2015 MEETING OF THE
WMO DISASTER RISK REDUCTION USER-INTERFACE EXPERT ADVISORY GROUP ON
MULTI-HAZARD EARLY WARNING SYSTEMS
(WMO DRR UI-EAG MHEWS)

19-21 April 2016
WMO Headquarters
Geneva, Switzerland
Room: Lake 7 (day 1), Salle C2 (day 2 & 3)

Webpage:

CONCEPT NOTE (DRAFT)
(as of 14 April 2016)

About the meeting
The World Meteorological Organization (WMO) Executive Council (EC), at its sixty-fourth session
(EC-64) in 2012, endorsed the establishment of Disaster Risk Reduction (DRR) User-Interface
Expert Advisory Groups (UI-EAGs) to guide the implementation of the WMO DRR priority
through its DRR Programme and related work plans. Among these Groups is the one on Multi-
Hazard Early Warning Systems (UI-EAG MHEWS) for which draft Terms of Reference (ToR) are
provided in Doc 4. and for which a number of National Meteorological and Hydrological Services
(NMHSs) as well as United Nations and other international agencies have nominated experts to
become a member.

Meeting objectives and expected outcomes
The objectives of this first Meeting of the UI-EAG MHEWS are to:

1. Discuss and adopt the ToR (Doc 4) of the EAG MHEWS and develop a related work
   plan;
2. Review the progress made by the WMO DRR Programme in the area of MHEWS,
   including the conduct of assessment and capacity development projects and the
   drafting and publication of knowledge products;
3. Review the draft WMO Guidelines for NMHSs on Institutional Roles and Partnerships in
   MHEWS (Doc 9) and develop a plan to finalize these guidelines;
4. Review and provide input to the WMO DRR Roadmap from a MHEWS perspective, and
   examining some current practices in MHEWS both within and external to WMO

Members to understand what makes them good practices. In addition, provide input as to how we might go about documenting these good practices in order to promulgate them to other WMO Members and their key stakeholders to assist in DRR and therefore assist in their response to the Sendai Framework;

5. Provide recommendations on the definitions of the terms “early warning system” and “multi-hazard early warning system” that would inform the discussion of the Open-ended Intergovernmental Expert Working Group on Terminology and Indicators Relating to DRR2 (OIEWG) for measuring progress with the implementation of the Sendai Framework for DRR 2015-2030 (from a WMO perspective); and,

6. Provide recommendations on WMO engagement in the International Network for MHEWS (IN-MHEWS, Doc 10) and the organization of the International Conference on MHEWS (IC-MHEWS, Doc 11).

Participants from NMHSs are invited to prepare 10-minute presentations each on national and regional practices in MHEWS and how these are addressing the calls for strengthening MHEWS in the Sendai Framework for DRR 2015-2030. Participants from United Nations agencies and international partner organizations are equally invited to give 10-min presentations each on how the work of their organizations supports the strengthening of MHEWS.

According to its objectives, the main expected outcomes of the meeting are:

(i) revised ToR agreed by the Group and ready for submission to the WMO DRR Focal Points of WMO regional associations (RAs), technical commissions (TCs) and technical programmes (TPs) – WMO DRR FP RA-TC-TP – the mechanism that is overseeing the work of the UI-EAGs (see Doc 6 for the WMO DRR Governance mechanisms);
(ii) Concrete recommendations for the revision and finalization of the WMO Guidelines for NMHSs on Institutional Roles and Partnerships in MHEWS (Doc 9);
(iii) Recommendations (also for inclusion in the WMO DRR Roadmap) on how the DRR Programme, and WMO as a whole, can further assist Members to strengthen MHEWS; and,
(iv) An agreed working definition for the terms early warning system and multi-hazard early warning system, based on the current draft definitions available from the OIEWG DRR and for the OIEWG DRR’s consideration during their next informal session in June 2016;

The recommendations will be summarized in a final report which will be publicly available on the WMO website and which will be considered by relevant WMO constituent bodies for further action.

