The Second Multi-Hazard Early Warning Conference (MHEWC-II)

Early Warning and Early Action towards Sustainable, Resilient and Inclusive Societies

13-14 May 2019, WMO Headquarters, Geneva, Switzerland

Concept Note

(Draft Version 8 as of 15 March 2019)

Background

The Sendai Framework for Disaster Risk Reduction 2015-2030[1] was adopted by 187 United Nations (UN) Member States on 18 March 2015, at the Fourth UN World Conference on Disaster Risk Reduction (WCDRR)[2] in Sendai, Japan, and endorsed by the UN General Assembly in June 2015, with the expected outcome of a "*substantial reduction of disaster risk and losses in lives, livelihoods and health and in the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries*" over the following 15 years.

During the negotiations, countries and partners highlighted the need to:

1. Continue to invest in, develop, maintain and strengthen people-centred, end-to-end early warning systems;
2. Promote the application of simple and low cost early warning equipment and facilities;
3. Broaden the dissemination channels for early warning information to facilitate early action.

Countries also called for the further development of and investment in effective, nationally compatible, regional multi-hazard early warning mechanisms. To address these needs, global Target (g) of the Sendai Framework was adopted, namely to *"substantially increase the availability of and access to multi-hazard early warning systems and disaster risk information and assessments to the people by 2030"*.

International recognition of the importance of, and investing in, early warning systems was also reflected in both the 2030 Agenda for Sustainable Development[3] and the Paris Agreement[4]. Sustainable Development Goal (SDG) 3 *"Ensure healthy lives and promote well-being for all at all ages"* and SDG 13 *"Take urgent action to combat climate change and its impacts"* set targets for governments to strengthen early warning systems. The Paris Climate Agreement, Article 7 on enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change" and Article 8 on loss and damage also place greater emphasis on strengthening early warning systems.

In order to contribute especially to the achievement of Target (g) of the Sendai Framework, several international and regional organizations as well as national institutions with a key role in early warning joined forces and established the ***International Network for Multi-Hazard Early Warning Systems (IN-MHEWS)[5]*** during the WCDRR in March 2015. IN-MHEWS aims to facilitate the sharing of expertise and good practice for multi-hazard early warning systems as a national strategy for

[1] https://www.unisdr.org/we/inform/publications/43291

[2] https://www.wcdrr.org/home

[3] https://sustainabledevelopment.un.org/post2015/transformingourworld

[4] https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement

[5] http://www.wmo.int/pages/prog/drr/documents/IN-MHEWS/IN-MHEWS.html

disaster risk reduction, climate change adaptation, and building resilience. In addition, it aims to guide and advocate the implementation and/or improvement of multi-hazard early warning systems, share lessons learnt regarding early warning and increase the efficiency of investments in such systems for enhanced societal resilience.

As part of its activities, IN-MHEWS organized the **First Multi-Hazard Early Warning Conference (MHEWC-I): Saving Lives, Reducing Losses**[6] as a pre-event of the Fifth Session of the Global Platform for Disaster Risk Reduction in 2017 (GP2017)[7]. This Conference, held in Cancún, Mexico, on 22 and 23 May 2017, brought together more than 450 experts and stakeholders to take stock of recent advances in multi-hazard early warning systems. The key outcome of this Conference is the publication *Multi-Hazard Early Warning Systems: A Checklist*[8].

To continue its advocacy efforts, IN-MHEWS is organizing the **Second Multi-Hazard Early Warning Conference (MHEWC-II)** on 13 and 14 May 2019, as a pre-event to the Sixth Session of the Global Platform for Disaster Risk Reduction (GP2019)[9] which will take place from 15 to 17 May in Geneva, Switzerland. The MHEWC-II will be held at the Headquarters of the World Meteorological Organization (WMO) in Geneva and is aligned with the guiding principles of the GP2019, building on the momentum created by the MHEWC-I in 2017.

