

HYDROMET

Improving monitoring and prediction of the impact of extreme meteorological and hydrological hazards

What We Do

GFDRR helps countries plan and prepare for extreme weather, cooperating closely with national hydrological and meteorological (hydromet) services and the World Meteorological Organization (WMO).

The Hydromet initiative supports governments in strengthening hydromet monitoring, forecasting and early-warning systems in vulnerable developing countries.

The Hydromet team assists governments in upgrading the technological systems that gather, analyze, and produce hydromet data, and provides training on how best to share and use that knowledge for decision-making purposes.

GFDRR is working to improve the ability of developing countries to understand, predict, and warn their citizens of meteorological and hydrological hazards. The Hydromet initiative advises national governments to drive investment and increase knowledge in modern systems and tools. This helps to close the development gap and minimize loss and damage from future extreme weather events.

\$1 INVESTED

in weather and climate services
= at least \$3 in socioeconomic
benefits.

\$2.4 TRILLION

in economic losses were
caused by hazards between
1970 and 2012.

2 MILLION

people were killed by natural
hazards between 1970 and 2012.

APPROACH

UPGRADING INFRASTRUCTURE

GFDRR delivers technical assistance in hydromet and early-warning systems (EWS), advising service management how to modernize and operate information systems needed to collect data, develop forecasts, and communicate the findings to the public and to risk managers.

The Hydromet team advises countries on the scope and composition of end-to-end hydromet service production systems that are sustainable within national fiscal and institutional constraints. The team also helps countries to make these systems operational.

After severe flooding in Sri Lanka this year, the team commissioned an assessment which concluded that improved forecasting and dissemination could have prevented damage. Subsequently, GFDRR developed an investment program which will be included in a larger WBG DRM operation.

TRAINING AND CAPACITY BUILDING

Even with upgraded technology, developing countries struggle due to insufficient expert manpower.

In cooperation with WMO, the Hydromet initiative ensures hydromet agency staff—including observers, ICT experts, forecasters and managers—have access to the best international approaches and learn to apply them.

The program also encourages governments to support capacity building, institutional strengthening, and resourcing to properly operate and maintain systems.

COORDINATION

The Hydromet initiative plays a unique role globally: On the ground, it brings expertise to WBG teams, designing and implementing projects that strengthen national meteorological and hydrological agencies.

This can involve institutional coordination, such as integrating the work of separate departments for sustainable hydromet and EWS service. The initiative also advises agencies on how to apply information to manage risk and improve productivity in weather-dependent sectors of the economy, such as agriculture.

GFDRR also maintains a strong partnership with the WMO and other development partners on its hydromet work. The WMO provides access to technical knowledge and expertise and links to the international policy dialogue. In turn, GFDRR helps leverage investment and ensures coordination and common approaches across partners.

Myanmar

One of the poorest countries in East Asia, Myanmar is transitioning to democracy with hopes of a brighter economic future. With 10 times the amount of per-capita water than China and India, it is a water-rich nation. This abundance is an asset, but it also presents a liability.

The Ayeyarwady is Myanmar's largest river basin and is often described as the heart of the nation. It is home to 70% of the population but is prone to severe flooding, leading to loss of life and large-scale economic damage. In 2015, **Cyclonic Storm Komen caused damage equivalent to more than 3% of GDP**, displacing an estimated 1.6 million people.

To upgrade the region's forecasting infrastructure, GFDRR helped leverage credit of over \$30 million from WBG's International Development Association. **The program is implementing early-warning systems with the latest forecasting and communications technology**, including mobile, to alert citizens to extreme weather and its potential impacts. The GFDRR team is also assisting in training programs for Myanmar's hydromet agency and advising the government on how farmers can exploit advanced knowledge of weather patterns.

The project is still in progress, but studies indicate the basin could save more than \$8 million a year in damages and benefit from up to \$200 million in improved economic productivity.

The Ayeyarwady is Myanmar's largest river basin and is often described as the heart of the nation. It is home to 70% of the population but is prone to severe flooding, leading to loss of life and large-scale economic damage.

Measuring Impact

TO DATE:

GFDRR is currently supporting **OVER \$400 MILLION** to improve hydromet agencies from partners such as WBG, Climate Investment Fund and Green Climate Fund.

The program has trained **MORE THAN 300 SPECIALISTS** in the last 3 years.

The initiative aims to support WBG in reaching an additional **100 MILLION PEOPLE** in developing countries with access to high-quality hydromet, and EWS data and services.

“The World Bank team, through GFDRR, have already helped us to develop a clearer strategy on how to modernize the service, to coordinate the work of lots of different development partners and to get ready for major projects in 2017. The project will improve the lives of farmers and other rural communities that are vulnerable to flood and droughts. Better forecasting and early warning will reduce the losses faced by farmers and help them to protect their incomes.”

—May Khin Chaw

Deputy Director of Agro-Meteorology | Yangon, Myanmar

ACTIVE ENGAGEMENTS



Next Steps

INVESTMENT SUPPORT

Launch up to six new projects in some of the world's least developed countries in Africa and small island states.

