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## 6<sup>th</sup> Disaster Risk Management Knowledge Centre (DRMKC) Annual Seminar

*22-23 November 2022  
Workshop Report*

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## **Abstract**

This report summarizes the contents and discussion of the 6th Disaster Risk Management Knowledge Centre (DRMKC) Annual Seminar, organized on 22-23 November 2022 in hybrid format, with participants in presence in Paris and connected from remote.

## **Acknowledgements**

The event was co-organized and designed by the Joint Research Centre – Disaster Risk Management Knowledge Centre (JRC-DRMKC) and the Directorate-General for European Civil Protection and Humanitarian Aid Operations (DG ECHO), with the Directorate-General for Research and Innovation (DG RTD).

The organizer team wishes to warmly thank all moderators and speakers of the Seminar's sessions who, with their knowledge and expertise, made the Seminar a successful event, and all participants for their active engagement in the event exchanges, being it online or in presence.

Finally, the organizers would like to offer their thanks to the French Ministry of Interior, who supported the effective implementation of the two days in Paris.

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## Executive Summary

On 22-23 November 2022 the 6th Disaster Risk Management Knowledge Centre (DRMKC) Annual Seminar took place, i.e. almost at the end of the first full year of activity of the Union Civil Protection Knowledge Network, which was established in November 2021.

The Annual Seminars of the [DRMKC](#) are the occasion in which the different actors engaged in Disaster Risk Management are invited to sit at the same table to exchange views, identify emerging challenges and define all together the way forward to effectively approach the changing landscape of risks to be faced.

This year's annual seminar was co-organized with the Directorate-General for European Civil Protection and Humanitarian Aid Operations (DG ECHO) and the French Ministry of Interior. Its aim was to look back at our achievements in developing together with the Disaster Risk Management (DRM) community the building blocks of the Science Pillar of the [Knowledge Network](#) of the Union Civil Protection Mechanism (UCPKN).

The annual seminar brought together scientists, practitioners, policy makers and civil protection authorities across Europe and beyond, to present and celebrate the achievements of the UCPKN Science Pillar in 2022, as well as to identify and discuss the challenges still standing.

The event was attended by 98 participants in presence, from 22 EU and non-EU Countries, plus 30 participants from remote via WebEx. The event was also web-streamed. Both, participants in presence and from remote, all engaged in lively discussions throughout the 4 sessions of the seminar, organized around the narrative "GAPS-PROCESS-SOLUTIONS-COMMUNICATION of scientific knowledge for DRM".

The Plan of Action of the Science Pillar foresees two phases: the first one, in which the integration and consolidation of the knowledge/services already available in the DRMKC should have taken place; the second one, for the identification and integration of OTHER relevant scientific activities, especially tacking stock of the expertise and knowledge available in the Member States (MS) and Participating States (PS) to the Union Civil Protection Mechanism (UCPM). The end of 2022 marks the transition from phase one to phase two, in which a greater engagement of the scientific community of the MS/PS and beyond is expected.

Based on exchanges occurred in Paris, as well as from the follow up messages received in the following days, with various proposal collaborations from MS/PS and academia, it appears that the Seminar contributed to serve the purpose of the expected transition.

# 6th DRMKC Annual Seminar: OUTCOMES

Advancing evidence-based policy and practice

OPENING SESSION	SESSION 1 - GAPS	SESSION 2 - PROCESS	SESSION 3 - SOLUTIONS	SESSION 4 - COMMUNICATIONS
<p>The DRMKC community is large and the network is expanding over time. The enlargement of the community should help addressing the following proposals put forward by panellists:</p> <ul style="list-style-type: none"> <li>• <b>Creating communities of expertise</b> by type of risk and connecting them on the European territory</li> <li>• Strengthening <b>cross-border and multi-sectoral synergies</b> by capitalizing on common experiences.</li> <li>• Putting focus on <b>experiential education and the use of modern technologies</b>, especially virtual or augmented reality for handling emerging and long term crisis.</li> <li>• Enhancing the <b>application of science in all phases of the disaster risk management cycle</b> and the work on <b>foresight and on scenario-building</b> to better anticipate crisis.</li> <li>• <b>Improving the understanding of impacts of disasters</b>, innovations and attribution research, combined with better loss data catalogues and learning lessons processes.</li> <li>• Looking into the future, <b>continue investing in early warning systems for all</b>.</li> <li>• Keeping <b>peace, humanitarian aid and migration</b> as the main lines of action for the external action area.</li> </ul>	<p>How can the scientific community enhance operational preparedness and response?</p> <ul style="list-style-type: none"> <li>• <b>Acknowledging existing scientific capacity already providing National and European Civil Protection Authorities with expert judgment</b> based on the existing scientific knowledge.</li> <li>• Keeping scientific advice easy to understand and targeted to the user's needs, e.g. by making <b>data accessible, quality-checked, compatible and exchangeable</b>.</li> <li>• <b>Addressing the "enormous wish list for technical innovation"</b> from the civil protection operational communities, to enhance civil protection capacities in an output-oriented way.</li> <li>• <b>Organising more crisis management exercises</b>, as realistic as possible, <b>to compensate the lack of real experience</b>, e.g. for nuclear disasters.</li> </ul>	<p>How to feed the scientific needs of the DRM community into science advice and research agendas?</p> <ul style="list-style-type: none"> <li>• In prevention/preparedness, taking the <b>opportunity to develop new models and innovate information and technological systems</b> and to apply them in <b>experimental settings</b>.</li> <li>• <b>Further shifting the focus from protection to resilience</b>, both in the physical and digital domains</li> <li>• <b>Developing methodologies to get grip on the uncertain event-impact chains</b>, using imagination to think the unthinkable</li> <li>• <b>Acknowledging that there will always be a residual risk for citizens to be prepared for and to take action about</b>, no matter how good the institutional preparations efforts are.</li> </ul>	<p>How to operationalise scientific knowledge in Disaster Risk Management?</p> <ul style="list-style-type: none"> <li>• Strengthening disaster resilience in the area of civil protection through the imminent adoption of the <b>5 Union Disaster Resilience Goals<sup>1</sup></b> and <b>forward-looking scenarios for 16 risks<sup>2</sup></b>, which will underpin the formulation of the goals.</li> <li>• Supporting the implementation of the Sendai Framework through UNDRR work on <b>global risk knowledge instruments and more practical capacity building support</b>.</li> <li>• <b>Encouraging the use of geo information systems</b> as a solution for building situational awareness and to support the Midterm Review of the Sendai Framework.</li> <li>• Promoting the good practice of using <b>regional multi-scale pilot projects</b> to address systemic risk interdependencies in Europe.</li> <li>• Enhancing the anticipatory capacity by using <b>digital technologies, behavioural and data sciences in an integrated way</b>.</li> </ul>	<p>How to make scientific knowledge easily accessible for different actors?</p> <ul style="list-style-type: none"> <li>• <b>Focusing risk communication on impact rather than probability</b> ("what if?")</li> <li>• <b>Using storytelling, visuals and narratives to create images for increased retention rate</b> of the underlying messages.</li> <li>• <b>Knowing and understanding your audience</b>, including its different levels (primary and secondary).</li> <li>• <b>Designing a communication strategy and plan prior to approaching decision makers and users</b>, especially with complex topics.</li> <li>• <b>Developing a risk culture</b>, by implementing several activities related to communication at regional and local level, <b>with a cross-border approach</b>.</li> </ul>
<p><sup>1</sup> Improved risk assessment, anticipation and management; increased risk awareness and preparedness; enhanced early warning; enhanced response capacity; enhanced robustness of the civil protection system  <sup>2</sup> heat/cold waves; wildfires; earthquakes; industrial incidents (incl. accidents); effects of armed conflicts; incl. population displacement; floods; marine pollution; cybersecurity incidents; volcanic eruptions; blackouts and energy disruptions; tsunamis; nuclear incidents (incl. accidents); effects of migration; major storms; pandemics; effects of terrorist attacks</p>				



# 1 Introduction

The 6th Annual Seminar of the Disaster Risk Management Knowledge Centre (DRMKC), the European Commission's science and knowledge service for Disaster Risk Management (DRM), took place on 22 and 23 November 2022, after the first full year of activity of the Union Civil Protection Knowledge Network (UCPKN) and its two pillars: the Science and the Capacity Development.

Under the "capacity development" pillar, a wide variety of already existing activities are being further enhanced to respond to changing needs. A topical training programme, a rich selection of exercises, an exchange programme for experts are all key to strengthen the agility and effectiveness of civil protection and disaster risk management, and support the Union Civil Protection Mechanism (UCPM) and its Member States and Participating States (MS/PS).

The Science pillar identifies, promotes and feeds the needs of the civil protection and disaster risk management community into the national and international research agendas to strengthen the use and dissemination of existing scientific knowledge in all DRM phases.

