

Hydromet at GFDRR

The Global Facility for Disaster Reduction and Recovery (GFDRR) works closely with the World Meteorological Organization (WMO), national meteorological and hydrological services, and other partners to help countries modernize their weather, climate, and hydrological information systems.

Why Hydrometeorological Services Matter

From 1970 to 2012, communities around the world suffered more than 8,800 hydrometeorological (hydromet) disasters, resulting in 1.94 million deaths and \$2.4 trillion in economic losses. The frequency of these disasters, along with associated damages, has increased nearly five-fold in the same time period, with recent years seeing some of the most powerful and destructive hydromet events on record, from Hurricane Sandy in the United States to Typhoon Yolanda in the Philippines.

What We Do

GFDRR helps countries develop modern and sustainable weather, climate, and water information systems, which are essential components of national hazard and climate risk management strategies. With support from GFDRR, in collaboration with regional and national meteorological and hydrological services, countries can improve preparedness, foster resilience, and enhance the economic performance of weather dependent sectors.

The GFDRR Hydromet Program, launched in 2011, is focused on three areas:

- Providing analytical support and knowledge management concerning weather and climate information systems and services;
- Building capacity and providing technical assistance to World Bank teams and client countries through workshops, training sessions, and advisory services; and
- Facilitating portfolio development and operations in priority countries.

Additionally, GFDRR provides country- and regional-level grants and implementation support for the modernization of weather, climate, and hydrological information services. Across its work, GFDRR emphasizes the role of the ultimate users of climate, weather, and water information—the people and businesses that will benefit most from effective hydromet services and drive sustainable demand for them.

Developing countries could achieve

\$30 billion

a year in economic benefits with better weather, climate, and hydrological observation and forecasting.

Developing countries could also achieve

\$2 billion

in reduced annual asset losses with better hydromet services, according to the World Bank.²



GFDRR
Global Facility for Disaster Reduction and Recovery

Description: GFDRR, through its Hydromet Program, supported the preparation of a World Bank project that modernized 40 automated hydrometeorological monitoring stations across Albania in FY2014. As a result, real-time data now flows to Albania's Institute for Geosciences, Environment, Water and Energy. Six of these newly updated stations report directly via satellite to the WMO's Global Telecommunication System, improving forecasting for both the country and the region.





and hydrological services, and WMO Centers of Excellence;

- Relationships with national meteorological and hydrological services in developing countries for strong institutional development and investment results;
- A range of international investment possibilities and financing tools to help countries achieve larger-scale improvements in hydromet services; and
- Access to central planning and finance ministries to raise the profile of and government support for national meteorological and hydrological services.

Snapshot: Leveraging in Practice

The GFDRR Hydromet Program supports design and implementation for large-scale improvements in countries' hydromet services, leveraging new projects with the Climate Investment Funds (CIF) through their Pilot Program for Climate Resilience (PPCR), the World Bank through the International Development Association (IDA)—a fund for the poorest countries—and the International Bank for Reconstruction and Development (IBRD), among other partners.

- > **Central Asia:** Hydrometeorology Modernization Project, \$27.7 million (IDA and PPCR)
- > **Jamaica:** Improving Climate Data and Information Management, \$6.8 million (PPCR)
- > **Malawi:** Shire River Basin Management Program, \$136.3 million (IDA and GEF)
- > **Mozambique:** Strengthening Hydrological and Meteorological Information Services for Climate Resilience, \$22 million (PPCR and Nordic Development Fund)
- > **Moldova:** Disaster and Climate Risk Management, \$10 million (IDA)
- > **Myanmar:** Ayeyarwady Integrated River Basin Management Project, Hydromet Observation and Information Systems Modernization Component, \$30.15 million (IDA)
- > **Nepal:** Building Resilience to Climate-Related Hazards, \$31 million (PPCR)
- > **Russia:** Hydromet Modernization Project II, \$139.5 million (\$60 million IBRD)
- > **Vietnam:** Managing Natural Hazards Project, Hydromet Component, \$30 million (IDA)
- > **Republic of Yemen:** Climate Information System and PPCR Coordination, \$19 million (PPCR)

GFDRR grants and initiatives to improve hydrometeorological services have helped leverage and shape more than

\$400 million
 in investments from the Climate Investment Funds, World Bank Group, and other partners.

