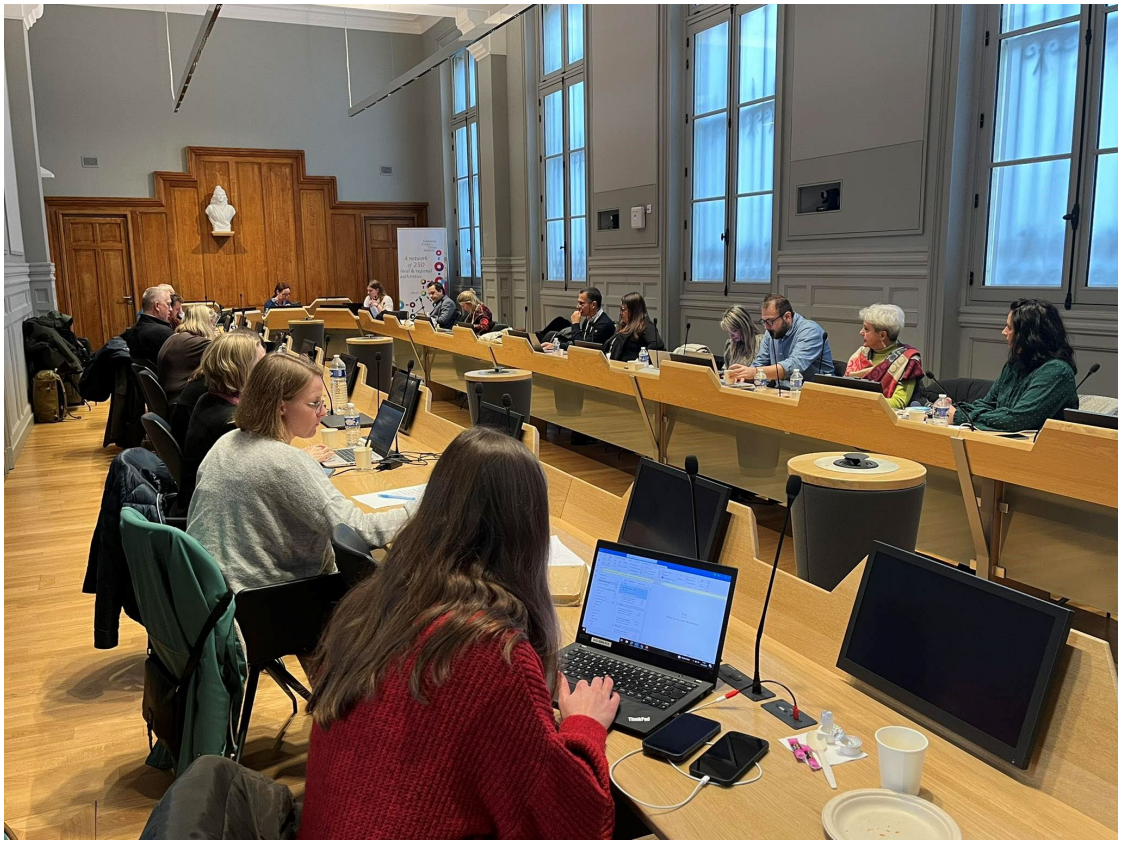

FIGURE 5: KEE# 1 – PRESENTATIONS

FIGURE 6: KEE# 1 – DISCUSSION SESSIONS

3.1.2 ATTENDANCE

A total of 28 people attended KEE #1, 27 of them in person and only 1 remotely. 21 were RiskPACC partners, and 7 belonged to the Efus cities (Table 5).

28 participants total	Status	
	In-person	Remotely
	27	1
	Internal and external participants	
	RiskPACC	Efus cities
	21	7
	Gender	
	Female	Male
	16	12

TABLE 5: STATUS OF PARTICIPANTS – KEE #1

Participants from France, Greece, Germany, Italy, Belgium, United Kingdom, Poland, Netherlands and Portugal attended KEE #1. Unfortunately, representatives from the two case studies, Israel and the Czech Republic, were unable to attend, but the valuable addition of the CPAs Efus cities compensated for this shortfall.

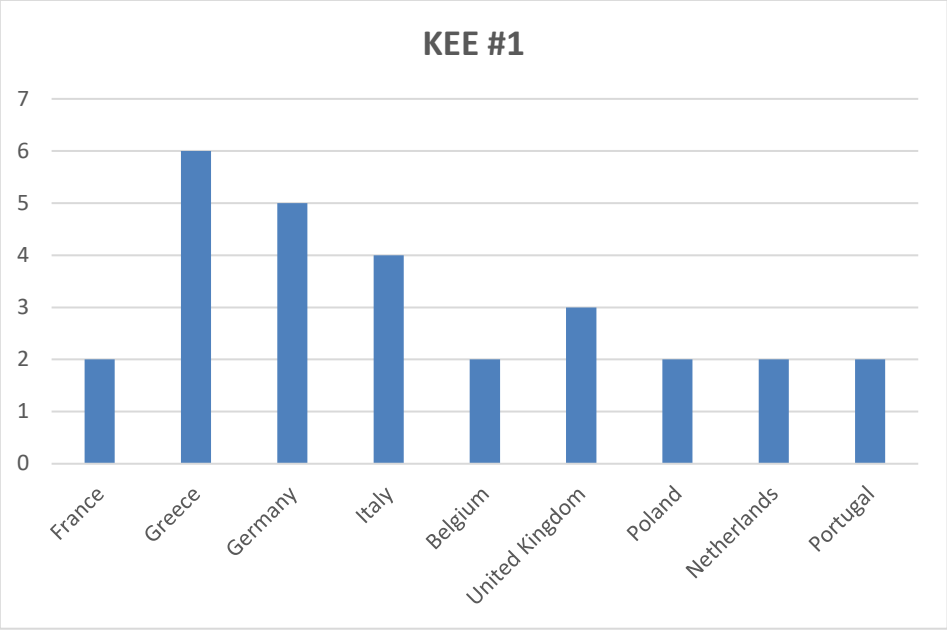

FIGURE 7: PARTICIPANTS' COUNTRY OF ORIGIN – KEE #1

3.2 KEE #2 - Padova

The second KEE was held in Padova on the 22nd of February 2024, featuring CDP and CAFO case studies. The day before, the plenary meeting of the project was held.

3.2.1 STRUCTURE

The event was organized into three sessions. The first session started with the presentation of CDP, sharing the main objectives and key findings. In this case study, two technological tools were tested, the Hermes and the Thermal Comport Tracker

tool. Both technological partners presented their results to the audience, with Hermes owner providing also a demonstration of the tool.

In the second session, the CAFO partner took the floor by sharing their insights and main outcomes. Following, the Aeolian app owner presented the step-by-step development of the tools through the feedback gained from the workshops of CAFO, MRP and MDA/MoE. Last, the PublicSonar partners presented the functionalities of their tool, as well as the cooperation with the partners to explore further potential of the tool.

The third session included the Framework session that was meant to be carried out in KEE #1 and presented by UCL. Participants were divided into groups of two individuals, and an exercise was given to them. The scope of the exercise was to evaluate how well participants could empathise with a chosen target group regarding disaster risk reduction in the context of the RiskPACC Collaborative Framework and how to assess to what extent they recognised the potential input and contributions from their target group to Disaster Risk Reduction (DRR), beyond looking after themselves. The insights of this exercise are fully described in D4.4 "RiskPACC Collaborative Framework".

The agenda of the 2nd KEE is given in Table 6.

22nd February - 2nd Knowledge Exchange Event		
Time	**Title**	**Presenter**
9:30 - 10:00	**Welcome - Registration**	
10:00 - 10:10	**Introduction to 2nd Knowledge Exchange Event**	Christina Gatsogianni, KEMEA
Session 1: CDP Case Study		
10:10 - 10:30	**CDP Case Study**	Giulia Canilli. Giovanni Vicentini, CDP
10:30 – 10:45	**Hermes app – CDP**	Pietro De Vito, STAM
10:45 – 11:00	**Thermal Comfort Tracker Tool - CDP**	Aulia Sukma, UT
11:00 – 11:10	**Coffee Break**	
11:20 – 12:10	**Discussion Session - CDP**	Christina Gatsogianni, KEMEA
Session 2: CAFO Case Study		
12:10 – 12:30	**CAFO Case Study**	Jakub Brumar, Lucie Sloukova, Pavel Wrana, CAFO
12:30 – 12:45	**Aeolian app – CAFO UC**	Chrysoula Papathanasiou, ICCS
12:45 – 13:00	**PublicSonar tool**	Jesse Manning, PublicSonar/CS
13:00 – 14:00	**Lunch break**	
14:00 – 15:20	**Discussion Session – CAFO + CDP**	Christina Gatsogianni, KEMEA
15:20 – 15:30	**Coffee Break**	
Session 3: Framework and conclusions		
15:30 – 17:00	**Framework Overview (2 sessions-45'x2)**	Femke Mulder, UCL
17:00 – 17:05	**Wrap-up Conclusions**	Christina Gatsogianni, KEMEA

TABLE 6: AGENDA – KEE #2

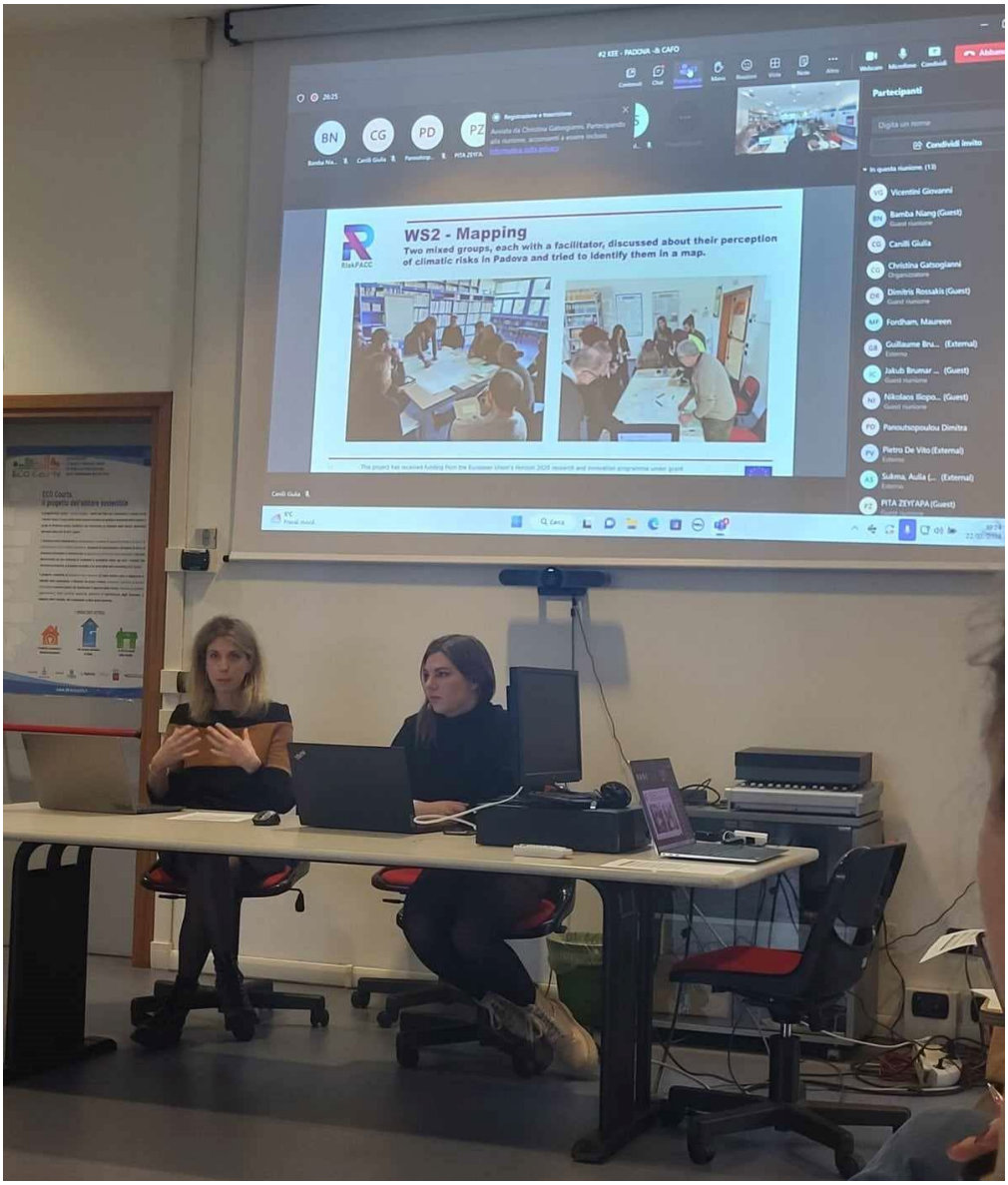

FIGURE 8: KEE# 2 – PRESENTANTIONS

FIGURE 9: KEE# 2 – DISCUSSION SESSIONS

3.2.2 ATTENDANCE

As well as the previous KEE, 28 people attended this event, 26 of them in person and only 2 remotely. 20 were RiskPACC partners, and 8 were part of the Efus cities network (Table 7).

28 participants total	Status	
	In-person	Remotely
	26	2
	Internal and external participants	
	RiskPACC	Efus cities
	20	8
	Gender	
	Female	Male
	16	12

TABLE 7: STATUS OF PARTICIPANTS – KEE #2

Participants, from France, Greece, Germany, Italy, Belgium, United Kingdom, Poland, Netherlands, Portugal and Czech Republic attended KEE #2. Unfortunately, representatives from the Israel case study were unable to attend. MRP case study partners were unable to attend in person in Padova, but they participated remotely.

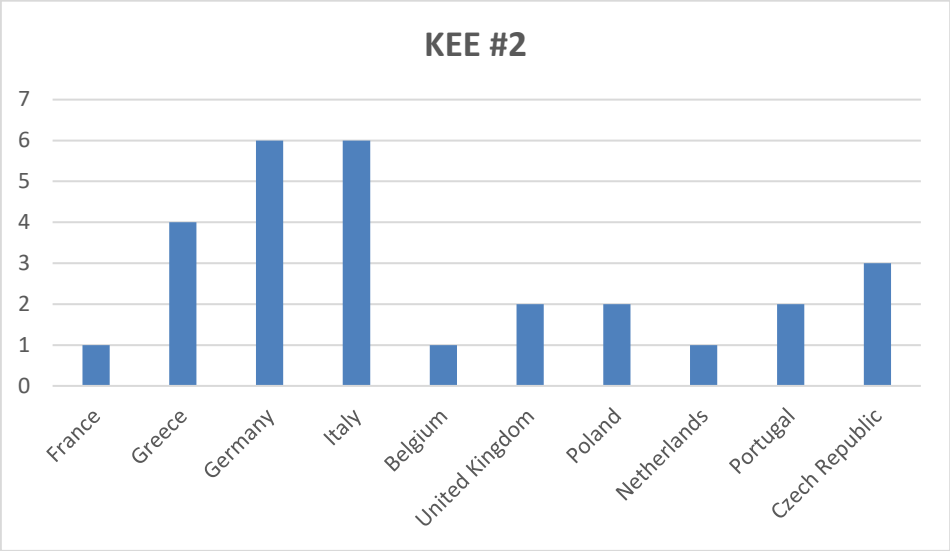

FIGURE 10: PARTICIPANTS' COUNTRY OF ORIGIN – KEE #2

3.3 KEE #3 - Rafina

The third and final KEE was held in Greece on the 22nd of May 2024, featuring MRP and MDA/MoE case studies.

3.3.1 REGISTRATION

The MRP case study consisted of four co-creation workshops, three of which focused on the project's conceptual and technological tools, while the fourth centred on an additional participatory mapping activity carried out with the assistance and leadership of UoW. The session began with the presentation of the key objectives and outcomes of the three co-creation workshops held in MRP. Next, the facilitator of the participatory

mapping activity discussed the benefits of the methodology tested and of the Volunteered Geographic Information (VGI) tools utilised in the additional workshop, as well as the primary outcomes of the activity.

Following this, the technological partner of UT showcased the features and outcomes of the MappingDamage tool. At this point, it should be mentioned that after the conclusion of the past co-creation workshops including the last testing of the tools, UT partners implemented critical enhancements to the MappingDamage tool to improve its user-friendliness and functionality. These improvements aim to close the mismatch between volunteers' self-assessments and the contributions perceived by the CPAs, which were highlighted in previous testing feedback. Consequently, the day before KEE #3, an additional workshop took place where MRP partners invited local volunteers to test the newly upgraded version of the tool under UT's guidance. UT's presentation therefore included insights and results from this latest iteration of the tool as well.

In the second session, MDA and MoE took the floor to present also their key workshop outcomes. Even though they had preliminary three co-creation workshops within Lab Phases I and II, a few days before KEE #3, they ran a supplementary workshop, focusing on volunteers' "citizens preparedness", also in view of the current war.

