World Meteorological Organization

Meteorological, Hydrological and Climate Services in Support of Disaster Risk Reduction

Asian Conference on Disaster Reduction 2007
25-27 June 2007, Astana, Republic of Kazakhstan

We cannot avoid hazards
...but we can Prevent Them from Becoming Disasters

Source: World Resources Institute

90% of Disasters are Hydro-Meteorological (Number of Events, 1980-2005)

Source: EM-DAT: The OFDA/CRED International Disaster Database - www.em-dati.net - Université Catholique de Louvain - Brussels - Belgium
Supporting National Capacities for Disaster Risk Management

24 hours a day, everyday of the year, in every country

National Meteorological and Hydrological Services

Products and Services

Needs, requirements, Feedback

WMO Coordinated Networks in Support of Disaster Risk Reduction:
Observation & Communication

Global Observing System

Coordinated Satellite Activities

Global Telecommunication System
**WMO Mechanisms to Support Members' Scientific and Technical Capacities**

### Thematic

**8 Technical Commissions**
- Basic Systems (CBS)
- Instruments and Methods of Observations (CIMO)
- Hydrology (CHy)
- Atmospheric Sciences (CAS)
- Aeronautical Meteorology (CAeM)
- Agricultural Meteorology (CAgM)
- Oceanography and Marine Meteorology (JCOMM)
- Climatology (CCl)

### Regional

- 2 World Meteorological Centres (WMC)
- 6 Regional Associations (RA)
- 40 Regional Specialised Meteorological Centres (RSMC)
- 30 Regional Meteorological Training Centres (RMTC)

**Members' National Meteorological and Hydrological Services (NMHSs)**

**10 Programmes**
- Applications of Meteorology (AMP)
- Atmospheric Research and Environment (AREP)
- Education and Training (ETR)
- Hydrology and Water Resources (HWR)
- Technical Cooperation (TOC)
- World Climate (WCP)
- Space (WSP)
- Disaster Prevention and Mitigation (DPM)
- World Weather Watch (WWW)

**PARTNERS**

---

**Regional Coordinated Networks in Support of Early Warnings, Specialized Services and Training**

- Regional Meteorological Training Centres
- Drought Monitoring Centres
- Medium Range Forecasting Centre
- Tropical Cyclone Forecasting Centres
- Environment Emergency Response Centres
- Regional Meteorological and Hydrological Specialised Centres
- World Meteorological Centres
Example of Regional Cooperation: WMO Global Tropical Cyclone Early Warning System

Regional cooperation (6 Regional Centres) in support of national tropical cyclone early warning systems

Economic Losses are on the Way Up

Source: EM-DAT: The OCHA CRED International Disaster Database - www.em-dat.net - Université Catholique de Louvain - Brussels - Belgium
While Casualties related to Hydro-Meteorological Disasters are Decreasing

<table>
<thead>
<tr>
<th>Decade</th>
<th>Geological</th>
<th>Hydrometeorological</th>
</tr>
</thead>
<tbody>
<tr>
<td>56-65</td>
<td>2.66</td>
<td>0.05</td>
</tr>
<tr>
<td>66-75</td>
<td>1.73</td>
<td>0.17</td>
</tr>
<tr>
<td>76-85</td>
<td>0.78</td>
<td>0.39</td>
</tr>
<tr>
<td>86-95</td>
<td>0.65</td>
<td>0.22</td>
</tr>
<tr>
<td>96-05</td>
<td>0.67</td>
<td>0.22</td>
</tr>
</tbody>
</table>

Source: EM-DAT: The OFDA/CRED International Disaster Database - www.em-dat.net - Université Catholique de Louvain - Brussels - Belgium

Return on Investment in Meteorological, Hydrological and Climate Services: 10 to 1

WMO Secretary-General, Madrid, 19 March 2007

Building capacities of National Meteorological and Hydrological Services is an investment toward national development.
Disaster Risk Management Involves a Wide Range of Decisions and Actions

Disaster Risk Management

Risk Identification → Historical hazard data and analysis
→ Changing hazard trends
→ Vulnerability assessment
→ Risk quantification

Risk Reduction → Sectoral planning
→ Early Warning Systems
→ Emergency Preparedness planning
→ Education and training

Risk Transfer → Financial tools
• Insurance
• Weather derivatives
• Cat bonds

Need for Effective and Harmonized Governance, Institutional and Operational Mechanisms

Disaster Risk Management

Governance
→ Strong political will and commitment
→ Disaster management plans
→ Legislation and policies (all levels)
→ Legal frameworks

Operational
→ Processes and mechanisms
→ Integration of information in decision process
→ Preparedness and drills
→ Training
→ Effective response
→ Feedback

Organizational
→ Clarity of roles and responsibilities
→ Coordination and partnerships
→ Integrated planning
Shifting Disaster Risk Management from Reaction to Prevention

- Traditionally, disaster risk management approach has been focused on emergency response and recovery measures.

World Conference on Disaster Reduction (WCDR)
168 countries adopted Hyogo Framework for Action (HFA)
Kobe, Japan, January 2005

- Shifting disaster risk management to a more comprehensive approach, involving
  - prevention
  - preparedness
  - contingency planning
  - emergency response and recovery measures.