Highlights

In collaboration with the WMO and other partners, GFDRR supports the modernization and strengthening of national weather, climate, and hydrological services, as well as early warning systems and other efforts for disaster preparedness, leading to significant additional investments and reforms.

Ghana: Launching a State-of-the-Art Flood Forecasting Model

The White Volta River Basin is a major contributor to Ghana's agriculture, energy, transport, and health sectors. Yet during the last decade, floods and other water-related hazards have become more frequent, posing a major threat to Ghana's economy.

With technical and financial support from GFDRR, the government of Ghana conducted a flood hazard assessment to identify flood-prone areas and develop a new warning and flood forecasting model, which was launched in FY2014. Once implemented, it will provide communities with advanced flood information, helping to save lives and manage flood-related crises in the region.

Central Asia: Taking a Regional Approach to Shared Hazards

The Central Asia Hydrometeorology Modernization Project takes a cooperative approach to strengthening transboundary weather, climate, and hydrological services in the region.

With GFDRR support, this work has enhanced early warning systems in the region. This includes in the Kyrgyz Republic, where the government has strengthened its use of early systems to inform

communities of ongoing natural hazards, particularly through TV and radio channels, to minimize disaster risks.

Overall, this project has led to a \$27.7 million program with the Pilot Program for Climate Resilience and the International Development Association. It aims to improve the accuracy and timeliness of regional forecasts by institutionalizing the sharing and archiving of hydromet information.

Mozambique: Managing Institutional Complexity toward Greater Climate Resilience

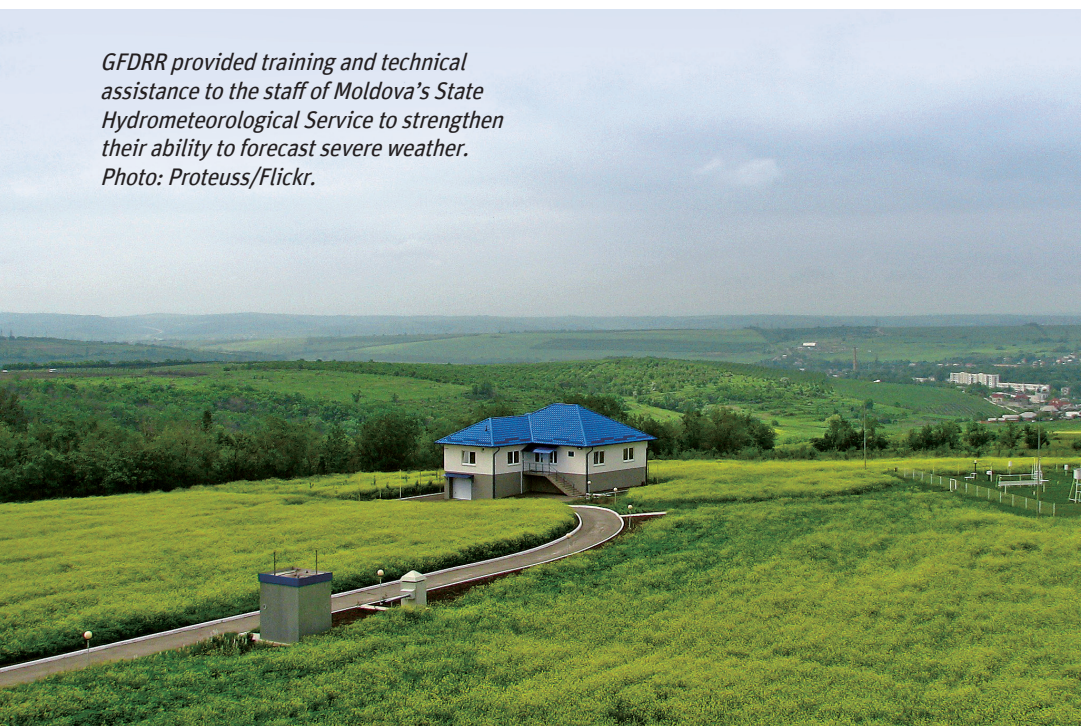
Since the destructive floods of 2000, Mozambique's achievements in disaster risk management have led to significantly fewer lives lost due to flooding. To further these achievements, the Pilot Program for Climate Resilience and the Nordic Development Fund are jointly financing a \$22 million project, building on GFDRR project design support, to improve hydromet information services.

