

FISCAL YEAR (FY) 2019

# HYDROMETEOROLOGICAL HAZARDS SECTOR UPDATE



Participants in the Urban Flash Flood Warning System Training, Istanbul, Turkey. Photo courtesy of Istanbul Coordination Center.

## An Introduction to Hydrometeorological Hazards

*Hydrometeorological hazards are processes or phenomena of atmospheric, hydrological, or oceanographic nature that may cause loss of life, injury or other adverse health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage (UNDRR, 2017). Hydrometeorological hazards include cyclones, droughts, floods, heatwaves, heavy snowfall, storms, and storm surges, but can also influence other hazards, such as epidemics, landslides, locust plagues, and wildfires.*

## Enhancing Flash Flood Guidance and Early Warning Systems

Each year, flash floods result in an estimated 5,000 deaths globally. To save lives and reduce the economic impact of floods, USAID/OFDA partners with the U.S. Hydrologic Research Center, the U.S. National Oceanic and Atmospheric Administration (NOAA), the World Meteorological Organization (WMO), and host country national meteorological and hydrological services (NMHSs) to support disaster managers, local governments, and humanitarian practitioners to monitor flash flood risks, improving early warnings of these events and enabling rapid response mechanisms. Through the introduction of new technologies, forecaster trainings, and technical assistance, USAID/OFDA and its partners aim to advance flash flood early warning systems in countries where no such capacity exists. USAID/OFDA continues to support global activities to enhance flash flood guidance and early warning systems, with systems either operational or in development in more than 60 countries providing early warning of these events to

## USAID/OFDA Hydrometeorological Hazards Activities

### FY 2019 FUNDING

Stand-Alone Global and Regional Hydrometeorological Hazards Programs	<b>\$6,800,032</b>
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Hydrometeorological Hazards Interventions Worldwide	<b>\$11,536,188</b>
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**\$18,336,220<sup>1</sup>**

## Sector Overview

Hydrometeorological disasters—such as cyclones, droughts, and floods—account for the largest number of natural disasters worldwide and affect more people than any other type of natural disaster. Between 1999 and 2018, about 90 percent of all recorded natural disasters were due to hydrometeorological hazards, impacting more than 4 billion people, causing more than 500,000 deaths, and resulting in an estimated \$2.2 trillion in economic damages. USAID's Office of U.S. Foreign Disaster Assistance (USAID/OFDA) supports programs to reduce the adverse impacts of hydrometeorological events through disaster risk reduction (DRR) activities designed to strengthen readiness, response, and resilience before disasters occur. USAID/OFDA-supported DRR initiatives emphasize locally sustainable and environmentally sensitive measures coordinated with vulnerable communities, as well as local and national stakeholders.

<sup>1</sup> USAID/OFDA supported hydrometeorological hazards activities in more than 60 countries during FY 2019, including Afghanistan, Brazil, Haiti, Indonesia, Iraq, Mongolia, and Somalia.

approximately 40 percent of the world's population, or almost 3 billion people in Africa, Asia, Europe, Latin America and the Caribbean. In FY 2019, USAID/OFDA partnered with disaster management agencies in Turkey to test the Flash Flood Guidance System's urban flood prediction capabilities in Istanbul, including the city's Disaster Coordination Center, Turkish State Hydraulic Works, and the Turkish State Meteorological Service.

## Natural and Nature-Based Flood Management Training

With \$400,000 in FY 2019 USAID/OFDA funding, the World Wildlife Fund (WWF) is working with civil society organizations, governments, the private sector and others to improve flood management at the local level. WWF and partners are building the capacity of civil society organizations to manage flood risks through an Integrated Flood Management approach as described in *Natural and Nature-Based Flood Management: A Green Guide*, a guidebook for flood managers that outlines regional flood risks and provides step-by-step instructions on how to implement natural and nature-based flood management policies.

## Nature Protects People: Ecosystem-Based Risk Reduction for Coastal Communities

To strengthen resilience in coastal communities, USAID/OFDA provided \$350,000 to support The Nature Conservancy to develop a virtual learning platform on coastal DRR. The platform provides information on fostering and maintaining healthy ecosystems such as coral reefs, sand dunes, and wetlands, which are essential for reducing risks in coastal areas. The platform also contains links to complementary resources such as videos and an Eco-Disaster Risk Reduction application. A centerpiece of the platform, the Nature Conservancy's Blue Guide captures best practices, guidance, and tools—created through an iterative process involving peer reviews and community-level testing—to support coastal DRR efforts. These tools will be widely disseminated through partnerships, social media, the Nature Conservancy network, and workshops to ensure they are accessible to key stakeholders in coastal communities.

## Ready, Responsible, and Resilient: Weather Ready Nations

The Weather Ready Nations (WRN) program strengthens countries' preparedness for extreme climate, water, and weather-related events. WRN builds the capacity of NMHSs and national disaster management agencies to improve the use of hydrometeorological information, shifting the focus of weather services from providing numerical weather forecasts to describing the potential impacts of approaching storms and other forms of extreme weather. With improved and actionable information, emergency managers, first responders, government officials, businesses, and the public are able to act upon early warnings to save lives and property, as well as preserve livelihoods. USAID/OFDA and the U.S. National Weather Service continue to collaborate with partner NMHSs in Barbados, Costa Rica, El Salvador, Guatemala, Indonesia, and South Africa to implement WRN, and expanded the program to include Sri Lanka's NHMS in FY 2019; expansion to additional countries is planned for FY 2020.

## Increasing Capacity for Weather Observations Using Low-Cost, Sustainable Technology

Actionable and informed weather observations are critical for providing early warning of hydrometeorological hazards. However, many countries lack adequate hydrological and meteorological networks due to the high cost of monitoring equipment, as well as ongoing operational and maintenance expenses. In response, USAID/OFDA, NOAA, the University Corporation for Atmospheric Research, and several NMHSs have developed 3-D printed automated weather stations (3D-PAWS), a low cost and sustainable automated weather station model to improve weather observation capacity in countries with limited meteorological networks. The 3D-PAWS have the capacity to simplify and expedite meteorological equipment repairs, increasing the scale and sustainability of meteorological networks. NMHSs can utilize the automated weather stations to operate meteorological networks—including communication tools, stream gauges, and weather observation stations—that are consistent with local capabilities and needs. In FY 2019, USAID/OFDA and NOAA continued to develop training materials and testing equipment. In addition, USAID/OFDA, NOAA, NMHSs, and WMO initiated a calibration certification process for 3D-PAWS at the WMO certification center to ensure stations conform to international standards.

## Strengthening Resilience to Climate-Related Disasters in Asia

USAID/OFDA supports the American Red Cross to strengthen disaster preparedness and resilience in coastal cities in Indonesia and other Southeast Asian countries through improved public engagement on DRR and disaster resilience. With USAID/OFDA support, the American Red Cross and the Red Cross and Red Crescent National Societies in Burma, Indonesia, and Vanuatu continued to design and pilot a model for civic coalitions to guide and support community analysis, decision-making, and problem-solving on climate-related risks and resilience in FY 2019.

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