WMO initiatives in Disaster Risk Management (An Overview)

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Presented by

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Agenda

1. Disasters and their impacts
2. Overview of WMO
3. WMO Initiatives for Strengthening National Capacities in Disaster Risk Management
4. Conclusions
1. Disasters and their impacts

90% of events, 70% of casualties and 65% of economic losses are related to hydro-meteorological hazards.

Distribution of Disasters Caused by Natural Hazards and their Impacts in Asia (1980-2005)

- Université Catholique de Louvain - Brussels
- Belgium
90% of Disasters are Hydro-Meteorological (Number of Events, 1980-2005)

Conclusions from 4th IPCC WG II (Impacts, Adaptation and Vulnerability)

<table>
<thead>
<tr>
<th>Phenomenon</th>
<th>Likelihood</th>
<th>Major projected impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increased frequency of heat waves</td>
<td>Very likely</td>
<td>Increased risk of heat-related mortality</td>
</tr>
<tr>
<td>Increased frequency of heavy precipitation events</td>
<td>Very likely</td>
<td>Increased loss of life and property due to flooding, and infectious, respiratory and skin diseases</td>
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<tr>
<td>Area affected by drought increases</td>
<td>Likely</td>
<td>Increased risk of food and water shortage</td>
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<td>Intense tropical cyclone activity increases</td>
<td>Likely</td>
<td>Increased risk of deaths, injuries, water- and food-borne diseases; Disruption by flood and high winds; Potential for population migrations, loss of property</td>
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<tr>
<td>Increased incidence of extreme high sea level</td>
<td>Likely</td>
<td>Increased risk of deaths and injuries by drowning in floods; Potential for movement of populations and infrastructure</td>
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Disaster risks are increasing, due to:

- Increasing intensity and frequency of hydrometeorological hazards;
- Increasing value of exposed elements due to development and demographic expansion.

Disaster risk management is a critical component of climate change adaptation.
2. Overview of WMO

- Specialized Scientific and Technical Agency of the United Nations Responsible for Observing, Monitoring, Detecting, Forecasting and Warnings of Meteorological, Hydrological and Climate Conditions

- 188 Members, Represented by the Heads of the National Meteorological and Hydrological Services at the WMO Governing Bodies
Mandate for Natural Hazards related to Weather, Climate and Water …

Primary mandate for: Severe storms, tropical cyclones (hurricanes and typhoons), storm surges, floods, cold spells, heat waves, cold waves, droughts, volcanic ash transport, air pollution, Sand and dust storms, etc.

Contributing to: Forest fires, locust swarms, health epidemics, tsunami, etc…

Research Side: International Coordination of Scientific Research and Assessment
World Climate Research Programme (WCRP)
World Weather Research Programme (WWRP)/THORPEX IPCC

Climate change
- Hot and cold spells
- Droughts

Climate variability
- Tropical cyclones
- Storm surges
- Heavy precipitation
- Northern Atlantic Oscillation
- El Niño
- Pacific Decadal Oscillation
- Northern Atlantic Oscillation
- El Niño

Flash floods
- Tornadoes
- Mud and landslides
- Hail and lightning
- Dust storms
- Ice storms

Droughts
- River basin flooding
- Storm (wind)
- Wildland fires and haze

Tropical cyclones
- Heat waves
- Cold spells
- Ice storms
Operational Side: Global Coordination of Network of National Meteorological and Hydrological Services and Space Agencies

- Coordination of global observing networks
- National data policy and exchange issues
- Standardization and protocols for observing, forecasting, dissemination and exchange,
- Global Telecommunication System
- Global Data Processing and Forecasting System (40 specialized centers)
- International and Regional Technical Cooperation Projects
- Technical advise and national capacity development
Communication, dissemination and service delivery

International & regional level:
- Global Telecommunication System
- National Meteorological and Hydrological Services
- Government and civil defence authorities
- Media
- General public
- Private sector

• Critical information is now available. It still can be better customized to support DRR
• Requirements of different sectors are being identified and prioritised.
**DRR Strategic Goals - Key Words**

1. Analyzing and providing **hazard information** for risk assessment
2. Strengthening and sustainability of multi-hazard **early warning systems**
3. Delivery of timely and understandable warnings and specialized forecasts -- **driven by user requirements**
4. Strengthening WMO/NMHS **cooperation and partnerships** with disaster risk reduction organizations
5. **Public outreach campaigns**

 Implemented through national and regional development projects leveraging WMO and partners’ resources/expertise.

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**Analysis of NMHSs’ Capacities, Gaps and Needs related to DRR and EWS**

**139 National Meteorological and Hydrological Services participated:**

1. Assessment of role of NMHSs as reflected in planning, legislation and national DRR coordination mechanisms;
2. Assessment of NMHS' capacities in observing, data management, forecasting and warning services;
3. Capacities to deliver products and services and warnings;
4. Assessment of NMHSs’ cooperation and coordination with other agencies and ministries.

**report available:**

Responses to the WMO Country-Level DPM Survey in Asia

25 out of 34 Asian Regional Association Members responded

Example: Number of Asian Members issuing warnings for listed hazards

Warnings could be significantly enhanced through strengthening of National Meteorological and Hydrological Services’ capacities
Summary: NMHSs’ Capacities and Needs in Asia

3.

