WMO Strategy and Roadmap on Disaster Risk Reduction

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WMO is the UN system's authoritative voice on weather, climate, water & related environmental issues

- UN Specialized Agency on weather, climate & water
- Coordinates 191 Members, 200 000 experts from meteor & hydrological services and academia
- Backbone Programme: World Weather Watch since 1963
- Co-Founder and host agency of IPCC
- Co-Founder of UNFCCC
We envision a world in 2030 where all WMO Members, especially the most vulnerable, are more resilient to the socioeconomic consequences of extreme weather, water, climate and other environmental events; and support their sustainable development through the best possible services, whether over land, at sea or in the air.

Reducing losses of life and property from hydrometeorological hazards.

Supporting climate action to build resilience and adaptation to climate risk.

Enhancing socioeconomic value from hydrometeorological and climate services.

1- Better serve societal needs: Delivering actionable, authoritative, accessible, user-oriented and fit-for-purpose services

2- Enhance Earth system observations and predictions: Strengthening the technical foundation for the future

3- Advance targeted research: Leveraging leadership in science

LTG 4 Close the gap on services: Enhancing and leveraging existing capabilities among all WMO Members to bring capability to all

LTG 5 Work smarter: Supporting effective policy- and decision-making and implementation in WMO
Reducing losses of life and property from hydrometeorological hazards.
Impacts of hydrometeorological and climatological hazards (1955–2014)

Human losses by decade (millions)

Economic losses by decade (billions of US$ adjusted to 2013)

Reduction of the number of victims thanks to greater effectiveness of forecasting, early warning systems and prevention measures
WMO Strategic Priority 1 - DRR!

The global total economic losses by decade and by hazard type in USD billions adjusted to 2011
European Center for Medium-Range Weather Forecasts (ECMWF) strategy: GOALS BY 2025

- **EARTH SYSTEM** PREDICTION & SERVICES, Goals By 2025:
  - Skilful predictions of high-impact weather up to two weeks (2016: one week) ahead with a horizontal resolution of 5 km
  - To improved predictions in the medium range as well as at monthly and seasonal timescales.
  - To produce forecasts with increasing fidelity on time ranges up to one year ahead.

- The Earth system models outputs enable authoritative and high quality information, including extreme environmental events, and flooding, climate variability, air quality, etc.

- This will meet the needs of WMO global contribution to UN-level (policy-makers), as well as national ever-increasing mandate requirements.
• The Extreme Forecast Index (EFI) in Figure 2 indicated a potential windstorm over northwest Europe more than one week before the event, but the location and high values of probabilities became accurate only a few days ahead of the event.

• By 2025 the EFI can be issued two weeks ahead with higher accuracy.
WMO suggested input to the draft Tokyo statement - 1

• Add to the Knowledge on Disaster Risk Section:

– Global efforts to contribute to improve prediction capability on disaster (weather and climate) facilitating DRR prevention and preparedness;
WMO Space Programme with New-Generation of Geostationary Constellation
The New Generation of GEO Meteorological Satellites for DRR: Himawari, FY-4, GOES-R, etc

3X MORE CHANNELS
Improves every product from current GOES Imager and will offer new products for severe weather forecasting, fire and smoke monitoring, volcanic ash advisories, and more.

4X BETTER RESOLUTION
The GOES-R series of satellites will offer images with greater clarity and 4x better resolution than earlier GOES satellites.

5X FASTER SCANS
Faster scans every 30 seconds of severe weather events and can scan the entire full disk of the Earth 5x faster than before.

GOES 2005

GOES-R 2016

WMO OMM
Through a domino effect, a single extreme event can lead to a broad breakdown of a city’s infrastructure:

**Example of Hazard Domino Effect (Typhoon)**

- **Typhoon**
  - Severe Convection
  - Heavy Rain
  - Traffic Accident
  - Farmland
- **Strong Wind**
  - Inundation
  - Water Logging
  - Basement Flooding
- **Storm Surge**
  - High Waves
  - Overflooding
  - Riverbanks Destroyed
- **Infrastructure Damage**
  - Transmission Line
  - Street Trees
  - Green House
  - Street Billboards
- **Casualty**
- **Inundation**
  - Logging
- **Marine Accident**
Typhoon Meranti, one of the most intense Typhoon (landing China on Sept. 15, 2016)

- Basic Data:
  - Highest Winds: 220km (10"), 305 KM (1")
  - Lowest Pressure: 890 hPa