Next, ICCS implemented a demonstration of the Aeolian app in the area of Rafina, allowing participants to navigate into the close area, use the Augmented Reality (AR) technology and explore areas of interest.

The agenda of the 3rd KEE is given in Table 8.

22nd of May- 3rd Knowledge Exchange Event		
Time	**Title**	**Presenter**
9:30 - 10:00	**Welcome - Registration**	
10:00 - 10:10	**Introduction to the 3rd Knowledge Exchange Event**	Christina Gatsogianni, KEMEA
	Session 1: MRP Case Study	
10:10 - 10:30	**MRP Case Study**	Sophia Papageorgiou & Mimika Panoutsopoulou, MRP
10:30 – 10:45	**Participatory Mapping Activity**	Vangelis Pitidis, UoW
10:45 – 11:00	**MappingDamage Tool - CDP**	Aulia Sukma, UT
11:00 – 11:15	**Coffee Break**	
	Session 2: MDA/MoE Case Study	
11:15 – 11:35	**MDA/MoE Case Study**	Assad Admon, MoE Chaim Rafalowski, MDA
11:35 – 12:05	**Aeolian app – MRP demonstration**	Chrysoula Papathanasiou, ICCS
12:05 – 13:00	**Discussion Session – MRP & MoE/MDA**	Christina Gatsogianni, KEMEA
13:00 – 14:00	**Lunch break**	
	Session 3: Framework and conclusions	
14:00 – 15:20	**The Risk PACC framework- practical implementation flow map**	Christina Gatsogianni, KEMEA
15:20 – 15:40	**Coffee Break**	
15:40 – 16:50	**The Risk PACC framework- practical implementation flow map**	Christina Gatsogianni, KEMEA
16:50 – 17:00	**Wrap-up Conclusions**	Christina Gatsogianni, KEMEA

TABLE 8: AGENDA – KEE #3

FIGURE 11: KEE# 3 – DISCUSSION SESSIONS

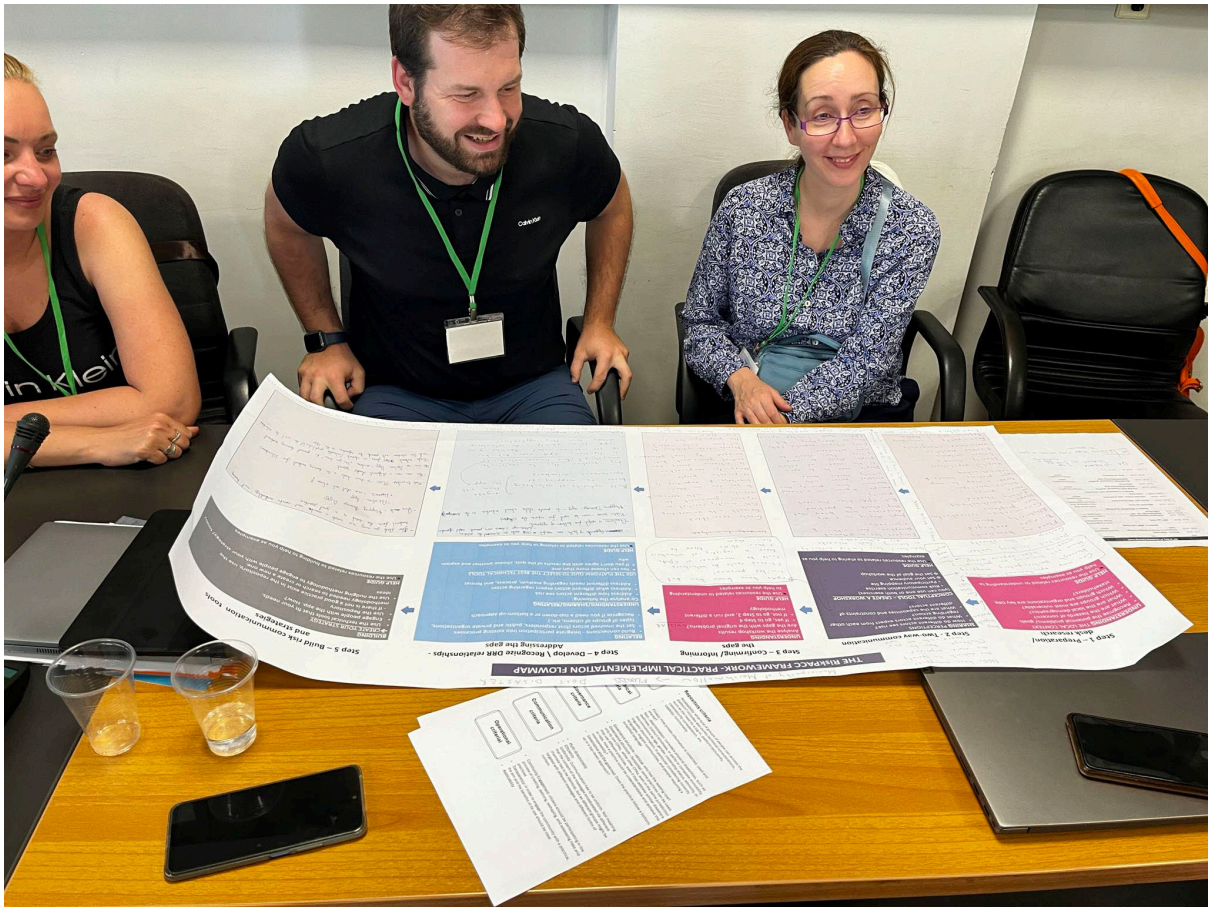

FIGURE 12: KEE# 3 – FRAMEWORK FLOWMAP

3.3.2 ATTENDANCE

A total of 28 people attended KEE #3, with 27 in person and only 1 attending remotely. Among the attendees, 24 were RiskPACC partners, while 4 represented the Efus cities (see Table 9). Notably, in addition to the participants from Portugal who had previously attended the earlier KEEs, this event marked the first participation for CPAs from the Municipality of Kalamaria (Greece).

28 participants total	Status	
	In-person	Remotely
	27	1
	Internal and external participants	
	RiskPACC	Efus cities
	24	4
	Gender	
	Female	Male
	18	10

TABLE 9: STATUS OF PARTICIPANTS – KEE #3

Participants from Greece, Germany, Italy, Belgium, the United Kingdom, the Netherlands, Portugal, the Czech Republic, and Israel attended KEE #3, which took place in Greece. This location provided an opportunity for more Greek partners to participate, including two CPAs from the Municipality of Kalamaria, representing Efus cities, including the Portuguese. However, in the same time frame, WP6 took up one

of their tasks and organised several Efus Cities workshops. Therefore, several partners who had participated in previous KEEs were unable to attend as there would have been too many business travels for the individual persons. This impacted their attendance at KEE #3.

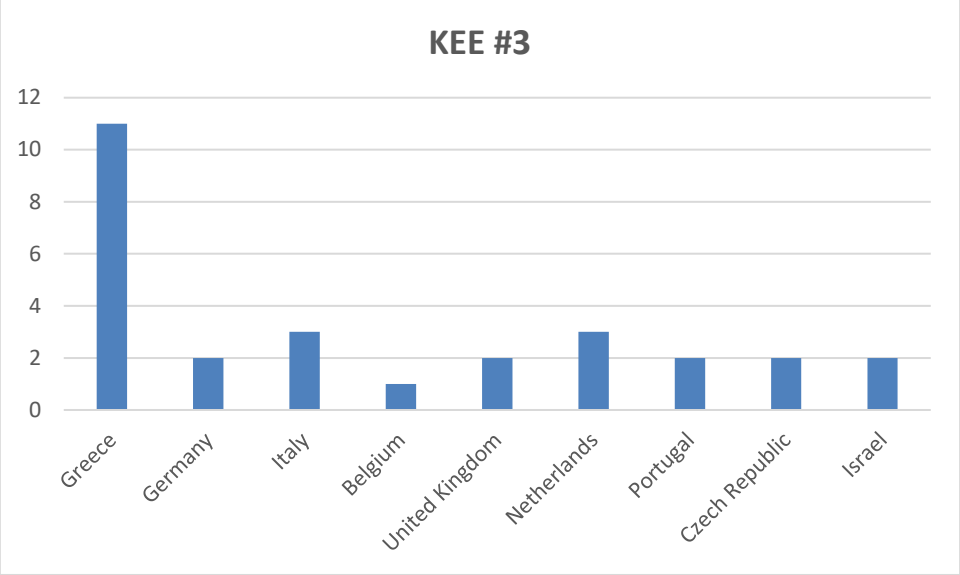

FIGURE 13: PARTICIPANTS' COUNTRY OF ORIGIN – KEE #3

4 CASE STUDIES KEY FINDINGS

This chapter will briefly highlight the key findings from the six case studies, ISAR, IBZ, CDP, CAFO, MRP and MDA/MoE, derived from the contributions provided by the case partners to the broader consortium within the KEEs.

4.1 ISAR

The key points of the ISAR case study are:

- **Hazard focus:** Global pandemic – the use of contact tracing/tracking apps during the Covid-19 pandemic
- **Target groups:** Citizens and CPAs
- **Technological tools:** PublicSonar
- **Conceptual tools:** Nudging

ISAR case study presented the objectives and the key outcomes from the three workshops of Lab Phases I and II. Its overall objectives are summarized as follows:

- Increasing the willingness to use different technologies (apps, social media platforms, etc.) for pandemic containment.
- Raising awareness of various aspects related to pandemic crisis management.
- Aligning with the Collaborative Framework and exploring the RPAG more in-depth.

- Identifying RPAGs between citizens and authorities related to tracking apps.
- Creating a structured platform for dialogue that encourages participants to share and discuss their diverse risk perceptions related to COVID-19.
- Identifying the most effective methods of risk communication to help citizens make informed and suitable decisions for risk reduction.
- Fostering co-design initiatives and building trust by collaborating on defined activities.

According to the ISAR findings, effective risk communication in order to be more effective, should:

- Be long-term sustainable independent of specific events or crises.
- Emphasize prevention measures and strategies.
- Use diverse communication channels to reach a broader audience.
- Foster confidence and trust.
- Be credible by ensuring that the information is reliable and trustworthy.
- Be tailored and oriented to different target groups to meet their different needs and interests.
- Encourage dialogue and promote an open exchange of information and ideas.
- Be transparent.

The main outcomes from the workshops were:

- There was significant interest in assessing pandemic risk communication strategies employed by local authorities and government agencies.
- The implementation of tracking apps was recognised as a valuable asset in enhancing pandemic response efforts.
- The concept of nudging was highlighted as a way to create incentives, with the technological possibility of encouraging vaccinations through the contact tracing application.
- Utilising sentiment analysis through the PublicSonar platform was identified as an effective method for evaluating offers specific to various authorities.

Lastly, the key challenges they have faced were:

- Recruiting participants.
- Ensuring gender balance.
- Integrating participatory exercises (e.g., participatory mapping).

4.2 IBZ

The key points of the IBZ case study are:

- **Hazard focus:** Multi-hazard
- **Target groups:** Primary school teachers & children (age 6-12)
- **Technological tools:** -
- **Conceptual tools:** Participatory mapping, use of IBZ's BE-Ready material

The Overall Objectives of the IBZ case study are summarized as follows:

- Assess the effectiveness of a preventive information campaign, featuring an educational package designed for primary school children in Belgium, known as BE-Ready (the focal tool in this case study).
- Analyse the influence of this educational resource on children's resilience and behaviour and identify ways to enhance and customize it to better meet current needs.

The main conclusions about the training materials for children are as follows:

- It is essential to ensure that all materials and games are designed to be accessible and inclusive for children and their parents. This includes taking different learning needs and backgrounds into account.
- The use of technology and gamification techniques is essential to actively engage children and improve memory retention.
- Activities or homework assignments should be created to encourage parental involvement and to stimulate discussions about risk and safety at home. This fosters a collaborative learning environment between children and their parents.
- All materials must be tailored to the age and intellectual levels of the children, ensuring that both content and format are suitable for them to understand.
- The development of training materials should include input from all relevant stakeholders, including teachers, parents, and experts, to ensure relevance and effectiveness.
- The teaching package should address a broader range of topics and hazards, such as disinformation, allowing for a more comprehensive educational experience.
- The tools and resources should fulfill the criteria of accessibility and inclusivity, not only for children and parents but also for teachers.

Overall, a holistic approach that incorporates these elements will enhance the effectiveness of educational materials and ensure a positive learning experience for children and their families.

Lastly, the main challenges during the preparation and implementation of the IBZ workshops were:

- Recruiting participants.
- Small group of participants (Lab phase I and second workshop Lab phase II).
- Dealing with ‘dominant’ participants.

4.3 CDP

The key points of the CDP case study are:

- **Hazard focus:** Flooding, droughts, heatwaves, mosquito infestations and infectious diseases; focus on climate change
- **Target groups:** General citizens
- **Technological tools:** PublicSonar, Hermes, Thermal Comfort Tracker
- **Conceptual tools:** Participatory mapping, Risk communication exercise

The main objectives of the CDP case study included the following:

- Exploration of local climate-related hazards and how the community perceives these risks.
- Investigating the role of CPAs; identifying their responsibilities and functions in addressing climate change.
- Insights into communication channels among different actors during crises.
- Assessment of current resources, and suggestions for new tools and innovations to enhance response capabilities and self-protection.

As presented by the CDP case study owners, within the discussion held in their workshops, they tried to identify the gaps and the different stakeholder's roles in the communication flow within the Municipality of Padova during the stages of prevision, prevention, rescue and overcoming the emergency. Their current communication seems to be one-way as represented in Figure 14.

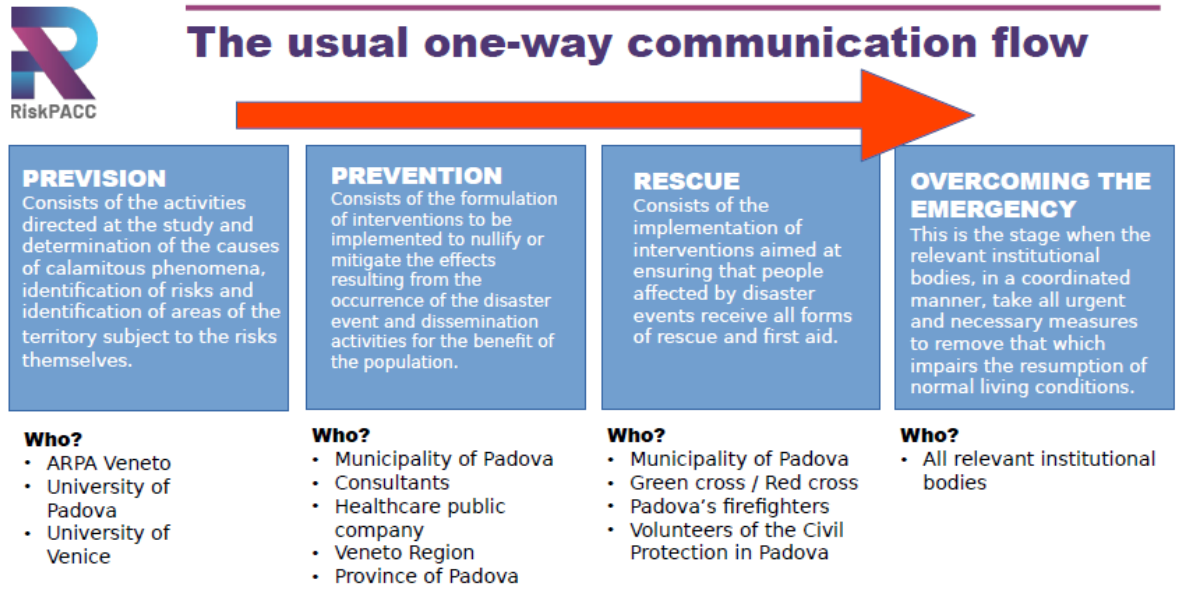

FIGURE 14: THE CURRENT COMMUNICATION FLOW IN CDP

As concluded, the main gaps that have been identified regarding the role of citizens, are:

- Limited participation in the prevention phase.
- Different approaches to responding to emergencies.
- Inefficient and fragmented communication flow.

After testing the RiskPACC technological tools, they have concluded that they could be useful and supportive enough to enhance two-way communication in the DRM as follows:

- In the prevision phase, all three tools can be useful:

- Hermes: Provides publications and bulletins to keep CPAs and citizens informed.
- Thermal Comfort: Conducts analyses and maps urban heat islands (UHI) to identify areas of concern.
- PublicSonar: Offers historical trend analysis to understand patterns and inform prevention strategies.

➢ In the prevention phase:
- Hermes: Offers guidelines and practical information kits to aid in disaster preparedness.
- Thermal Comfort: Highlights hotspots in urban areas that should be avoided by vulnerable populations and suggests redesign strategies for public spaces to mitigate UHI effects.