Purpose, goal and objectives of the MHEWC-II

The purpose of the MHEWC-II is to highlight the role that national governance plays in the implementation and sustainability of multi-hazard early warning systems, taking into account the fundamental information on all risk dimensions (hazard, exposure, vulnerability and coping/adaptive capacity), regulatory frameworks and policies, institutional partnerships, and ensuring that warnings are received, well understood and actionable by the intended audience. With the goal of continuing to advocate for the implementation and improvement of multi-hazard early warning systems worldwide, the objectives of the MHEWC-II are to:

1. Highlight and advocate for:

    a. A comprehensive multi-hazard approach to early warning governance that is based on effective national legislation, and regulatory framework, institutional partnerships, that benefit from regional and global support mechanisms and encompasses urban and rural populations, women and men, older people and youth, people with disabilities, etc.; Regulatory frameworks and policies
    b. The development, access and use of the best science and new technologies to underpin all components of an multi-hazard early warning systems;
    c. Co-design of early warning systems and the generation and use of sound risk information and advisory and warning messages tailored to the different needs of specific groups, including mechanisms to integrate local and indigenous knowledge and to provide feedback learning for system improvement;
    d. Learning from good practices in early warning, including in those areas such as monitoring, forecasting and risk communication that leverage the latest technologies and standards (e.g. communication and information technologies,

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[6] See https://www.wmo.int/earlywarnings2019.

[7] https://www.unisdr.org/conferences/2017/globalplatform/en

[8] Available in the six official UN languages at
https://library.wmo.int/index.php?lvl=notice_display&id=20228#.XDdsNK6nGHs

[9] https://www.unisdr.org/conference/2019/globalplatform/home

mobile phone solutions, social media, standards such as the Common Alerting Protocol (CAP) for all hazards alerting);

    e. Strengthening the Early Warning/ Early Action (EWEA) chain, taking on an impact-based forecasting approach in early warning to enable organizations and communities to formulate understandable and actionable messages and take respective preparedness and response measures.

2. <u>Take stock of the progress made by governments with:</u>

    a. Integrating/synergizing single-hazard early warning systems in their country toward a more comprehensive multi-hazard approach;

    b. Implementing the Multi-Hazard Early Warning Systems Checklist as a standard framework, adopting system-based thinking;

    c. Assessing the effectiveness of multi-hazard early warning systems and the return on investment;

    d. Reporting on/Achieving Target (g) of the Sendai Framework and related approaches and challenges, using the Sendai Monitor[10] and guided by the Technical Guidance for Monitoring and Reporting on Progress in Achieving the Global Targets of the Sendai Framework[11];

    e. Engaging the private sector and the civil society as partners in the operation of multi-hazard early warning systems as a way to ensure their long-term sustainability.

3. <u>Identify:</u>

    a. Requirements and challenges that governments have in the development and implementation of people-centred, end-to-end and multi-hazard early warning systems (including capturing cascading effects of hazards/disasters) that ensure interoperability with local to national scales as well as transboundary regional scales;

    b. Opportunities and current limitations for transdisciplinary research (e.g. new developments in the area of socio-hydrology) to progress in the development of observation and monitoring systems, the use of Big Data, including satellite-based data, data-driven modelling and the strengthening of capacities to leverage the latest information and communication technology (e.g. social media) particularly for Least Developed Countries (LDCs), Small Island Developing States (SIDS) and Land-locked Developing Countries (LLDCs);

    c. How governments finance the implementation or strengthening of multi-hazard early warning systems as a way to reach Target (g) of the Sendai Framework;

    d. Policy-relevant advice on incorporation of multi-hazard early warning systems concepts into national and local disaster risk reduction strategies to contribute to the implementation of Target (e) of the Sendai Framework.

Structure and session themes of the Conference:

1. **Opening Session:** Welcome to and objectives and expected outcomes of the Conference; Conceptual background on multi-hazard early warning systems; System-based thinking as a prerequisite; Recent examples of advances in multi-hazard early warning systems; Rationale for and relevance of multi-hazard early warning systems and their promotion;

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[10] See https://sendaimonitor.unisdr.org.

[11] See https://www.unisdr.org/we/inform/publications/54970.

2. **Session 1 — The "last mile":** (i) Trust between institutions and the general public; (ii) Accountability issues; (iii) Co-design of (multi-hazard) early warning systems – tailoring warnings and advisories to specific user needs[12] through fostering participatory approaches; (iii) Achieving last mile connectivity and an acceptable balance to provide a reliable alert in the shortest possible time; (iv) Understanding how risk perceptions, past experiences and awareness shape the understanding of warning messages; (v) Difference between real risk and perceived risk (e.g. in urban vs. rural areas); (vi) Risk and warning communication (considering education, training and awareness raising efforts at national and local levels designed for specific target groups of the population and the strategic role of the international community in facilitating such initiatives and supporting the national authorities); and (vii) Using the CAP standard to leverage all available media for all hazards alerting;