- Impact:
  - Philippines, Korea and East China (Taiwan & Fujian),
  - Losses in Fujian alone
    - Died: 28
    - Missing: 15
    - Injured: 50
    - Impacted: 304,320
    - Economic loss: 21 Billion (RMB)
WMO observation vision in 2040 requires greatly enhanced capability for Disaster Prediction and Monitoring.
WMO Global Multi-Hazard Alert System - GMAS: Building on the Regional success
WMO suggested input to the draft Tokyo statement - 2

• Add to the Knowledge on Disaster Risk Section:
  – Develop and Utilize advanced observing and information technology for disaster monitoring and warning;
Supporting climate action to build resilience and adaptation to climate risk.
Sendai Framework for Disaster Risk Reduction 2015 - 2030
The plenat will be warmer, leading to more frequent extreme events in the future.
January-February 2016 global Temperature increase reference: 1881-1910

Strong El Niño Episodes:
- 1982/1983
- 2015/2016
Model simulations indicate hurricanes in a warmer climate are likely to become more intense. Tropical storms today and in 3°C warmed climate.
WMO suggested input to the draft Tokyo statement - 3

• Add to the Knowledge on Disaster Risk Section, and/or for resilience, and build back better:

  – Improve knowledge of climate change impact on future disaster scenarios, and resilience measures must be forward-looking
WMO suggested input to the draft Tokyo statement - 4

• Add to strengthening disaster governance:
  – Promote national legislation and mechanism engaging all stakeholders on Disaster Risk Prevention and Reduction, and national authoritative information should be provided and utilized.
Promote the national legislation on DRR

- Example 1: Meteorology Law of the People's Republic of China (adopted on October 31, 1999)
  - Chapter V: Prevention of Meteorological Disasters
  - Article 27 People's governments at or above the county level shall improve their monitoring and warning systems for meteorological disasters, make arrangements for relevant departments to work out plans for prevention of meteorological disasters, and take effective measures to increase the capability of preventing such disasters. Relevant organizations and individuals shall comply with the directions given and arrangements made by the people's governments, and shall make a success of prevention of meteorological disasters.
Promote the national legislation on DRR

• Example 2: Disaster Countermeasures Laws and Acts of Japan

• Japan’s legislation for disaster management system, including the Disaster Countermeasures Basic Act, addresses all of disaster phases of prevention, mitigation and preparedness, emergency response as well as recovery and reconstruction with roles and responsibilities among the national and local governments clearly defined, it is stipulated that the relevant entities of the public of the public ad private sectors are to cooperate in implementing various disaster countermeasures.
Weather–Ready & Climate Smart Nation- USA example is about readying your community for extreme weather, water, and climate events

• What is NOAA doing to build a Weather-Ready & Climate Smart Nation?
  – NOAA’s National Weather Service is transforming its operations to help America respond. Offices now provide forecast information in a way that better supports emergency managers, first responders, government officials, businesses and the public make fast, smart decisions to save lives and property and enhance livelihoods.

• While we at NOAA are taking steps towards building a Weather–Ready Nation, NOAA can not do it alone!

• What can you do to help us build a Weather–Ready Nation?
  – Become a Weather–Ready Nation Ambassador! Building a Weather–Ready Nation requires action from other government agencies, America’s Weather Industry, emergency managers, researchers, the media, nonprofits, and businesses. Any organization committed to serving as an example and engaging their stakeholders to make this country ready, responsive, and resilient can be an Ambassador.
National legal framework will ensure national authoritative information be best used for DRR

Figure 1: Overall framework of WMO DRR activities – weather, climate and hydrological services to support decision-making for DRR
Pay special attention to the lower-middle income countries on DRR.

Figure 28
Economic losses in absolute values and compared to GDP

(b) Death tolls

- 9,200 deaths (5%)
- 6,900 deaths (3%)
- 11,600 deaths (4%)
- 214,700 deaths (89%)

Economic losses in billion US$:
- High income: 1,659
- Upper Middle income: 678
- Lower Middle income: 173
- Low income: 71

Economic losses as % of GDP:
- High income: 0.3
- Upper Middle income: 0.6
- Lower Middle income: 0.2
- Low income: 5.1

Graph showing economic losses in absolute values and compared to GDP for different income levels.
DRR has a long way to go, WMO will strengthen our collaborations with the whole community for meeting the common challenges!

Proverb:
If you want go fast, go alone
If you want go far, go together!