➢ In the rescue phase:
- Hermes: Features chat functionality for real-time information about ongoing events, facilitating bilateral communication.
- PublicSonar: Allows the collection of citizen feedback on current events via social media, providing detailed, site-specific information.

➢ Overcoming the emergency phase:
- Hermes: Continues to utilise chat functionality to disseminate information about damage that has occurred during emergencies.
- PublicSonar: Gathers input from citizens on damage through social media, improving understanding of impact and needs during recovery.

Overall, these applications provide a comprehensive approach to disaster management through information dissemination, real-time communication, and community engagement, enhancing both preventative measures and response efforts.

4.4 CAFO

The key points of the CAFO case study are:

- **Hazard focus:** Leakage of CBRN – any other specific risk
- **Target groups:** Citizens and CPAs
- **Technological tools:** Aeolian app, PublicSonar app
- **Conceptual tools:** Participatory mapping, Risk communication exercise

The objectives of the CAFO case study are summarized as follows:

- Assess citizens' awareness of emergency events and risk management strategies.
- Identify ways to improve interactions between CPAs and citizens.
- Explore the potential for using modern technologies, such as apps and social media platforms, to close the RPAG.
- Implement RiskPACC techniques to facilitate two-way communication.
- Align the Framework and conduct a more in-depth exploration of RPAG.

The main conclusions of the CAFO case study are bulleting in the following:

➢ There was a strong eagerness for open dialogue between CPAs and citizens.

- There is a high level of trust in local authorities and government agencies, particularly during emergencies.
- The experience gained and the effective communication techniques developed through RiskPACC, have proven to be extremely valuable.
- The Aeolian app and PublicSonar show significant promise and could serve as effective tools to bridge the RPAG.

Lastly, the main challenges during the preparation and implementation of the CAFO workshops were:

- Gender balance.
- Achievement in testing the tools.

4.5 MRP

The key points of the MRP case study are:

- **Hazard focus:** Forest fires, flooding
- **Target groups:** Elderly population, young children, volunteers, general citizens, CPAs
- **Technological tools:** Aeolian app, MappingDamage tool
- **Conceptual tools:** Participatory mapping, Risk communication exercise

The overall objectives of the MRP case study are summarized as follows:

- Assess the current State of the Art and improve awareness and risk perception in relation to forest fires and floods.
- Address the relationship of vulnerability patterns between forest and urban interfaces, known as wildland-urban interfaces (WUI).
- Investigate the interconnection between the impacts of forest fires and the risk of flooding.
- Raise awareness among citizens and CPAs.
- Enhance communication between CPAs and citizens before and during hazardous events.
- Strengthen voluntary institutions.
- Improve evacuation planning and communication of the respective routes, through the use of VGI.

The main results of the MRP workshops are briefly presented as follows:

- The tragedy that marked the area, has demonstrated the communications and RPAG between citizens and CPAs, increasing the awareness among citizens.
- Special educational/training programs should be designed and implemented.
- There should be dynamic evacuation plans.
- Building trust relationships between CPAs and citizens is vital.
- Building a risk communication system where the information provided will be short and clear for all citizens is important.

The contribution of the conceptual tools is essential to:

- Bring up the importance of risk communication between CPAs and citizens.
- Help to understand and bridge the existing gaps in local society.

- Building trust with the local society.
- Inspiring the local community.

The contribution of the technological tools that have been tested in the MRP case study can facilitate to:

- Improve communication between citizens and CPAs, and citizens with each other.
- Increase citizen participation in the pre-planning phase.
- Educate local communities to better organize themselves in case of emergencies.

4.6 MDA/MoE

The key points of MDA/MoE case study are:

- **Hazard focus:** Earthquakes
- **Target groups:** Associated volunteers of MoE and MDA
- **Technological tools:** Aeolian app, Hermes tool
- **Conceptual tools:** Participatory mapping, Risk communication exercise

The objectives of the MDA/MoE workshops were:

- Identifying the roles of citizens, volunteers and CPAs in preparation for an earthquake.
- Investigate RPAG between expected and actual planning and preparedness actions of CPA volunteers and barriers to these actions.

The overall conclusions can be summarised as follows:

- It is crucial to train and educate the families of volunteers so that they can respond quickly and effectively in case of an earthquake.
- The way in which messages are communicated plays a crucial role in encouraging volunteers to take proactive steps in earthquake preparedness.
- Many “citizen preparedness campaigns” rely primarily on fear, which is why they often fall short.
- Effective campaigns use incentives, positive messages and empowerment, and the creation of “social norms”.
- It is essential to minimize the burdens associated with preparedness efforts.
- Preparedness should evoke positive feelings, especially when children are involved.
- The role of “influencers” in shaping attitudes toward preparedness cannot be underestimated.
- Preparedness linked to an “imminent threat” tends to spur only short-term action.
- There is a widespread tendency to see public authorities as having the primary responsibility for individuals.

5 DISCUSSION SESSIONS

This chapter contains the main analysis of the discussion sessions held within the KEEs. Instead of presenting answers to each question individually, a comprehensive analysis is provided to help the reader gain a deeper understanding of the tools' capabilities and the innovative solutions proposed by the participants.

5.1 Design of groups

For the discussion sessions, participants were organized into groups of 6-7 individuals.

In KEE #1, groups were primarily categorised by country and language resulting in four distinct groups during the initial discussions of the findings presented in the ISAR case study. In the case of IBZ, three groups were formed due to the necessity for some partners to leave for professional commitments.

In KEE #2, four randomly mixed groups were created to facilitate discussions for both case studies, CAFO and CDP. Additionally, one group consisting of two participants joined remotely.

In KEE #3, four groups were formed focused on the specific hazards concerning each group's expertise.

A series of questionnaires, as presented in subchapter 5.3. following, and time was allocated for them to discuss among themselves and formulate their answers to the questions posed. Each group chose a notetaker in order to fill in the answers and to guide the discussion when needed. After the discussions among the groups were established, representatives from each group presented their findings to the whole assembly.

5.2 Content of analysis

Throughout the discussions and subsequent analysis of the responses, no significant differences were observed based on how the groups were categorised. Instead, the results appeared to be closely linked to the participants' professional backgrounds and personal experiences.

In several instances, particularly concerning the evaluation of technological tools, groups demonstrated remarkable coherence in their opinions. However, when it came to assessing conceptual tools and exploring methods beyond the RiskPACC project, some differences were noticed not in different directions, but with each group's input complementing the others, collectively providing a well-rounded perspective on the issues examined.

Furthermore, many responses gathered from different questions or even from different KEEs yielded similar, if not identical, results. To avoid producing an overly lengthy document that would address each question in isolation, followed by a repetitive analysis that could confuse readers about which are the final key findings of the

exchange of knowledge, a collective evaluation of all tools and solutions of all KEEs has been opted.

Concluding, in sub-chapter 5.4, this thorough analysis contains:

- Suggestions for the workshops' improvements.
- The main strengths, weaknesses and recommendations for improvement of the conceptual and technological tools
- Methods and approaches inside and outside RiskPACC to improve interactions with different audiences, and to enhance awareness and preparedness.
- Recommendations for CPAs on how to develop training material for children.

5.3 Questions

Following, the questionnaires given in the discussion sessions are presented.

5.3.1 KEE #1

ISAR

1. What did you find interesting about the adapted risk communication exercise that was used in the workshop?
2. What would you do differently during the preparation of the workshops to overcome the challenges that came up?
3. What was your impression of the nudging tool tested in the workshop? Did you find it useful? For what kind of scenarios could nudging be useful, from your point of view?
4. In your opinion, in what way was the app (PublicSonar) useful or not useful in addressing the pandemic as a hazard? What improvements would you suggest for the future?
5. Would you use the PublicSonar app for a future hazard? How could the tool be adjusted to better fit your needs?
6. What other approaches/tools/methods beyond the RiskPACC project could be used to improve people's awareness and preparation?
7. What would you suggest in order to improve the interaction between CPAs and citizens in case of a pandemic?

IBZ

1. What did you find interesting about the participatory mapping exercise that was tested during the workshop? In your opinion, do you think that it provided interesting results?
2. What would you do differently during the preparation of the workshops to overcome the challenges that came up?
3. What was your impression of the methodologies used for children in order to increase their preparedness and awareness? What did you find useful/not useful/appropriate?
4. Did you find the participatory mapping exercise appropriate to use for exploring the risks faced by children? What did you like and what you did not like about it? How could you adjust the participatory mapping to be tailored for children?

5. Do you have any advice on future improvements regarding the implementation of a co-creation workshop for children?
6. Are you familiar with any training material used for children? If yes, explain.
7. What other approaches/tools/methods beyond the RiskPACC project could be used to improve children's awareness and preparation?
8. How would you design training materials for CPAs on how they should communicate risk to children? (e.g. regarding their efforts, methods, media)

5.3.2 KEE #2

CAFO

1. In your opinion, in what way was the app (Aeolian) useful or not useful in enhancing preparedness and response in a hazard? What improvements would you suggest for the future?
2. In your opinion, how could the Aeolian app achieve a common risk communication amongst CPAs?

CDP

1. In your opinion, in what way was the app (Hermes) useful or not useful in enhancing preparedness and response in a hazard? What improvements would you suggest for the future?
2. In your opinion, how the CPAs could explore the functionalities of the Hermes app to achieve two-way communication with the public?
3. What would you suggest for the CPAs to do in order to engage citizens with the Hermes app?
4. In your opinion, in what way was the app (Thermal Comfort Tracker tool) useful or not useful in enhancing preparedness and response in a hazard? What improvements would you suggest for the future?

CDP AND CAFO

1. What did you find interesting about the participatory mapping exercise that was tested during the workshop of CDP and what in the workshops of CAFO? In your opinion, do you think that it provided interesting results?
2. What did you find interesting about the risk communication exercise that was tested during the workshop of CDP and what in the workshops of CAFO? In your opinion, do you think that it provided interesting results?
3. In your opinion, in what way was the app (PublicSonar) useful or not useful in addressing the hazards in the workshop of CDP and what way in the workshop of CAFO? Do you notice any differences? What improvements would you suggest for the future?
4. In what ways do you think the sentiment analysis tool would help to notify the authorities?
5. In what ways do you think the sentiment analysis tool would help establish a two-way communication flow between citizens and CPAs?

6. What other approaches/tools/methods beyond the RiskPACC project could be used to improve vulnerable groups' awareness and preparation (elderly, people with disabilities, immigrants, women, people hard to reach)?
7. What would you suggest in order to improve the interaction between CPAs and citizens in case of a hazard?

5.3.3 KEE #3

1. In what cases would you consider the use of a VGI tool?
2. In your opinion, in what way is the app (MappingDamage tool) useful in enhancing preparedness and response in a hazard? What improvements would you suggest for the future? What else would you like to see in it?
3. What would you suggest in order to improve the interaction between CPAs and volunteers in case of a disaster? How would you enhance the involvement and engagement of local citizens?

5.4 Analysis

5.4.1 Workshop Improvement

In order to address the challenges that came up in the co-creation workshops, related to the limited number of participants, achieving gender balance, effectively integrating exercises, and managing dominant personalities, the following key recommendations are proposed:

- **Prioritise communication**: Prioritising in-person meetings over technological tools can enhance communication and reduce potential technical issues. Additionally, employing a translator can ensure clear communication among participants, accommodate linguistic diversity and facilitate understanding.
- **Advanced planning**: Ensuring workshop invitations are sent 1-3 weeks in advance and then following them up with phone calls to reduce last-minute cancellations, ensures that participants reserve the date on their calendars and feel more invested in attending.
- **Enhance preparation time**: Estimating more time for comprehensive planning and coordination of resources, such as defining roles, setting responsibilities, and preparing the materials needed, will increase the likelihood of a well-executed workshop.
- **Build security culture**: Adopting a community approach by creating a safer environment for participants, similar to initiatives such as COVID-19 vaccinations, can create a sense of shared responsibility among participants, fostering greater engagement and participation.
- **Tailored outreach**: Recognising and addressing the specific interests and needs of pre-defined target groups will ensure that the workshop content resonates and engages a diverse range of participants. This tailored approach can enhance relevance and participation.
- **Structured participation guidelines**: Implementing clear and structured guidelines can facilitate discussions and prevent dominant voices from overshadowing others, ensuring that all participants have equal opportunity to contribute to discussions.

- **Diversity and inclusivity**: Targeted outreach to under-represented groups is essential to achieving diversity. Using personal contacts for invitations can lead to more inclusive participation.
- **Comprehensive orientation and sufficient communication**: The schedule of the workshop has to be arranged in a way such as to provide ample time for participant orientation and familiarisation with workshop objectives in order to enhance understanding.
- **Resource alignment**: Ensuring that all needed resources and personnel are sufficient for the seamless implementation of the workshop.
- **Regular engagement**: Sending newsletters and allowing participants to contribute to topics and comments, fosters ongoing engagement and collaboration. This facilitates keeping participants more interested in the workshops' topics.

By focusing on these key areas, communication, planning, inclusivity, and resource management, the challenges of preparing and delivering workshops can be effectively overcome, resulting in a more enriching and impactful experience for all participants.

As introduced by the IBZ case study, there was a lot of discussion about how CPAs can communicate directly with children. In this context, it was discussed what aspects a co-creation workshop should satisfy in order to be tailored to children. Some suggestions from the participants are summarised below:

- **Involvement of families**: Engage parents and grandparents in the workshops fosters a supportive environment and enhances participation.
- **Integration of school council**: Organise workshops during school council meetings to encourage wider involvement.
- **Gamification**: Incorporate a gamification approach that involves both adults and children, introducing elements of friendly competition. For example, schools could compete for the title of "best prepared" in civil protection themes, with points and prizes awarded. In addition, utilising digital tools, such as Sim City, to provide interactive learning experiences that explore risks and responses, makes the workshops more engaging.
- **Field trips**: Make workshops more interactive by planning field trips to allow children to experience potential risks first-hand in relevant locations, to facilitate getting a deeper understanding of the risks they may face.
- **Mapping exercises**: For children aged 9-10 years and older, conducting smaller-scale mapping exercises focused on their daily school routes, will facilitate maintaining the activities feasible and relatable while fostering a sense of personal responsibility for their safety.

By implementing these recommendations, CPAs, educators and communication professionals can create more effective and engaging co-creation workshops, helping young children understand and prepare for potential risks in a collaborative manner.

5.4.2 CONCEPTUAL TOOLS

5.4.2.1 VGI TOOLS

VGI tools, such as OpenStreetMap (OSM) are dynamic tools, that can, through a chain of volunteers, map areas under a common purpose. The main strengths of such tools are summarised below:

+ **Integration of local knowledge**: VGI tools enable the incorporation of local knowledge, which is critical for effective risk identification and damage mapping, sometimes by providing insights that may not be captured by traditional data sources.
+ **Flexibility and utility**: VGI tools can be used in various use cases from simple mapping tasks to complex analysis, such as damage assessment, resource identification, preparedness activities, and identification of vulnerability areas and groups.
+ **Community engagement**: VGI tools promote citizens' engagement and encourage them to participate in mapping projects, building a sense of community and empowering individuals.
+ **Cost-effective**: Using volunteers to collect data, making it a financially viable option for many community-based projects.
+ **Real-time updates**: With ongoing contributions from volunteers, VGI tools can provide real-time or near-real-time information that is crucial in disaster preparedness and recovery phases.

Although VGI tools are considered revolutionary, they present some weaknesses which are summarized below:

– **Data reliability and validity**: The quality and accuracy of the data collected can vary significantly. Uncertified volunteer data may lack the necessary validation and may not meet the standards required for official use. These tools are more effective in supporting others by integrating the appropriate information, not working as stand-alone tools.
– **Dependency on local knowledge**: Successful mapping often requires knowledge of the local environment, which makes it difficult for people who are not familiar with an area to provide the appropriate data.
– **Possibility of information overload**: Numerous volunteers submitting data can lead to an overwhelming amount of information, making it difficult for authorities to filter and use it effectively.
– **Miscommunication of CPAs' data needs**: There is a risk for volunteers to provide irrelevant or unwanted information when CPAs do not communicate clearly what their data needs are. CPAs should not assume that these types of applications will help them overcome their problems.
– **Limited utility for national authorities**: While VGI can be efficient and valuable at the local level, its utility may be limited at larger national levels.