Meeting participants and (expected) members of the UI-EAG MHEWS

The UI-EAG MHEWS will involve experts from NMHSs including from WMO technical commissions (TCs) and technical programmes (TPs) and from United Nations and other international agencies. The list of participants can be found in Doc 3.

2 http://www.preventionweb.net/drr-framework/open-ended-working-group/
Disaster risk reduction – a high priority for the World Meteorological Organization

The crosscutting WMO DRR Programme was established by WMO Members in 2003, with the aim to enhance the contributions of their NMHSs to DRR in a cost-effective, systematic, and sustainable manner through developing knowledge products, capacity development projects and multi-stakeholder cooperation in disaster risk and emergency management at local to global levels. The scope of the Programme is defined through its five strategic goals underpinned by the Hyogo Framework for Action 2005-2015: Building the Resilience of Nations and Communities to Disasters (HFA) and approved by the fifteenth World Meteorological Congress (Cg-XV) in 2007:

1. Development, improvement and sustainability of early warning systems in particular related to scientific and technical infrastructures, systems and capabilities for research, observing, detecting, forecasting and warnings of weather-, water- and climate-related hazards;
2. Development, improvement and sustainability of standardized hazard databases and metadata, systems, methods, tools and applications of modern technologies such as geographical information systems for recording, analyzing and providing hazard information for risk assessment, sectoral planning, risk transfer and other informed decision-making;
3. Development and delivery of warnings, specialized forecasts and other products and services that are timely, understandable to those at risk and driven by requirements of disaster risk reduction decision processes and operations engaging socio-economic sectors;
4. Stimulate a culture of resilience and prevention through strengthening of capacities for better integration of meteorological, hydrological and climate products and services in disaster risk reduction across all socio economic sectors, such as land use planning and infrastructure design and continued public education and outreach campaigns; and
5. Strengthening cooperation and partnerships of WMO and NMHSs in national, regional and international user forums, mechanisms and structures for implementation of disaster risk reduction.

The scope of the Programme encompasses strengthening NMHSs’ capacities to:

(i) support preparedness through early warning systems,
(ii) provide hazard information for risk assessments, prevention, response, recovery, and risk transfer across sectors,
(iii) mitigate existing risks and prevent the creation of new risks,
(iv) respond to user requirements, and
(v) cooperate and engage in disaster risk governance structures at all levels.

Through this Programme, WMO has played an important role in supporting its Members in the implementation of the HFA. Cg-17 in 2015 reaffirmed DRR as one of the high-priority areas for WMO, thereby acknowledging the significance of the Sendai Framework for DRR 2015-2030 (see below) for WMO and the new opportunities and challenges it poses for NMHSs. The WMO DRR priority cuts across all other WMO priorities and contributes to related priority areas such as capacity development and the implementation of the Global Framework for Climate Services (GFCS).

Through its crosscutting nature the WMO’s DRR Programme is inextricably linked to all WMO RAs, TCs, and TPs. Hence, the DRR Programme strives to ensure that the activities of WMO’s constituent bodies and programmes and their operational and research networks are aligned
when assisting Members in their efforts to reduce disaster risks and the impacts of hydro-meteorological hazards (see Doc 6). It should be noted that:

- Cg-17 reconfirmed the establishment of the DRR Focal Points of TCs and TPs (DRR FP TC-TP) and requested it to include focal points of the RAs as a mechanism to support the WMO-wide coordination of DRR activities (now DRR FP RA-TC-TP) (Doc 7); and,
- EC-67 in 2015 established the EC Working Group on DRR (EC WG-DRR) to provide guidance on the implementation of the DRR Programme (Doc 8). The first session of the EC WG DRR took place from 4-7 April 2016 in Geneva.