Supporting hydrometeorological service delivery in Mozambique requires flexibility due to a complex institutional landscape, including a national meteorological service, five regional water authorities, the national water resource directorate, and a national disaster management agency that oversees the country's early warning systems. Benefitting from GFDRR implementation support, the project will help build capacity at relevant government agencies, while also working with them on coordination, information exchange, and early warning delivery.

GFDRR provided training and technical assistance to the staff of Moldova's State Hydrometeorological Service to strengthen their ability to forecast severe weather.
Photo: Proteuss/Flickr.

As of FY2015,
GFDRR has provided
53 grants
in **31 countries**

to improve the accuracy and timeliness of forecasting and early warning systems. GFDRR has supported major hydromet modernization investments in every World Bank operational region.



Lessons Learned

Modernization programs must identify and secure sustainable operations and maintenance financing to be transformative.

Evidence suggests that well-functioning national meteorological and hydrological services, when matched with appropriate resources, provide substantial socioeconomic benefits, well in excess of their costs. However, investments in hydrology, meteorology, and climate services require sustained financing of operations and maintenance costs, as well as a highly-skilled and motivated professional work force. While these costs are not large, ample evidence worldwide shows that they are often neglected. In Mozambique, for example, the government received two Doppler radars in 2006 without provision for ongoing financing. Within a few years, both radars had stopped working.

Public recognition of the value of services helps build sustainable resource streams and client bases.

When the users of hydrometeorological services—from specific industries to the general public—do not understand the value of the services offered, they will not use them or pay for them. The best means of mitigating this risk is to accurately assess and demonstrate the benefits of hydromet services, and to initiate and maintain dialogue with national citizens and stakeholders.

In the Republic of Yemen, GFDRR-backed analytical work provided evidence for a \$19 million Pilot Program

for Climate Resilience hydrometeorology modernization project. As a result, the Ministry of Finance committed to increasing the country's hydromet services budget for at least five years. Similarly, in Nepal, analytical evidence also helped secure budget increases from the Ministry of Finance, while efforts to involve farmers and to recognize their importance as clients has improved the ability of Nepal's meteorological and hydrological services to deliver more useful services.

Advancing Knowledge on Hydromet Services

GFDRR supports research, knowledge sharing, and practitioner peer-to-peer learning:

- In early 2015, GFDRR published a guide for assessing the socio-economic benefits of meteorological and hydrological services, titled, "Valuing Weather and Climate: Economic Assessment of Meteorological and Hydrological Services."
- In April 2015, GFDRR supported the InterMetAsia 2015 conference in Singapore. This is the only dedicated meteorology event in the Asia-Pacific and an opportunity for Bank clients to view and discuss new technologies for meteorological observation.
- In May 2015, GFDRR, in partnership with the WMO, the World Bank Group, and USAID, held a training workshop in the Seychelles for the national meteorological and hydrological services of Southern African Development Community members. The focus of the workshop was on designing socio-economic benefits studies of meteorological and hydrological services and products.
- In February 2015, GFDRR supported and provided expertise at an expert forum in Turkey called, "DRR in a Changing Climate: Lessons Learned," in cooperation with USAID, NOAA, WMO, and the Turkish State Meteorological Service.