As asked the participants to consider the use of the VGI tools, they shared the following recommendations for VGI tools:

- **Implement training programs for volunteers**: Establishing training programs to educate volunteers about their roles, best practices for data collection, and the objectives of the mapping tasks ensures that volunteers will understand the local context and the specific needs of CPAs, which, following, can improve the quality of data. This can further lead to sustainable engagement with volunteers.
- **Establish clear guidelines and standards**: Developing clear guidelines for data submission, including criteria for what constitutes valuable information, will help volunteers understand the CPAs' needs and reduce irrelevant contributions.
- **Incorporate a verification process**: Implementing a verification process, possibly by certified local experts or partnerships with local authorities to validate the submitted data can enhance the credibility of the information collected.
- **Utilising multiple data sources**: Integrating the VGI data with other formal sources (e.g., governmental data, expert analyses) to achieve comprehensive assessments, can facilitate providing a clearer picture for risk identification and post-disaster recovery.
- **Enhance user-friendly interfaces**: By developing intuitive and accessible interfaces for VGI tools, it can maximize participation from diverse communities.
- **Recognise volunteer contributions**: Implementing incentive programs or recognition initiatives for volunteers to thank them for their efforts, will encourage engagement and boost morale, making volunteers feel more important.

By focusing on these strengths and addressing the weaknesses while following these recommendations, VGI tools can be better positioned to support local communities in disaster preparedness, recovery, and civic engagement.

5.4.2.2 Participatory Mapping Exercise

The participatory mapping exercise, or else titled in the project "participatory mapping lite exercise" served as an ice-breaking activity, facilitating engaging discussions during the workshops and providing valuable insights for the CPAs or the communicator professionals. The activity highlighted the vulnerabilities of different areas and fostered greater awareness among diverse social groups. Each case study owner adapted the exercise to their specific need, and presented the main findings in the KEEs, allowing participants to discuss how they could further explore the potential of these exercises. They identified several key points, such as:

+ **Improving engagement**: The participatory mapping exercise effectively engages participants by fostering a collaborative environment that encourages interaction and dialogue among the participants.
+ **Facilitating the identification of risks**: It allows participants to identify areas vulnerable to various risks, providing a comprehensive overview of local challenges.

+ **Diverse perspectives**: It facilitates sharing perspectives from different groups regarding risk assessment and preparedness. For instance, the IBZ case study exercise revealed that CPAs concentrated on emergency preparation while teachers concentrated on the students.
+ **Valuable insights**: By narrowing the focus to smaller geographic areas, participants can produce more useful insights, such as the case study of CAFO, where a higher number of hazards were identified.
+ **Adaptability for different age groups**: The exercise can be modified to accommodate a range of participant ages, including children of various ages.
+ **Skill development**: By learning about and using mapping tools, the activity helps citizens, even older kids, develop their spatial awareness and emergency preparedness skills.

Respectively, they have identified the following weak points:

– **Variability in geographical scale**: When stakeholders fail to provide similar geographic scales of similar weight, might result in inconsistent findings and impede comprehensive comprehension, which makes it challenging to successfully synthesise findings.
– **Limited utility for younger participants**: Younger children may struggle to retain information and understand complex concepts, which could reduce the mapping exercise's usefulness for them.
– **Facilitation challenges**: To guarantee that every voice is heard and to steer conversations in the right direction, effective facilitation is necessary, which may call for specialised training or experience on the part of facilitators.

To overcome the weaknesses of the participatory mapping exercise, and in order to increase its usefulness, participants recommended the following:

➢ **Standardise geographic scope and areas**: Establishing clear guidelines on the geographic scale of mapping exercises, would help participants to focus on smaller, more manageable areas to gain more actionable insights.
➢ **Use tailor engagement techniques and tools**: Developing age-appropriate mapping techniques that resonate with younger children, such as game-oriented approaches, or utilising tools like Google Maps, Street View, and timeline features related to their daily lives, can further facilitate engagement with children from different age groups.
➢ **Ensure representation of different target groups**: Make sure vulnerable populations participate in mapping activities so that risk assessments also consider their particular problems and experiences.
➢ **Training for facilitators**: Provide facilitators with training and guidelines to successfully guide CPAs, equipping them with tools, materials, and tricks to lead discussions and engage diverse groups.
➢ **Incorporate technology**: Including user-friendly digital tools and additional resources (such as demonstrations or tutorials) helps participants become familiar with mapping tools without feeling overwhelmed.

- **Conduct follow-up sessions**: The conduction of follow-up sessions to delve deeper into the hazards that have been identified and to create detailed action plans based on the lessons learned, guarantees ongoing participation and use of the exercise outcomes.
- **Create feedback mechanisms**: For improving future mapping exercises, implementing a post-exercise feedback mechanism to collect participants' reflections on what worked well and what could be improved could be useful.

The participatory mapping exercise is a valuable tool in CPAs' hands, as it facilitates gaining insights into the audience's perception of risks and their actions. Although the exercise seems very effective when used for adults, there is a big question mark if is the best fit for exploring risks faced by children, and if yes, what age group can benefit from these kinds of exercises.

5.4.2.3 Risk Communication Exercise

The risk communication exercise gained positive reviews from the participants' perceptions, enabling them to increase their engagement in the workshops, bringing them closer to the core concepts of RiskPACC and helping them to understand the RPAG. The most important aspects they highlighted are:

+ **Is a solution-oriented approach**: The activity successfully encouraged a proactive approach in participants by emphasising finding solutions rather than just pointing out problems. This is crucial for fostering a collaborative environment.
+ **Builds empathy**: Encouraging participants to comprehend the perspectives of others enhanced their empathy, a vital competency for proficient risk communication that successfully helps to address the needs of different stakeholders. Although the psychological components of communication have been briefly discussed, a more in-depth examination of the feelings associated with risk perception could help to better understand the fears and concerns of the community.
+ **Integrates theory and practice**: By tailoring the exercise to the fundamental ideas of RiskPACC and RPAG, participants would be able to use their theoretical knowledge in a real-world setting, which will improve their learning.
+ **Ability to utilise visual tools**: The use of images, cartoons, and visuals to explain complex ideas such as nudging, like in the ISAR case study, made the content more accessible and engaging. This aligns with the principle that visual aids can significantly enhance understanding.
+ **Acknowledges diverse communication preferences**: The exercise recognised that different stakeholders have varied communication preferences, underscoring the significance of customised strategies for successful engagement.
+ **Focuses on trust and two-way communication**: Emphasising the importance of trust and building channels for two-way communication showcased a deep understanding of the dynamics in risk communication.

Although participants highlighted the usefulness of the risk communication exercise, they also highlighted aspects that could significantly improve its usefulness.

- **Incorporate collaborative tool development**: Adding a session where participants would co-create a communication tool that can be used in real-world scenarios, could stimulate creative thinking and collaborative resource ownership.
- **Address trust concerns**: Developing additional strategies to build trust, particularly in communities with historical distrust in governmental entities, such as community engagement practices that prioritise transparency and accountability, could improve the exercise's results.
- **Enhance emotional engagement**: Introduce sessions focused on the emotional aspects of risk communication, providing training on how to manage fears and concerns that may arise during disasters or crises.
- **Feedback mechanism**: Establish a feedback mechanism that allows participants to voice their concerns and insights after the implementation of the exercise. This could help in improving future workshops.
- **Crisis simulation**: Incorporating a crisis simulation exercise within the workshop to allow participants to practice communication strategies in a controlled but realistic environment, improves their readiness for real-life applications.

In summary, the adapted risk communication exercise not only engaged participants in a meaningful way but also advanced their understanding of complex frameworks and theories and helped them to understand the risk perspectives of different stakeholders. Continued emphasis on collaborative tool development and the use of varied communication strategies could further enhance the effectiveness of future workshops, ultimately leading to improved risk communication practices.

5.4.2.4 Nudging

Participants had the chance to understand the functionalities of the nudging tool when presented in the ISAR case study. They found it useful enough by mentioning the following strength points:

+ **Targeted approach**: Nudging can effectively influence individuals to an open message or policy making it a useful tool for specific target groups. Its effectiveness depends on a large degree of the target audience. For example, in the ISAR case study, it was said, that it can be particularly beneficial for individuals who are supportive of vaccines, but it may be less effective for those who are strongly opposed. Understanding audience attitudes to vaccination is therefore critical to the successful implementation of nudging strategies. So, by tailoring messages to those who are not strongly opposed to a topic, the nudging tool can enhance engagement and increase the likelihood of positive outcomes.
+ **Increases engagement**: The nudging tool encourages meaningful discussions and promotes cognitive engagement among participants, leading to a deeper understanding of the topic.

- **Simplicity and accessibility**: The nudging tool emphasises clear and concise communication, opening up information to a wide audience and speeding up decision-making.
- **Scalability to reach various audiences**: The tool's ability to influence large groups simultaneously, makes it applicable in various contexts, such as public health campaigns and emergency response strategies.
- **Incorporation of storytelling**: The use of storytelling techniques, especially those that leverage humour and symbols, can help to alleviate negativity and pressure in discussions.

To improve its effectiveness and even reach people who have strong beliefs against the core campaign of the nudging tool, they recommended the following:

- **Tailor messaging for diverse audiences**: Developing separate tailored nudging strategies for different audience groups, especially those with different attitudes towards the core nudging message, could increase the tool's effectiveness among those who may require more persuasive approaches.
- **Incorporate emotional appeals**: Improve the tool by integrating stronger emotional appeals alongside rational arguments, in order to reach individuals who might be indifferent or resistant.
- **Implement evaluation measures**: In order to assess the true impact of the nudging strategies, there is a need for quantitative measurement techniques. Establishing a comprehensive evaluation framework that includes both qualitative and quantitative measures, such as pre- and post-intervention surveys, general opinion questionnaires and, in the case of ISAR, tracking the numbers of vaccinated individuals, could be helpful.
- **Utilise storytelling**: Expanding the use of storytelling techniques within the nudging framework leads to more compelling and relatable communication.
- **Train DRR professionals**: To make emergency response teams more capable of handling a crisis, make sure they receive training on the appropriate application of nudging, especially for prevention measures.
- **Utility in the pre-disaster phase**: Employing nudging strategies before emergencies occur, could potentially improve response mechanisms.

In conclusion, while nudging tools hold great promise for influencing behaviour towards vaccination and other public health initiatives, their success depends on the selection of the target audience, measurement of outcomes, clear communication, and adaptation of strategies to specific cultural and contextual needs.

5.4.2.5 IBZ Be -Ready-training material

The methodologies used for children in the IBZ case study to enhance their preparedness and awareness left a positive impression providing interesting results. The engaging methods and the age-appropriate training materials are aspects that were identified by the participants as the most useful. More detailed, the methodologies used were considered useful since included the following:

- **Contain engaging methodologies**: The use of games and quizzes, helps in enhancing children's interest and makes the learning process more enjoyable.
- **Age-appropriate content**: The materials provided are suitable for a wide age range of children.
- **Providing instructions**: Clear guidelines were provided to teachers that facilitated the effective implementation of the exercises.
- **Sharing positive formulations**: The use of encouraging words and statements, facilitating in enhancing motivation and engagement while fostering a pleasant learning atmosphere.
- **Parental involvement**: Integrating the training with community events (such as a marathon) encourages parental involvement and further enriches the learning experience for children.

Furthermore, they recommended also some improvements that could help in making these materials more engaging and efficient.

- **Developing more age-appropriate materials**: Develop additional materials or modify existing also for older children.
- **Translation – accessibility improvement**: Translating the materials into multiple languages will expand their accessibility and will make them usable in different cultural and linguistic contexts.
- **Feedback loop**: Creating a mechanism that collects continuous feedback from both children and teachers, would facilitate the ongoing improvement of the training materials.
- **Parental engagement**: Involving parents in more learning processes, like workshops, informational sessions, or relevant events, would enhance the learning process.
- **Enhance integration**: The BE-Ready training game and quiz methodologies should be embedded into RiskPACC 's tools, in order to create a more coherent training experience.

By addressing these recommendations, the training materials can further enhance their impact on disaster preparedness education for children.

5.4.3 TECHNOLOGICAL TOOLS

5.4.3.1 Aeolian app

The Aeolian app, tested in three case studies allowed participants to get a more holistic idea of its functionalities and usefulness. From the discussions held, participants highlighted the following as the most significant key strength points of the tool:

- **Supports bilateral communication**: The app supports two-way communication, allowing users to engage in meaningful conversations that can facilitate better understanding and coordination during emergencies.
- **Increased awareness:** The app successfully raises awareness of hazards and disaster preparedness among citizens.

+ **Training opportunities:** Offers a range of training modules designed to enhance users' preparedness and response skills, ensuring they are well-equipped in case of an emergency.
+ **Gamification:** Incorporates elements of gamification that effectively engage younger audiences and motivate them to participate in emergency preparedness activities.
+ **Reporting portal:** Serves as a platform for community involvement in hazard awareness, by allowing users to report incidents.

Regarding its weaknesses, participants spotted the following:

– **User interface**: The app's current design is not intuitive, which could frustrate users and limit its effectiveness in emergencies.
– **Social acceptance**: Concerns about social acceptance and the potential risk to citizens must be addressed to foster trust and enhance app usage.
– **Lack of specific training**: Current training uploaded to the app may not address the different roles of different CPAs, leading to inconsistent levels of preparedness.
– **AR limitations**: The AR elements are underdeveloped and lack rich media such as photos and videos to enhance user interaction and understanding.
– **Unclear reporting procedures:** Users may find the review process and incident reporting responsibilities unclear, which could lead to confusion and misinformation.
– **Limited customisation:** The app currently lacks sufficient options to tailor its features for specific regions or local challenges, reducing its effectiveness in diverse contexts.
– **Focus on young users:** While engaging younger demographics is crucial, the app could alienate older users if it does not include features tailored to their needs.

Suggestions for improvement could be the following:

➢ **Redesign of the user interface and enhance the tool's visualisation:** Improve the app's user interface to make it more intuitive and user-friendly, making it easier for users to navigate and understand the severity and nature of threats.
➢ **Tailored training programs**: Develop specific training programs for different types of CPAs to ensure all parties are well-prepared and on the same page.
➢ **Enhance AR features**: Invest in upgrading the AR elements by incorporating relevant images and videos to support training and real-time communication.
➢ **Clarify the reporting processes**: Establish clear guidelines for verification procedures and responsible parties for incident reporting to build credibility and ensure accountability.
➢ **Customisation options**: Introduce features that allow users to customize their experience, such as choosing background themes and adjusting font sizes.

- **Inclusive incentives**: Define rewards and incentives for participation in gamified elements, ensuring that these are inclusive of all age groups to avoid alienating older users.
- **Compatibility with other platforms**: Explore the possibility of integrating the Aeolian app with the Hermes tool to enhance interoperability and streamline communication in risk management.
- **Feedback loop for continuous improvement**: Establish a feedback mechanism where users can report their experiences and suggest improvements, ensuring that the app evolves in line with user needs.
- **Building common ground**: By building a common ground between the authorities, the app could be used to coordinate different types of CPAs during a disaster by instantly informing them about a new event and facilitating them to interact directly.

Aeolian app consists of many dynamic aspects, which could facilitate citizens' preparedness in case of an emergency. While it offers valuable resources, there is significant potential for improvement to further optimise its usability and help build a more concrete two-way communication between CPAs and citizens.

5.4.3.2 PublicSonar

The sentiment analysis tool is a crucial instrument for enhancing communication between citizens and CPAs, particularly during emergencies. It improves crisis management efforts and community engagement by streamlining emergency communications, enhancing the accuracy of information, and becoming an integral part of a trusted conversation between citizens and CPAs. Moreover, as highlighted in the KEEs, the main key points of such tools can be effective in notifying authorities and enhancing communication between citizens and CPAs. More briefly, participants highlighted the following strengths:

+ **Timely notification and response**: By integrating with emergency response systems like "112" the sentiment analysis tool allows for quick notifications to authorities during emergencies, ensuring a timely response to hazards. It also can filter out fake information, enabling authorities to receive accurate and relevant data.
+ **Citizen information transmission**: The tool facilitates the rapid communication of citizen-generated insights to CPAs, helping them respond quickly to emerging situations. By identifying false information, it improves the reliability of data used by authorities for decision-making.
+ **Understanding public sentiment**: Although such tools do not directly notify citizens, they provide valuable insights into public sentiment that can inform strategic communications. This enables authorities to engage effectively with the community and address their concerns during emergencies.
+ **Proactive communication strategies:** CPAs can develop proactive communication strategies for each of the sentiments they identify, helping to reassure the public and build trust in government in times of crisis.

+ **Fostering participation and awareness:** By understanding the sentiments and needs of citizens, CPAs can organize training campaigns, build trust, and encourage active participation in disaster management efforts. This two-way communication fosters a stronger relationship between authorities and the public.

PublicSonar is a tool that integrates sentiment analysis. Participants from multiple case studies and also within the awareness workshops had the chance to explore its functionalities and its utility. The main strength points of the tool that they have identified are:

+ **Real-time monitoring and analysis:** PublicSonar effectively gathers real-time data from social media to assess public sentiment, detect fake news, and anticipate events such as protests or disasters. While it does not enable direct communication with citizens, it equips authorities with crucial context for their responses.
+ **Broad utility**: The tool provides customised reporting that helps improve communication and crisis response for a variety of audiences.
+ **Nudging strategies and engagement**: The ability to monitor public response to nudging strategies and involve users in fact-checking increases community engagement and transparency.
+ **Identification of hate speech and disinformation**: The tool can help identify hate speech, detect misinformation, and contribute to public safety and awareness.
+ **Data aggregation:** By combining information from several sources, PublicSonar offers, in contrast to other tools, a more comprehensive picture of public sentiment and hazard awareness.
+ **Proactive hazard management:** The tool serves as an early warning system, facilitating prompt responses to emerging threats and enhancing overall safety and preparedness.