In order to better define users of different weather, water, and climate services for DRR and their requirements as well as to leverage the activities of RAs, TCs, and TPs, EC-64 in 2012 supported the utilization of DRR User-Interface Expert Advisory Groups (UI-EAGs), comprised of leading experts from the diverse DRR user community (public and private sectors), United Nations and international partner agencies, academia as well as from the NMHSs. As mentioned above, EC-64 decided to endorse the establishment of UI-EAGs on:

(i) Hazard/Risk Analysis (HRA);
(ii) Multi-Hazard Early Warning Systems (MHEWS);
(iii) Disaster Risk Financing (DRF); and,
(iv) Humanitarian Planning and Response (HUM).

Cg-17 encouraged the Secretariat to continue with such user-driven approaches in the development of DRR knowledge products, science-based and risk-informed services, and in the implementation of demonstration projects.

**Progress with implementing the WMO DRR Programme and priority in the area of MHEWS**

The development and implementation of early warning systems is one of the areas where the most progress has been made within the HFA. Improvements in risk monitoring and forecasting, satellite data quality and increasing computer power and connectivity have resulted in a transformation of early warning across the globe. Despite this progress, gaps remain: integration of comprehensive risk information into hazard warning information is still weak, and it is still rare for alerts to provide information on the level of risk and possible actions beyond evacuation alerts.3

Since the DRR Programmes inception, a number of accomplishments have been made. The development of a systematic methodology for documentation of national MHEWS is an example. The methodology was employed in several initiatives, such as:

1. Documentation of seven good practices on MHEWS by WMO Members which led to publication of *Institutional Partnerships in MHEWS*4 in 2012. This book documents seven examples of Early Warning Systems for hydrometeorological and other hazards that have proven effective in reducing losses due to these hazards. The cases studied encompass a variety of climatic regimes and stages of economic development, raging across the industrialized countries of Germany, France, Japan and the United States, to Bangladesh, the island nation of Cuba and the mega-city of Shanghai. Demonstrated

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4 [http://library.wmo.int/opac/?lvl=notice_display&id=10659#.Vwzxk2P_yeI]
characteristics of these exemplary cases are synthesized into ten guiding principles for successful early warning systems that will, it is hoped, prove useful to countries seeking to develop or strengthen such systems within their own borders.

2. A comprehensive assessment of the institutional and technical capacities and needs of the Caribbean region to support MHEWS and risk assessment. The assessment was conducted over a two-year period which consisted of several workshops in the region and the publishing of the assessment report: *Strengthening of Risk Assessment and Multi-Hazard Early Warning Systems for Meteorological, Hydrological and Climate Hazards in the Caribbean*.

3. An assessment carried out in 2007-2008 by the World Bank, WMO and the Secretariat of the United Nations Strategy for Disaster Risk Reduction (UNISDR) through the South Eastern Europe Disaster Risk Mitigation and Adaptation Programme (SEEDRMAP). The assessment led to the publishing of the report *Strengthening Multi-Hazard Early Warning Systems and Risk Assessment in the Western Balkans and Turkey: Assessment of Capacities, Gaps and Needs*. The assessment revealed serious deficiencies in the capability of the NMHSs of many of the SEE countries to provide the required support to DRR, as well as insufficient cooperation between the DRR stakeholders, including NMHSs, at national and regional level.

4. The Costa Rica Early Warning Systems for Hydro-Meteorological Hazards Project which was funded by the World Bank Global Facility for Disaster Reduction and Recovery (GFDRR) and was implemented in close coordination with the United Nations Development Programme (UNDP). The purpose of the Project was to develop an effective framework for an operational early warning system at the Pilot Site of the Sarapiqui river basin in order to:
   a) strengthen cooperation efforts between IMN and CNE in collaboration with other national government agencies and non-governmental organizations at the local level;
   b) promote replication at other sites;
   c) integrate the Costa Rica legal framework and policy instruments with existing standard operational procedures and protocols;
   d) develop a feedback mechanism aimed to improve the preventative approach, overall coordination and operation during its design and implementation; and,
   e) provide IMN and CNE with the necessary tools to optimize the information for decision making.