On 10 November 2021 the Commission published the Implementing Decision ((EU) 2021/1956) which formally established the Union Civil Protection Knowledge Network, with a strong Science Pillar, clearly referencing the Disaster Risk Management Knowledge Centre, DRMKC, as a core building block.

At the launch of the UCPKN, the Commission and the Member/Participating States agreed the DRMKC annual seminars would represent the fora in which the DRM community will: i) convene and evaluate the status of implementation of the Science Pillar and ii) brainstorm on possible activities for the way forward, to be considered in its yearly action plan.

The current Plan of Action of the Science Pillar foresees two phases: the first one, in which the integration and consolidation of the knowledge/services already available in the DRMKC should have taken place; the second one, for the identification and integration of other relevant scientific activities tacking stock of the expertise and knowledge available in the MS/PS. During 2022 the following activities were actually completed by DRMKC:

- the integration of the Risk Data Hub in the Science Pillar
- the launch of a prototype DRM shared terminology for it, together with DG ECHO, DG RTD, DG HOME, UNDRR, WHO
- the support to DG ECHO for definition of the Union Disaster Resilience Goals
- the collaboration with DG ECHO and DIGIT for the design of the UCPKN Knowledge Library, which will soon be launched in the UCPKN platform, and which builds on the DRMKC experience with the Project Explorer and the Gaps Explorer, as well as on the DRM taxonomy
- the collaboration with DG ECHO in the implementation of a number of events and capacity building initiatives, like the workshop and the stand of the UCPKN at the Civil Protection Forum and the workshop on the new functionalities of the RDH, both in June, or the workshop on the science advice to policy making at the "Youth in Civil Protection" study visit organized by the UCPKN in Brussels in October.

Last year's seminar inspired and guided the activities of the Science Pillar. The main research gaps highlighted in November 2021 were the following:

- Compound, concurrent and cascade events, especially focusing on the nexus with climate change
- Communication challenges and the impact of human factor on DRM
- Moving beyond borders with risk assessment and scenarios
- The study of costs and effects of mitigation actions

A summary of the main outcomes of last year's event is available in the [workshop factsheet](#) on the DRMKC website.



This year's seminar was organized around a narrative which looked into the "GAPS-PROCESS-SOLUTIONS-COMMUNICATION" of scientific knowledge for DRM. Thanks to five panels of distinguished speakers and moderators, we touched upon all the above-mentioned topics:

- The opening session confirmed the increasing role of the Science Pillar of the UCPKN as a space where existing and new scientific networks would be able to create, manage and share scientific knowledge and data with the aim of supporting decision makers in better anticipating, preparing for, and responding to disasters considering the changing landscape of the risks we are facing.
- Session 1 and 2 drilled down on challenges of dealing with complex situations while orienting the research agendas and providing advice to policy makers
- Session 3 focused on the DRM-climate change nexus, with specific attention to risk assessment methodologies for doing so, while informing –at the same time– the new processes of trans-boundary scenario building and of the Union Disaster Resilience Goals (UDRGs)
- Session 4 made us reflect around the social dimension of DRM and specifically of the risk communication.

## 2 Summary of sessions

This 2-day event aimed to share the achievements of the UCPKN Science Pillar in addressing challenges such as compound, concurrent and cascade events which need to be included in risk analysis or the communication challenges in risk management, among others.

The seminar was opened by the remarks from:

- the French Ministry, with Stéphane Thebault - Departement Director in charge of international affairs, resources and strategy;
- the Czech Republic chair of the council working party PROCIV, Mr Chalupa Jiří
- the Directorate-General for European Civil Protection and Humanitarian Aid Operations (DG ECHO), with Olimpia Imperiali - Deputy Head of the Situational Awareness Sector
- the European Commission's Joint Research Centre (DG JRC), with Tom De Groeve - Acting Head of "Disaster Risk Management" Unit

Below is a summary of the main conclusions from each session. All presentations given at the event, as well as the web streaming recordings, are available on the DRMKC website:

<https://drmkc.jrc.ec.europa.eu/events-news/drmkc-annual-seminars/6th-drmkc-annual-seminar>

### OPENING REMARKS

**Stéphane Thebault**, Department director in charge of international affairs, resources and strategy, welcomed all participants in Paris for the 6th annual seminar of the DRMKC. He mentioned that the Directorate General, represented by him at the event, led work in the first half of 2022, within the framework of the French Presidency of the Council of the European Union, on the impact of climate change on European civil protection and thanked once again the DRMKC, DG ECHO, as well as the Copernicus Climate Change Service, for their support and essential contributions to their joint reflections at the time.

In that context, they had collectively identified the following lessons and axes:

- Dialogue, exchange, mutual knowledge, identification and sharing of good practices between communities, and in particular between the scientific and operational worlds, are one of the keys to responding to these multi-sectoral risks that we are all facing
- A systemic and multidisciplinary approach to the issues at stake must be systematically favored in order to develop lines of work that can provide concrete solutions in the short, medium and long term
- In this sense, we must continue to reflect collectively on the development of this formidable tool, the Knowledge Network, and on the key role that it will have to play with regard to these new perspectives
- It is crucial to capitalize on this network, and more particularly on the DRMKC, its scientific pillar, to create communities of expertise with an approach by type of risk and to connect them on the European territory, as an extension of the NEMAUSUS project that they are currently carrying out with the support of their consortium partners
- Finally, and in a complementary manner, we must strengthen cross-border and multi-sectoral synergies by capitalizing on our common experiences of shared risk basins.

He recalled that our primary objectives, our mandate, are to protect populations, to contribute to the resilience of our societies and highlighted that expectations from us, whether we are decision-makers, scientists, academics or relief workers, are immense. He said himself certain that the work that will be carried out at the Seminar will consolidate the cornerstone of our Mechanism.

The agenda of the Knowledge Network is full: we have a reference newsletter, a strategic plan, a timetable to consolidate, working groups to initiate and a reflection to carry out with our neighbors. He wished the participants a lively, nourished, thoughtful and constructive exchanges under the auspices of the colleagues from the DRMKC.

**Chalupa Jiří**, Chair of the council working party PROCIV - Czech Republic, spoke in the name of the ongoing Czech Presidency of the Council of the European Union. He mentioned that during the preparatory works for

the DRMKC Annual Seminar, their presidency team has asked several questions, the most important one was – Is there any relation or link between the Czech Presidency Civil Protection priorities and the activities of the Knowledge Network? Do we have common interests?

So he informed the audience about the priorities of the Czech Presidency. The first one, “*Strengthen the EU ability to respond to long term emergencies*” -decided at the beginning of the year under the influence of COVID-19 pandemics, as well as the extended forest fires and floods- became even more relevant at the end of February, with the possible lack of gas and electricity resources provoked by the events ongoing between Russia and Ukraine. The CZ Presidency also organized a dedicated workshop on this: “Prevention, Preparedness and Response to Long-Term Emergencies”. Some of the outcomes were the following:

- Participants discussed a number of national initiatives and tools in place in order to ensure that our population become better prepared for emergencies, such as web preparation portals, training centers (mobile and fixed), national campaigns such as crisis preparedness weeks. A growing focus was put on experiential education and the use of modern technologies, especially virtual or augmented reality.
- On emergency energy supplies, participants recognized the added value of the new rescEU energy supply capacity and pointed out that emergency energy supplies (e.g. generators) alone are not enough, but require additional experts and staff. Also, production of generators is time consuming, costly and not environmentally friendly, so we should take a look at alternative sources of energy such as for example solar energy.
- There is a need for more in-depth discussions about the availability of different types of water related to expected climate change in Europe, which will probably bring about more frequent and longer droughts and in effect a lack of natural sources of water.
- Understanding the changing European risk landscape with an increasing trend to cross-sectoral, transboundary emergencies with complex cascading effects is fundamental for addressing long term emergencies.

The above conclusions of the workshop highlight the evident close link between the Czech Presidency Priority and the work of the Knowledge network.

Another example was also provided, about the management of forest fires and the cooperation with Science. The Czech Republic had to deal with its worst wild fire event this summer. Firefighters had used various types of equipment to extinguish the fire. From fire engines to helicopters and aircrafts. The new technologies were used – for example drones for monitoring the affected area, finding the focal points of fire, measuring the temperature (it was a result of a security research and co-operation with Universities). The Copernicus satellite images were very important in coping with fire. And last but not least, they benefitted from the knowledge of firefighters from abroad, who came to help them.

He concluded that there is an obvious common interest, as sharing knowledge among civil protection community and other actors (like researchers, universities, first responders, public and private sector) is crucial, and the results of the 6th Disaster Risk Management Knowledge Center Annual Seminar will contribute to it.

**Olimpia Imperiali**, Deputy Head of the Situational Awareness Sector of DG ECHO spoke on behalf of Mr. Hans Das, the Acting Head of Unit A3 at DG ECHO. She thanked DRMKC for giving her the floor as co-chair of the Disaster Risk Management Knowledge Centre that represents one of the many examples of successful cooperation between Commission’s Services and Member States.