Looking Ahead

Continuing its focus on helping countries improve their hydrometeorological services, GFDRR will:

- Provide assistance for a new \$100 million euro Climate Risk and Early Warning System plan, in partnership with France, Norway, the UN, WMO, and the World Bank, which aims to close gaps in risk information and early warning systems for a range of natural hazards, including floods, storms, and droughts;
- Provide ongoing support for projects through the Regional Framework Program to Improve Hydromet Services in Sub-Saharan Africa;
- Work toward a GFDRR-based hydromet information exchange, a web-based global database of projects in the hydromet sector aimed to simplify and encourage the entry of new partners for the hydromet sector;
- Prepare a global assessment on the status of national hydrological services (NHS) and recommendations for improvement of NHS performance, with an estimated publication date of late 2015;
- Provide ongoing support for the preparation of projects in Ethiopia, Rwanda, Myanmar, Peru, Uganda, Haiti, Sahel, Burkina Faso, and Mali, and conduct exploratory work toward additional projects;
- Provide ongoing support for the implementation of projects in Yemen, Mozambique, Nepal, Central Asia, Russia, India, Sao Tome and Principe, and Brazil;
- Strengthen partnerships with donors, WMO, and leading meteorological and hydrological agencies; and
- Strengthen its relationship and alignment with the Global Framework for Climate Services (GFCS).

As GFDRR continues to develop its monitoring and evaluation framework, it will work with the World Bank and other partners to evaluate whether the projects it supports have successfully:

- Increased accuracy and timeliness of weather forecasts and early warning systems, and
- Increased satisfaction of both the general public and specific economic sectors with hydrometeorological services offered.

Global Framework for Climate Services (GFCS)

The GFCS is an international partnership of governments and organizations that produce and use climate information and services. It seeks to enable researchers to join forces with these producers and users to improve the quality and quantity of climate services worldwide, particularly in developing countries.

GFDRR supports projects planned and implemented by the Global Framework's principles and goals. Its support for the GFCS principles of reducing society's vulnerability to climate-related hazards through the better provision of climate services, while building relationships between providers and users of these services at both the technical and decision-making levels, is demonstrated by GFDRR's assistance in a number of GFCS focus areas, including Burkina Faso, Kyrgyz Republic, Nepal, Myanmar, and the Sahel.

In addition, GFDRR promotes alignment between its own operations and any existing or planned GFCS projects, as well as serves as the World Bank's focal point in the Project Oversight Board.

Strategic Partners



China Meteorological
Administration



FINNISH METEOROLOGICAL
INSTITUTE
Finnish Meteorological
Institute



CLIMATE
INVESTMENT
FUNDS
Climate Investment Funds (CIF),
including Pilot Program
for Climate Resilience



GFCS
GLOBAL FRAMEWORK FOR
CLIMATE SERVICES
Global Framework
for Climate Services



KMA
Korea
Meteorological
Administration
Korean Meteorological
Administration



WMO
World Meteorological
Organization



MétéoSuisse
MeteoSwiss



Met Office
The United Kingdom's
Met Office



NOAA
United States National Oceanic
and Atmospheric Administration
through the National Weather Service

“For more than 60 years, the [WMO] has been leading international cooperation to enhance weather and climate services globally and especially in least developed countries and Small Island Developing States. Today, thanks to the [Hydromet Program of GFDRR] more countries will receive support for modernizing their hydro-meteorological infrastructure to better deliver adequate weather and climate services. ... We are committed to reinforce this cooperation further for the benefit of hydro-meteorological services in those countries where it is most needed.”

—Michel Jarraud, Secretary-General, WMO

NOTES

¹ World Bank, GFDRR, Government of Japan (2012). The Sendai Report: Managing Disaster Risk for a Resilient Future.



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GFDRR PILLAR: Preparedness

People in vulnerable countries will be better protected through more accurate and timely early warning, and through civil protection agencies capable of mobilizing a fast response in the event of a disaster.