Webinar report – ERA4CS Task 7.4 – 01st June 2017

A participatory webinar for researchers, practitioners and climate service providers and purveyors working on disaster risk reduction

The objectives of the webinar, an activity under the ERA4CS Additional Activities – Task 7.4 – were to fill knowledge and information gaps related to climate services that can support disaster risk reduction. In doing so, the aim is to inform the development of a common vision and implementation on research and innovation supporting climate services that could be implemented by national, European and international funders. Two discussion questions were used to frame the webinar in the context of the challenges and the strategic mechanism set out in the JPI Climate SRIA in particular relating to:

i. The climate decision-making process;
ii. Informing decision making in support of disaster risk reduction; and
iii. Better understanding the interlinkages and relationships between climate change and disaster risk reduction.

There were 16 participants (see Annex 1) in this participatory webinar that commenced with an introduction to Task 7.4 and its activities. This was followed by highlights from the Global Forum on Disaster Risk Reduction. Specific points noted were that the role of climate services was discussed in many of the Forum sessions and included:

- It was recognised that reducing losses attributed to disasters has short, medium and long-terms benefits and is essential to achieving economic and social development and environmental sustainability.
- High expectations were expressed that climate services would be able to provide improved viability and accessibility of high-resolution climate information that could be translated into improved risk assessment. The risk assessment should not stop at designing the hazard scenarios but should also quantify the potential economic damage, which could then be used in cost-benefit analysis for disaster risk reduction.
- There was reference to climate services and the new high-resolution information that would be available from Copernicus Climate Change Service (C3S) and Land Monitoring Services.
- Climate services are seen as important in the context of DRR and there is a need to further engage the community to inform the future development of climate services. Of particular importance are the roles of climate services in informing planning related to prevention and recovery (building back better) and engaging the relevant communities to ensure that the services and information available is useful, relevant and accessible, as well as credible.

The highlights from discussions during the webinar and from written comments received from a number of invites are reflected in this report, captured under the two discussion questions below.

Discussion question 1:

What research are you involved in (or aware of) that is addressing climate services for disaster risk management decision making?

- To what extent is that research inter-disciplinary?
- Is any of that research conducted in collaboration with other research organisations or supported by a number of funding bodies? (looking to identify synergies)

Participants indicated the various research projects and initiatives they are (or have been) involved in of relevance. A list of projects is included in Annex 2.

Research and related activities, much of which was multi- or inter-disciplinary, identified by participants during the discussions including the following:

- The Disaster Risk Reduction (DRR) Roadmap for the World Meteorological Organisation (April 2017)[1] and associated work plan[2] – prioritised and realistically achievable activities and deliverables that are consistent with the WMO Strategic and Operating Plans, as well as the work plans for relevant WMO programmes and projects. One element of the vision associated with this framework is enabling co-design, co-production and co-delivery by NMHSs and partners of a user-driven service that support disaster risk management measures in multiple sectors and at various spatial and temporal scales.
- Smart use of climate intelligence to increase urban resilience and generate added value for businesses and society at large (see CLARITY[3] H2020 – Integrated Climate Adaptation Service Tools for Improving Resilience Measure Efficiency)
- Integration of weather and climate information (GFCS Adaptation Programme for Africa, as known as climate services for action) to support the alignment of DRR and CCA communities and their actions
- Within Building Resilience and Adaptation to Climate Extremes and Disasters (BRACED[4]) there is consideration of the climate services required at the local level, understanding what we are learning about the required enabling environment, decision-making at the local level, the utility to providing climate services at a more systematic level (in terms of local, national and regional governments), and the roles of intermediaries (and evolution of these roles).
- Exploring the direct relationships between natural climate variability and flood and drought impacts, with the intention of allowing fast and practical impact assessments on the basis of

[1] http://www.wmo.int/pages/prog/drr/documents/roadmap/documents/PRES_WMONo.04-17_Dr.XuTang_ReportDRRRoadmapforWMO.pdf
[2] https://www.wmo.int/pages/prog/drr/documents/2015.12.14-Doc7-WMODRRWorkPlan2016-2017_Draft.pdf
[3] http://www.clarity-h2020.eu
[4] http://www.braced.org/

known climate oscillations[5] - climate variability and flood/drought risks (seasonal predictions); future weather and compound events (applied at the local scale); methods to support drought risk management (prevent, mitigate and cope with drought-induced disaster management rather than reactive emergency management); and probabilistic impact assessment.