She mentioned that the sixth Annual Seminar of the Disaster Risk Management Knowledge Centre marks the first year of the creation of the Knowledge Network and its Science Pillar and wished “Happy Birthday” to the initiative. She took the opportunity to thank the French Ministry of Interior to co-host this relevant event in Paris and warmly welcome all participants coming from all over Europe to exchange views on our common goal: to strengthen the application of science in all phases of the disaster risk management cycle.

Europe is facing a changing risk landscape. As we speak, we are facing an unprecedented crisis and under the Union Civil Protection Mechanism, DG ECHO and its Emergency Response Coordination Centre (ERCC) is facilitating the delivery of aid to Ukraine and its neighbours. They have delivered more than 74 000 tonnes of emergency assistance to Ukrainian people, coordinated above 1500 medical evacuation operations and established three logistics hubs and a medical hub to enable and ensure the efficiency of these operations.

They are facilitating cross-sectoral cooperation for example in health, energy and CBRN. More than 450 million EUR worth of assistance has already been delivered to Ukraine via the UCPM.

To meet these but also future challenges, DG ECHO is working to further reinforce the current crisis management system, strengthening for example their work on foresight and on scenario-building in order to be able to anticipate better, earlier and together with our MS to boost our society's resilience. To do this effectively, we need to rely on scientific evidence. In particular, science plays an essential role to understand existing and emerging risks. A good understanding of risks is critical to prevent or mitigate the adverse consequences of disasters, including the development of efficient early warning systems. Early warning systems are an important component of the disaster reduction chain.

In this context, the DRMKC has already successfully contributed to improve our common understanding of risk (analysing for example the national risk assessment) and to further enhance our early warning systems, such as the Global Disaster Alert and Coordination system (GDACS), the European Flood Awareness System (EFAS), the European Forest Fires Information System (EFFIS) or the European Drought Observatory (EDO).

While recalling the good results achieved so far, we should also acknowledge that in a world of increasing uncertainties, we need to do more. And science can offer decision-makers facts to help them navigate the current and upcoming challenges. The DRMKC is a core element of the UCPKN Science Pillar. It will offer practical means to further exploit scientific knowledge and make it available to decision makers.

The science pillar of the KN will be the space where existing and new scientific networks would be able to create, manage and share scientific knowledge and help the decision makers to better anticipate, prepare for, and respond to disasters and ultimately enhance the Union's resilience.

She concluded by saying that all of our actions are going to be shaped by and founded on clear evidence. This is why this event is so important.

**Tom De Groeve**, Acting Head of "Disaster Risk Management" Unit, DG Joint Research Centre. The DRMKC annual seminar is one of the highlights of the Disaster Risk Management Unit of the JRC. We are meeting as a community almost every year and involve as much as possible Member States authorities. The community is large and the network is expanding over time. The event takes place after the COP27 which provides a framework for the loss and damage recording. The outcomes are very important for the DRM community and call for a better understanding of impacts of disasters, innovations and attribution research, better loss data catalogues (e.g. the DRMKC Risk Data Hub), learning lessons. We need also to look into the future disasters and invest in early warning system. The network looks also in the external action: peace, humanitarian aid and migration. We hope the DRMKC annual seminar would be the opportunity to discuss what to do in the next years to address the gaps and find solutions (build proposals, use research outputs, etc.).

### **SESSION 1 (GAPS) – How can the scientific community enhance operational preparedness and response?**

The format of the first session was an interactive discussion facilitated by the moderator of the session, **Peter Billing** (former Head of Unit Security and Situational Awareness, DG ECHO A.3, European Commission). He opened the exchange with a reflection on how scientific knowledge is fundamental for a good understanding of the situation and for taking effective decisions to prepare for and respond to disasters. He also highlighted, however, that the existing knowledge might have limitations in certain situations. These limitations can come either from the lack of data or from new elements related to a specific event. Nevertheless, these challenges might become an opportunity to enhance the scientific knowledge in certain areas and to fill existing gaps. For example, a tsunami in Indonesia caused by an underwater landslide highlighted the need to further explore this kind of event. The UCPKN could enable the interaction between the scientific networks used by operational actors and the wider scientific community.

Civil Protection Authorities as well as the ERCC use various networks of scientific institutes with 24/7 monitoring capacity. Those institutes are usually providing an expert judgment based on the existing scientific knowledge. Therefore, the panellists of this session were representing different operational actors, to reflect on their needs and their expectations from the Knowledge Network Science Pillar:

Speakers from the National Civil Protection Authorities were invited to explain how they are connected with the scientific community, what scientific data are used and needed and what they expect from the UCPKN:

- Laurent Alfonso, European Affairs Officer for the French Directorate General for Civil Protection and Crisis Management and seconded national expert on civil protection at the Union for the Mediterranean. His field experiences at national and international level gave him a cross-disciplinary approach to crisis

management, with skills acquired in prevention and communication. He is coordinator of the PPRD South III EU funded programme and peer of UCPM Peer reviews

- Susanne Wacht, International Affairs Officer, German Federal Agency for Technical Relief (THW), representing Germany in the Civil Protection Committee and main focal point for the work under the Union Civil Protection Mechanism. She has a strong operational background being deployed in several national and international civil protection missions.

Speakers representing the ERCC's European scientific partnerships and Copernicus Emergency Management Services (CEMS) were also invited to express their views on how these services could benefit from the Knowledge Network and what the gaps are from a perspective of an operational scientific institute:

Following the tour de table, the moderator asked some additional questions to fuel the discussions, in particular:

- How can we better anticipate emerging disasters when signals are still very weak?
- How can the scientific community support us to better prepare for disasters with cascading and cumulative effects?
- How can we improve real-time data sharing?

Below our summary of the gaps and needs expressed from the panellists:

**Laurent Alfonso** (Civil Protection expert & French Civil Security European Affairs Officer, Union for the Mediterranean) underlined the importance that scientific advice should be easy to understand and targeted to the user's needs in order to be applied. To this aim, he highlighted that it's important to assure that **data are provided in a structured way, to make them compatible and exchangeable**. He also provided some example of platforms and tools that France is using to collect qualitative data.

**Susanne Wacht** (International Affairs Officer, German Federal Agency for Technical Relief - HW) brought her field experience into the discussion and provided some practical examples of the needs that field experts are expecting from the scientific community. She conveyed the **"enormous wish list for technical innovation" from the civil protection operational communities**, to enhance civil protection capacities, BUT she also highlighted **the need to discuss the "HOW" (to bridge the science/knowledge gap in an output-oriented way)**.

**Alberto Micheli** (Research director, National Institute of Geophysics and Volcanology - INGV) focused on the need for **an effective platform of communication between users and research community**. A roundtable where to have the chance to talk to each other would be important and the Knowledge Network Science Pillar could probably provide this. He also supported the request for an effort on making **data accessible and quality-checked, as well as harmonized or standardized** (as much as possible) to allow also **AI applications and help to calculate e.g., the impact of events**. Micheli also mentioned the need to **promote methodologies and benchmarking exercises**.

**Klaas van der Meer** (Head Expertise Group, The Belgian Nuclear Research Centre - SCK CEN) provided a short **presentation of the EAHSP-RN consortium and services**. He described the existing networks in the Radiological and Nuclear field and underlined some gaps in data. He also mentioned the sensitiveness of their advice in case of an accident inside the EU. Since it is the national nuclear regulatory authority that should inform neighbouring countries and international organizations like the EU and the IAEA, and determine which countermeasures are taken, the EAHSP-RN consortium has to walk a thin line in its description of the incident and possible consequences in order to not compromise the role of the concerned national authority and its own role. He finally mentioned the need for **more exercises, as realistic as possible, to compensate for the lack of real experience in e.g., nuclear disasters**.

Finally, **Peter Salamon** (Scientific project manager, Joint Research Centre, European Commission), shared his experience of a fruitful and **continuous interaction with end users** in order to receive feedback to improve the service and provide even better answers to the needs, in the framework of the Copernicus service. He also mentioned the importance of **dissemination of information about available tools**, capacity building and trainings of the trainers.

Session 1 contributed directly to the **2<sup>nd</sup> goal of the UCPKN**, which aims at "Support knowledge sharing and learning to strengthen the collective capacity to prevent, prepare for and respond effectively to emergencies". We heard from the scientific experts about their expectations from the UCPKN and its Science Pillar and how

they can benefit from it. Addressing the gaps and the expectations listed above is quite challenging, but this is what the Knowledge Network and its Science Pillar are expected to achieve with the support of the DRM community.

