**World
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UNDP

Training Workshop on
Multi-Hazard Early Warning Systems
with focus on Institutional Coordination and Cooperation

1-3 October 2009
Pula, Croatia
(http://www.wmo.int/pages/prog/drr/events/Pula/index_en.html)

DISCUSSIONS TOPICS FOR THE WORKSHOP (Training sessions and working groups)

Multi-Hazard Early Warning Systems with focus on Institutional Coordination and Cooperation and National Meteorological and Hydrological Services

During the working groups, the moderators will facilitate discussions using the following topics. All participants in the training are encouraged to prepare background materials and information for discussions at the working groups (see details below).

1   Background in the establishment of early warning systems in your country

2   Governance and Institutional Arrangements (national to local levels)

  2.1   Policy, intuitional and legal frameworks to support emergency planning and response

  2.2   National to local emergency planning and related linkages to early warning systems

  2.3   Organizational structure for implementing the plans

  2.4   Institutional capacities and concept of operations (coordination and operational collaboration)

  2.5   Utilization of a multi-hazard approach

  2.6   Key factors considered for sustainability of different components of early warning systems with a multi-hazard approach

3   Utilization of risk information in emergency planning and warnings

  3.1   Organizational responsibilities and arrangements for the development of risk information

  3.2   Hazard assessment, quantification and mapping (national to local)

  3.3   Assessment of vulnerabilities and exposure (national to local)

  3.4   Storage and accessibility of disaster and national hazard risk information

  3.5   Development and utilization of hazard/risk information to support emergency planning and warnings

4   Hazard Monitoring, forecasting, and mandates for warning development

  4.1   Organizational responsibilities for monitoring, forecasting and development of hazard warnings

  4.2   Organizational collaboration and coordination for development of hazard warnings

5   Development of understandable, authoritative, recognizable and timely warnings

  5.1   Warning message development cycle

  5.2   Warning message improvement cycle

6   Warning dissemination mechanisms

7   Emergency preparedness and response activities (national to local)

  7.1   Disaster preparedness and response planning and emergency response activation

  7.2   Community response capacities

  7.3   Public awareness and education

8   Development of warnings and related products and services for the disaster risk management user community

9   Improvement of overall operational framework of early warning systems

10   Examples of previous events where the operational early warning systems has led to improvements in emergency preparedness and prevention

Note: For each items the sub-topic points that apply to your national system are in blue font and the ones addressing the specific roles of National Meteorological and Hydrological Service are in red font.

1   Background in the establishment of early warning system in your country

2   Governance and Institutional Arrangements (national to local levels)

2.1 Policy, institutional and legal frameworks to support emergency planning and response

Describe your countries institutional, legislation and legal frameworks, coordination platform and mechanisms for emergency preparedness and response planning, particularly pertaining responsibilities, establishment and enforcement of mandates, procedures, and protocols during an emergency situation at local to national levels. Also, address how the early warning system is reflected in the emergency planning, policies and legislation, and whether there are any specific policies and legislation on early warning systems.

Describe how the National Meteorological and Hydrological Services is reflected in the countries legislation and legal frameworks.

Please describe if hazard impact analyses are carried out by National Meteorological and Hydrological Services and/or other national agencies and whether this information is used to justify appropriate funding for the National Meteorological and Hydrological Service activities in early warning systems. If so, please describe and provide examples.

2.2 National to local emergency planning and related linkages to early warning systems

Describe the national to local emergency preparedness and planning, procedures, and protocols at national to local levels and map how the early Warnings are integrated operationally in these planning at different levels.

Describe how the National Meteorological and Hydrological Service is involved in the early warning system planning process and identify the roles and activities that it plays.

2.3 Organizational structure for implementing the plans

Map the early warning system organizational structure at national, provincial to local levels, identifying ministries, disaster risk management agencies and authorities, other technical agencies, media, NGOs, at national to local levels, etc. that are mandated to support this process and their roles and responsibilities at different stages of the operational early warning systems.

Please provide organizational diagrams (as annexes) detailing the institutional and decision-making structure of the early warning system in your country. Additionally, please provide a early warning system decision tree chart detailing who makes what decisions and when and where.

Please clearly identify in the organizational diagram, what are the interfaces of the National Meteorological and Hydrological Service with other agencies and stakeholders, and what types of services and expertise the National Meteorological and Hydrological Service provides to them.

2.4 Institutional capacities and concept of operations (coordination and operational collaboration)

Identify the working relationships between each of the stakeholders you stated in item 2.2.3, and whether these working relationships are formalized by mandate of legislation, Memorandum of Understanding (MOU), or other form of agreement.

If your country has a Concept of Operations (CONOPS) and specific operational procedures for guiding your early warning system operations, and coordination process among the agencies, please provide a brief description of the process behind its development and structure. If your early warning system does not have a CONOPS or similar document, what process is behind the operational early warning system, how is it implemented?