3. **Session 2 — Enhancing the link between EWEA through impact-based forecasts (IBF)**: (i) Readiness of communities to take action on early warnings; (ii) Need for accessing and including vulnerability and exposure data into the hazard models to identify potential impact areas and magnitudes; (iii) Sectoral impacts addressed by e.g. food-chain and health related warning systems; (iv) Good practices on integrating indigenous/local knowledge on the risk assessment and warning message design; (v) Good practices and challenges to incorporate the impact dimension in warning messages to allow relevant decision making; and (vi) Forecast-based action and financing;

4. **Session 3 — Science, technology and innovation:** (i) Improving observation, monitoring and forecasting systems and other technologies (e.g. portable modelling); (ii) Effective use of latest/advanced and appropriate/suitable/fit-for-purpose science and technology (e.g. innovative low-cost measures and novel IT tools); (iii) Governance challenges to effectively and sustainably integrate and test new technologies, approaches, data sources (Big data, satellite-based data, crowdsourcing, etc.) to enhance monitoring and forecasting capabilities and to build and share relevant and fit-for-purpose risk information; (iv) Ensure socially relevant warning communication technologies; (v) Incorporating science and technical research departments and institutes, agencies, and universities in national (multi-hazard) early warning systems (e.g. through working closely with academia through secondments, PhD programmes and/or embedding research institutes/departments within the organizations delivering key components of the warning system; (vi) Implications for the research agenda; and (vii) Private-public collaborations for improved observation, monitoring and forecasting;

5. **Session 4 — Making early warning systems multi-hazard:** (i) Implementing a multi-hazard approach (marine submersion, flash floods, landslides storms, tropical cyclones, earthquakes and tsunamis for coastal regions, liquefaction, etc.) also from an observational network perspective and given that many hazards are consecutive/cascading/compound events and have spatio-temporal dependencies; (ii) Harmonising multi-hazard impact estimations coming from hazard-specific algorithms and analyses; Multi-hazard early warning systems for man-made (air quality, atmospheric accidental pollution, oil spills), nat-tech and biological hazards, agriculture-related and health-related hazards (looking at the

[12] See also Taylor, A. L., T. Kox, D. Johnston (eds), 2018, Communicating High Impact Weather: Improving warnings and decision making processes, International Journal of Disaster Risk Reduction, 30, pp1-158, https://www.sciencedirect.com/journal/international-journal-of-disaster-risk-reduction/vol/30/part/PA

correlations between food chain and health, from climate to short term);
(iii) Capturing cascading effects of a hazard (e.g. volcanic eruption that provokes underwater landslides that can trigger tsunamis) vs. simultaneous hazards or all hazards vs. multiple hazards; (iv) Considering different time scales from real time to a seasonal perspective (tsunami warnings vs El Niño-la Niña SOPs); (v) Estimating the reduction or increase of vulnerability to a hazard caused by a prior hazard/disaster event; and (vi) Making hazard-specific early warning systems interoperable and integrating them to become a reliable multi-hazard early warning system;

6. **Session 5 – Evaluation of the socio-economic benefits of multi-hazard early warning systems:** (i) Assessing the performance and scope of (current) hazard-specific and multi-hazard early warning systems, including how to quantify how many people have access to and benefit from a multi-hazard early warning system; (ii) Return on investment of (multi-hazard) early warning systems and EWEA; and (iii) Assessing the integration of early warning systems for individual hazards into multi-hazard early warning systems and the usefulness of a system specific to one hazard for other hazards/purposes;

7. **Session 6 – Governance for multi-hazard early warning systems:**
(i) Regulatory/ legal frameworks; (ii) Institutional arrangements;
(iii) Partnerships, including the role of the private sector (with its positive and negative impacts, especially for sustainable funding), of civil society and of international cooperation; (iv) Financing and sustaining multi-hazard early warning systems to fulfil the global Targets (e) and (g) of the Sendai Framework; (v) Lessons learnt from the recent reporting by countries on Target (g); (vi) Perspectives on how countries are planning/shaping their policies to implement Target (g); (vii) Increasing human resources especially those with multi-disciplinary skills and young professionals; and (viii) Integration of early warning systems as part of national and local disaster risk reduction strategies (Linkage to Sendai global Target (e));

8. **Closing Session:** Wrap up of the Conference sessions, addressing progress, evaluating the current situation through (regional) assessments of effectiveness and investments) and summarizing challenges; Highlight of good practices; Formulation of input into the GP2019 working session on MHEWS and the High-level dialogues.