## **SESSION 2 (PROCESS) – Feeding the scientific needs of the DRM community into science advice and research agendas**

In the session 2, moderated by **Scira Menoni** (SNE, EC Directorate-General for Research and Innovation Science Policy), the focus was on how to make sure that the research agendas at national, EU and international levels are reflecting the needs of the DRM community. **This session was meant to contribute directly to the 3rd goal of the UCPKN: which is to strengthen application of research in civil protection and disaster risk management planning and operations, specifically by linking the scientific community with operational actors within the UCPM and enabling an effective feedback mechanism between them.**

Crises that have occurred over the last decades and even more, coming one on top of the other in the last few years, are a manifestation of the complexity of threats and systemic vulnerabilities of our era. Science is under pressure: on the one hand to provide useful and usable advice when uncertainties and stakes are still very high, on the other to rush studies and experiments much beyond the traditional protocols that are followed in academia.

New forms of **scientific endeavour** are developing requiring new criteria of assessment and new codes of conducts. **Scientific advice must draw on scientific evidence** to provide policy makers with a clear understanding of what is known and what can be eventually done in a crisis. **Such advice is also fed in its turn by new research that produces new results as the crisis is unfolding.**

Somehow, the scientific needs are both different and interconnected across the entire disaster risk cycle from prevention to response and recovery. In the “cold phase” the opportunity is there to develop new models and innovate information and technological systems and to apply them in experimental setting. During and immediately after a crisis ad hoc funding schemes can be envisaged and made more systematic to rapidly trigger research on the specific type of crisis that has occurred in order to elicit available knowledge and search for solutions. In the recovery, lessons learnt and improvement of both models and tools can be envisaged and asked for by the scientific community. A form of “data rescue” can be also envisaged: e.g., Susanne Wacht referred to site visits to the Western European 2021 flood areas in the aftermath of the event to secure information on damage and functioning of emergency response systems.

Session 2 was therefore organized around a reflection on the experiences of feeding scientific needs in the research agendas and scientific advice in the different phases of the disaster management cycle, i.e. in prevention/preparedness, in emergency/crisis management and in recovery phase.

### PREVENTION/PREPAREDNESS

**Giannis Skiadaresis** (Coordinator for Infrastructure Resilience, DG HOME F2, European Commission) spoke about how research can feed the needs of risk prevention and enhanced resilience of critical infrastructure. He provided an overview on the main elements for Member States and for critical entities of the CER Directive (CRE). This directive started in 2020, as an example of connectivity between the emerging and complex threats. The directive shifts the focus from the concept of protection to the one of resilience, with the identification of 11 critical sectors at national level and a risk-based approach at critical entities level. Physical and digital infrastructure are addressed specifically.

**Bart van den Hurk** (Strategic Research Manager at DELTARES, PI of Hor2020 RECEIPT project) reflected on the frequency of historic extremes, which is shown to increase: extremes will increasingly become the new normal; climate increases probability but with very big uncertainty. The European citizens and other players need to be prepared to the “unpredictable” as there is always a residual risk for citizens and local players to be prepared for and to take action about. He mentioned the role of event scenarios and impact cascades to inform crisis prevention and management. The European Union Climate Risk Assessment (EUCRA) is preparing for risk assessments explicitly addressing complex impact pathways, which challenges the concept of quantitative risk assessments using exceedance thresholds. As in principle every extreme event and its corresponding impact chain is unique, it’s very difficult to calculate a return time for it. So also science needs to develop methodologies to get grip on the rigid and uncertain event-impact chains, which requires imagination to think of the unthinkable. We also need to bring the climate change concepts into the realm of emergency management and make sure people can learn from the events that are occurring already today.

**Daniela Di Bucci** (Geologist, Italian Civil Protection Department - ICPD) shared her institution's experience in civil protection planning for Vesuvius and Phlegrean Fields volcanoes. She described the complexity of the volcanic behaviour of the mentioned volcanic systems and the essential contribution of Science to the civil protection planning, e.g. in the definition of the evacuation areas for different volcanic phenomena, like pyroclastic flows (red area, to be completely evacuated in case of activation of the civil protection plan) or like ash fall (yellow area, to be evacuated by sectors, depending on the meteorological conditions of the moment).

#### EMERGENCY/CRISIS MANAGEMENT

**Maarja Krusmaa** (Vice rector of the Tallinn University of Technology and member of the Group of Chief Scientific Advisors of the EU) presented what scientific evidence reveals about challenges in EU crisis management. In particular, following the official presentation in the European Parliament plenary in Strasbourg on the same day, presented some insights from the "Scientific opinion on the Strategic Crisis Management in the European Union". Among them, she mentioned that more and more crises are likely to escalate to cross boundaries and cross borders. There is a need for much faster response cross boundaries and cross sectorial than what we have now. Interdisciplinary is needed, as well as integration for financial and economy impacts assessments and of the competences of statistical offices. She also reflected the trust topic: in complex systems, why people have to listen to us? How to deliver data in an explainable way? For policy makers, it is very important to communicate and explain the "why" of their decisions. It is important to integrate local knowledge - lot of knowledge at level of practitioners of civil protection is not formalised - take into account diversity, exchange best practices, be open minded to listen to others. People do not want to be saved; they want to know how they can save themselves.

For this phase of the DRM, Daniela Di Bucci shared the case study of the technical management of the Costa Concordia shipwreck. Also in this case Science was crucial for the management of the (protracted) emergency situation, with heavy potential impacts on the environment, in addition to the human lives losses. Some new technical/scientific approaches were needed for the ship removal operations (anchoring, stabilizing, parbuckling, re-floating the wreck) as well as for ensuring the safety of the protected marine environment during the operations (sea waters constantly monitored through satellite monitoring; check of the sea quality by aircraft with infrared cameras; set up to identify hydrocarbon pollution; special waste management; seabed cleaning operations and restoration of the marine flora after the removal).

#### RECOVERY

**Reimund Swarze** (Head of department of Climate Economics, Executive Board of DKKV- Germany and member of UN E-STAG) spoke about the recovery plans from the pandemic in Europe: looking into the building back principle from an economic and financial perspective. He shared information about Europe's Recovery and Resilience Facility (RRF) and elaborated on the question "Are national programs on track towards a green and resilient recovery?" He concluded that Europe has taken significant steps to deliver a green and resilient recovery, but the targets were met (and surpassed) only in the RRFs reported to the EC, less so in the national recovery programs. Only between 3% and 12% of the expenditure for "ecological transition" in the test countries are climate adaptation related. This "mitigation bias" needs to be offset by strengthening nature-based DRR and CCA efforts. He recommended to develop a resilience and a sustainable finance taxonomy and to accompany the overall top-down ongoing process with bottom-up approaches as well.

The final case study shared by Daniela Di Bucci was about the technical management of the 2016-2017 seismic sequence in Central Italy. This emergency affected several regions in Central Italy, with immense damages on residential buildings, schools, hospitals, cultural heritage, livestock farms, roads and other lifelines, for a total amount of economic losses in the order of EUR 21 billion and considerable indirect social and economic impacts. In the recovery phase, science can play an important in facilitating the combination of energy upgrading and seismic retrofitting for the affected built areas.

### **SESSION 3 (SOLUTIONS) - How to operationalise DRM scientific knowledge**

This session addressed the mechanism for operationalizing DRM science into the Disaster Resilience Goals and Scenario-building processes: what kind of databases, models, assessment tools and services are needed to implement a performance-based approach for monitoring the progress towards disaster resilience building.

In the session we learned about:

- European and global policies & knowledge & action platforms
- Risk scenarios & tools, including databases
- Adaptation pathways
- Resilience goals



— Foresights

There are many other initiatives that were mentioned but were not addressed due to time constraints. Some of them include:

- the European Climate Risk Assessment which was mandated by the 2021 EU Adaptation Strategy and is implemented by the European Environment Agency (EEA). The process started in October 2022 and the final report is expected in Spring 2024. The report will complement the knowledge provided by the IPCC AR6 and translate identify key climate related risks the management of which require European cooperation and coordination.
- The EU Mission on adaptation to climate change - one of the five mission-oriented research & innovation programs of the Horizon Europe – sets out to help 150 European communities and regions to develop transformative adaptation pathways and 75 deep demonstrators of transformative climate resilience. Several projects have been chosen and will start shortly, including the CLIMAAX project developing a regional climate risk assessment framework and toolbox supporting the European regions in better understanding of risks and opportunities of accelerated adaptation.
- New generation of climate, adaptation and resilience services – set to translate climate information into actionable knowledge helping businesses and policy makers to make climate smart decisions – is driven by the 2015 European research and innovation roadmap. Climateurope2 project – started in September 2022 – continues providing market & policy assessment and help building community standards across many areas pertaining climate services.

In session 3 there were 6 panellists, whose contributions were organized with a first round of statements, in which they had the opportunity to introduce their initial reflections. Below the list of statements from the panellists:

**Maria Brattemark** (policy officer, ECHO.B.2 - Prevention and Disaster Risk Management, European Commission) clarified the role of the Union Civil Protection Mechanisms on prevention, in particular describing (i) the tools available (such as DRG, DRM summary reporting on risk assessment and risk management capability assessment, Article 6 progress report, PPP projects, Peer reviews) and (ii) the plan to step up action on wildfire prevention in the next years – given the past serious wildfire seasons. She also spoke about the Disaster Resilience Goals process, explaining the legal mandate and the link to the ongoing process related to scenario building. The state of play of the adoption and the presentation of the 5 Disaster Resilience Goals was shared as well.