Describe how the organizational structure of the early warning system is reviewed and whether it is reviewed regularly. Describe the process for improving the system to ensure that the all early warning system stakeholder capacities are best utilized.

What role does the National Meteorological and Hydrological Services play in CONOPS development and implementation?

2.5 Utilization of a multi-hazard approach

How is your multi-hazard approach utilized to ensure interoperability, cost-effectiveness of the early warning system within and across agencies in your country?

Please describe if utilization of a multi-hazard approach in your early warning system has led to the leveraging of resources and cost effectiveness within and across agencies in your country. If so, please describe how and give specific examples.

Please describe how your National Meteorological and Hydrological Service utilizes a multi-hazard approach to ensure maximum utilization of finances, infrastructure, human resources, institutional capacities. Please provide examples of specific approaches in your description.

2.6 Key factors considered for sustainability of different components of early warning systems with a multi-hazard approach

Development of early warning system has a number of financial costs associated with it. These include long-term on-going investments in the four components of the early warning systems, including (1) Observing, monitoring and forecasting of hazard, (2) development of risk information and inclusion of risk information in the warning messages, (3) Communication systems for dissemination of warnings to the authorities and population at risk, and (4) emergency preparedness and response on planning at the community level (training, emergency planning and drills) with support from provincial and national governments. Furthermore, operations of the early warning system during a potential event, has many costs including the coordination, cost of preparedness prior to an event, evacuations, etc. In addition, there are other human resource requirements and training for the development and maintenance of these systems over time.

Do agencies in your country utilize a systematic mechanism to analyze the costs and benefits of your countries multi-hazard early warning system? If yes, please describe the methodology and provide an example of the analysis.

Please describe factors (financial, infrastructure, human resources, institutional, etc) critical for sustainability of different components of early warning systems requirements in your country.

Have you utilized a multi-hazard approach that leverages resources, networks, etc within and across your agencies to enable sustainability? Please describe and provide examples.

Please describe the government funding mechanisms (national to local) for the development, maintenance, sustainability and improvement of the early warning system and emergency preparedness activities in your countries. Please describe how these funding mechanisms have been institutionalized (e.g., designated budget line within the ministries, institutional budgets) and provide specific examples. Does the design and implementation of the early warning system accommodate the available resources long term?

Please describe how your National Meteorological and Hydrological Service sustains its human resources and institutional capacities for early warning systems.

3 Utilization of risk information in emergency planning and warnings

3.1 Organizational responsibilities and arrangements for the development of risk information

Identify key government agencies (e.g. agencies responsible for economic data, demographic data, land use planning, social data, etc.) involved in hazard and vulnerability assessments along with their roles and responsibilities.

Identify legislation or policies mandating the preparation of hazard and vulnerability maps for communities and whether they cover all communities at risk. Describe if and how hazard and risk maps are used in the emergency planning and response operations.

Identify and describe any national standards for the systematic collection, sharing and assessment of hazard and vulnerability data. Additionally, describe the review process that evaluates processes, methods, capacities related to risk knowledge to identify gaps and needs. Describe any review and feedback processes that are in place to identify weaknesses in risk assessment and ensuring corrective actions are taken.

Has the interaction of vulnerabilities with hazards been assessed to determine the risks faced by each region or community? If yes, how has this been accomplished?

Identify and describe the role the National Meteorological and Hydrological Service plays in the areas, particularly pertaining to provision of hazard information, participation in risk assessment projects and activities.

Describe and identify the role the National Meteorological and Hydrological Service plays in the national hazard impact analysis and how the information and data are used to improve

the National Meteorological and Hydrological Services warnings and related products and services.

3.2 Hazard assessment, quantification and mapping (national to local)

Identify the major hazards (please see the hazard list attached in Annex III), in terms of loss of life and property, that affect your country and provide information on their frequency of occurrence, location and level of impacts in your country. Please describe (through examples) if these risks have increased or decreased overtime, due to human-related activities.

Identify and describe 2or 3 major disaster events that have occurred in the past 50 years that have caused serious loss of life or damage to livelihoods in your country. Please describe in what ways these incidents have led to improvements in your countries early warning system and emergency preparedness.

How have communities and different stakeholders (e.g., industry, different government ministries, etc) been consulted to ensure risk information is comprehensive, and is this information provided at local and national levels?

Identify and describe the role the National Meteorological and Hydrological Services plays in the hazard assessment process.

3.3 Assessment of vulnerabilities and exposure (national to local)

Describe how community vulnerability assessments are conducted and for which natural hazards. Describe historical data sources and potential future hazard event scenarios considered in your countries vulnerability assessments.