The project has led to unprecedented coordination and cooperation among the three national agencies, National Meteorological Institute (IMN), the National Commission of Risk Prevention and Emergency Response (CNE), and the Instituto Costarricense de Electricidad (ICE) at national level and with over 50 Sarapiqui River basin communities. A simulation exercise on 28 February drew over 800 participants – some 500 volunteered to participate in an evacuation exercise coordinated by CNE, the police, the Red Cross and local authorities.

5 http://library.wmo.int/pmb_ged/wmo_1082.pdf
7 http://library.wmo.int/pmb_ged/SEEPhaseI-FinalReport.pdf
WMO Guidelines for NMHSs on Institutional Roles and Partnerships in MHEWS

Building upon the outcomes of two MHEWS Symposia in 2006 (Geneva, Switzerland) and 2009 (Toulouse, France) where a mythology was developed to identify and document good practices in National MHEWS led to the documentation of seven good practice examples of MHEWS for hydrometeorological and other hazards by WMO Members (Germany, France, Japan, the United States of America, Bangladesh, Cuba and Shanghai/China) which led to publication of Institutional Partnerships in MHEWS, demonstrated characteristics of these exemplary cases were synthesized into ten guiding principles for successful (M)HEWS. These principles may prove useful to other countries seeking to develop or strengthen such systems within their own borders. The draft WMO Guidelines for National Meteorological and Hydrological Services on Institutional Roles and Partnerships in MHEWS (Doc 9) were developed based on these ten principles.


The Sendai Framework for DRR 2015-2030 and its implications for WMO

In 2015 the Sendai Framework for DRR 2015-2030 (hereafter called Sendai Framework) was adopted at the Third United Nations World Conference on DRR (WCDRR) in March 2015. The Sendai Framework is built on elements that ensure continuity with the work done by countries and other stakeholders under the HFA, However, it introduces a number of innovations that emerged from the consultations and negotiations. The most significant shifts include:

- a strong emphasis on disaster risk management as opposed to disaster management;
- the 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 as an expected outcome;
- a goal focused on preventing the creation of new risks, reducing existing risks and strengthening resilience; and,
- the definition of seven global targets for achieving the expected outcome.

The Framework highlights that there remains a need to address existing challenges and prepare for future ones by:

1. focusing on monitoring, assessing and understanding disaster risk and sharing such information and on how it is created;
2. strengthening disaster risk governance and coordination across relevant institutions and sectors and the full and meaningful participation of relevant stakeholders at appropriate levels;
3. investing in the economic, social, health, cultural and educational resilience of persons, communities and countries and the environment, as well as through technology and research; and,

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¹⁰ [https://drive.google.com/file/d/0BwdvoC9AeWjUVTfNVZa19XckU/view?usp=sharing](https://drive.google.com/file/d/0BwdvoC9AeWjUVTfNVZa19XckU/view?usp=sharing)
4. enhancing multi-hazard early warning systems, preparedness, response, recovery, rehabilitation and reconstruction.

Another innovation of this 15-year, voluntary, non-binding agreement is a set of guiding principles. These recognize that each State, with all its institutions, has the primary role to reduce disaster risk but that responsibility should be shared with other stakeholders, including local governments, civil society and the private sector. In addition, the scope of the Sendai Framework has been broadened significantly to focus on both natural and man-made hazards and related environmental, technological and biological hazards and risks. There is also clear recognition of stakeholders and their roles, including the role of the UN System and the strengthening of international cooperation and global partnerships. The seven global targets outlined in the Sendai Framework are:

a) Substantially reduce global disaster mortality by 2030, aiming to lower average per 100 000 global mortality rate in the decade 2020–2030 compared to the period 2005–2015;
b) Substantially reduce the number of affected people globally by 2030, aiming to lower the average global figure per 100 000 in the decade 2020–2030 compared to the period 2005–2015;
c) Reduce direct disaster economic loss in relation to global gross domestic product by 2030;
d) Substantially reduce disaster damage to critical infrastructure and disruption of basic services, such as health and educational facilities, including through developing their resilience by 2030;
e) Substantially increase the number of countries with national and local DRR strategies by 2020;
f) Substantially enhance international cooperation to developing countries through adequate and sustainable support to complement their national actions for implementation of this framework by 2030; and,
g) Substantially increase the availability of and access to multi-hazard early warning systems (MHEWSs) and disaster risk information and assessments by 2030.