**Phillip Frank Vilar Welter** (policy officer, ECHO.B.1 - Civil Protection Horizontal Issues, European Commission) focused on DG ECHO's scenario-building initiative under Art.10 of the Decision 1313/2013/EU. Under this initiative, the Commission, EU Member States and Participating States to the Union Civil Protection Mechanism are developing disaster scenarios to improve cross-sectoral disaster risk management planning at Union level, both for natural and man-made disasters which cause or are capable of causing multi-country transboundary effects, including the adverse effects of climate change. The initiative will better inform future prevention, preparedness and response measures, drive policy initiatives for the UCPM, and support the definition of specific targets for the Union Disaster Resilience Goals (DRGs). The presentation also listed the specific scenarios that are currently being developed under the scenario-building initiative.

**Andrew Bower** (program manager, UNDRR Regional Office for Europe & Central Asia) focused his statements on two dimensions: 1) the global context and frameworks surrounding the need and call for greater operationalization of DRM scientific knowledge, in reaching resilience goals and targets and supporting the implementation of the Sendai Framework; 2) how UNDRR is approaching this dimension in its engagement with UN Member countries and the broader DRR community, through its work on global risk knowledge instruments and more practical capacity building support, with interesting linkages to the DRG and science-policy interface at EU level.

**Beata Janowczyk** (head of Risk Assessment and Emergency Planning Unit Government Centre for Security in Poland), highlighted how the Covid-19 pandemic and the migration crisis showed the importance of geoinformation systems as a solution for building situational awareness. Sometimes it is not possible to foresee all hazards, but it is always a priority to provide accurate and updated information. As an example, she presented the [GIS National Security system](#), a result of cooperation among many governmental entities, the private sector and the world of science, as a joint fight against the spread of the coronavirus pandemic which

has been created and used for the crisis management system in Poland by the government in cooperation with scientists in the matter of the pandemic. The GIS National Security system proved to be effective not only for pandemics. On the one hand, they share data with research institutions, and provide analyses and scenarios modelled by artificial intelligence. On the other hand, those products are shared with entities responsible for crisis management and civil protection, scientists, services, and also decision makers. The system was also used to collect data and information during the Midterm Review of the Sendai Framework process this year. A part of the work of Government Centre for Security is direct informing about threats. For this purpose the Centre has developed SMS Alert - one of the tools of the early warning system in Poland. SMS Alert system sends text messages to all people in an endangered area. This is another example of cooperation between decision makers and the scientists; it has solid foundation developed together with research and development entities in the field of monitoring of threats and population warning. It is a good example of the joint effort towards reducing disasters' risks, but at the same time building the resilient society. *"In the context of my experience, I am absolutely certain science and innovation can support decision-makers to increase the ability to manage risk and also crisis situations. During the last 2 years we were working together with different actors from different sectors to reach the best solution, but I can't imagine this work without scientists".*

**Philip Ward** (head of the Global Water and Climate Risk section, Institute for Environmental Studies, VU University Amsterdam) exposed the good practice of MYRIAD-EU project which addressed the topic of systemic risk interdependencies in Europe, looking specifically at 5 multi-scale pilots, each dedicated to deep dive into a given challenge:

- North Sea - challenge: how can spatial planning at the interface of land and sea environments be optimized in the face of increasing and interrelated risks?
- Scandinavia – challenge: how can we maintain healthy eco-systems under climate-related risks while meeting increasing demands for energy, food and other ecosystems services, and what is the role of nature-based solutions?
- Danube region – challenge: how can we increase resilience to multiple disasters that impact several interconnected countries with strong macro-economic relations?
- Veneto region (Italy) – challenge: how can diverse natural landscapes from the mountains to the sea achieve a forward-looking perspective conducive to multi-risk planning?
- Canary islands – challenge: how can island regions with a strong dependence on tourism become more resilient to multi-hazard risks?

In each Pilot the project first defined a future sustainability challenge (see above) and then they involved stakeholders from different sectors to discuss ways to achieve that challenge. In doing so they addressed all of the different possible hazards (and combinations of hazards) in the regions that are relevant to the challenge.

The project encountered the challenge of the diverse language and terminology used around concepts related to systemic risk, to face which the UNDRR Hazard Information Profiles are surely a good building block. Therefore the project invested also on the design of a [disaster risk gateway](#), wiki-style platform open for contributions from everybody, to look into interactions across hazards and sectors and which includes a section on terminology.

The intervention of **Minke Meijnders** (strategic foresight analyst, UN Global Pulse) focused on foresight (and risk) related initiatives proposed in the SG's "Our Common Agenda" (presented in September 2021), and more specifically on the Global Risk Report and the Global Emergency Platform. She shared thoughts on the importance of transforming our institutions to be more anticipatory, and what role UN Global Pulse plays in this regard. Key highlights from the agenda:

- Global Risk Report to be out in 2024: will reflect the perspective of global experts, involving the broader risk community and private sector. The report looks into the 25 years looking into 2 scenarios: breakthrough (perpetual crisis, pandemics) and breakdown scenarios (sustainable recovery). COVID-19 crisis was a wake-up call for more anticipatory action. Behavioral science, digital technologies and data sciences are crucial for enhancing the anticipatory capacity when used in a mixed/integrated way.
- Global emergency Platform: to be established by a UN resolution: looks into poly-crisis. It will be member states led.

#### **SESSION 4 (COMMUNICATION) - Making scientific knowledge easily accessible for different actors: good practices of science support to policy and decision-making**

The session reflected on the topic of accessibility and communication of scientific knowledge and presented experiences of collaboration between scientists, practitioners, policy- and decision makers as well as application of research in civil protection and disaster risk management planning and operations. The moderator, Felix Bloch - Head of Unit, ECHO.B3, kick-started the discussion with a short teaser video, from the movie "Don't Look up", which presents some interesting points of reflection that ideally reconnect with the final audience polling/interactive session of the 2021 DRKMC Annual Seminar, like the different speed/timeline of science and decision making, the way scientists and policy makers interact, the complexity and the language barrier ("just tell us what it is"), uncertainty, recognition and trust ("We are gonna get our own scientists. No offense").

The panellists were then asked to say if they could relate to the video and the communication problem in it. It emerged that, indeed, it is challenging to communicate about risk. There is a risk that "this" will happen and something needs to be done, but there is uncertainty as when and whether it will happen. It is difficult to communicate on the base of probability and communicate "what if".

A recommendation was given by the panellists: communication needs to assume that it will happen and focus on the consequences, so scrap the probability and focus on what the impact of the event will be, to catch people's attention and leverage on their emotional side, making them visualize the impacts on their own life/family/community:

- - There is probability that an event happened in the past might occur again.
- - If that happens, what might the outcome be? Are you ready? What/who could be impacted? A fire would propagate, burn the protected areas, houses if they have trees there... looking at the different components of risks. There are a series of assets at risk: population, infrastructure, natural resources: how vulnerable are they? Do you have an evacuation plan? Points where the population could gather?
- - It is key to depict clearly the consequences, so that the target audience can "visualise" the potential impact of events (Jesús San-Miguel-Ayanz).

Moreover, it is really important to use "narratives" and focus on the metalevel, think in terms of imaginative and emotional engagement. There is a growing awareness that providing scientific information to the public is not enough - they have data, the information is there, but it does not reach people in a way that resonates with them, they don't take action. The same is true for climate change and other risk communication: things that are difficult to imagine and understand - (getting population ready for the unexpected) should be communicated through the engagement of their emotions and imagination. Many people have reservations about this, as they think that processing and acting on scientific information is a matter of paying attention to data and logical argument. But we, as humans, are not 100% rational beings and, under pressure, it is often our emotional brain which commands and take decisions. When you add images, the communication is much more effective, emotions and emotional reactions to risk differ from logical assumptions so you can make very different decisions based on that.

In addition, risk by definition is in the future, people need imagination in order to see that, so that it becomes relevant for them, and they have a reaction to it because it might mean something to them, their children, friends, etc. Right now, risk communication is very logical but not very imaginative. Storytelling can help because it creates images in the mind and the retention rate of the underlying messages is higher. This approach has a solid scientific base, it builds on neuro-physical research and cognitive psychology. (**Alexa Weik von Mossner**).

On the other hand, there is the risk that decisions are based on personal fears, and we do not want to create panic among the population. So the key message is "know your audience" and always consider the fact there are *several levels* of audience: primary and secondary. You need to keep several audiences in mind when you communicate risks through images and narratives. Also, future work needs to focus on the source, the person who tells the story: act through transdisciplinary collaboration in order to train people, so they get better at communicating (**Alexa Weik von Mossner**).