Identify vulnerabilities which have been mapped (e.g. people or communities along coastlines identified and mapped) and what agency or agencies are mandated/tasked to produce these maps. Please describe how factors such as disability, access to infrastructure, gender, economic diversity and environmental sensitivities have been considered in your countries vulnerability assessments.

Describe the review and feedback process which identifies weaknesses in your vulnerability assessments and ensures corrective actions are taken.

Identify and describe the role the National Meteorological and Hydrological Service plays in the vulnerability assessment process.

3.4 Storage and accessibility of disaster and national hazard risk information

Please describe your hazard and vulnerability archival system by providing details on whether they are centralized. Please specify which agencies provide input on the various types of hazards.

Is hazard and vulnerability data made available to government, the public, and the international community when appropriate? If yes, what mechanisms are used to disseminate this information?

Describe the quality management framework process in place to keep data current. How often is this process reviewed?

Identify and describe any responsibilities the National Meteorological and Hydrological Service have with respect to storage and/or accessibility of disaster and national risk information.

3.5 Development and utilization of hazard/risk information to support emergency planning and warnings

Describe how hazard risk information is utilized in emergency planning.

Identify and describe the role the National Meteorological and Hydrological Service plays in the development and utilization of hazard risk information in emergency planning and warnings.

Please describe how the results of risk assessments been integrated into local risk management plans.

Does the National Meteorological and Hydrological Service incorporate risk information into its warning messages? If yes, what type of information is included? Is the inclusion of risk information into warning messages mandated by the government?

4 Hazard monitoring, forecasting, and mandates for warning development

4.1 Organizational responsibilities for monitoring, forecasting and development of hazard warnings

Map national agencies that have the mandate (are the authority in the country) for monitoring, forecasting and development of warnings for each of the high risk hazard Identified in item 2.3.2.

Specifically, please identify where the National Meteorological and Hydrological Service:

Type I hazards: Has sole mandate for the development of the warning for the hazard (specify the hazard);

Type II hazards - Has joint mandate for the development of the warning hazard for the hazard (specify the hazard)

Type III hazards - Provides information to other agencies that have the mandate for the development of the warning for the hazard (specify the hazard).

4.2 Organizational collaboration and coordination for monitoring, forecasting and development of hazard warnings

Identify and describe the coordination mechanism for interaction of the technical agencies having hazard warning mandate Types I, II, III.

Identify and describe the specific coordination mechanisms of the National Meteorological and Hydrological Service in the context of Types I, II, IIII, with other agencies.

Describe the operational observation monitoring, forecasting and warning systems of National Meteorological and Hydrological Service in your country and its operational engagement with other technical agencies. Please provide a clear map of end-to-end forecast and warning process, particularly how it engages other agencies.

5 Development of timely authoritative, recognizable, and understandable warnings.

5.1 Warning message development cycle

Describe the warning and response cycle from the time a threat is detected to the time the event is considered to be ended.

Describe who is responsible for the development of warnings for different hazards. Are warning alerts and messages tailored to the specific needs of those at risk (e.g. for diverse cultural, social, gender, linguistic and educational backgrounds)?

Have studies been undertaken regarding how the public accesses and interprets early warning messages? Have lessons learned been incorporated into message format and dissemination processes? If yes, how often are these studies completed and what mechanisms ensure that corrective actions are taken?

Are the warning readiness levels, linking level of potential risk to actions on the ground? How are these developed, based on what thresholds? How are the readiness levels communicated with the authorities, emergency response units and public at-risk

Identify existing coordination mechanisms for interactions of National Meteorological and Hydrological Service with their key stakeholders (disaster risk management agencies) for understanding of their needs and requirements for warning and other specialized forecast products and service (e.g., content, format, delivery, lead-time, communication of technical limitations.)

Discuss the mechanisms for establishment of on-going dialogue between National Meteorological and Hydrological Service and the disaster risk management agencies for the understanding of needs and requirements of these agencies as input into the product development of the National Meteorological and Hydrological Service.

Describe the different tapes of National Meteorological and Hydrological Service products (e.g., warning messages, specialized forecasts, advisory services, etc) that address stakeholder requirements and help obtain the response that is needed, to support improved community emergency preparedness and response.

Discuss the capacity building and training approaches that has improved product development, delivery, usability, evaluation and interpretation between the National Meteorological and Hydrological Service and the stakeholders to understand the technical limitations to maximize effective utilization of these products and services by the users and establish credibility and trust.

5.2 Warning message improvement cycle

Describe the review and warning improvement process used in your early warning system at all levels.

Describe the role the National Meteorological and Hydrological Service plays in the warning review and improvement process.

6 Warning dissemination mechanisms

Describe the warning dissemination chain and whether it is enforced through government policy or legislation (e.g. message passed from government to emergency managers and communities etc).