- Forecast-based financing of preparedness: developing an operational protocol[6] – interdisciplinary research directed at understanding what actions (before a potential disaster occurs) can be influenced by climate services and understanding decision-making processes and the related climate information with the aim of seamlessly developing the required services.

As an example of synergies and complementarities, specific reference was made to two Coordination and Support Actions – PLACARD and ESPREssO (the two co-sponsors of this webinar). These two networking activities were put in place through H2020 to look across and enhancing the relationship between DRR and climate change adaptation (CCA). The Platform for Climate Adaptation and Risk Reduction (PLACARD[7]) is a hub for dialogue (science, policy and practice), knowledge exchange and collaboration between CCA and DRR communities. Specifically, PLACARD aims specifically to:

- Establish a network of networks of CCA and DRR stakeholder groups and initiatives at the international, European, national and sub-national scales
- Create a common 'space' to facilitate dialogue and consultation among stakeholders and initiatives
- Design effective science, policy and practice dialogues
- Take stock of the CCA and DRR decision-making context
- Facilitate and guide knowledge exchange and mobilisation between CCA and DRR
- Strengthen CCA and DRR institutions and give direction to policy-practice agendas
- Streamline the dissemination and implementation of ongoing and evolving research and innovation activities on CCA and DRR across scales.

Enhancing Synergies for Disaster Prevention in the European Union (ESPREssO)[8] aims at contributing to a new strategic vision to approach natural risk reduction and climate change adaptation, thereby opening new frontiers for research and policy making.

To achieve this goal, the project structure is built upon the central role of three main challenges to be addressed in order to propose ways to mitigate differences, to identify gaps, and to overcome the boundaries among different topics:

1. To propose ways to create more coherent national and European approaches on Disaster Risk Reduction, Climate Change Adaptation and resilience strengthening;
2. To enhance risk management capabilities by bridging the gap between science and legal/policy issues at local and national levels in six European countries;
3. To address the issue of efficient management of trans-boundary crises.

[5] http://www.imprex.eu/innovation/novel-concepts
[6] http://www.climatecentre.org/downloads/files/FbF%20Brochure4.pdf
[7] http://www.placard-network.eu/
[8] http://www.espressoproject.eu/

The main final products of ESPREssO will be guidelines on risk management capability and a Vision Paper on future research strategies in order to better define the research priorities following the Sendai Framework for Disaster Risk Reduction 2015-2030.

Specific mention was made of the challenges in working with these two communities: differences in user terminology (e.g., definition of risk and vulnerability); bridging the differences in the course of research; and temporal and spatial focus for responses.

The Disaster Risk Management Knowledge Centre (DRMKC)[9] was mentioned as providing a networked approach to the science-policy interface in DRM, across the Commission, EU member states and the DRM community. Activities of the DRMKC support the translation of complex scientific data and analyses into usable information and provide science-based advice for DRM policies, as well as timely and reliable scientific-based analyses for emergency preparedness and coordinated response activities. It brings together existing initiatives in which science and innovative practices contribute to the management of disaster risks.

This Commission initiative builds on three main pillars: 1) **Partnerships** and networks to improve science-based services; 2) Better use and uptake of research and operational **knowledge**; 3) **Innovative** tools and practices for risk and crisis management.

The DRMKC report "Science for Disaster Risk Management 2017: knowing better and losing less[10]" contributes to the Science and Technology Roadmap of the Sendai Framework for DRR and aims to review scientific solutions and support the integration of science into informed decision making through synthesizing and translating evidence for DRM and strengthening the science-policy and science-operation interface.

Discussion question 2:

What do you believe are the priority research and knowledge gaps related to climate service research to support disaster risk management decision making?

- Climate services capable of supporting DRR risk assessments and in the development of indicators and targets (both slow onset (e.g., drought) and sudden (e.g., landslides, floods, cloud bursts) disasters)
- Climate services capable of supporting the integration of climate change adaptation and disaster risk reduction (e.g., PPRR[11]), as well as sustainable development.
- Climate services to support decisions and decision making in the context of multi-hazards (e.g., warning and response systems support)

[9] http://drmkc.jrc.ec.europa.eu/
[10] http://drmkc.jrc.ec.europa.eu/portals/0/Knowledge/ScienceforDRM/Executive_Summary_of_Science_for_DRM_2017.pdf
[11] PPRR – Prevention, Preparedness, Response and Recovery