The target audience need and deserve to have the right figures and know exactly what lies behind (e.g. rounding up, uncertainty, methodology). Therefore, communication needs to be thought of from the very beginning, at the moment you create a product, improvisation at the very end when you have finished the analysis cannot be the way. Communication, communicate comes from "communis" - generally defined as achieving a joint and shared understanding instead of merely transmitting information- or as one analysis team once said after requesting a copy of their product: "we cannot send it, but we can come to you and

present it and explain it to you so you understand it". On a more technical level, a communication plan should always be developed before approaching decision makers/clients/users, especially with complex topics, like (e.g.) tools and methods in budgeting and funding in the area of "climate economics": the link from forecasting and foresight in Climate Change to drafting the required and evidence-based financing to counter its negative effects and impacts should be addressed, together with options on "how" to translate scientific physical results, such as flood, wildfire or drought projections, into economics (**Juha-Pekka Jäpölä**).

Communication is really what matters, and looking at conversations during this event, even between policy makers communication was not always very clear. E.g. DG HOME talking about the directive, are we sure that everyone in the audience knows what a directive is? Even yesterday, between scientists of different branches of science, communication failures could be detected (**Felix Bloch**).

Normally not so much the lack of data that impedes good risk communication, we have though a problem of *harmonisation* of data – each country has a gathering system that works for them, harmonise and standardise data to have a clear description of the situation, as –in a field – we need to make people aware that the fire risk is there and expanding to new areas. The Commission expert group on forest fires (since 1998), to which 43 countries participate, meet twice per year and communicate with MS/PS, informing each other of what it's going on at EU and national levels, respectively. The Commission inform how the scientific concepts are implemented into operational systems and then get feedback from the audience, to see if information was of use to them or not. Two way communication builds understanding and collaboration – it should be always a two-way channel (**Jesús San-Miguel-Ayanz**).

The reflection around forest fire risk communication continued with **Laura Carlon**, Deputy head, Forest and Natura 2000 Service, Région Provence-Alpes-Côte d'Azur, who shared a good practice in developing the culture of fire risk. The MED-PSS project worked with different CP actors to define a common risk communication campaign. The project consortium investigate the state of the art and tried to develop fire risk culture, implementing several activities related to communication in their territories, at regional/local level, with a cross-border approach (test cases in Corsica, Tuscany, Région Provence-Alpes-Côte d'Azur and Sardinia regions).

The dominant logic of communication strategies is the transmission of information to reach the greatest number of target audiences. However, the challenge is way more complex than this: a communication strategy means identifying common values in the target audience, which depends on many factors, including cultural ones. The acceptability of a message need to be considered and worked around. And, of course, this is coupled with institutional agendas, which need to focus on many things at the same time: preventing, improving the image of the institution, recruiting more volunteers. There is a wide range of stakes that comes and it is impossible to reach all target audiences or all phases of the risk cycle at once, as we need to use multiple communication channels.

In practical terms, the process followed in the project was the following:

1. USE OF SURVEYS, PRE-TESTS to design a global campaign targeting general public, which implied the need to plan/develop: (i) relations with the press, (ii) an approach to social media, (iii) a common platform with shared vocabulary (iv) a presence in international actions on forest fires, e.g. International forest fires day in March.
2. CO-CONSTRUCTION – development of a united charter that allowed for recognition when the project partners talked, with attention to the tone of the messages, to the selection of words used, adapting them to local specificities
3. PRE-TEST OF THE CAMPAIGN: it's very important to test the message you want to implement during the campaign and to readjust it if necessary, before publishing the campaign
4. CONSISTENCY IN VARIETY of expressions: there is need to update/modify the main campaign messages from one year to the other, being careful to not the axis of communications campaign – one way is to keep a visual identity of the campaign.
5. EVALUATION of the communication campaign at the end.

The panel agreed on some final remarks: understand your audience and adapt your communication – agree, understand what you want to communicate and then evaluate through pre-tests and tests what works and what doesn't work, to be more strategic.

The session was followed by a series of questions from the audience, which raised several issues: the possibility of defining a common EU communication strategy; the risk of not knowing our audience; the need to face the challenge of communicating with people who don't know languages (actually, the poor, the most vulnerable), the need to establish links with other campaigns, the challenges posed by disinformation; and the

need to communicate uncertainty. Maria Brattemark informed that a call for good communication practices will follow the adoption of the Disaster Resilience Goals. Andrew Bower underline that 13 October is for the United Nations the International Day for Disaster Risk Reduction: in perspective, we could possibly work to have, on the same day, an EU day to promote a global culture of risk-awareness and to celebrate how people and communities around the world are reducing their exposure to disasters.

### 3 Key messages from the discussion

Thanks to the expertise and engagement of all -moderators, speakers and participants- the event allowed us to learn valuable insights that can support our joint activities in the framework of the UCPKN Science Pillar. Below a summary of the main messages which we believe could inspire the way forward.

#### OPENING SESSION

The DRMKC community is large and **the network is expanding over time**. The enlargement of the community should help addressing the following proposals put forward by panellists:

- **Creating communities of expertise** by type of risk and connecting them on the European territory
- Strengthening **cross-border and multi-sectoral synergies** by capitalizing on common experiences.
- Putting focus on **experiential education and the use of modern technologies**, especially virtual or augmented reality for handling emerging and long term crisis.
- Enhancing the **application of science in all phases of the disaster risk management** cycle and the work on **foresight and on scenario-building** to better anticipate crisis.
- **Improving the understanding of impacts of disasters**, innovations and attribution research, combined with better loss data catalogues and learning lessons processes.
- Looking into the future, **continue investing in early warning systems for all**.
- Keeping **peace, humanitarian aid and migration** as the main lines of action for the external action area.

#### SESSION 1 – GAPS

How can the scientific community enhance operational preparedness and response?

- **Acknowledging existing scientific networks with 24/7 monitoring capacity already providing National and European Civil Protection Authorities with expert judgment** based on the existing scientific knowledge.
- Keeping scientific advice easy to understand and targeted to the user's needs, e.g. by making **data accessible, quality-checked, compatible and exchangeable**.
- **Addressing the “enormous wish list for technical innovation”** from the civil protection operational communities, to enhance civil protection capacities **in an output-oriented way**.
- **Organising more crisis management exercises**, as realistic as possible, **to compensate the lack of real experience**, e.g. for nuclear disasters.

#### SESSION 2 – PROCESS

How to feed the scientific needs of the DRM community into science advice and research agendas?

- In prevention/preparedness, taking the **opportunity to develop new models and innovate information and technological systems** and to apply them **in experimental settings**.
- **Further shifting the focus from protection to resilience**, both in the physical and digital domains
- **Developing methodologies to get grip on the uncertain event-impact chains**, using imagination to think the unthinkable
- **Acknowledging that there will always be a residual risk for citizens to be prepared for and to take action about**, no matter how good the institutional preparations efforts are.

#### SESSION 3 – SOLUTIONS

How to operationalise scientific knowledge in Disaster Risk Management?

- Strengthening disaster resilience in the area of civil protection through the imminent adoption of the **5 Union Disaster Resilience Goals**<sup>1</sup> and **forward-looking scenarios for 16 risks**<sup>2</sup>, which will underpin the formulation of the goals.
- Supporting the implementation of the Sendai Framework through UNDRR work on **global risk knowledge instruments and more practical capacity building support**.
- **Encouraging the use of geo information systems** as a solution for building situational awareness and to support the Midterm Review of the Sendai Framework.
- Promoting the good practice of using **regional multi-scale pilot projects** to address systemic risk interdependencies in Europe.
- Enhancing the anticipatory capacity by using **digital technologies, behavioural and data sciences in an integrated way**.

#### **SESSION 4 – COMMUNICATIONS**

How to make scientific knowledge easily accessible for different actors?

- **Focusing** risk communication on **impact rather than probability** (“what if?”)
- **Using storytelling, visuals and narratives to create images for increased retention rate** of the underlying messages.
- **Knowing and understanding your audience**, including its different levels (primary and secondary).
- **Designing a communication strategy and plan prior to approaching decision makers and users**, especially with complex topics.
- **Developing a risk culture**, by implementing several activities related to communication at regional and local level, **with a cross-border approach**.