There are a number of provisions in the Sendai Framework, called for by and addressed to States, which are especially relevant to WMO (such as target g) above):

- Promoting the collection, analysis, management and use of relevant data and practical information in line with national circumstances and making use of space and in situ information that results from maintained and strengthened in situ and remotely-sensed Earth and climate observations;
- Ensuring dissemination of reliable data in an appropriate format and accessibility of non-sensitive information, taking into account the needs of different categories of users (including social and cultural requirements, in particular, gender);
- Strengthening disaster risk modelling, assessment, mapping, monitoring and multi-hazard early warning systems (MHEWSs) through the strengthening of technical and scientific capacity to capitalize on and consolidate existing knowledge and through developing and applying methodologies and tools;
- Promoting and improving dialogue and cooperation among scientific and technological communities, the private sector, other relevant stakeholders and policymakers in order to facilitate a science/policy interface for effective decision-making in disaster risk management and for sharing good practices internationally;
- Strengthening disaster-resilient public and private investments in structural, non-structural and functional disaster risk prevention and reduction measures;
• Investing in, developing, maintaining and strengthening people-centred, multi-sectoral MHEWSs, including telecommunications systems for hazard monitoring and emergencies, simple and low-cost early warning equipment and facilities, and broadened release channels for warning information that is tailored to different user needs;

• Promoting the further development of and investment in effective, nationally compatible, regional multi-hazard early warning mechanisms, where relevant, contributing to the Global Framework for Climate Services (GFCS), and facilitate the sharing and exchange of information across all countries;

• Supporting relevant UN entities to strengthen and implement global mechanisms on hydrometeorological issues in order to raise awareness and improve the understanding of water-related disaster risks; and,

• Promoting international cooperation for DRR and enhanced coordination of respective strategies of UN entities and other international and regional organizations, especially in developing countries, in particular, the least developed countries, Small Island Developing States (SIDS), landlocked developing countries and African countries.

The WMO community has a wide range of services and products on offer for the implementation of the Sendai Framework, while other activities and commitments still need to be implemented.

Monitoring progress with achieving the targets of the Sendai Framework – Indicators and Terminology

WCDRR recommended that the UN General Assembly establish an open-ended intergovernmental expert working group (OIEWG DRR), comprised of experts nominated by States, and supported by UNISDR, with involvement of relevant stakeholders, for the development of a set of possible indicators and terminology to measure global progress in the implementation of Sendai Framework in coherence with the work of the inter-agency and expert group on sustainable development indicators (IAEG SDG). The First Session was held from 28-30 September 2016 and the Second Session from 9-11 February 2016. The Third and final session will take place in mid-November 2016.

The Sendai Framework also recommends the update of the 2009 UNISDR Terminology on DRR by December 2016 through the OIEWG DRR, and WCDRR recommended that the OIEWG DRR considers the recommendations of the UNISDR Scientific and Technical Advisory Group (STAG) on this matter.

WMO and representatives from the NMHSs of its Members can (and are expected to) make valuable contributions to the design of the final indicators and terms of the terminology relevant to WMO, and the formulation of the indicators will determine what NMHSs are expected to report on over the next 15 years.

The WMO Disaster Risk Reduction Roadmap

WMO is now realigning its DRR Programme with the Sendai Framework while considering the provisions of other global frameworks that are highly relevant to DRR, for example, on sustainable development, climate change, humanitarian assistance and urban issues. A first step was the decision by EC-66 in 2014 and Cg-17, to produce and regularly update a WMO DRR Roadmap of “prioritized 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”. A first draft was presented to Cg-17 and further input will be
collected during this meeting. It should be recalled that Cg-17 emphasized that all DRR activities should consider and leverage existing guidelines, good practices, frameworks, etc. from the RAs, TCs, TPs and from NMHSs’ own DRR roadmaps, frameworks and good practices.

