

MANAGING DISASTER RISK IN CENTRAL AMERICA

Strengthening hydrometeorological services to curb risk

AT A GLANCE

Region Honduras and Nicaragua

Risks River floods, hurricanes, tropical storms, landslides, long term economic and fiscal impacts

Area of Engagement Strengthening hydromet services and early warning systems

As disaster risk intensifies in Central America due to the impact of weather events and climate change, Honduras and Nicaragua are taking action to be better prepared for natural hazards by modernizing hydromet services.



Flooding in the north of Honduras on the Uluá River has displaced many from their small homes. (Photo source: World Bank)

A TRANSBOUNDARY APPROACH FOR SIMILAR REGIONAL CHALLENGES

In Central America, adverse hydrometeorological events are the most frequent disasters generated by natural hazards in Honduras and Nicaragua. From 1990 to 2012, it is estimated that annual economic losses due to weather-related disasters—including hurricanes, tropical storms, floods, and landslides—were equivalent to 2.8 percent and 1.9 percent of GDP for Honduras and Nicaragua, respectively.

Both Honduras and Nicaragua are exposed to hurricanes that frequently strike the countries, resulting in extensive flooding, landslides, and destruction from strong winds. This is treacherous for the rural economies, which rely on income in the agriculture sector, leaving populations in an extremely vulnerable position. Moreover, these countries are consistently facing high levels of physical and financial risk and losing hundreds of lives every year because of extreme weather events such as intense storms, flooding events, and hurricanes that have left economic damage in the billions of dollars. Specifically, in Nicaragua, Hurricane Felix (2007) caused damage and losses equivalent to 14.4 percent of GDP, while the heavy rains of 2007 in the northwestern region and the 2011 Tropical Depression 12E eliminated 3 percent and 6.8 percent of GDP, respectively.

In Honduras, Hurricane Mitch (1998) represented the worst disaster in the country's recent history, affecting 90 percent of its territory, leading to over 5,700 deaths and 8,000 missing as well as displacing nearly half a million individuals. The overall damage amounted to 81.0 percent of GDP, and subsequent extreme meteorological events since Hurricane Mitch would suggest that Honduras' disaster vulnerability is on the rise. In Honduras alone, between 1980 and 2010, over 15,000 people were killed and over 4 million were affected by disasters, while economic damage amounted to US\$4.5 billion.

APPLYING HYDROMET EXPERTISE AND INVESTMENT

More than 15 million citizens in Central America are at risk of not having access to public weather services, timely early warning systems, or hydrometeorological information. The lack of access to this information leads to not having the ability to be prepared. Ultimately, having these systems and processes in place allows countries to plan, prepare, and if necessary, evacuate in a disaster situation.

During 2015–19, both countries embarked on an effort to strengthen the institutional capacities at the national level to support early warning systems for meteorological, hydrological, and climate-related hazards in Honduras and Nicaragua, including at the subnational levels in the Nicaragua Caribbean coastal and Rio San Juan regions and the Honduras Chamalecón and Ulúa River basins.

A three-year project was implemented to develop access to basic hydromet information for 4.5 million in Honduras and 3 million in Nicaragua through low-cost, high-impact activities, such as newly digitalizing all hydromet records, developing a hydromet database, and creating a roadmap and strategy for how to improve hydromet services in the coming years. The countries aimed to develop a strong hydromet and early warning system so they could act quickly against an extreme weather event. In the end, having the most up-to-date and reliable information is key for a country and its citizens.

The Government of Japan, through the Japan–World Bank DRM Program, provided a US\$1.45 million grant to Honduras and Nicaragua to support their hydromet modernization efforts. Building on the experience of Japan in identifying, predicting, and managing the risks posed by weather hazards, Honduras and Nicaragua developed modernization plans for their hydromet infrastructure and improved their weather forecasting capabilities. Overall, the investment helped not only to benefit more than 7 million people to give them access to hydromet information, but also leveraged more than US\$13 million dollars between the two countries to finance more activities described in the hydromet modernization plans.

LESSONS LEARNED

The Importance of Modernization Plans

The development of modernization plans proved to be a practical way to help Honduras and Nicaragua improve their public weather services, invest in disaster-related early warning systems, and strengthen their hydrometeorological information and decision support systems for climate-dependent sectors.

The Criticality of Installing a Database

Using the low-cost database platform initiated the transformation and modernization of both national institutions. The development of hydromet service websites proved useful to increase the visibility of the National Meteorological and Hydrological Services. These websites could have an important impact in both countries to make the case for improved hydromet services to gain the support of users and beneficiary institutions.



More than
7
MILLION
citizens now have access
to weather and forecasting
information

MODERNIZATION PLANS DEVELOPED

The Modernization Plans developed through this grant established a framework toward strengthening early warning systems and improved the weather services provided to end users in both countries.

OPERATIONAL PROCEDURES IN PLACE

Through this grant, manuals and procedures were developed to help both governments improve the accuracy of the current weather forecasts made by introducing the use of appropriate methods, tools and operational procedures, and recommendations to implement concrete actions to improve weather forecasts and capabilities.

DATABASE AND WEBSITES OPERATIONAL

Websites allowed real-time and historical information to be managed and stored with a new meteorological, hydrological, and climate database management system.

“Previously when we were asked, for example, a map with the accumulated rainfall of recent days, we took several hours to produce it. Now with the MCH [the WMO Meteorological, Climatological and Hydrological database management system] it is something that is produced and published on the website automatically.”

—Francisco Argueñal, Chief Meteorologist of the Honduran Emergency Commission