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<sup>1</sup> improved risk assessment, anticipation and management; increased risk awareness and preparedness; enhanced early warning; enhanced response capacity; enhanced robustness of the civil protection system

<sup>2</sup> heat/cold waves; wildfires; earthquakes; industrial incidents (incl. accidents); effects of armed conflicts, incl. population displacement; floods; marine pollution; cybersecurity incidents; volcanic eruptions, blackouts and energy disruptions; tsunamis; nuclear incidents (incl. accidents); effects of migration; major storms; pandemics; effects of terrorist attacks



## 4 Feedback from the participants

An [online survey](#) was shared with all participants after the event to gather feedback on the format and content of the event. We received 27 responses. The results are summarized as follows:

- The average rating of the overall experience during the event was 4, on a scale of 0-5.
- Regarding the question about prior to the event, how much of the necessary information on logistics and the agenda did participants get, the average score was 4 on a scale of 0-5.
- Except for one responder, all replied Yes to the question if the information was communicated in time.
- In terms of how satisfied were the participants of the organization and the presentation the average score varied between 3 (remote attendees) and 4 (attendees in person) on a scale of 0-5.
- As a participant how useful was the information that obtained during the event, the attendees, both remote and in person gave an average score of 4 on a scale of 0-5.
- For remote participants, how easy was it to be involved in the discussions the average score was 2 on a scale of 0-5.
- Those who responded to the question, 18 found the time allocated to each Session enough for the discussions and 9 didn't.
- To the question of "I found the event very useful. It will affect my current and near future activities" the average score was 4 on a scale of 0-5.
- In the free text question we asked participants to add topics that should be addressed in the next annual seminar, suggestions for workshops, trainings or other ideas that help addressing the gaps identified during the discussions.

Suggestions:

- Some found that between practitioners and scientists working on the subject of DRM is challenging: the challenge seems to be to connect the DRMKC to national/local initiatives by being accessible to all.
- Need for demonstrations of tools, ideally the same time allocated to theoretical and field related, in a coordination centre.
- Some participants highlighted that they wished to have more time for discussions; potentially considering setting up break-out rooms as it is a practice during workshops.
- It was highlighted that a stronger focus on communication and making scientific knowledge easily accessible for different actors would be useful for future events.
- NATECH risks and Cybersecurity risks were emphasized as potential future topics to be discussed.

## 5 Conclusions

The Annual Seminars of the [Disaster Risk Management Knowledge Centre](#) are the occasion in which the different actors engaged in Disaster Risk Management are invited to sit at the same table to exchange views, identify emerging challenges and define all together the way forward to effectively approach the changing landscape of risks to be faced.

This year's annual seminar was co-organized with DG ECHO and the French Ministry of Interior. The aim of this year's seminar was to look back at our achievements in developing together with the DRM community the building blocks of the Science Pillar of the [Knowledge Network](#) of the Union Civil Protection Mechanism, established in November 2021. The event also aimed at brainstorming on the action plan of the Science Pillar for 2023.

The first full year of activity of the Union Civil Protection Knowledge Network was presented and celebrated. Achievements of 2022 and challenges still standing were discussed, especially regarding the Science Pillar of the Knowledge Network. This seminar represented an opportunity to launch a new phase of dialogue between civil protection authorities and the scientific community to continue building the network together.

In fact, the Plan of Action of the Science Pillar foresees two phases: the first one, in which the integration and consolidation of the knowledge/services already available in the DRMKC should have taken place; the second one, for the identification and integration of OTHER relevant scientific activities, especially tacking stock of the expertise and knowledge available in the MS/PS. The end of 2022 marks the transition from phase one to phase two, in which a greater engagement of the scientific community of the MS/PS and beyond is expected. Judging from exchanges occurred in Paris, as well as from the follow up messages received from participants soon after, with various proposal collaborations from MS/PS and academia, it seems that the Seminar served the purpose of the expected transition.

## ANNEX 1: Agenda and Format

The 6<sup>th</sup> DRMKC Annual Seminar took place as a public event on Tuesday 22 and Wednesday 23 November 2022 in hybrid format. Participation to the event was possible in presence or from remote after registration and a livestreaming was also provided.

The presentations were either given live from the event venue (Novotel Paris Gare de Lyon, Paris) or from remote via WebEx. Questions and comments from the audience were collected in the room and using the WebEx chat and they were answered during the Seminar.

The event's detailed agenda is shown below.

<b>Tuesday, 22 November 2022</b>		
13:00	13:55	<b>Welcome Buffet Lunch</b>
13:55	14:15	<b>Opening remarks of DAY 1 - Opening remarks from France, Directors of JRC, DG ECHO and CZ Presidency</b>
		Christina Corbane <i>Leader of Disaster Risk Management Knowledge Centre, Joint Research Centre, European Commission</i>
		<b>Speakers:</b>
		Tom De Groeve <i>Acting Head of "Disaster Risk Management" Unit, Joint Research Centre, European Commission</i>
		Olimpia Imperiali <i>Emergency Management and rescEU, Unit A3, DG ECHO, European Commission</i>
		Stéphane Thebault <i>Departement Director in charge of international affairs, resources and strategy</i>
		Chalupa Jiří <i>Chair of the council working party PROCIV - Czech Republic</i>
14:15	15:30	<b>SESSION 1 (GAPS) – How can the scientific community enhance operational preparedness and response?</b>
		<b><i>Purpose /question for the session:</i></b> <i>identifying needs from the operational actors and scientific communities, and understanding their views on the added-value of the KN for their activities.</i> Scientific knowledge is fundamental for a good understanding of the situation and for taking effective decisions on preparations or response. Operational actors, including the ERCC, use various networks of scientific institutes with 24/7 monitoring capacity. Those institutes are usually providing an expert judgment based on the existing scientific knowledge. However, the existing knowledge might have limitations in certain situations. These limitations can come either from the lack of data or from new elements related to specific event. Nevertheless, these challenges might become an opportunity to enhance the scientific knowledge in certain areas and to fill existing gaps. For example, a tsunami in Indonesia caused by an underwater landslide, highlighted the need to further explore this kind of event. In this context the Knowledge Network could enable the interaction between the scientific networks used by operational actors and the wider scientific community. This session aims at highlighting the needs of the users of the scientific knowledge and at triggering the discussion on how to best

		benefit from the Knowledge Network. The session would also address the issue of access and exchanges of data.
		Peter Billing <i>former Deputy Director, Head of Unit A3, DG ECHO, European Commission</i>
		<b>Speakers:</b>
		Laurent Alfonso <i>Civil Protection expert &amp; French Civil Security European Affairs Officer, Union for the Mediterranean</i>
		Susanne Wacht <i>International Affairs Officer, German Federal Agency for Technical Relief (THW)</i>
		Alberto Michellini <i>Research director, National Institute of Geophysics and Volcanology (INGV)</i>
		Klaas van der Meer <i>Head Expertise Group, The Belgian Nuclear Research Centre (SCK CEN)</i>
		Peter Salamon <i>Scientific project manager, Joint Research Centre, European Commission</i>
15:30	16:00	<b>Break</b>
16:00	17:15	<b>SESSION 2 (PROCESS) – Feeding the scientific needs of the DRM community into science advice and research agendas</b>
		<p><b><i>Purpose /question for the session:</i></b> <i>how make sure that the identified knowledge needs are orienting science advice and national/international research agendas.</i></p> <p>Crises that have occurred over the last decades and even more, coming one on top of the other in the last few years, are a manifestation of the complexity of threats and systemic vulnerabilities of our era. Cascading and cross-boundary impacts, ripple effects across spatial and temporal scales and triggering of unsuspected chains of losses to economy and society through highly interdependent supply chains have created an unprecedented demand for scientific advice on the one hand and for new research to find solutions on the fly on the other. New forms of scientific endeavour are developing requiring new criteria of assessment and new codes of conducts. Scientific advice must draw on scientific evidence to provide policy makers with a clear understanding of what is known and what can be eventually done in a crisis. Such advice is also fed in its turn by new research that produces new results as the crisis is unfolding. Science in under pressure: on the one hand to provide useful and usable advice when uncertainties and stakes are still very high, on the other to rush studies and experiments much beyond the traditional protocols that are followed in academia. Somehow, the scientific needs are both different and interconnected across the entire disaster cycle from prevention to response and recovery. In peace time the opportunity is there to develop new models and innovate information and technological systems and to apply them in experimental setting. During the crisis, as has been done during the Covid 19, ad hoc funding schemes can be envisaged and made more systematic to rapidly trigger research on the specific type of crisis that has occurred in order to elicit available knowledge and search for solutions. In the recovery, lessons learnt and improvement of both models and tools can be envisaged and asked for by the scientific community. There is a clear interplay between the research that can be asked for along the three phases and also, for more local types of events it may well be that different phases are experienced in different countries.</p>