The Roadmap will guide WMO’s activities in all components of disaster risk management as well as their further enhancement and coordination across WMO constituent bodies and programmes. It is a coordinated organization-wide plan of action and will be continuously updated and verified for consistency with the other WMO planning documents. The aim of the Roadmap is furthermore to emphasize the role WMO and the NMHSs of its Members need to play in the effective implementation of the Sendai Framework across all levels, sectors and timescales, including the provision of weather-specific early warnings with improved lead time, slower onset seasonal or climate-related information, and hazard information for risk assessments, prevention, response, recovery, and risk transfer, i.e. for the reduction of existing risks and preventing the creation of new risks.

The International Network for MHEWS (IN-MHEWS) and the International Conference on MHEWS (IC-MHEWS)

In line with the Sendai Framework and building upon the WMO community’s considerable capacities that contribute to multi-hazard early warning systems (MHEWSs), WMO is playing a key role in developing and promoting the International Network for MHEWSs (IN-MHEWS, Doc 10), a major commitment made at WCDRR, as well as the conduct of an International Conference on MHEWSs (IC-MHEWS, Doc 11) planned for December 2016. IN-MHEWS is a multi-stakeholder partnership that will facilitate the sharing of expertise and good practice in strengthening MHEWS as a national strategy for DRR, climate change adaptation and building resilience. IC-MHEWS will build upon the three international conferences on early warning (1998, 2003, and 2006, hosted by the Government of Germany) and three WMO expert symposia on MHEWS (2006, 2009 and 2010) and will identify effective strategies and actions needed to promote and strengthen MHEWSs in support of the implementation of the Sendai Framework as well as a state-of-the-art of MHEWS globally.

The World Meteorological Organization (WMO)

Originating from the International Meteorological Organization established in 1873, WMO became the specialized agency of the United Nations in 1951 for meteorology, operational hydrology and related geophysical sciences. Today, it is the authoritative voice of the United Nations system on the state and behaviour of the Earth’s atmosphere (weather), its interaction with the oceans, the climate it produces, and the resulting distribution of water resources. As weather, climate, and the water cycle do not recognize any political boundaries, WMO promotes international cooperation in these areas by coordinating the activities of the NMHSs of its 191 Member states and territories (on 1 January 2015), most of which operate 24/7 throughout the year. It provides a unique mechanism for the timely exchange of data, information and products and fosters the improved understanding and development of meteorology and operational hydrology, as well as the benefits from their applications.

WMO carries out its work through scientific and technical programmes. These are designed to assist all Members to provide, and benefit from, meteorological and hydrological services and to address present and emerging problems. Within the framework of these programmes, NMHSs contribute substantially to the protection of life and property against natural hazards, to
safeguarding the environment, and to enhancing the economic and social well-being in all sectors of society.

The World Meteorological Congress is the supreme body of the Organization and brings together the delegates of Members once every four years. The Executive Council, the executive body of the Organization, is responsible to Congress for the coordination of the WMO programmes and the utilization of its budgetary resources. Composed of 37 directors of NMHSs, it meets at least once a year to review the activities of the Organization. Six regional associations (RAs) are each composed of Members whose task it is to coordinate meteorological, hydrological and related activities within their respective Regions (Africa; Asia; South America; North America, Central America and the Caribbean; South-West Pacific; and Europe). Eight technical commissions (TCs), composed of experts designated by Members, study meteorological and hydrological operational systems, applications and research and establish methodologies and procedures. They have been established for basic systems, instruments and methods of observation, atmospheric sciences, aeronautical meteorology, agricultural meteorology, oceanography and marine meteorology (jointly with IOC of UNESCO), hydrology and climatology. Through the RAs, TCs, and the programmes, WMO engages leading experts around the world to develop guidelines, manuals and standards for its Members’ consideration and adoption. The Secretariat serves as the administrative, documentation and information centre of the Organization and provides support to the work of the above-mentioned WMO constituent bodies.