KNOWLEDGE SHARING AND CAPACITY BUILDING

Complete four analytical reports, including the assessment of hydrological service delivery in developing countries along with recommendations for improvement, and an upcoming capacity assessment in Ethiopia.

IMPLEMENT THE CLIMATE RISK AND EARLY WARNING SYSTEMS INITIATIVE

Together with UN agencies, implement the Climate Risk and Early Warning Systems initiative—which seeks to mobilize \$100 million by 2020—launched by France and donor countries during the landmark climate conference COP21.

PROJECT IMPLEMENTATION

Provide support for implementation of at least 10 WBG-funded hydromet/EWS projects.

Sub-Saharan Africa

From droughts and flooding to tropical cyclones and landslides, Sub-Saharan African countries are particularly vulnerable to disasters due to uneven rainfall. But across the region, almost half of weather stations on the ground—and three-quarters of airborne stations—do not report data, making it difficult to know where and when these devastating hydromet-related hazards may strike.

In partnership with the African Development Bank and the WMO, WBG and GFDRR launched the Africa Regional Hydromet Program with the goal of improving hydromet agencies and promoting collaboration across borders.

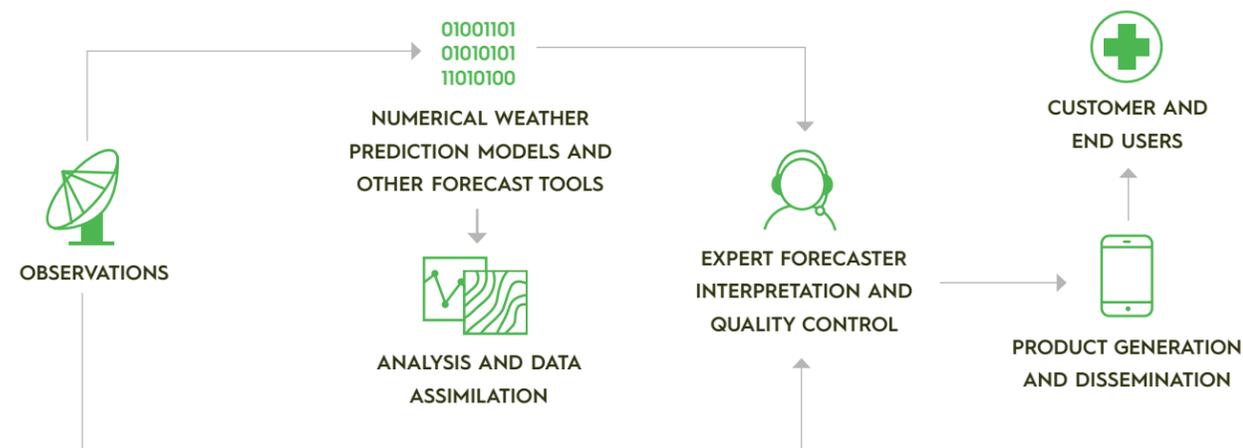
Working nationally, regionally, and continent-wide, the initiative aims to raise up to \$600 million in funding to modernize, building monitoring and forecasting technologies that can generate weather information and strengthening the agencies delivering that information.

In Mali, for example, GFDRR helped secure a grant of \$22.75 million from the Green Climate Fund and helped mobilize about \$10 million investments for the Democratic Republic of Congo.

The Hydromet initiative will make weather data more accessible, getting accurate and actionable information into the hands of decision-makers and the public. In so doing, it will help to reduce the human and economic cost of hydromet-related disasters and improve productivity in socioeconomic sectors sensitive to weather and climate conditions. The initiative can result in billions per year in economic benefits and act as a model for other regions looking to build their resilience to disaster.

In Mali, GFDRR helped secure a grant of \$22.75 million from the Green Climate Fund and helped mobilize about \$10 million investments for the Democratic Republic of Congo.

ACTIVITIES OF A TYPICAL NATIONAL METEOROLOGICAL SERVICE



Research to Build the Investment Case

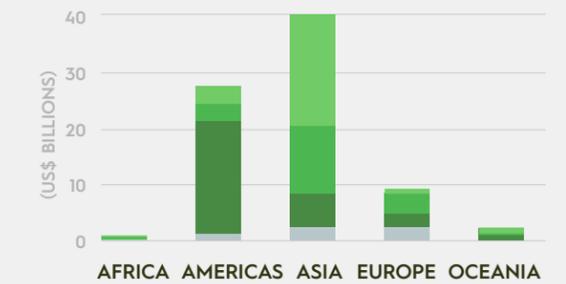
GFDRR's Weather and Climate Resilience report outlined the case for overhauling hydromet agencies in developing countries around the world. In the last 15-20 years, these agencies have become so degraded that modernization is needed in more than 100 countries, half of which are in Africa. This overarching global challenge requires international investment of at least \$1.5 billion, with an additional \$300-400 million a year required to support the proper operation of modernized systems. The joint WMO, WBG, GFDRR and USAID report "Valuing Weather and Climate: Economic Assessment of Meteorological and Hydrological Services" strengthened the financing case by quantifying the benefits hydromet services provide and how this information can be used to prioritize investments.