Although PublicSonar has enabled the detection of thousands of messages from a variety of sources in a short period of time, it also appears to be weak in some respects, as the following:

– **Interpretation challenges**: The tool faces difficulties in accurately interpreting user-generated content, as sometimes the intentions of each post may be unclear.
– **Analysis complexity**: There is a lack of clarity about how to analyse public opinion and mitigate negative influences, leading to uncertainty about the tool's effectiveness.
– **Resource constraints**: The tool requires efficiency in human resources. Limitations in hardware availability and staffing can affect the operational capability of the application, particularly during the initial implementation and transition phases.

- **Communication gaps:** Language support challenges can limit usability and engagement, especially for non-native speakers.
- **Complexity of use**: The complexity of the tool can be a challenge for real-time use, especially for staff unfamiliar with the platform, leading to potential resistance to change.
- **Baseline assessment challenges**: Conducting a baseline assessment beforehand makes initial deployment more difficult and restricts efficacy during emergencies.

In order to overcome the weaknesses and improve the effectiveness of the PublicSonar tool, some suggestions for improvement could be:

- **Integration of additional features**: Expand the tool's functionality to include nudging strategies and features that facilitate two-way communication for better engagement with users.
- **Enhanced reporting capabilities**: Develop tailored reporting options for different user groups, such as CPAs and citizens, to meet their specific needs and increase the relevance of the application.
- **Collaboration and resource sharing**: Foster partnerships with other tools and community organisations to streamline operations, ensure data is shared effectively and reduce duplication of effort.
- **User-generated content interpretation**: Enhance algorithms to improve the accuracy of sentiment analysis and content interpretation, helping with better identification of misinformation and public sentiment.
- **Comprehensive training and support**: Provide thorough training resources and support for personnel transitioning to the PublicSonar, ensuring users are equipped to navigate the tool effectively.
- **Language support improvement**: Invest in enhancing language support features to ensure inclusivity and better communication with diverse communities.
- **Address hardware and resource limitations**: Identify and allocate the necessary human and hardware resources to support the implementation and operation of the application, possibly exploring outsourcing for sustainable functionality.

In conclusion, while the PublicSonar is a valuable asset in understanding and responding to public sentiment and crises, addressing its current limitations and enhancing its functionalities through strategic improvements and collaborations will be key to its future success.

5.4.3.3 Hermes

The Hermes tool serves as a valuable tool for enhancing emergency response and community engagement during hazards. Its effectiveness relies not only on improved features such as training and verification procedures but also on assertive and proactive CPA engagement tactics. Moreover, participants highlighted as the most useful aspects of the tool to the following:

+ **Two-way communication**: The tool facilitates real-time communication between citizens and CPAs, enabling immediate feedback and interaction during hazard events.
+ **Accessibility**: The tool is designed to be inclusive, accommodating users with disabilities or visual impairments and offering multiple language options.
+ **Information dissemination**: CPAs can quickly access information and respond more effectively to emergencies, improving situational awareness for both authorities and the public.
+ **Community engagement**: By enabling users to report risks and provide feedback, the app promotes citizen participation and cultivates a feeling of community connection.
+ **Integration potential**: The possibility of integrating the tool with existing communication channels and agencies can lead to the creation of a centralised platform for information sharing.

On the other hand, several weaknesses were targeted that limit the tool's effectiveness:

– **User engagement and registration**: Citizens need to actively engage and register with the tool to fully benefit, which can limit its reach and effectiveness.
– **Dependence on personnel**: The tool requires sufficient personnel from CPAs to manage incoming information effectively. Without this, the system may become overwhelmed.
– **Potential for redundancy**: False or redundant reports submitted by citizens might clog the communication channel and cause confusion.
– **Credibility issues**: There is a need to establish the credibility of users and sources of information to prevent misinformation and panic.
– **Lack of offline functionality**: In conditions like heavy rain or floods, the tool may not be functional without internet connectivity.

Therefore, they suggest the following, in order to improve its functionality:

➢ **Verification mechanisms:** Create verification mechanisms for user accounts, to ensure that the reports and information are submitted only by verified users, to ensure credibility.
➢ **Training for CPAs**: Support CPAs with training on how to distinguish genuine messages from false reports to ensure effective responses.
➢ **Filtering the information**: Creating filtering and prioritisation of protocols will improve information management, by helping to focus on credible reports that require immediate attention.
➢ **Incorporation of offline functionality**: Enabling offline connection with the tool will allow users to access critical information during emergencies without internet connectivity.
➢ **Language options:** Expanding language options to include local dialects or mother tongues will enhance accessibility and make the app more user-friendly.
➢ **Clear guidelines:** Create and communicate clear rules and objectives for using the app, ensuring all users understand how to engage responsibly.

- **Protocols for emergency declarations:** Establishing protocols for emergency declarations within the tool will prevent misinformation and panic.
- **Gamification:** Incorporating gamification elements into the tool will enhance users' participation.
- **Integrating with existing systems**: Integrate Hermes with other tools and emergency services to create a unified communication platform. In order to achieve seamless integration, the tool has to be checked regularly and adapted to be aligned with the objectives of the established protocols of emergency management organisations.

By addressing these recommendations, Hermes can enhance its strengths, mitigate weaknesses, and maximise its potential for effective hazard communication and response.

5.4.3.4 Thermal Comfort Tracker tool

The Thermal Comfort Tracker Tool proved useful in enhancing preparedness and response to hazards, by providing CPAs with timely information from sensors regarding dangerous thermal situations. In more detail, the key strengths of the tool are summarized as follows:

+ **Timely alerts**: The tool provides CPAs with real-time data from sensors allowing for rapid response to dangerous thermal situations, which enhances overall preparedness.
+ **Effective hazard response**: By identifying areas prone to high temperatures, CPAs can take proactive measures to address heat-related issues, enabling them to act more effectively and quickly, both in the preparation phase and during an event.
+ **Identification of hotspots**: The tool helps cities identify areas prone to high temperatures and contributes to informed decision-making for mitigating heat effects.
+ **Emergency integration potential**: Communities can become more resilient to heat-related hazards overall by incorporating the tool's data into current emergency preparedness and management practices.

However, participants spotted also some weaknesses regarding:

– **Limited communication channels**: The tool does not facilitate direct communication between CPAs and the public, which can lead to gaps in information dissemination during hazardous situations.
– **Predictability limitations**: While the tool is effective for identifying hotspots, it seems to be less useful in scenarios where heatwaves are predictable, with information readily available on other platforms.
– **User experience**: There is currently a lack of language options, which could limit engagement with diverse user groups.

In order to enhance its functionality, participants recognised the following fields for improvement:

- **Enhance communication features**: Developing a direct communication channel within the tool that allows CPAs to engage with the public, like notifications, SMS updates, or social media integrations, would ensure timely information dissemination.
- **Streamline equipment requirements**: Simplifying the necessary equipment to operate the tool would make it more practical and user-friendly.
- **Broaden data insights**: Shifting the focus of the tool's reporting capabilities to include less predictable thermal conditions, offers unique data points that complement existing weather information services, especially for CPAs and city planners.
- **Integration into emergency protocols**: Encouraging CPAs to incorporate thermal data into emergency management strategies and protocols will ensure that thermal comfort considerations are part of broader risk assessments and preparedness plans.
- **User training and support**: Providing training sessions or resources for CPAs and city planners will maximize the effective use of the tool and its integration with other emergency management systems.
- **Language support**: To reach a wider audience, including language options within the tool to improve accessibility, ensures that non-native speakers can utilise the tool effectively.

By addressing these areas, the Thermal Comfort Tracker tool can significantly enhance its functionality, improve user engagement, and ultimately provide better support for communities facing thermal hazards.

5.4.3.5 MappingDamage Tool

MappingDamage tool was tested only in the MRP case study, so participants had the chance to explore its functionalities only in the last KEE. According to their knowledge exchange, they have identified several strengths and weakness points and also shared some recommendations that could further help improve its functionality and usefulness, as shown below.

The main strengths have highlighted as follows:

+ **Risk assessment data collection**: Users have the ability to collect data related to vegetation and fire risks, which can inform CPA strategies for fire prevention and mitigation.
+ **Community involvement**: MappingDamage as a VGI tool is supported by volunteer networks. Engaging volunteers can promote community participation and increase awareness about fire safety and vegetation management.
+ **Technology integration**: Utilising AI and existing applications could enhance data interpretation and risk assessment processes.
+ **Validation of data**: Volunteers can help validate existing data and contribute to the generation of new information on the proximity of vegetation to homes.

They have also marked the following weaknesses:

- **Data utilization and accessibility concerns**: There was a concern from some participants regarding the purpose of collecting data, whether it does or doesn't lead to actionable insights or solutions. In addition, there is a concern about the accessibility of specific data, for instance, if some information can be provided only by owners of houses.
- **Limited scope of assessment**: Focusing only on specific streets can overlook broader citywide risk factors and ultimately hinder effective fire prevention strategies.
- **Data updates**: If the tool is supported only by volunteer efforts, there is a concern if these data are regularly updated.
- **Resource constraints**: Lack of financial and human resources restricts the ability to conduct thorough assessments and implement necessary changes.
- **Ambiguous responsibilities**: The division of responsibilities between volunteers and CPAs is unclear, leading to potential inefficiencies and miscommunication.
- **People at risk**: Even though the tool doesn't support the idea of collecting data in the field when a disaster is still active, participants shared their concerns about the potential risk of getting trapped or injured when they collect data on the field in the middle of an ongoing emergency.

To overcome the strengths and weaknesses, participants proposed the following:

- **Clarify roles and responsibilities**: Establish clear lines of responsibilities between volunteers and CPAs will enhance efficiency and accountability.
- **Broaden the assessment**: Extend risk assessments to whole neighbourhoods or the whole city, rather than just a few streets, to ensure comprehensive fire risk reduction.
- **Enhance data accessibility**: Simplify the process of downloading and accessing data to encourage wider use of the tool and collaboration.
- **Regularly update VGI data**: Implement a schedule for regular updates to valuable geographic information to maintain its relevance and usefulness.
- **Amplify volunteer input**: Develop systems to weigh volunteer feedback and observations more heavily in the data analysis process in order to provide insightful information.
- **Integrate technology solutions**: Enhance the system by incorporating AI for data analysis and creating seamless connections to existing applications used by CPAs.
- **Institutionalise technology use**: Create systems that support the adoption of technology within the everyday operations of CPAs to ensure its sustained impact.
- **Train volunteers**: Develop training programs for volunteers to familiarise them with existing tools and technologies for effective engagement.

In conclusion, while the MappingDamage Tool holds significant potential for enhancing data-driven decision-making in CPAs, its effectiveness hinges on several factors,

including strategic integration, effective communication, community involvement, and sufficient resource allocation.

5.4.3.6 Tools engagement

To ensure the sustainability of the apps, it is crucial to foster engagement among citizens and CPAs. During the discussions, participants proposed the following strategies to enhance user interaction with the tools:

- **Marketing strategies**: Launch marketing initiatives, including social media and community outreach, to generate interest in the tools. Utilise social media and collaborate with community influencers to boost awareness and promote app downloads. Effective marketing and promotional strategies will cultivate interest and foster greater citizen engagement
- **Engage with community leaders and influencers**: Collaborate with community leaders and influencers to advocate for the tools and highlight their significance during emergencies, thereby encouraging citizen participation.
- **Community involvement**: Encourage local volunteers and organisations to facilitate demonstrations and awareness-raising activities in their communities.
- **Publicity across channels**: Promote tools and their training resources through various platforms, such as social media and community websites, to expand the reach and engage a larger audience.
- **Training and workshops**: Organise live demonstrations and create training materials to educate citizens on the tool's functionalities.
- **Targeted awareness campaigns**: Develop campaigns aimed at various demographics, including schools, elderly homes, and vulnerable groups to increase understanding and usage.
- **Feedback mechanisms**: Utilise surveys and questionnaires to gather insights from users, allowing CPAs to tailor their approach based on community feedback.
- **Nudging techniques**: Employ gentle reminders and prompts to encourage regular tool usage amongst citizens.
- **Trust establishment**: Adopt an informal communication style to build trust with community members and promote clarity during informational outreach.
- **Incentives for engagement**: Clearly outline rewards and incentives within the gamified aspects of the tools. This will help to stimulate engagement from a wider range of users, not just younger ones.

By implementing these strategies, community engagement can be enhanced and achieved, ensuring the long-term sustainability of the tools.

5.4.4 Preparedness and Awareness Methods

5.4.4.1 Methods for CPAs-Citizens interaction improvement

To enhance the interaction between CPAs and citizens in case of an emergency, several key strategies should be considered:

- **Strengthen consistent communication**: CPAs should establish regular communication plans to provide updates and information throughout the crisis.

This consistency builds trust and reliability and ensures that citizens receive timely and accurate information when needed.

- **Foster two-way communication**: Creating platforms that allow citizens to voice their questions and concerns, that contain hotlines, online forums, or social media channels, where CPAs can engage directly with the public, promotes a sense of involvement and community ownership.
- **Engage through informative sessions**: Organizing regular webinars, community talks, and video presentations to convey essential information, could help in addressing common concerns and providing updates and safety measures.
- **Streamlined communication channels**: CPAs should use standardised communication platforms that they own or have thoroughly examined in order to reduce the risk of misinformation. By limiting the number of tools and channels, CPAs can avoid overwhelming the public while ensuring that the appropriate information is clearly disseminated.
- **Collaborate with community leaders**: Recruiting influential people from different communities, especially those representing vulnerable populations, can help tailor messages that resonate with their communities, ensuring inclusivity and relevance.
- **Utilise existing community networks**: Leverage networks of local organizations and volunteers to disseminate information effectively. Word-of-mouth can be powerful, especially when combined with formal channels.
- **Promote transparency**: Transparent communication about the limitations of knowledge and uncertainties surrounding the situation can strengthen trust, as citizens will appreciate the honesty and feel more empowered to seek clarification when needed.
- **Tailor communications to diverse audiences**: Utilising democratic organs to present problems and ideas can strengthen communication and facilitate transparency.
- **Engage youth and educational institutions**: Conduct campaigns in schools to raise awareness among students and families. By involving younger people, CPAs can instill a culture of preparedness and resilience.
- **Innovative distribution methods**: Employ creative methods to reach every household, such as including informational leaflets with utility bills or using school newsletters. This will ensure widespread dissemination of important updates.
- **Leverage local success stories:** Draw inspiration from successful strategies employed in other regions, such as those in Portugal, where local stakeholders collaborated in a productive manner by utilising face-to-face communication and district-by-district connections, ensuring that the responses were tailored to the specific needs of the communities.
- **Training programs**: Implement training programs for citizens and volunteers, emphasizing preparedness and safety protocols. Furthermore, if implemented at an early age, it can help in enhancing responsibility and preparedness, and in building personal capacity, so that they would be more prepared when a

hazard arises. This can be achieved through workshops, conventions, and conferences aimed at raising awareness, especially targeting schools, elderly homes, and other vulnerable groups.

- **Ensure access to essential resources:** To promote a sense of safety among all CPAs and citizens, for instance in case of a pandemic, it is crucial to provide healthcare professionals with adequate protective equipment, such as masks and gloves. This initiative will not only increase their commitment but also strengthen public confidence in the collective health efforts of CPAs.
- **Build relationships:** Establish connections with the community before any potential risk arises will foster trust and cooperation. Regular engagement through community events can help CPAs establish a relationship that is crucial during times of need.
- **Empower citizen participation**: Encouraging community involvement by delegating specific tasks to citizens, will foster a spirit of collaboration and responsibility.
- **Fostering inter-agency collaboration**: Ensure a consistent and effective approach to emergencies by improving communication and coordination between local, regional and central government.
- **Clarifying responsibilities**: In order to achieve effective collaboration is essential to clarify the responsibilities of different actors, recognising the capabilities and their constraints.

By integrating these strategies, CPAs can significantly improve their interaction with citizens, fostering a cooperative and informed community ready to face the challenges of a pandemic or other hazards effectively.

5.4.4.2 Methods for CPAs -Volunteer interaction improvement

Citizens often tend to focus only on their individual security and fail to take proactive steps to protect themselves. Their involvement in disaster management often comes after a disaster has occurred. Each citizen is responsible for building his/her own personal capacity.