- Supporting reliable impact assessment – consideration of physical, economic and social impacts, and the alternative options for long and short-term preparedness action, including infrastructure (retrofitting and new)
- Enhancing the accessibility and usability of high resolution data – including provision of useful and relevant information on limitations and uncertainties. Includes use of innovations related to accessing and using the data (see Google Earth Engine[12])
- Integrating climate and weather services, with other information needed to support decision making within CCA and DRR.
- Seasonal forecasts – their reliability and value to decisions and decision making
- Connecting the global resolution information to climate information at the regional level to more high resolution information that also takes into consideration the urban microclimate.
- Interdisciplinary research – climate science, social science, humanities and engineering science that would bring into the research the appropriate knowledge and skills (including urban modellers, risk and decision theories and practice)
- Working across spatial scales from national, to city to neighbourhood scales, but also transnational and catchment levels – informing CCA and DRR decision-makers by allowing them to move from generic responses to ones that are focused on the specific within a given context.
- Climate services supporting adaptive management or adaptation pathways – includes drawing on social and engineering sciences where these approaches are being further developed.
- Demonstrating the reliability of climate services and the types of decisions they are able to support – value of climate services.
- Transforming data and scenarios into narratives or 'weather pictures'. This could include making use of weather typing approaches.
- Conveying uncertainty to inform decisions and decision-making processes – relevant and usable information consistent with decision-making processes.

Specific reference was made to the results of a session on Climate Services and Disaster Risk Response held during the KNMI Workshop (02-04th November 2015, The Netherlands) which explored with participants:

- How can we better link the various networks and initiatives for Climate Services, Climate Change Adaptation and Disaster Risk Response?
- What are the specific climate services and data needs of the DRR community and to what extent can they be met by Climate Service providers?
- How can public/private providers of CS and DRR be connected to strengthen CS market growth?

A summary of the results of that session is available in Annex 3.

Next steps:

[12] https://earthengine.google.com/

- Webinar report shared with all participants and posted on ERA4CS website, as well as on the PLACARD and ESPREssO websites
- Meeting at ECCA 2017 (Glasgow, 05th-09th June) to discuss potential future action
- Information analysis and report writing – May 2017
- Task 7.4 Final Report June/July 2017: based on all evidence gathered and will inform vision and implementation strategy (Task 7.5)

Annex 1 – Participants

Jaroslav Mysiak (CMCC)	Rob Groenland (KNMI)
Valeria Silvestri (Civil protection, Italy)	Andrew Kruczkeiwicz (University of Columbia)
Roop Singh (Red Cross Red Crescent Climate Centre)	Noel Nelson (UK Met Office)
Mario Pulquerio (PLACARD – University of Lisbon)	Mattia Leone (Università di Napoli Federico II - Centro Studi PLINIVS-LUPT)
Cees van de Guchte (Deltares)	Filomena Papa (Civil Protection, Italy)
Petra Manderscheid (JPI Climate)	Marc Kierans (EPA, Ireland)
Zehra Zaidi (European Centre for Climate Change	Montserrat Marin Ferrer (JRC)
Maja Zuvela-Aloise (ZAMG)	
Roger Street (Chair)	

Annex 2: Information on research projects shared by participants (and in written comments from invitees unable to participate in the webinar)

Building Resilience and Adaptation to Climate Extremes and Disasters (BRACED)
http://www.braced.org/

Climate forecast enabled knowledge services (CLARA)
http://cordis.europa.eu/project/rcn/210522_en.html

Integrated Climate Adaptation Service Tools for Improving Resilience Measure Efficiency (CLARITY)
http://www.clarity-h2020.eu

A Disaster Risk Reduction Roadmap for the World Meteorological Organisation
http://www.wmo.int/pages/prog/drr/documents/roadmap/index.html

Enhancing Synergies for Disaster Prevention in the European Union (ESPREssO)
http://www.espressoproject.eu/

Forecast-based financing of preparedness: developing an operational protocol
http://www.climatecentre.org/downloads/files/FbF%20Brochure4.pdf

IMPREX http://www.imprex.eu/

Platform for Climate Adaptation and Risk Reduction (PLACARD) http://www.placard-network.eu/

Science for Disaster Risk Reduction (JRC) https://ec.europa.eu/jrc/en/publication/thematic-reports/science-disaster-risk-reduction

Annex 3:

KNMI workshop

2-4 November 2015 Egmond aan Zee, The Netherlands

Session: Climate Services and Disaster Risk Response

Summary conclusions by Mario Pulquério, Jaroslav Mysiak, Saskia van Pelt and Rob Swart

NMIs started working on climate services by improving access to climate observation and projection data in support of climate impact assessment. However, institutions involved in Disaster Risk Reduction need guidance on how to select and interpret the available data to take into account the changing intensity and frequency of extreme weather events in a meaningful way. This session discussed three questions:

- How can we better link the various networks and initiatives for Climate Services, Climate Change Adaptation and Disaster Risk Response? Introduced by Mario Pulquério (FCUL, Portugal)
- What are the specific climate services and data needs of the DRR community and to what extent can they be met by Climate Service providers? Introduced by Jaroslav Mysiak (CMCC, Italy)
- How can public/private providers of CS and DRR be connected to strengthen CS market growth? Introduced by Saskia van Pelt (Weather Impact, Netherlands)

First question: How can we better link the various networks and initiatives for Climate Services, Climate Change Adaptation and Disaster Risk Response?

This question was subdivided into 4 questions: How can we better link the various networks and initiatives for Climate Services, Climate Change Adaptation and Disaster Risk Response? How to break traditional silos so that the connection of CS, CCA and DRR community is improved? Where is the need to improve CS and DRR partnerships: Global/regional to Nacional; National to local? And how can we improve these partnerships? Who from DRR community needs CS? The discussion with the audience provided the following insights:

- There are numerous examples of NMS s working closely with other organizations involved in civil protection, including through the **national platforms established under the HFA** 2005-2015. In some countries, DRR institutions consult NMSs routinely and obligatorily in cases of weather-related emergencies.
- The **partnership** is perceived as beneficial and welcome. The cooperation with **intermediaries**, such as consultancies is sometimes seen as **competition**, especially in areas in which MOs see their expertise worth to expand.
- Sometimes a confusing distinction is made between **adaptation services** and climate services, with different institutions and associated information portals. Often the former services are provided by intermediary organizations while the latter are claimed by the NMSs. Clients would benefit from a seamless collaboration between the various services providers without having to worry about terminology.
- The cooperation and partnership requires clear definition of roles (and benefits and responsibilities) among the partners with **complementary strengths**, and a sound financial or

business model (see also question 3). The main role of NMS is to give information about the risks, and to share data. They should not tell what to do.

- For NMSs which provide direct services to societal users, it important to improve their communicate skills. In many cases, NMS expertise is important, but has to be translated for effective use and combined with non-climate information (impacts, socio-economic information). Climate services can be a platform where different disciplines come together. Even if intermediaries are involved, NMSs may decide to have a few experts in these areas, who can at least talk with and **understand the intermediaries and societal end users**.
- **The DRR community is not homogeneous.** It includes different actors in different countries at different administrative levels who go through different stages: PPRR (Prevention, Preparedness, Response, and Recovery).
- **Climate** is more important in **Prevention and Recovery**, while **Preparedness and Response** is more related with **short-term weather forecast** (1-3 days). The different actors have different needs that need to be considered by CS.
- It is important to establish partnerships with **already existing relevant networks**. An example is the Information and Knowledge Management for Disaster Risk Reduction (IKM4DRR) network that addresses the differences and similarities of CCA and DRR.
- Important to understand is where CS fit in the **development of indicators** for measuring the progress of the Sendai Framework for DRR. What is the CS role here?
- **Local planners** are key clients for the development of CS at the local scale. It is important for local planners to consider a wide range of information and knowledge coming from CCA and DRR for better decision making.
- Local DRR knowledge is important to be considered in CCA, but DRR is mostly organized at the local level, while information about climate change is available on the national level. More efforts should be made to **better connect national and local entities** and actions. The global/regional to national partnerships are already well developed.
- In countries where the DRR, CS and CCA communities are not yet well-connected, it is recommended to organize **meetings** were **different players** come **together**.
- "Climate Services" as such mean nothing to DRR. **Language and terminology needs to be adapted** to that of the DRR community for engagement and effective communication. CS, CCA and DRR actors working together in projects can help to learn each other's language.

Second question: What are the specific climate services and data needs of the DRR community and to what extent can they be met by Climate Service providers?