A reception on the first day as well as up to six side events (two to three slots per day of 60 min during the lunch breaks) are also foreseen[13]. The latest version of the Programme of the Conference is separately available on the Conference website.

Target participants

The implementation of the Sendai Framework will require collaboration of policy-makers, practitioners and researchers from all geographical regions and from local, national, regional and international levels to identify knowledge gaps, co-design and co-produce knowledge, and make science and technology more readily available and accessible to support practical disaster risk reduction. The target audience therefore comprises representatives from:

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[13] Information to be provided at a later stage.

- All countries those who stand to benefit the most from further development of multi-hazard early warning systems such as LDC, SIDS and LLDC;
- Government representatives from National Disaster Risk Management or Civil Protection Agencies, National Meteorological and Hydrological Services (NMHSs), Geological Surveys or Institutes and different sectors including health, environment, agriculture, infrastructures, development, etc.;
- Key intergovernmental and international organizations, including regional organizations;
- Other donors;
- Nongovernmental organizations (NGOs);
- Academia;
- The media;
- Private Sector entities that play a major role in the provision of data and information and the operations of many systems that are key to the multi-hazards early warning efforts.

The organizers will try to accommodate as many interested persons as possible. However, due to the limited capacity of the Conference venue, a registration and selection process is being set up that will take into account gender and regional balance, adequate representation of young professionals and key disciplines and organizations, etc. More information will be available on the website of the Conference. A webcast (with possibilities to interact via an App) will be available for the interested public.

Expected outcomes

The outcomes will need to highlight strategies and actions to build, promote and strengthen multi-hazard early warning systems, especially how to address key gaps such as faster and broader dissemination of warnings and the quality of the information provided to the 'last mile', at risk communities or affected populations, through capacity development and operational support.

A first and immediate outcome will be an input to a variety of sessions of the GP2019, especially the working session on multi-hazard early warning systems as well as the High-level Dialogues, to be reflected in the Chair's Summary of the GP2019 and its proceedings. This will be reflected in a Conference Statement/Declaration.

Furthermore, a dedicated outcome document will be produced in the months following the Conference, based on its outcomes, including a set of recommendations that could be achieved by countries before the next Conference (MHEWC-III). It is hoped that such a document will also influence investments in multi-hazard early warning systems and programming of development partners, donors and the private sector as well as the Science and Technology Roadmap[14] to support the implementation of the Sendai Framework.

The proceedings of the Conference and/or selected papers and session summaries will also be published. Technical issue briefs will be available for selected MHEWC-II sessions and from the GP2019 working session on multi-hazard early warning systems to provide further information on the specific topics. Lastly, from the inputs into the MHEWC-II, an online, categorized "good practice and lessons learnt repository" will be created, adding to those compiled from the MHEWC-I.

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[14] http://www.preventionweb.net/files/45270_unisdrscienceandtechnologyroadmap.pdf

Organizers

IN-MHEWS Steering Committee that acts as the Organizing Committee	
Climate Risk and Early Warning Systems (CREWS) Initiative	UN Economic and Social Commission for Asia and the Pacific (UNESCAP)
Food and Agriculture Organization of the UN (FAO)	UN Educational Scientific and Cultural Organization (UNESCO)
Intergovernmental Oceanographic Commission of UNESCO (IOC-UNESCO)	UN Institute for Training and Research (UNITAR) / Operational Satellite Applications Programme (UNOSAT)
International Atomic Energy Agency (IAEA)	UN Office for Disaster Risk Reduction (UNISDR)
International Federation of Red Cross and Red Crescent Societies (IFRC)	UN Office for Outer Space Affairs (UNOOSA) / UN Platform for Space-based Information for Disaster Management and Emergency Response (UN-SPIDER)
International Science Coucil (ISC) / Integrated Research on Disaster Risk (IRDR)	
International Telecommunication Union (ITU)	World Bank Group (WBG) / Global Facility for Disaster Reduction and Recovery (GFDRR)
Joint Research Centre (JRC) of the European Commission (EC)	World Food Programme (WFP)
	World Health Organization (WHO)
UN Development Programme (UNDP)	World Meteorological Organization (WMO)
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Practical Action	Water Youth Network
Netherlands Red Cross (Rode Kruis)	
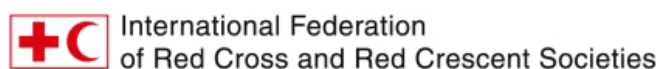
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