Additionally, there is a concerning trend of individuals attempting to contribute to disaster response in uncoordinated ways. Unlike in the past, when volunteering in disaster was more connected with the volunteer firefighters, different ranges of volunteers exist, but most of the time they are not organized and don't participate in broader disaster response efforts. This highlights the need for a cohesive approach to community involvement in disaster preparedness and recovery.

Improving the interaction between CPAs and volunteers requires thoughtful strategies that foster engagement, enhance readiness, and ensure effective DRR. Among the discussions of the participants, the main suggestions for improving this interaction are summarized in the following:

- **Establish a centralized communication channel**: Develop a robust communication channel that is independent of local infrastructure disruptions. This could be a dedicated app or platform that provides real-time updates,

guidance on how to get involved and information on upcoming training or volunteer opportunities.

- **Recruitment and training of volunteers:** Develop shorter, focused training sessions for volunteers that emphasize essential skills and knowledge relevant to specific situations (e.g., urban cleaning, first aid) rather than lengthy courses. This could be modular and flexible, designed to fit the busy schedules of potential volunteers, especially younger individuals. In addition, it is essential to identify specific roles within DRR where volunteers can be most effective (e.g., logistics management, community education) and tailor recruitment efforts accordingly.
- **Create incentive programs**: Create a system of rewards or recognition (e.g., digital tokens, badges) for volunteers to acknowledge their contributions and encourage continued involvement. Highlight community benefits that directly resonate with volunteers' lives, such as improved local services.
- **Develop a volunteer app**: Create an app that allows citizens to register as volunteers, access training information, receive updates on DRR activities, and connect with other community members. Include features where citizens can report local issues (e.g., streetlight outages) while simultaneously promoting DRR initiatives and consistence training sessions in different aspects.
- **Maintain a volunteer database:** CPAs should create and maintain an up-to-date list of volunteers, including their skills and availability, to facilitate efficient coordination during disasters. When needed, CPAs can quickly identify who can help with specific tasks, such as cooking, cleaning, or providing medical assistance.
- **Clarify roles and responsibilities**: To ensure that CPAs are not burdened with tasks outside their primary responsibilities and to avoid duplications, a clear definition of the roles of CPAs and volunteers in disaster management must be established.
- **Organize spontaneous volunteer efforts**: Develop a framework for managing spontaneous volunteers during emergencies.
- **Facilitate continuous coordination**: Regular meetings should be holding between CPAs, volunteers, and community members to discuss strategies, share resources, and improve governance around DRR initiatives.
- **Integrate preparedness education in schools**: CPAs should collaborate with educational authorities in order to include disaster preparedness and risk reduction in school curricula. This would create a culture of preparedness from a young age. Of course, in order to promote this endeavour, advocacy for pertinent legislation is also required.
- **Build trust and community resilience**: To build trust between CPAs and citizens, constant engagement with the community is needed. This could be achieved through information sessions and training and by using community leaders to assist in organizing and directing volunteer activities. Building trust ties is a long-term process, but it is essential to a successful DRR.

By implementing these strategies, CPAs can strengthen their relationship with volunteers, enhance community resilience, and create a more effective DRR network.

5.4.4.3 Approaches outside RiskPACC for general citizens' awareness and preparedness improvement

In addition to the RiskPACC project, several innovative approaches and tools can be used to increase public awareness and preparedness.

- **Organise comprehensive communication campaigns**: Launching sustained communication campaigns across multiple platforms, such as social media, television, radio, and print, will facilitate reaching a wider audience. These campaigns should feature clear, consistent messaging about risks and have to be frequently updated in order to maintain public engagement.
- **Use of technology and data visualization**: Implementing tools such as interactive dashboards that display localised data, real-time updates and insights tailored to specific regions would improve decision-making at the local level. Careful attention to privacy and transparency will build trust in these tools.
- **Collaborative educational initiatives**: Collaboration between government agencies and educational institutions is essential for successful preparedness. Training teachers to educate students on risk preparedness and utilising electronic registers to communicate with local communities can significantly improve awareness.
- **Incorporating risk education in school curricula**: Moreover, embedding pandemic preparedness content into educational programs even from an early age ensures that young people are informed about risk preparedness.
- **Targeted outreach to vulnerable populations**: Contact persons, such as community leaders or local influencers, can help disseminate tailored messages to at-risk groups. These individuals can provide specific guidance and support, ensuring that sensitive communities receive appropriate resources and information.
- **Sharing through public interfaces**: Interactive platforms, such as digital billboards in community spaces and QR-coded stickers on everyday products, can offer immediate access to essential information. These engaging formats serve as effective mediums for disseminating crucial information to the general public.
- **Mitigate misinformation**: Fact-checking initiatives are necessary to stop the spread of misinformation. Collaborating with platforms like Google can aid in stopping the dissemination of misleading material. Additionally, hiring gatekeepers or reviewers with relevant experience can guarantee the veracity of the information supplied.
- **Workshops and community engagement**: Organizing tailored workshops, lectures, and informational panels within various communities, such as schools, senior centres, and rehabilitation facilities, promote deeper understanding**.**
- **Transparency and trust building**: Authorities must prioritize transparency in communications and engage in credible corporate communications to uphold public trust. The response plan has to be clearly articulated, and the resources have to be sufficient, in order to reassure the public of their safety and preparedness.

- **Strengthening community networks**: A strong support system can be established by promoting the creation of local committees, community leaders, and health experts. These committees can facilitate regular discussions, information sharing, and collaborative planning for risk responses.

By using a multi-faceted approach that combines technology, community engagement and robust education, awareness and preparedness efforts for DRR can be significantly improved.

5.4.4.4 Approach outside RiskPACC for vulnerable population's awareness and preparedness improvement

To enhance awareness and preparedness among vulnerable groups, such as the elderly, individuals with disabilities, immigrants, women, and hard-to-reach populations, beyond the efforts of the RiskPACC project, a multifaceted approach incorporating various strategies, tools, and methods is essential. Participants through extended discussions, proposed the following.

- **Collaborative stakeholder engagement**: Local authorities, non – governmental organisations (NGOs), and community organizations should collaboratively work together in identifying the vulnerable communities in their territory, and in designing targeted training methods for different demographics. Their expertise in communicating with different communities can provide valuable insights into the unique needs and barriers faced by these groups, facilitating the building of a more effective training strategy for vulnerable populations.
- **Training for different demographics and community leaders**: It is essential to develop training sessions not only for different vulnerable communities, but also for individuals who care for these communities, including healthcare professionals, educators, and local community workers. These training sessions should focus on effective communication strategies and the specific needs of the vulnerable populations they serve.
- **Diverse educational materials**: Creating training materials in various formats is essential to meet the needs and preferences of diverse populations. Materials such as audio recordings, videos with subtitles, visually engaging flyers, and easy-to-read guides can help ensure that information reaches diverse audiences. Specialised resources, like Braille or materials for children, should also be produced.
- **Tailored communication strategies**: Using targeted communication channels can engage different vulnerable groups. For example, older adults may prefer Facebook or community newsletters, while TikTok or Instagram can engage more effectively younger people.
- **Conduction of awareness events, workshops and multimedia campaigns**: Organizing accessible community-focused events and interactive workshops will allow participants to actively learn about preparedness through real-life scenarios and practical exercises. Additionally, comprehensive awareness campaigns can be organized through media, like television, radio and social

media, which can amplify messages and increase visibility. Also, creative content can help raise awareness in a relatable manner.

- **Unified local warning systems**: Implementing a localized warning system, possibly upgraded with cell broadcast technology, including language preferences and accessibility needs, can ensure timely alerting and information dissemination to vulnerable populations.

By implementing this comprehensive approach, stakeholders can significantly improve awareness and preparedness among vulnerable groups, equipping them with the knowledge and tools required to navigate challenges effectively.

5.4.4.5 Approach outside RiskPACC for children's awareness and preparedness improvement

The IBZ case study laid the groundwork to start a conversation about what approaches, tools, and methods are more useful to effectively improve children's awareness and preparedness regarding safety and emergency response. Most of the participants had relevant experiences or were familiar with such training materials, sharing that the most risk awareness comes from school. For instance, Cardiopulmonary Resuscitation (CPR) and first aid training, which are essential for life-saving skills, fire alarm tests and training on using fire extinguishers aim to prepare children for emergencies. However, these materials primarily focus on addressing immediate safety concerns rather than broader disaster preparedness. In Greece, since it is a high-risk seismic country, schools are conducting training exercises for earthquakes, where students are educated on how to respond during seismic events. Additionally, the Fire Brigade conducts presentations at schools to raise awareness about the risk of fire and educate children on fire safety measures. These initiatives play a crucial role in preparing children for various hazards they may encounter. Lastly, other countries, such as Italy, have developed national special projects. "I Don't Risk", led by the National Civil Protection, includes a comic guide and an inclusive communication campaign. Additionally, there's a program called "We Are Civil Protection" that offers grants for 1-2 weeks summer camps for school children.

Participants, then, through collaborative discussions proposed enhanced approaches, tools, and methods beyond the RiskPACC project that can effectively improve children's awareness and preparedness regarding safety and emergency response.

- **Interactive games and role-playing sessions**: Interactive games or exercises conducted by teachers in schools or on school platforms can also effectively educate children about various risks and safety measures. Role-playing activities that simulate emergency scenarios can help children learn the importance of teamwork, communication, and quick thinking in crises. Moreover, participants suggested an example of a three-level game approach. For elementary school, a card-based game with two teams, where learning is about the need to share cards to win; for high schools, a 'spinning top' game where students have to manage all the risks with limited resources; or a 'panic centre' game where all students act as citizens and elect a major who is

responsible for choosing an emergency team and they play simulating different scenarios.

- **Emergency simulation activities**: Educational games that simulate emergency scenarios could also be effective in engaging children and teaching them essential safety practices. These methods aim to empower children with the knowledge and confidence to respond effectively to various hazards and enhance their decision-making.
- **Organizing field trips**: Children could benefit when coming in contact with field activities. Pathfinding activities would give the chance to children to experience risks firsthand and learn how to navigate through them.
- **Parental training**: It is essential to also equip parents with the skills to educate their children about different scenarios and risks, which would further strengthen children's preparedness. This could be achieved through digital platforms, or by hosting events involving families, focusing on emergency plans, assembling preparedness kits and conducting safety drills, thus reinforcing the concepts learned in a family context.
- **Social media campaigns**: Social media campaigns that engage children and families in safety challenges or awareness days, by using platforms that children are familiar with, such as TikTok and Instagram, can help spread important messages in a fun and relatable format, which will enhance their engagement.

By combining fun, interactive and educational methods with community and family involvement, these approaches can significantly increase children's awareness and preparedness for various risks and emergencies. The aim is to create an engaging learning environment that equips children with the knowledge, skills and confidence to respond effectively to emergencies.

5.4.4.6 Training material for children

Related to the IBZ case study, and according to the RiskPACC Collaborative Framework building tool, the participants were asked to design training materials for CPAs on how to communicate with children in an engaging, age-appropriate manner (e.g. regarding their efforts, methods, and media). These are the aspects they highlighted that these training materials should serve:

- **Collaboration with educators**: Collaborate with teachers and child development experts to identify appropriate methods for different age groups. Translate complex risk concepts into simple terms that children can understand.
- **Training for CPAs**: Provide training for CPAs to develop skills in child education and effective communication strategies. CPAs should use appropriate, calm and clear language when communicating with children.
- **Incorporation of games and gamified activities**: Gamification can help engage both children and adults, by making the learning process more enjoyable and memorable. Guide CPAs to create creative games that encourage active participation and teach children about various risks.
- **Interactive activities**: Use materials that encourage interaction, such as storytelling, role-playing, creative arts and comics, to maintain interest.

- **Involvement of adults**: Organise intergenerational talks in which CPAs engage with children alongside their grandparents, parents or other adults to promote knowledge sharing.
- **Local collaboration**: Establish agreements with municipalities and school authorities for the implementation of risk communication activities.
- **Clarifying responsibility**: Define the hierarchy of responsibilities from the national government to local schools to ensure coherent policy implementation.
- **School partnerships**: Ensure that communication activities are integrated into the school curriculum and approved by the education authorities.
- **National advocacy**: Advocate for the inclusion of risk communication in the national civic education curriculum.
- **External trainers**: Consider involving external trainers specialising in children's education and risk communication to increase the effectiveness of training, similar to initiatives in Padua schools.

By adopting a collaborative approach that involves educators, leveraging engaging methods such as games and comics, and fostering a supportive community environment, CPAs can effectively communicate risk to children. Clear and structured training for CPAs is essential to ensure they can convey important information in an age-appropriate, engaging, and empowering manner.

6 THE FRAMEWORK FLOWMAP

On KEE #3, the last session included the testing of the Framework Flowmap. This Flowmap was developed as part of the training material of T4.4, integrating all the concepts and tools that were created throughout the project that were mainly tested in the WP3 workshops. Here, for consistency reasons, will present briefly the requirements of the different steps, but the exercise in more detail is presented in D4.6. Then, an extensive analysis will follow, based on the groups' responses.

6.1 Exercise guidelines

The Framework Flowmap contains 5 steps, as described below with the following guidelines.

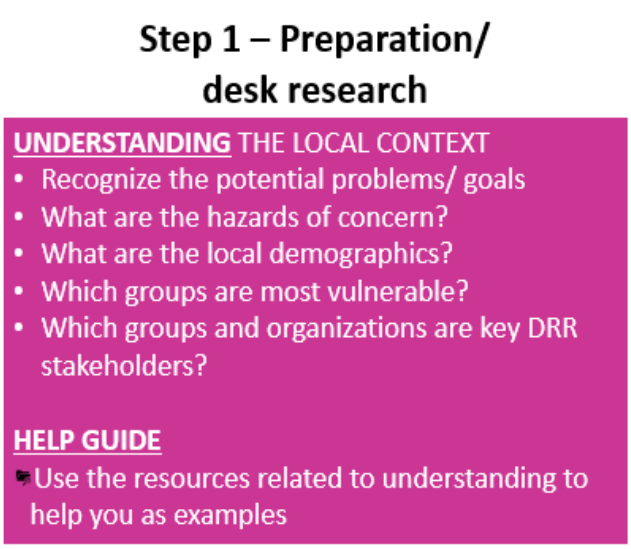

FIGURE 15: FRAMEWORK FLOWMAP– STEP 1

Initially, participants needed to identify the hazards they are concerned about and the recognised potential problems they may face in the event of a disaster. They needed to be aware of the local demographics of the area they were testing, including the most vulnerable groups. Finally, they had to note down the groups and organizations that they identified as they key DRR stakeholders in their scenario. A help guide within the RiskPACC platform was provided to them with resources to help them get deeper into their understanding needs (Figure 15).

FIGURE 16: FRAMEWORK FLOWMAP– STEP 2

Next, participants had to analyse the risk perceptions of each actor involved and what they expected from each one to do. They also needed to recognise the capabilities and constraints of the different actors.

They were given the ability to run a workshop using one of the two conceptual exercises of the project (participatory mapping lite and risk communication exercise). They were provided with a help guide within the RiskPACC platform with resources that could help them set their sharing needs (Figure 16).

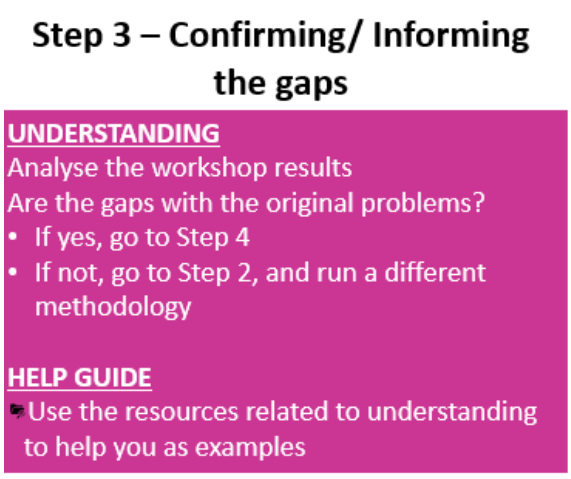

FIGURE 17: FRAMEWORK FLOWMAP– STEP 3

In Step 3, they had to analyse the workshop results. If the analysis showed that the gaps identified were in line with the initial findings, they could move on to the next stage of their strategy. However, if the results were inconclusive, they would need to revisit Step 2 and adopt an alternative methodology, like conducting a workshop with a different audience, utilising a different exercise, or employing different resources.

In a practical setting, it is more effective to assess whether the initial gaps identified are consistent with the findings of the analysis in step 2 (Figure 17).