The weather and climate indicators are a critical but alone insufficient input for the knowledge value chain. To be able to inform DRR community, the W&C need to be tailor-made for specific purpose. How can Met Offices and intermediaries collaborate in delivering fit-for-purpose knowledge? A sound risk assessment necessitates time series of hazard frequencies/intensities and ensuing economic damage and loss. Ideally both are quality assured and professionally distributed (perhaps via statistical bureaus). What are the difficulties in standardising and sharing weather and climate information in a form useful for downstream users? The discussion with the audience provided the following insights:

- It is important to realize that climate change is never a single issue. E.g., hazard and disaster data are not kept by NMSs and neither should they be. But for CS to be effective for DRR, the **different types of data** (climate, climate impacts, socio-economic, hazard and disaster) **should be connected**.
- Relevant data may be collected by **different agencies**. Climate is the responsibility of NMS while hazards are the responsibility of other organisations (e.g., insurance companies). Analysing the link between hazards and climate has to be done jointly. Information needs to be tailored to the needs of users by **intermediate actors**. This is already happening in several projects, but needs to be expanded to upscale the usage of the vast amount of available data for DRR and CCA support.
- There is currently a **lack of hazard and disaster data sharing**. Organisations that hold this type of data do not have the habit of sharing it. There is a need to create ways for hazard and disaster data sharing. Types of organisations that may hold this type of data include insurance companies, statistical agencies, academia, Red Cross. UNISDR through **PreventionWeb** provides some of these data but it has **low quality** in terms of density.
- What is important in order to understand how natural hazards risk is evolving, is the information behind the data (**metadata**), but little information is generally available so far.
- NMSs usually don't have information about the vulnerability thresholds (exceeding of which leads to damage). **Information** (or better knowledge base) **on impacts** should be systematically collected and developed, in a similar way as the weather and climate information is **collected on ground**.
- The information for informing decision making changes fast, which needs to be accounted for. There is a need to show the **added value** of collecting hazard and disaster data to governments in order for them to invest in collecting data through time in a consistent way.
- **Citizen science** might play an important role to collect hazard and disaster detailed data (example: Twitter for measuring flood extension), but **filtering and interpreting** relevant information is hard work!
- Lack of and compatibility between data is a major problem in climate change action. **Standardization or harmonization** may facilitate bringing together different type of data, which is important for increasing comparability. Standardization may be difficult to apply at the local level because of the specificity of each location.
- **Copernicus** could be at the heart of such a standardization effort (which is now already done for climate data) for a broader set of data relevant for climate services and DRR, including hazard and impact data. Possibly, CEN (currently looking at integrating climate change in standards for energy, transport and buildings) can also play a role.
- More evidence should be collected on **economic value of public open data provision** (link to PSI Directive).

Third question: How can public/private providers of CS and DRR be connected to strengthen CS market growth?

This question was further elaborated into a number of sub questions: In addition to the public provision of climate services, is there a need for commercial services on this market? What would be the ideal mix between commercial and public services? How could commercial services add value to public services? How to finance CS services?

- There is **a clear need** for commercial climate services serving the potentially vast number of clients (e.g., companies, municipalities). At the public level basic climate data can be provided and **guidelines how they should be used**. Consultancies who have better contact with the end-users can then do their work tailoring the information to clients' needs, following the guidelines.
- Currently the demand for climate services is **as yet relatively limited**, and CS institutions like NMSs can still sometimes satisfy the demand from a research and development perspective. Potential clients for commercial services may have the impression that all the information they need is **available for free** from the public services, so why pay? However, they may find out that skills and expertise of NMSs for tailoring, translation and communication are limited and as soon as the demand for services would rise, public services may not be able to answer all the questions anymore.
- **Tailoring information to needs of companies or local actors** is needed to create a market. Tailored information usually needs to be **paid** as it requires a lot of effort from, for example, public institutions such as NMS, and private consultancy companies.
- A **good mix between public and private information** is needed for the safety, security and well-being of societies and countries. This mix can change through time depending on the necessities: private can become public (e.g., the private sector can initially help to communicate information which later may become publicly available) and vice-versa (e.g., public institutions can address some questions until the point that there will be too many to deal with).
- Research projects may help to foster the creation of a market. But there are important limitations. **Companies** outside the circle of research projects have **difficulties in accessing information and funds**. Additionally, many companies have a very limit amount of financial and human resources for R&I.
- **No real good solutions** are at the moment foreseen to finance the development of a climate services market for climate services in general or for the DRR community in particular. An **inventory of successful business models** and the development of **innovative new ones** is urgently needed to help developing a commercial CS market as well as more insights into the added economic value of climate services. Several of the participants recall negative experiences of closing potentially innovative projects due to unresolved financial issues.
- Until now companies who only focus on CS have trouble getting their activities financed. A likely explanation is the **low priority** of climate change as compared to other issues. Individual private companies are not financing adaptation now, most of the financing and investments are done by (national) governments. At more local scales (e.g. cities) there is often not enough budget to invest in adaptation.
- If climate services are **integrated** with issues and objectives higher on the priority lists of companies, cities and other institutions, funds for such broader commercial services may be easier to obtain.