Modernization is needed in more than 100 countries, half of which are in Africa.

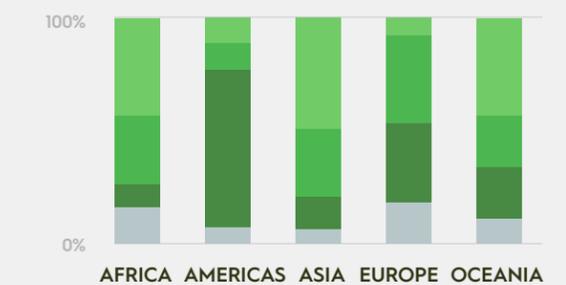
AVERAGE ANNUAL DAMAGES CAUSED BY REPORTED NATURAL DISASTERS, 1990-2011

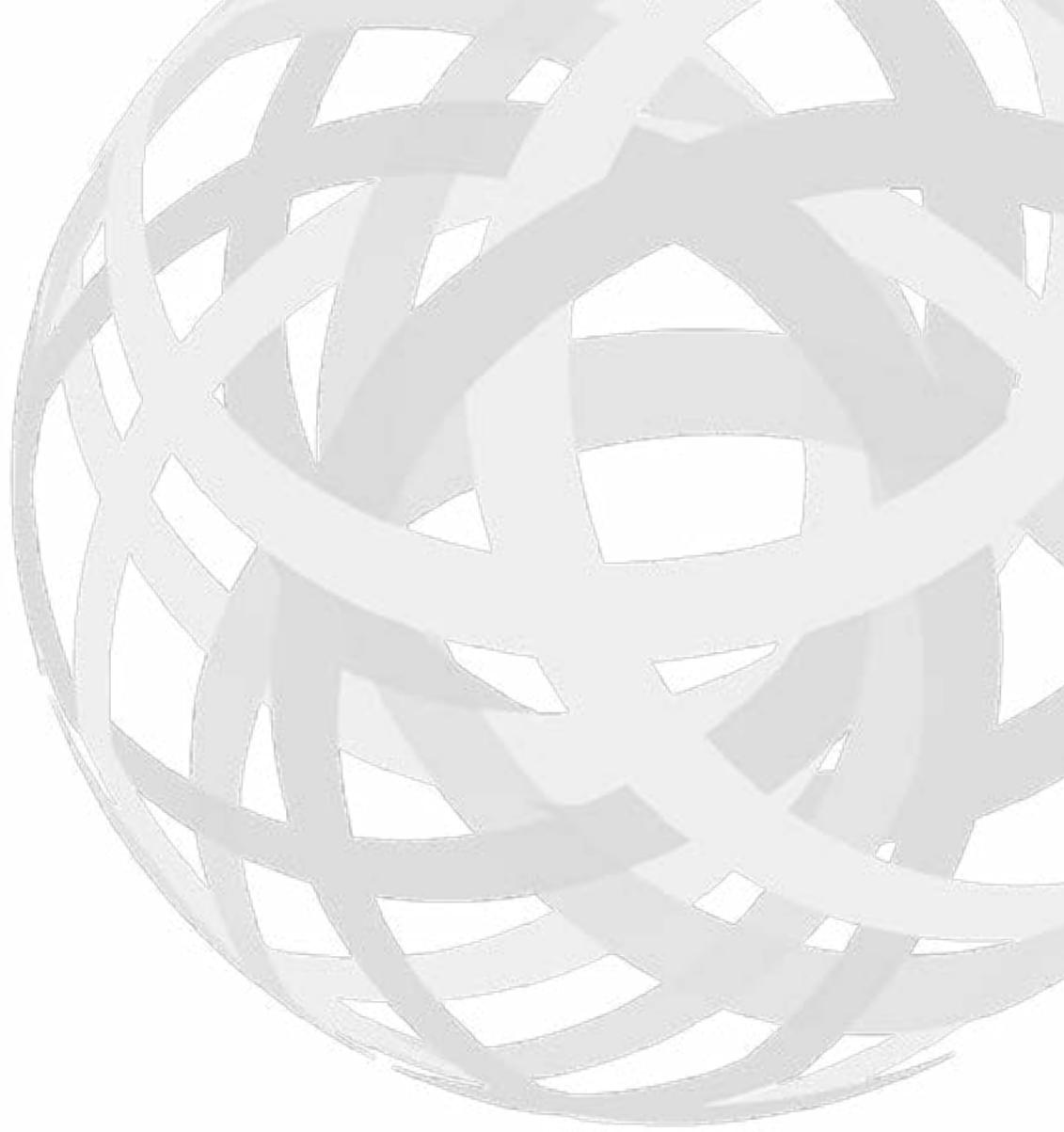


AVERAGE ANNUAL ESTIMATED DAMAGES PER DISASTER GROUP



PROPORTION OF AVERAGE ANNUAL DAMAGES PER DISASTER GROUP





CONTACT

VLADIMIR TSIRKUNOV

vtsirkunov@worldbank.org

GFDRR THEMATIC INITIATIVE: INCLUSIVE COMMUNITY RESILIENCE
Empowering Communities For Resilience