Identify and describe the authoritative entities in your country responsible for the issuance of different warnings (e.g., national government to issue all hazard warnings or meteorological authorities to provide weather messages, health authorities to provide health warnings, etc) within your early warning system?

Describe the functions, roles and responsibilities of each early warning system partner within the warning dissemination process as specified in legislation or government policy (e.g. national warning centre, National Meteorological and Hydrological Service, media, Red cross Red Crescent Societies, etc.)?

What mechanisms are used to widely disseminate hazard warnings to remote households and communities (e.g., trained and empowered volunteer network)? Please elaborate on the various mechanisms including volunteer networks within the early warning system at community level and how they are empowered.

Identify and describe the role of your National Meteorological and Hydrological Service within the warning dissemination process.

Identify infrastructures and protocols for dissemination of warnings, specialized forecasts and other products developed by the National Meteorological and Hydrological Service to the stakeholders at national to local levels to ensure the data and information reach the target users (e.g., national operations centre, media, Red Cross communication systems)

Identify mechanisms for improving dissemination of warnings by the appropriate agencies and organizations to the national and local level stakeholders through formal and informal channels.

Identify the roles/mandates of the National Meteorological and Hydrological Service and other organizations involved in disaster management in warning dissemination (e.g., what can be sent out to the public and by whom; what can the National Meteorological and Hydrological Service send to a specific stakeholder).

7 Emergency preparedness and response activities (national to local)

7.1 Disaster preparedness and response planning and emergency response activation

Describe how the emergency preparedness and response plans are targeted to the individual needs of vulnerable communities, authorities and emergency respondents.

Describe how hazard and vulnerability maps are utilized in the development of emergency preparedness and response plans.

Discuss how emergency preparedness and response plans are developed and disseminated to at risk communities, and how often they are exercised/practiced and evaluated.

Describe and give examples, whether previous disaster events and responses been analysed, and the lessons learned incorporated into updates of disaster management plans.

Discuss how your early warning system response plan anticipates the need for large and small scale evacuations. Have evacuation routes been established and exercised? If yes, how often are they exercised?

Identify and describe the role of your National Meteorological and Hydrological Service within disaster response planning. Are there joint training programmes between the forecasters and the disaster risk management agencies and emergency responders?

7.2 Community response capacities

Describe how the community's ability to respond effectively to early warnings been assessed in your country.

Describe how previous responses to disasters been documented, analysed and lessons learned incorporated into future capacity building strategies. Please provide any examples already documented.

Identify and describe how community-focused organizations are engaged to assist with community preparedness and training of the public.

Describe how community, volunteer education and training programmes have been developed and implemented and how often are such training activities conducted? (e.g., annually, monthly, etc)

Identify and describe the role played by your National Meteorological and Hydrological Service within communities' response activities, including advisory and other services.

7.3 Public awareness and education

Describe how your local communities are educated on how warnings will be disseminated, which sources are reliable, and how to respond to different types of hazards after an early warning message is received.

Describe how communities are trained to recognise simple hydro-meteorological and geophysical hazard signals to allow for a timely and immediate response.

Identify and describe how on-going public awareness and education programmes are built into school curricula from primary schools to university.

Identify and discuss how the mass media and alternative media (e.g. Internet) are utilized to improve public awareness.

Identify and describe any public awareness and education campaigns tailored to the specific hazards and the needs of each audience (e.g. children, emergency managers, and media).

Discuss how public awareness strategies and programmes are evaluated and updated.

Identify and describe the role your National Meteorological and Hydrological Service plays in public awareness and education activities.

8 Development of warnings and related products and services for the disaster risk management user community

Describe the mechanisms for identifying and developing your National Meteorological and Hydrological Services relations within the disaster risk management user community.

Describe the mechanisms for identifying the requirements and development of specifications for warnings and related products and services for the disaster risk management user community.

Describe the mechanisms for the delivery of products and services to the disaster risk management user community.

Please describe the challenges in working with users and how you overcome them (e.g. lack of understanding of the science limitations forecasting, etc)

Describe the mechanisms through which you assess disaster risk management customer satisfaction and how this information is used to improve your warning products and services.

9 Improvement of overall operational framework of the early warning system

Identify and describe the feedback mechanisms within the operational early warning system that are utilized during and after an event in order to improve:

1. Products and services provided by the National Meteorological and Hydrological Service to disaster risk management agencies and other stakeholders.

2. Operational coordination mechanisms of the National Meteorological and Hydrological Services with other disaster risk management stakeholders at various levels.

10 Examples of previous events where the operational early warning system has led to improvements in emergency preparedness and prevention

Identify two to three specific events where your operational early warning system has saved lives and livelihoods and describe the operational experiences and lessons learned.

Identify and describe the role your National Meteorological and Hydrological Service played in these specific events and how it supported the early warning system and emergency response operations.