West African RBOs  Think tank virtual roundtables on digital transformation

Earth System monitoring, Hydrometry and innovation for river basins

Dr D. Berod, WMO Secretariat

Team at the round table:

- Rokhaya Ba (technical regulation)
- Tania Gascon (Floods and early warning systems)
- Daniel Sighomnou (water monitoring systems)
- Florian Teichert (innovation in Hydrometry)
- Ramesh Tripathi (Volta project)
The World Meteorological Organization

WMO is the authoritative voice of the United Nations on weather, climate and water. WMO mandate includes:

- **Facilitate worldwide cooperation** in the field of meteorology and hydrology and their application to the benefit of all;

- Promote the **establishment and maintenance of systems for the rapid exchange of data information** in meteorology, climatology and hydrology;

- Promote **standardization** of observations and ensure the uniform publication of observations and statistics;

- Further the application of meteorology, climatology and hydrology to **development issues** (transportation, water management, agriculture, etc.);

- Encourage **research and training**, and assist in coordinating their international aspects.

WMO HQ in Geneva, Switzerland
Hydrological services support 8 ambitions

• 1) No one is surprised by a flood
• 2) Everyone is prepared for drought
• 3) Hydro-climate and meteorological data support the food security agenda
• 4) High-quality data supports science
• 5) Science provides a sound basis for operational hydrology
• 6) We have thorough knowledge of the water resources of our world
• 7) Sustainable development is supported by hydrological information
• 8) Water quality is known
WMO help Countries with a Hydrological Value Chain

**MODELLING & FORECASTING**
- **Flood Forecasting Initiative** delivers timely and more accurate flood forecasting and warning products and services

**DATA**
- **WMO HydroHub** enhances and innovates hydrological monitoring systems worldwide
- **World Water Data Initiative** supports countries in water-related policy development

**PRODUCTS & SERVICES**
- **WMO HydroSOS** provides global reference information on current and future status of freshwater systems

**DECISION SUPPORT**
- **Water Resources Management**
  - Associated Programme on Flood Management
  - Integrated Drought Management Programme
  - Data & products to support decision making
  - Sustainable water management
  - Disaster risk reduction
  - Economic development
  - Environmental conservation

Feedback

Reliable & accessible hydrological data

Consistent & high-quality hydrological data & products
The World Hydrological Cycle Observing System
WHYCOS: water monitoring networks projects

- Successful: 15 components in 25 years
- To be improved: sustainability of achievement, funding mechanisms
- In the pipeline: Indian Ocean, Chad, Senegal, Southern Africa
The WMO HydroHub – the new generation of water monitoring

1. Building Hydrological **Monitoring Capacity**
2. Embedding **Innovation** in Hydrometry
3. Enabling Hydrological **Data Sharing**
4. Connecting the **Global Water Monitoring Community**
5. Providing a **Global Focal Point for Hydrometry**
Data sharing and interoperability of systems: WMO Hydrological Observing System WHOS

MULTIPLE DATA PROVIDERS

CONNECTOR, no data stored

WHOS

TOOLS

➢ Implement interoperability with exchange protocols
➢ Metadata mapping
➢ Data format conversion

USER NEEDS

SEARCH
FIND
ACCESS
FILTER
DOWNLOAD
VISUALIZE
ANALYZE
MODEL
HydroSOS: - Hydrological Status and Outlook System

Pilot WMO Initiative that aims at providing global hydrological information products (current & near future)

**AT A GLANCE**

- **20 million** people at risk from flooding
- **$80 billion** in associated damage from flooding
- **$8 billion** in losses from drought
- **9.7 billion** population by 2050

HydroSOS

- What is the hydrological status?
- Is it different from normal?
- Will it get better or worse over coming weeks and months?
HydroSOS: for and by national hydrological Services

- To use local data and analysis, complemented with information from downscaling global models where gaps are identified.
- To provide easy access to hydrological status and outlook products through a web-based platform.
- To be used by National Meteorological and Hydrological Services, as well as agencies related to water management, ecosystems, agriculture, disaster risk reduction, energy, etc for decision making related to water resources.
- To inform decisions and prevent conflicts related to the use of water resources, especially in transboundary river basins.
- Integration of local needs and knowledge with global services
It is based on satellite estimates/NWP that allows monitoring extreme rainfall events to analyze/anticipate their potential to trigger flash floods in future hours.

The products must be validated/adjusted with RT data and information on the surface conditions.

West Africa FFGS: Burkina Faso, Niger, and Mali
In cooperation with regional centers ANACIM, AGRHYMET
Web-based Early Warning System

- Sub-basin Flood Warning
- River Warning and forecasts
- Volta Basin level
- Drought Warning
- Drought Monitor and Outlook

- Location of hydrometeorological stations
- Icons for types of hazards
- Warning levels (green to red)
- Links to social media
Joint initiative to improve early warning systems for risks linked to extreme weather events.

This initiative

• Mobilizes resources to implement activities that are already planned

• It establishes the bases to access funds such as Green Climate Fund and Adaptation Fund

• Implementation, e.g., in Western Africa
Conclusion 1, a perspective

Digital transformation: from the Latin “digitus”, the finger, then digit, the number

⇒ Digital transformation: shape your future with your own fingers
Conclusion 2, to start the discussion:

• User requirement and benefits are key

• broadly networked, collaborative, interoperable digital system based on a co-production model that includes mutual education and training (AOS 2019 call for action).

• CARE principle: Collective benefit; Authority to Control; Responsibility; and Ethics

• Acquiring information and knowledge ↔ sharing data
Thank you

Merci