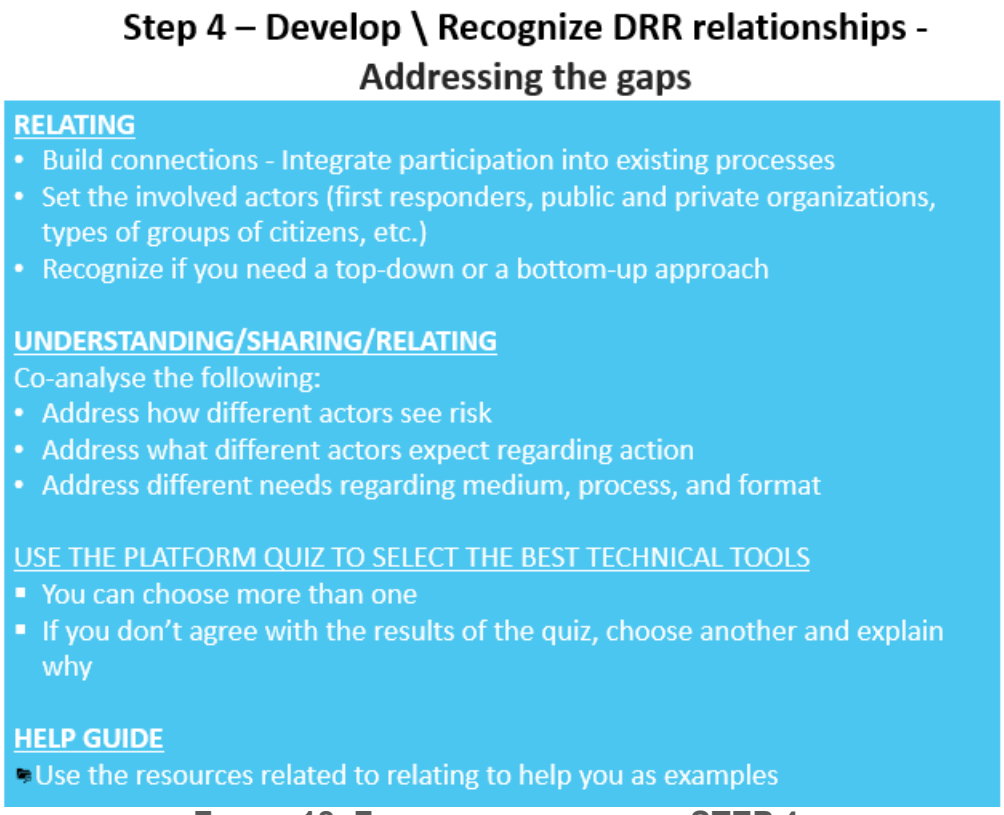

FIGURE 18: FRAMEWORK FLOWMAP– STEP 4

In Step 4, which focuses on relating, participants were asked to make connections between the actors identified in Step 1. Additionally, they should determine whether a top-down or bottom-up approach was most appropriate for their strategy. Building on the combined insights from the Understanding, Sharing and Relating modules of the Collaborative Framework, participants would need to jointly analyse how these different actors perceive risk, their expectations for action, and their specific needs in terms of medium, process and format.

Finally, using the platform's quiz, they could identify the most appropriate technical tools to meet their needs and objectives (Figure 18).

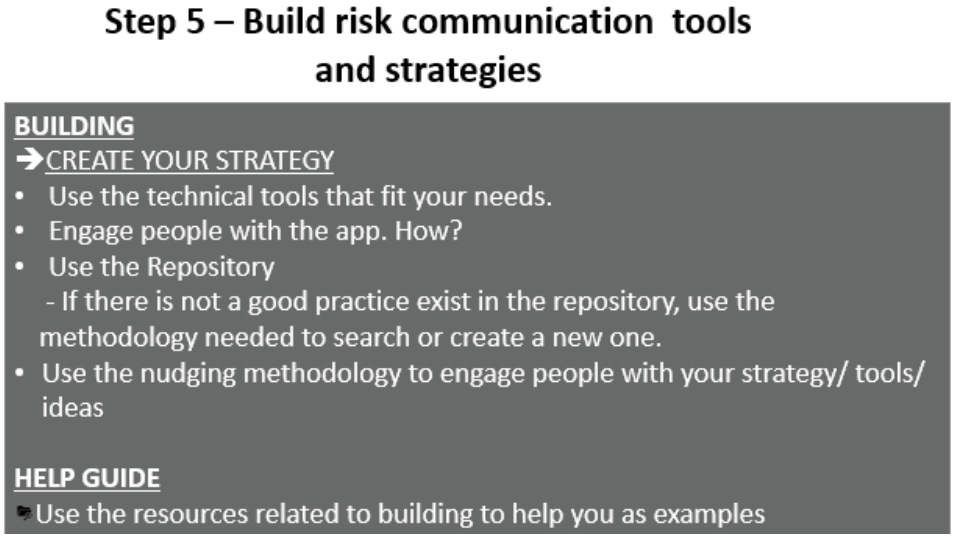

FIGURE 19: FRAMEWORK FLOWMAP– STEP 5

In the final step, participants were invited to develop a tailored strategy based on the specific needs they had identified as most relevant. While they didn't need to include all the tools considered in the previous phase, they should envisage a comprehensive approach to engaging with citizens through their chosen tool or tools, for instance, they could consider using nudging techniques. Participants could also draw on the best practices available in the repository, to find a practice that fits their needs and gaps identified. In case they couldn't find anything directly applicable, they were encouraged to adapt the RiskPACC repository methodology to design a new solution that could be more proactive to support their strategy. To support their efforts, a wealth of resources related to the building module were also available on the platform (Figure 19).

Each group was asked to work together to identify a hazard that was most relevant to their expertise and to create a hypothetical scenario that would support the implementation of the strategic framework. All groups, pre-, during- and post-disaster focused on flood events. A DIN A0 printed document was provided to them, as shown in Figure 20 below.

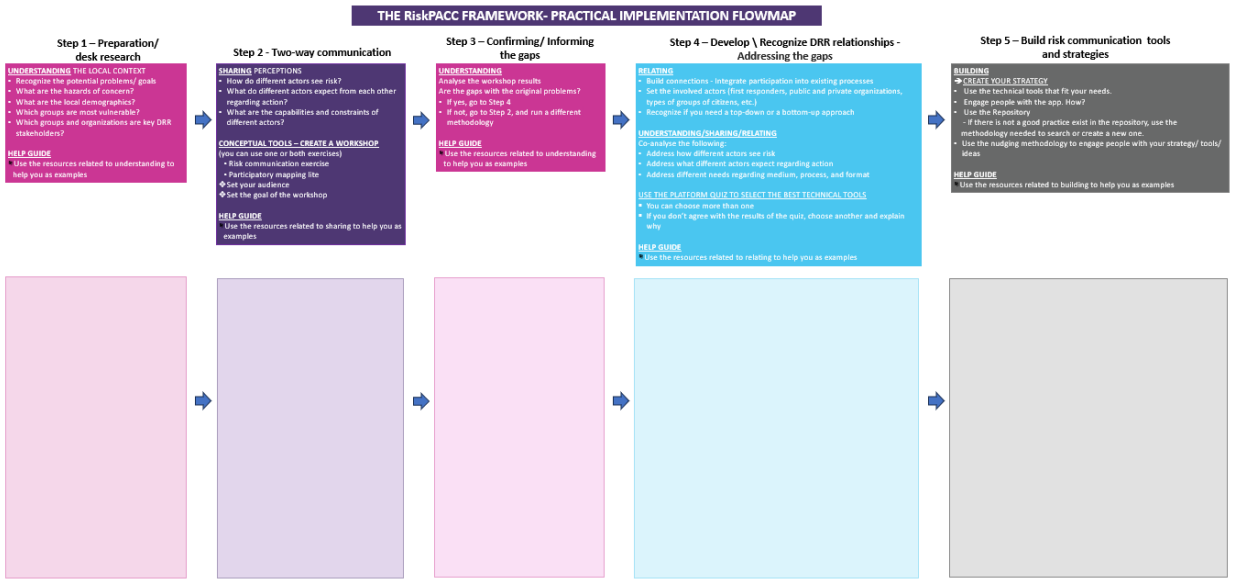

FIGURE 20: PRACTICAL IMPLEMENTATION OF THE FRAMEWORK FLOWMAP

In the upcoming chapters, the results of their discussions will be presented along with the key conclusions drawn from them.

6.2 Groups' reports and analysis

The results will be presented step-by-step in order to facilitate in depicting the similarities and differences between the different groups procedures.

STEP 1 - PREPARATION - DESK RESEARCH			
UNDERSTANDING THE LOCAL CONTEXT			
	PRE – DISASTER GROUP	**DURING-DISASTER GROUPS**	**POST – DISASTER GROUP**
• Recognise the potential problems/ goals • What are the hazards of concern?	- **Floodings**	- **Floodings** - Soil constitution - Damage to building and cars - Damage to infrastructures interruption - Interruption in the morality of the city - livelihood disruption - People and animal rescue Interruption of public Services (schools, hospitals, etc.) - Interruption of services use / electricity / internet.	- **Floodings** - Polluted drinking water - Garbage in the streets - Flooding basements - Bridges destroyed - Electricity down - Communication infrastructure problems - Illegal constructions - Areas and buildings totally flooded
• What are the local demographics?	- Citizens residing in Flood - prone areas - Citizens living closer to the sea and to steep slopes		
• Which groups are most vulnerable?	- Tourists - Elderly people - People with disabilities/mobility issues- economically & socially margins - Children & younger populations communities	- Elderly people - People living in specific areas (low, close to rivers...) - People with disabilities - Children	- Hospital population - Elderly homes - School children - Disabled population - Unregistered immigrants
• Which groups and organizations are key DRR stakeholders?	- Municipality - Civil protection - The Fire Brigade - Police Department - Local rescue/volunteer groups - Local Hospitals/Healthcare facilities	- Civil protection/volunteers. - Fire services / Police - Catastrophic Services/Ministry - Hospital /ambulances - NGOs - Service Support group - Logistic platform for food, medicines, insurance	- Municipality - Regional gov - Firefighters - Volunteers - NGOs - Central gov - Police

TABLE 10: STEP 1 – RESPONSES

As seen in the table above, participants in the pre-disaster assessment, focused on a flood-prone area near the coast characterised by steep slopes. They identified several vulnerable groups, including tourists, the elderly, children, people with disabilities and those with financial hardship or social marginalization. Key stakeholders relevant to DRR were recognised, CPAs, fire services, police and volunteer forces, including local healthcare facilities and hospitals.

The during-disaster group has also set up several hazards that threaten a city's resilience, including soil composition, structural damage to buildings and vehicles, and disruption to infrastructure. A flood disaster can severely disrupt critical services, such as public utilities, electricity and internet services, and jeopardize the safety of people and animals.

Participants of this group have recognised the same DRR actors as the other groups, adding NGOs and support services, as well as logistics platforms for food, medicine and insurance, highlighting that they play a vital role in emergencies.

After a flood event, participants identified lasting hazards and impacts. These included polluted drinking water, flooded areas and buildings, collapsed bridges, power outages, communication disruptions, sanitation issues such as garbage accumulation in the streets, and concerns over illegal constructions. DRR stakeholders identified in the previous phases from the other groups remained relevant, and the vulnerable populations were further expanded to include people in hospitals and undocumented migrants.

This coherence between the participants' responses underscores the importance of maintaining stakeholder engagement at all stages of Disaster Risk Management (DRM) to ensure a comprehensive response and recovery effort.

STEP 2 - TWO-WAY COMMUNICATION			
SHARING PERCEPTIONS			
	PRE – DISASTER GROUP	**DURING-DISASTER GROUPS**	**POST – DISASTER GROUP**
• How do different actors see risk?	General / Lay population tends to underestimate risk.	They analyse it in 3 levels: - Political: responsibility and accountability connected to their race budget allocation. It is a matter of concern as well - Technical: 1) Analysis, 2) Strategy and planning, 3) Monitoring - Operational: Field of work and the national POA. They are those who reset to the risk.	Everyone has a different perception even within the same organization.
• What do different actors expect from each other regarding action?	- CPAs should inform citizens about specific actions to be undertaken. - Citizens are expected to follow orders. - Citizens expect authorities to do everything to mitigate the impact of an event. - CPAs would expect citizens to follow orders and build capacity personally.	- Political: They want the solution, possibly easy and not expensive. They also want usability as well, both technical and Operational. - Technical: Clarity from the political level (poor / budget) - They want to be listened to and taken into account. They also expect operational workers to be efficient. - Operational: Clarity, good tools and equipment, safety and good guidance.	- People that are staying in very dangerous areas, believe that they should be prioritized. But CPAs know the real priority. - Example: a person with a flooded basement has lower priority than a disabled person with an entirely flooded house. - People need to be open to the needs of others. People should be more giving. There should be more volunteers - Citizens expect everything from CPAs. They usually don't prepare themselves. - Example: Citizens don't have power generators or salt in case of snow. - Need active citizens
• What are the capabilities and constraints of different actors?		- Political Capacities: they make the relevant decisions. Constraints: time and money - Technical: Capacities: Knowledge.	- CPAS have knowledge about what their actions should be, but they have limited personnel. - Citizens could be volunteers and could be manpower of CPAs.

		- Constraints. They do not have the power - Operational: - Capacities: Knowledge ➔ they use a lot of equipment can be both capability and constraint. - Constraints: Communication when is no good	- Need a registry of volunteers and their skills. There is a need to train them. - NGOs have manpower, are active in society, and are more organized. There is always a challenge how to coordinate all this help. - Volunteers have limited authority or training. They are enthusiastic but they lack mandate.
CONCEPTUAL TOOLS – CREATE A WORKSHOP (you can use one or both exercises) • Risk communication exercise • Participatory mapping lite ❖ Set your audience ❖ Set the goal of the workshop	Goal of the workshop. Enable citizens and CPAs to act accordingly during a flooding event. Use both: Risk communication exercise. Participatory mapping lite exercise.		- Use of VGI by mapping the area that has been affected the most. - Use spontaneous volunteers to map through participatory mapping. Training them on participatory mapping, it will help expending the network of volunteering mapping.

TABLE 11: STEP 2 – RESPONSES

The analysis of step 2 provided many important insights into the risk perceptions of different actors.

Participants in the pre-disaster group highlighted a worrying trend in public perception, that many individuals tend to underestimate the potential impact of such disasters while the post-disaster group added that risk perception differs even between individuals within the same organisation. This underestimation often leads to a lack of preparedness, as citizens often feel unprepared for such events, and they rely on public authorities and expect them to take the lead in response and recovery efforts. On the contrary, CPAs are expected to inform citizens of necessary actions and urge them to equip themselves with the necessary skills and knowledge in advance. On the other hand, CPAs expect citizens to have already built up their personal capacity.

The during-disaster group followed a different analysis, by sharing information and resources across three distinct levels:

1. **Political Level:** This level includes responsibility and accountability linked to budget allocations. Stakeholders are looking for effective, user-friendly and financially viable solutions. They have the authority to make impactful decisions, but they often face time and budget constraints.

2. **Technical Level:** This aspect involves analysis, strategy and planning, and monitoring. Stakeholders want clarity on the political level as well as efficiency from the operational workers. They want also an acknowledgment of their expertise, but also that they do not have final decision-making authority, despite this expertise.

3. **Operational Level:** This level involves first responders who implement the national plan of action (POA). These teams need clear instructions, access to the right tools and equipment, and proper guidance to improve safety protocols. Despite their extensive knowledge, they often face communication barriers that hinder their ability to perform effectively.

After a disaster, people are often misled about what they expect from each other. For instance, individuals living in vulnerable areas often believe they should be prioritised, while CPAs make robust decisions about how to allocate their resources by taking into consideration the urgency and severity of all emergencies. So, a disabled person whose entire house is flooded is considered a more critical situation than a resident with a flooded basement.

Moreover, as noted by the first group, many citizens rely heavily on CPAs for support and often do not prepare themselves properly in case of a disaster. For example, citizens often do not invest in emergency power supplies or winter kits, highlighting the need for greater personal responsibility and community cooperation.

As recognised by the previous group, CPAs have valuable knowledge of effective disaster response strategies but are often constrained by limited human resources. To make better use of the strength of the community and make people more giving and willing to help others, participants suggested engagement of citizens with volunteering. While volunteers bring enthusiasm and a willingness to help, they often lack formal authority and training, which can hinder their effectiveness. So, a significant challenge persists in how to coordinate and properly train the myriads of volunteer efforts. Participants suggested the creation of a registry of volunteers categorised by skills, as well as a structured training program. NGOs could play a key role in mobilising manpower, given their organisation and community engagement capabilities.

Participants suggested that sharing knowledge and experiences within interactive workshops would be very efficient in addressing the identified knowledge gaps and empowering both citizens and CPAs to respond effectively during flooding events. The first group decided to integrate both conceptual exercises, risk communication and participatory mapping. Participants from the during–disaster group couldn't imagine such a workshop could satisfy the purpose and their strategy. The post-disaster group was more optimistic about incorporating VGI tools in their strategy. In cases of extensive flooding, volunteer-led participatory mapping could provide critical geographic insights. Ensuring consistent training for volunteers would expand the network of those able to contribute effectively, ultimately fostering a more resilient community response.