		Scira Menoni <i>Seconded National Expert, Directorate-General for Research and Innovation Science Policy</i>
		<b>Speakers:</b>
		Maarja Krusmaa <i>Vice rector of the Tallinn University of Technology and member of the Group of Chief Scientific Advisors of the EU</i>
		Reimund Schwarze <i>Head of department of Climate Economics, Executive Board of DKKV- Germany and member of UN E-STAG</i>
		Giannis Skiadareisis <i>Coordinator for Infrastructure Resilience, DG HOME F2, European Commission</i>
		Bart van den Hurk <i>Strategic Research Manager, RECEIPT project</i>
		Daniela Di Bucci <i>Geologist, Italian Civil Protection Department (ICPD)</i>
17:15	17:30	<b>Closing remarks of DAY 1</b>
19:00	23:00	<b>Social dinner</b>
<b>Wednesday, 23 November 2022</b>		
08:30	09:00	<b>Arrival - Coffee</b>
09:00	09:15	<b>Opening remarks of DAY 2</b>
09:15	10:30	<b>SESSION 3 (SOLUTIONS): how to operationalise DRM scientific knowledge</b>
		<p><b><i>Purpose /question for the session:</i></b> <i>how the scientific research is supporting the development and implementation of the Disaster Resilience Goals and the Scenarios.</i></p> <p>While political leadership and community engagement are essential for the successful implementation of science-informed policies and action, the scientific community has a responsibility to formulate applicable methodologies and solutions that respond to real-world challenges. The Commission together with Member States is working towards improving resilience to large scale disasters by developing Union Disaster Resilience Goals based on current- and forward-looking scenarios, including the effects of climate change and cross-sectoral impact analysis. Scientific information- and evidence-based approaches are crucial to advance disaster resilience and scenario building. This session will address the mechanism for operationalizing DRM science into the Disaster Resilience Goals and Scenario-building processes: what kind of databases, models, assessment tools and services are needed to implement a performance-based approach for monitoring the progress towards disaster resilience building.</p>
		Jaroslav Mysiak <i>Director of the research division Risk Assessment and Adaptation Strategies (CMCC)</i>

		<b>Speakers:</b>
		Philip J. Ward <i>Head of the Global Water and Climate Risk section, Institute for Environmental Studies, VU University Amsterdam</i>
		Andrew Bower <i>Program manager, UNDRR</i>
		Beata Janowczyk <i>Head of Risk Assessment and Emergency Planning Unit Government Centre for Security in Poland</i>
		Phillip Frank Vilar Welter <i>Policy officer, ECHO.B.1 - Civil Protection Horizontal Issues, European Commission</i>
		Maria Brattemark <i>Policy officer, ECHO.B.2 - Prevention and Disaster Risk Management, European Commission</i>
		Minke Meijnders <i>Strategic foresight analyst, UN Global Pulse</i>
10:30	11:00	<b>Break</b>
11:00	12:15	<b>SESSION 4 (COMMUNICATION) - Making scientific knowledge easily accessible for different actors: good practices of science support to policy and decision-making</b>
		<b>Purpose /question for the session:</b> <i>the session will reflect on the topic of accessibility and communication of scientific knowledge and will present experiences of collaboration between scientists, practitioners, policy- and decision makers as well as application of research in civil protection and disaster risk management planning and operations.</i> Integrating and applying scientific knowledge in the various phases of the disaster risk management cycle is not always straightforward. Scientific knowledge is often fragmented among different national, scientific, and technical communities. Frequently, they do not or cannot coordinate with decision makers at the different institutional levels where disaster risks are managed. In a similar manner, operational actors at times struggle with information overload, accessing the right knowledge at the right time, or selecting what is the most relevant for their work. The Union Civil Protection Knowledge Network aims to address this communication gap.
		Felix Bloch <i>Head of Unit, ECHO.B3, European Commission</i>
		<b>Speakers:</b>
		Georgios Georgiou <i>Conservator of Forests, Fire Protection Section, Department of Forests, Republic of Cyprus</i>
		Laura Carlon <i>Deputy head, Forest and Natura 2000 Service, Région Provence-Alpes-Côte d'Azur</i>
		Jesús San-Miguel-Ayanz <i>Programme officer, Wildfires team, Joint Research Centre, European Commission</i>

		Alexa Weik von Mossner <i>Associate Professor, University of Klagenfurt</i>
		Juha-Pekka Jäpölä <i>Project officer, DG ECHO.B.3 and PhD researcher, University of Antwerp</i>
12:15	12:30	<b>Closing remarks of DAY 2</b>
		Wrap-up from moderators of the sessions.
		Tom De Groeve <i>Acting Head of "Disaster Risk Management" Unit, Joint Research Centre, European Commission</i>
12:30	14:00	<b>Lunch</b>
<b>Wednesday, 23 November 2022</b>		
14:00	16:00	<b>Knowledge Network Board, closed session, only for invited Member States representatives</b>



## ANNEX 2: Attendance

The event was attended by 98 participants in presence, from 22 EU and non-EU Countries, plus a maximum of 30 participants from remote via WebEx.

We recorded a maximum of 165 connections to the livestreaming, even though we need to consider that a viewer can generate more than one connection during the live; e.g. close and reopen the streaming page later, this counts as double connection.

Maximum number of connections were recorded from Spain, Italy, Germany and UK on Day 1; Spain, Italy, France and Germany on Day 2.

See below details of the connections recorded for the web streaming, and the countries represented.

### DAY1 , 22.11

**Total connections:** 105

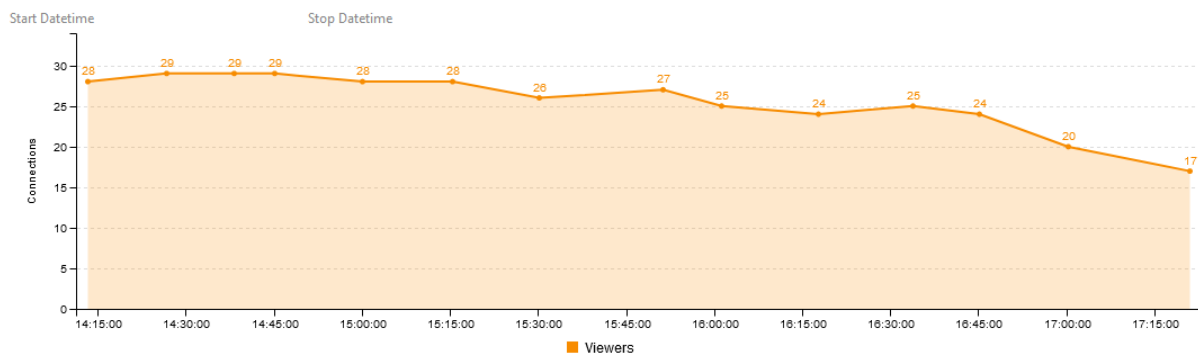
*(a viewer can generate more than one connection during the live; e.g. close and reopen the streaming page later, this counts as double connection)*

**Peak viewers:** 29

*(max simultaneous unique viewers at a specific moment in time)*

**Graph with the number of simultaneous viewers in time:**

*(shows the evolution of simultaneously connected (unique) viewers throughout the duration of the event, i.e. viewers connected and actively watching the Live):*



### Countries:

	Spain	49
	Italy	14
	Germany	8
	United Kingdom	7
	Belgium	5
	Europe	4

	Slovenia	SI	3
	Egypt	EG	2
	Luxembourg	LU	2
	France	FR	2
	Canada	CA	1
	Internal	INT	1
	Peru	PE	1

## DAY 2 , 23.11

**Total connections:** 60

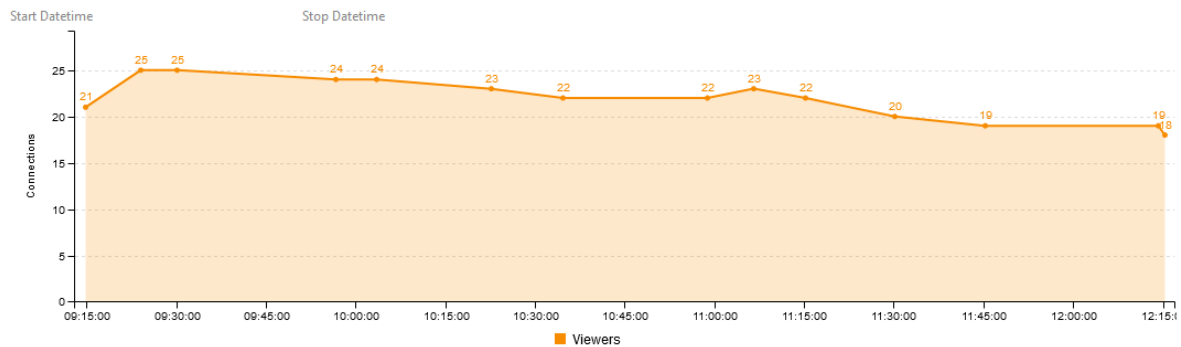
(a viewer can generate more than one connection during the live; e.g. close and reopen the streaming page later, this counts as double connection)

**Peak viewers:** 25




(max simultaneous unique viewers at a specific moment in time)

**Graph with the number of simultaneous viewers in time:**

(shows the evolution of simultaneously connected (unique) viewers throughout the duration of the event, i.e. viewers connected and actively watching the Live):



**Countries:**

	Spain	ES	35
	Italy	IT	6
	France	FR	4
	Germany	DE	4
	Belgium	BE	3
	United States	US	2
	Slovenia	SI	2
	Greece	GR	1
	United Kingdom	GB	1
	Internal	INT	1
	Luxembourg	LU	1

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