Strategic Foundation

Hyogo Framework for Action
2005-2015
(World Conference on Disaster Reduction, Jan 2005)

WMO Strategic Plan
2008-2011
(Top Level Objectives and Five Strategic Thrusts)

Strategic Goals of WMO in Disaster Risk Reduction
WMO Strategic Goals for DRR

1. Strengthening and sustainability of early warning systems
2. Analyzing and providing hazard information for risk assessment
3. Delivery of timely and understandable warnings and specialized forecasts -- driven by user requirements
4. Integration of NMHSs' products and services in disaster risk reduction,
5. Strengthening WMO/NMHS cooperation and partnerships at national to international level with disaster risk reduction organizations
6. Public outreach campaigns

Linking DRR Strategic Goals to Action

Implementation through regional and national projects, with following end results:

1. Modernized NMHSs systems.
2. Strengthened national operational multi-hazard early warning systems.
4. Strengthened cooperation of NMHSs with civil protection and disaster risk management agencies.
5. Trained NMHS
6. Sustained capacities over time
7. Enhanced awareness ministerial and public
Examples of DRR Crosscutting Projects initiated in 2007

<table>
<thead>
<tr>
<th>Project</th>
<th>Country / Region</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multi-Hazard Early Warning</td>
<td>France and Shanghai Mega-City</td>
</tr>
<tr>
<td>Severe Weather Forecasting</td>
<td>South East Africa</td>
</tr>
<tr>
<td>Global Flash Flood Guidance System</td>
<td>Central America, followed by Africa</td>
</tr>
<tr>
<td>Flood Risk Assessment</td>
<td>To be initiated in 6 countries</td>
</tr>
<tr>
<td>Drought Monitoring and Risk Assessment</td>
<td>South East Europe &amp; Africa</td>
</tr>
<tr>
<td>Public Education and Outreach</td>
<td>Global</td>
</tr>
</tbody>
</table>

Other projects are also being considered for 2008-2011

Systematic Assessment of Capacities, Requirements and Priorities

By country groupings:
1. Hazards affecting the countries
2. Role of National Meteorological Services for disaster risk reduction
3. Capacities to deliver products and services in support of disaster risk reduction
4. Challenges, requirements and opportunities

At regional level:
1. Regional strategy for disaster risk reduction
2. Opportunities for partnerships
Responses to the WMO Country-Level DPM Survey

139 out of 187 Members (74 %) participated

Analysis for ADRC Member Countries

21/25 Countries Participated
Number of responding countries who identified themselves as being affected by specific hazards

National Context for Disaster Risk Reduction:
Legislation and Governance

Disaster reduction activities are coordinated at the national level:
18 / 21

Disaster reduction activities are coordinated under the direct line authority of the head of government: 17 / 21

Legislation governs the way that disaster risk reduction is organized in the countries:
17 / 21

Legal and governance mechanisms are available but are limiting implementation of DRR initiatives in 10 of 21 countries
National Context for Disaster Risk Reduction:
National Structures/Mechanisms for Disaster Risk Reduction

A national committee for disaster risk reduction involves multiple ministries and agencies:

NMHS is a member of this national committee:

Lack of clear legislation or policies regarding the role of the NMHS in DRR:

NMHSs participate in national coordination mechanisms when available; The definition of stakeholders’ roles and responsibilities with regards to DRR needs to be improved in half of participating countries.

National Capacities for Issuance of Warnings
Number of Countries Maintaining Standardized Information about Hazards and their Socio-Economic Impacts

A national agency is responsible for providing official information on the impacts of disasters in the country: 18 / 21

National Meteorological and Hydrological Services have access to official, reliable, information on impacts: 17 / 21

90% of participating ADRC Member countries have information about impacts of disasters available, compared to 67% globally

---

National Context for Disaster Risk Reduction:
Contributions of NMHS to National Disaster Risk Reduction

NMHS provide early warning information to:

---
National Context for Disaster Risk Reduction: Contributions of NMHS to National Disaster Risk Reduction

Dissemination methods for warnings:

- Facsimile
- Posting on a web page
- Meetings or briefings
- Hard copy mailing
- Mobile phone text messaging
- Siren, signal balls, flags, etc.
- Recorded media
- Others

NMHS provide critical contributions to DRR.

NMHSs are operational 24/7 in almost every country.

24 hours a day, every day forecasting service: 19 / 21

24 hours a day, every day dedicated warning service: 18 / 21
National Context for Disaster Risk Reduction:
Limiting Factors for Contributions of NMHSs to DRR

Lack of resources and infrastructure to deliver critical products and services for disaster risk reduction:

13 / 21

Lack of linkages between the NMHS and other organizations (e.g. emergency response):

6 / 21

Lack of clear legislation or policies regarding the role of the NMHS:

10 / 21

Main strengths:
Linkages between NMHSs and other organizations

Major limiting factor:
Resources

Common Challenges

Governance:
- Demonstrating socio-economic benefits of prevention measures

Organizational coordination:
- Partnerships, definition of roles and responsibilities of every stakeholder

Technical:
- Telecommunications, internet access, computer hardware and software
- Observing networks development and sustainability
- Hazard data: data management, methodologies for data rescue, quality assurance, statistical analysis of hazard characteristics and mapping
- Specialised forecasting services in support of risk reduction

Education and Training:
- Technical training and capacity development
- Joint multi-disciplinary training with multiple agencies
- Public outreach programmes
Thank You

For more information please contact:
Maryam Golnaraghi, Ph.D.
Chief of Natural Disaster Prevention and Mitigation Programme
World Meteorological Organization
Tel. 41.22.730.8006
Fax. 41.22.730.8023
Email. MGolnaraghi@WMO.int

http://www.wmo.int/disasters