STEP 3 - CONFIRMING / INFORMING THE GAPS			
UNDERSTANDING			
	PRE – DISASTER GROUP	DURING-DISASTER GROUPS	POST – DISASTER GROUP
• Analyse the workshop results • Are the gaps with the original problems?	Focus on the elderly people. Outcomes of the risk communication exercise.		- Create committees. - Consult with universities. - Call ministry / central or regional government for assistance with assessment. So, you can use their knowledge & their expertise to compensate people. - Money for compensation to citizens comes from the central government but is managed by the local government. - Provide free utilities to citizens (like water). - No property tax for five years from the Central Government.

TABLE 12: STEP 3 – RESPONSES

In step 3, the pre-disaster group, analysing the results from the above workshops, and particularly the risk communication exercise revealed heightened concerns among the older population (participants based the results of their strategy on the main outcomes that they had within the local workshops).

While the during-disaster group didn't fill in this step as they didn't include it in their strategy, the post-disaster group has concluded what are the key strategies to facilitate them to address the identified gaps. Establishing committees, collaborating with universities, and seeking support from central or regional governments for knowledge-sharing initiatives can significantly enhance expertise. Additionally, providing essential services, such as free utilities like water, or implementing political measures, for instance, a five-year exemption from property tax through the Central Government for the affected areas, can further build trust and strengthen two-way communication between CPAs and the communities that they serve.

STEP 4 - DEVELOP/ RECOGNISE DRR RELATIONSHIPS- ADDRESS THE GAPS			
RELATING			
	PRE – DISASTER GROUP	DURING-DISASTER GROUPS	POST – DISASTER GROUP
• Build connections - Integrate participation into existing processes	-	Protocols and guidelines for technical, operational and guidelines for citizens. Keep the human knowledge.	
• Set the involved actors (first responders, public and private organizations,	The same as set in step 1	The same as set in step 1. It is necessary to build a connection between involved actresses to be set.	

types of groups of citizens, etc.)			
• Recognise if you need a top-down or a bottom-up approach	-	In the response phase, the top-down approach is essential, but citizens can communicate to civil protection as well but only in specific ways and channels, for example with apps. The top-down approach has to wait and be relatable without the bottom-up approach.	- Both top-down and bottom-up approaches are useful: CPAs need to come up with a solution. - In the bottom-up approach, citizens can provide useful information
UNDERSTANDING/SHARING/RELATING Co-analyse the following			
• Address how different actors see risk		Official channels only from CPAs to citizens	
• Address what different actors expect regarding action	- CPAs, Tourists, elderly people, people with disabilities ➔ Methodology and activities to use the apps	-	-
• Address different needs regarding medium, process, and format		Both laptop and paper	-
• USE THE PLATFORM QUIZ TO SELECT THE BEST TECHNICAL TOOLS	- The Aeolian app could be used at this level of the preparedness phase, enabling two-way communication between the different identified groups and CPAs. - Public Sonar tool for sentiment analysis could be used as well.	Automatic tools like the public sonar can be useful, but anything time-consuming or that requires a lot of staff does not work. ➔ AI for the future?	- Aeolian is useful for the bottom-up approach. - Public sonar can be used to inform the citizens. - Mapping damage app can be used to provide data about the situation in the municipality.

TABLE 13: STEP 4 – RESPONSES

Recognising the relations between the different actors, participants from the pre-disaster group encountered challenges in identifying effective connections among different stakeholders and determining the most effective approach, top-down or bottom-up, for their strategy. These discussions underscored the necessity for the group to formulate a robust methodology and engage in targeted activities that leverage various applications effectively.

Running the platform quiz, two tools were highlighted as particularly relevant to their strategy. The Aeolian app could prove useful during the preparedness phase by facilitating two-way communication between the identified groups and CPAs, while the PublicSonar tool through the sentiment analysis, could facilitate in assessing public perception and inform strategies more effectively.

In terms of stakeholder relations, the during-disaster group recognised the importance of integrating protocols and guidelines that encompass technical, operational and citizen aspects to facilitate collaborative efforts. While a top-down approach is vital for effective crisis management, the role of citizens cannot be underestimated. They can actively engage with CPAs via dedicated communication channels, including mobile applications. A successful response strategy requires a combination of top-down and bottom-up communication methods.

The platform quiz for this group, resulted in the Aeolian app and the PublicSonar tool. Participants showed their confidence in using the PublicSonar as the most suitable option for their strategy, because of its unique ability in facilitating real-time information sharing. They also emphasised the need for tools that do not take up excessive time or human resources, ensuring a streamlined response during emergencies.

Participants from the post-disaster group, recognised the value of both top-down and bottom-up approaches, emphasizing the need for CPAs to tailor their strategies based on specific objectives. The bottom-up approach allows citizens to share vital information that can significantly aid recovery efforts.

The platform quiz resulted in three RiskPACC tools that were particularly aligned with the post-disaster group's strategy. The Aeolian app was highlighted for its applicability in promoting a bottom-up approach to communication. Meanwhile, the PublicSonar tool would continue to play a vital role in keeping citizens informed. Additionally, the MappingDamage was identified as beneficial for municipalities, as it facilitates the collection of situational data related to the affected area, thereby enhancing decision-making during recovery and rebuilding processes.

Overall, these insights across the pre-, during-, and post-disaster phases underscore that a balanced combination of approaches is crucial for effective disaster management, enabling a seamless flow of information and a collaborative response to emergencies.

STEP 5 - BUILD RISK COMMUNICATION TOOLS AND STRATEGIES			
BUILDING			
	PRE – DISASTER GROUP	**DURING-DISASTER GROUPS**	**POST – DISASTER GROUP**
➔ CREATE YOUR STRATEGY • Use the technical tools that fit your needs. • Engage people with the app. How? • Use the Repository ⇨ If there is not a good practice exist in the repository, use the methodology needed to search or create a new one. • Use the nudging methodology to	**Aeolian app** - Identify and implement the right incentives that encourage active participation to effectively engage citizens with the Aeolian app. - Leveraging existing apps, such as WhatsApp, to share activities, updates, and resources, can facilitate connecting citizens with the Aeolian app and CPAs. - Ensuring a higher level of verification for the Aeolian app, along with other applications, is crucial for maintaining trust and credibility. - As part of a larger National App integration initiative, it is vital to recognise that the potential use of various apps is not inherently detrimental. In fact, it can enhance user engagement when	**PUBLIC SONAR** Engage: - Organize campaigns to showcase the tool and its outcomes, along with an explanation of its functionalities. - Sending reward messages directed to those who post useful information. Strategy: - Combination of data from monitoring devices, sensors, meteorological broadcasts, and the PublicSonar app to gain a comprehensive understanding of the current situation. - Drones can be useful occasionally. - Strategy to communicate during the emergency is crucial, providing the most important information to citizens. Other means: radio, social networks and official channels. - Communication in order to be efficient, should incorporate the key element of insurance, even before the response phase. This is related to the	- After floods go away, we create a committee and create methodology and training material from the event as a good practice. - Use of MappingDamage App and Aeolian App. - Post Disaster Plan: Two tools in the training material for volunteers. - We can use a different disaster approach. - We can use the Aeolian App-section “Do you Know” to spread training material. - People without smartphones or internet (unable people) should be used by volunteers and the volunteers will provide the information to the App

engage people with your strategy/ tools/ ideas	implemented thoughtfully. However, to maximize effectiveness, specific functionalities of the Aeolian app should be clarified and continuously updated. Supporting existing functionalities with regular updates can help keep the app relevant and functional, ultimately leading to increased user satisfaction and participation.	correct behaviour in case of emergency as well, otherwise the insurance will not pay for the damages.	

TABLE 14: STEP 5 – RESPONSES

The pre-disaster group chose to use the Aeolian app within their strategy and highlighted that CPAs should implement effective incentives in order to encourage active citizen participation with the app. They could also make use of existing platforms and tools, such as WhatsApp, to share updates, activities and resources.

Ensuring a high level of verification and authenticity for the Aeolian, among other relevant applications, is essential to build and maintain user trust. Integrating these apps into a cohesive national app initiative can further increase user engagement and participation. In order to increase the relevance of the Aeolian app, it is essential to provide regular updates that clarify its functionalities. These updates will not only keep users informed but also ensure ongoing satisfaction and active participation.

The during-disaster group's strategy focuses on fostering citizen engagement through well-crafted awareness campaigns that emphasise PublicSonar 's functionalities and the positive impacts of community involvement. Participants can enhance this engagement by offering incentives for residents who contribute valuable information. Their strategy could include:

- Combining data from monitoring devices, sensors, and weather forecasts with the data from the PublicSonar, in order to develop a holistic view of the situation.
- Utilising drones when appropriate.
- Establishing a robust communication strategy during emergencies to deliver critical information to citizens. They can use radio, social networks and other official channels.
- Incorporating insurance-related messaging even prior to the response phase to inform individuals about appropriate behaviour during emergencies. Failure to understand these behaviours could result in insurance claims rejections. This highlights the importance of education in fostering a culture of preparedness.

Implementing these key aspects improves their community's ability to respond effectively to flooding events.

The post-disaster group built their communication strategy by taking advantage of all MappingDamage and Aeolian apps' functionalities. The first step in their strategy is to establish a committee dedicated to reflection and learning. This committee will develop

a methodology and training materials based on the experience of the recent floods to guide future preparedness efforts.

To facilitate effective post-disaster strategies, a comprehensive plan should be developed that includes creating training materials for these applications aimed at volunteers. Initiatives such as "Do You Know" sections can help disseminate critical knowledge effectively. Recognising that not all community members may be familiar with technology or smartphones, it becomes imperative to equip volunteers with the necessary tools and information to bridge this gap. Through this approach, the community can enhance its resilience and preparedness for future flooding events, ensuring that all voices are heard and included in the process.

6.3 Exercise conclusions

This exercise is designed to help participants develop an effective communication strategy by following the structured, yet respectful steps outlined in the RiskPACC Collaborative Framework. The process starts with identifying and understanding potential challenges and local demographics, then moving on to sharing insights between different actors, recognising the relationships between different stakeholders and clarifying the approach needed to engage them.

RiskPACC offers a variety of conceptual and technological tools designed to support this communication strategy. However, it's essential to note that these guidelines should not be followed rigidly. Instead, they should serve as a framework to help participants navigate the various factors necessary for creating a successful communication plan.

Feedback indicated that some steps were challenging for participants, particularly for representatives from Efus cities who had limited familiarity with the RiskPACC framework prior to the exercise. As a result, they found certain steps overly complex, even with guidance provided throughout the exercise in the KEE. Of course, teams included also scientific leaders, who were more acquainted with the Framework modules and guided them within the process. This indicates that individuals either CPAs, or other professionals, need time to be trained and understand the functionalities of some tools. This also highlights the fact that expert guidance is crucial in helping CPAs identify gaps in their approaches. Experts provide support to CPAs in sharing their expertise with citizens through facilitated discussions.

In addition, elements of the strategy involved the implementation of realistic scenarios, such as step 3, which proved difficult to address in hypothetical contexts. Nevertheless, participants drew on their personal experiences and insights from previous local workshops, which helped them to articulate their strategy effectively.

It is worth noting that although participants were introduced to the various tools available within the RiskPACC project, they ultimately chose those that best meet their needs. Of course, they were encouraged to consider not only RiskPACC tools but also alternative resources that could enhance their strategies.

Discussions among participants provided important and practical insights for strengthening strategic communications. These conversations led to solutions based on their personal experiences and local knowledge, demonstrating the value of collaboration. Although not every aspect of the exercise was fully addressed, each team managed to formulate a strategy that met many of the requirements.

One of the key takeaways from this exercise is that although there are viable solutions, the main challenges lie in a lack of education, insufficient resources and misunderstandings between different stakeholders. More particular, the main conclusions regarding participants' responses are:

- **Role of stakeholders:** Consistent recognition of key stakeholders across all assessment phases, such as CPAs, fire services, police, volunteer forces, NGOs, and local healthcare facilities, emphasizes the necessity for ongoing collaboration. Their engagement is essential at every stage of DRM in order to formulate a comprehensive and effective response to disasters.
- **Public perception and preparedness**: As one of the main gaps that have been identified within RiskPACC, there is a worrying tendency to underestimate disaster risks, with citizens often relying heavily on public authorities for preparedness and response, which can lead to inadequate personal preparedness. There is a need to foster a culture of personal responsibility and community cooperation to build a more resilient society.
- **Misaligned expectations**: The stakeholders often have misconceptions about what they can expect from each other. For example, public authorities have a better perception of severity situations and how they will allocate their resources, which is not aligned with individuals' perception that are in need and expect to be prioritized. It is crucial to establish clearer communication and set realistic expectations.
- **Community engagement and volunteer coordination**: The involvement of community volunteers is crucial. However, there are challenges due to the lack of authority and training of volunteers. Recommendations include the creation of a register of volunteers by skills and the implementation of structured training programs to improve coordination and effectiveness.
- **Adoption of technology for disaster management**: The use of tools such as Aeolian for citizen engagement and PublicSonar for community awareness campaigns can help improve responses. These technologies are not mandatory to be used as stand-alone tools, but a synergy, combined with data collected from various sources, can pave the way for a robust, multi-dimensional communication strategy. Integrating these tools into a cohesive national initiative can further increase user engagement and encourage greater community participation. In addition, regular updates and ongoing training are essential to maintain user confidence and engagement, while the use of technology ensures better preparedness and response.
- **Strategic initiatives**: Following a disaster, strategies should focus on sharing knowledge through workshops, forming committees for reflection, and improving communication about recovery processes. Providing services such

as free utilities and tax exemptions can help rebuild community trust and improve communication between CPAs and the public.

- **Ongoing education and training**: There is a need for ongoing training and the production of comprehensive materials to improve the community's understanding of disaster preparedness. Initiatives to educate both CPAs and citizens, supported by technology, will strengthen community resilience to future disaster events.

Collectively, these conclusions highlight the importance of a coordinated, inclusive and well-communicated approach to DRM that takes into account the complexity of stakeholder relationships, public perceptions and the critical role of technology in enhancing preparedness and response. Addressing these issues is crucial for enhancing the overall effectiveness of communication strategies in the future.

7 CONCLUSION

In conclusion, the objective of T3.6 has been successfully achieved, as evidenced by the fruitful interactions and collaborations among the participants. The collaborative environment fostered within the KEEs not only facilitated a rich dialogue among them but also enabled participants to gain valuable insights into the different strategies and practices used within and beyond the RiskPACC framework, building a solid foundation for continued engagement and improvement of community resilience.

Lessons learned and key conclusions drawn from the different sessions conducted in the KEEs highlighted the critical importance of establishing effective communication and engagement strategies between CPAs, citizens and volunteers, as well as the need for ongoing collaboration and continuous adaptation of strategies in response to emerging challenges.

These shared experiences and lessons learned have outlined the following key aspects as the most significant for improving community practices to enhance risk preparedness and awareness and finally facilitating in bridging the RPAG:

- **Building relationships:** Building trust with communities before emergencies is one of the key foundations for effective cooperation and trust during crises.
- **Clarifying roles and responsibilities**: A clear definition of the roles of CPAs, volunteers and citizens is needed to avoid overburdening CPAs and improve the overall efficiency of disaster management.
- **Ensuring access to essential resources**: Ensuring the supply of critical resources, will enhance CPAs' commitment to community safety and thereby build public confidence.
- **Establishing consistent two-way communication**: Communication can be more effective if it is consistent and delivered through social media and open

channels. This can help reach a wider audience, build trust and community involvement, and enable better response to emergencies.

- **Technology innovations for awareness:** Implementing technology (like apps and data visualization tools) can improve real-time communication and decision-making. An efficient strategy could combine more than one app and emergency services into a cohesive national app to further increase user engagement and participation.
- **Utilising of standardised and verified communication tools**: The use of controlled and tested platforms minimises the spread of misinformation and ensures clarity of messaging, building trust within the communication.
- **Ensuring transparency in relationships**: Honest communication about uncertainties, capabilities and constraints of each actor will build trusting relationships between CPAs and citizens.
- **Volunteer engagement:** The improvement of volunteer organisation through role-specific training can have a positive impact on disaster response and resilience.
- **Communication through community leaders**: Collaborations with local organisations and community leaders can help develop strategies that address the specific needs of vulnerable communities and people hard to reach.
- **Engaging with children:** Involving schools in preparedness training creates a culture of resilience among young people, empowering them to take proactive measures in their communities.
- **Developing targeted strategies:** Designing tailored training materials and communications for vulnerable populations ensures that all community members can enhance their preparedness.

Integrating these aspects into practice can significantly improve the overall effectiveness of disaster preparedness efforts. By emphasising consistent communication, community engagement, tailored education, and utilising innovative strategies, CPAs can foster resilient communities capable of effectively responding to various hazards and crises.

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The RiskPACC Consortium

FIGURE 21: THE RISKPACC CONSORTIUM