WMO Initiatives for Strengthening National Capacities in Disaster Risk Management
Disaster Risk Management Framework

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Information and Knowledge Sharing
Education and training

Role of National Meteorological and Hydrological Services in Risk Assessment

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Information and Knowledge Sharing
Education and training
WMO Projects to Support National Hazard Analysis and Support Risk Assessment

Flood, Drought, Tropical Cyclone and Severe Storms and other meteorological hazards underway

1. Standardized hazard data and metadata
2. Standardized hazard analysis and mapping methodologies
3. Mainstreaming risk assessment in sectoral planning (partners)
4. Capacity development and training
5. Demonstration projects in selected countries
Role of National Meteorological and Hydrological Services in Risk Reduction

Risk Transfer
- Historical hazard data, analysis and changing hazard trends
- Exposed assets & vulnerability
- Risk quantification

Risk Reduction
- PREPAREDNESS: early warning systems, emergency planning and response capacities
- MITIGATION AND PREVENTION: Medium to long term sectoral planning (e.g. building resilient infrastructure)

Information and Knowledge Sharing
- Education and training

Governance and Organizational Coordination and Cooperation
- CAT insurance
- CAT bonds
- Alternative Risk Transfer mechanisms
- Other emerging products

Enhanced risk information provides inputs for mid- to long-term planning:
- landuse planning
- infrastructure development
- building codes
- climate adaptation strategies
Reducing disaster risks through mid- to long-term sectoral planning and early warning systems

Economic losses related to disasters are on the way up

While casualties related to hydro-meteorological disasters are decreasing

Source: EM-DAT: The OFDA/CRED International Disaster Database
In many countries, early warning systems are not an integral part of disaster risk management.

**NATIONAL SERVICES**
- Meteorological
- Hydrological
- Geological
- Marine
- Health (etc.)

**COORDINATION AMONG NATIONAL SERVICES**

**Effective Early Warning Systems**

1. National to local governments
2. COORDINATION AMONG NATIONAL SERVICES:
   - Meteorological
   - Hydrological
   - Geological
   - Marine
   - Health (etc.)

3. Feedback
4. Community Preparedness
5. Post-disaster recovery

Effective Early Warning Systems supported by DRR plans, legislation and coordination mechanisms.
WMO Initiatives for Strengthening EWS

- Documentation of good practices in early warning systems (France, China (Shanghai), Bangladesh, Cuba and others), focusing on governance, inter-agency coordination and operational aspects of EWS.

Comprehensive EWS Pilot Projects with Multi-Hazard Approach (since 2006)

- Central America
- South-Eastern Europe
- South-Eastern Africa
- China (Shanghai)
Role of National Meteorological and Hydrological Services for Financial Risk Transfer Markets

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Information and Knowledge Sharing

Education and training

Risk Transfer

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- CAT bonds
- Alternative Risk Transfer mechanisms
- Other emerging products

Examples of Catastrophe (CAT) Insurance / Bond and Weather Risk Management Markets

- European Agricultural Risk
- Hydro Electric Power Risk Contracts
- Wind Power Risk Contracts
- Heating Degree Day Contracts

- Catastrophe Insurance and Bond Markets
- Weather Risk Management Markets (ART)

- Southeastern Europe Disaster Risk management Project
- Southeastern and Central European Risk Insurance Facility
- UK Flood CAT Bond

- Caribbean Catastrophe Risk Insurance Facility
- Indian Agricultural Risk

- Drought Risk Management in Ethiopia
- Malawi Drought Risk Management

- Pacific Ri Insurance Facility
Access to hydro-meteorological data is critical for development of these markets

- Historical records
  - Temporal and geographical coverage
  - Need for data rescue activities
- On-going real-time observations and updates
- Tamper-proof weather stations
- Data accessibility and quality
- Use of new technologies (satellites)
  - Verification
  - Enhanced estimates
  - Currently, challenge is lack of sufficient historical records

WMO Contributes to Development of Financial Risk Transfer Markets with World Bank, WFP and WRMA

1) Raising awareness on needs and opportunities

2) Developing a joint work plan (2008 - 2009) for national capacity development projects
   - Modernization of observing networks, Data Rescue Programmes, Data management and archiving systems, technical tools and methodologies

3) Motivating coordinated climate research
   - Patterns of risk (spatial and temporal correlations)
Conclusions

• WMO has initiated a crosscutting programme on DRR (2003)

• WMO initiatives in DRR focus on:
  – Hazard data analysis as an input to risk assessment;
  – Early warning systems;
  – Financial risk transfer mechanisms.

• WMO is exploring opportunities to initiate DRR projects in Asia in 2009-2010
Useful links – Publications

- World Meteorological Organization – Disaster Risk Reduction Programme
  [http://www.wmo.int/disasters](http://www.wmo.int/disasters)
- United Nations International Strategy for Disaster Reduction (ISDR)
  [http://www.unisdr.org](http://www.unisdr.org)
- PreventionWeb
  [http://www.preventionweb.net](http://www.preventionweb.net)
- World Bank – Disaster Risk Management Team
- UNDP – Bureau for Crisis Prevention and Recovery
- International Federation of Red Cross and Red Crescent Societies (IFRC)
  [http://www.ifrc.org](http://www.ifrc.org)
- Prevention Consortium
  [http://www.preventionconsortium.org](http://www.preventionconsortium.org)
- Office for the Coordination of Humanitarian Affairs (OCHA)
- Global Facility for Disaster Reduction and Recovery (GFDRR)
  [http://gfdrr.org](http://gfdrr.org)
- Global Risk Identification Programme
  [http://www.gri-p.net](http://www.gri-p.net)
- Dartmouth Flood Observatory (DFO)
  [http://www.dartmouth.edu/~floods](http://www.dartmouth.edu/~floods)
- University of Colorado at Boulder: Natural Hazards Center
  [http://www.colorado.edu/hazards](http://www.colorado.edu/hazards)
- Gateway to the United Nations System’s Work on Climate Change
  [www.un.org/climatechange](http://www.un.org/climatechange)
Thank You

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