FISCAL YEAR (FY) 2019

GEOLOGICAL HAZARDS SECTOR UPDATE

USAID/OFDA staff describe the damage in Palu City, Indonesia, after a magnitude 7.5 earthquake on September 28, 2018, to U.S. Ambassador to Indonesia Joseph R. Donovan Jr. *Photo by Erik A. Kurniawan/U.S. Department of State.*

Building the Global Earthquake Model and Risk Map

In FY 2019, USAID/OFDA continued support for the Global Earthquake Model Foundation (GEM), a public–private partnership that aims to establish uniform and accessible standards for calculating and communicating the risk of an earthquake occurring in a particular area. In 2019, GEM launched the Global Seismic Risk Map, the world's first earthquake risk model with global coverage. The Seismic Risk Map presents the geographic distribution of average annual loss due to earthquakes, normalized by average construction costs by country. In addition, GEM's Seismic Hazard Map depicts the geographic distribution of peak ground accelerations—a measure of earthquake intensity—with at least a 10 percent probability of being exceeded in the next 50 years, showing where earthquakes are most likely to occur and their potential severity. Both maps are based on the open-source OpenQuake software and implemented through the sharing of seismic data among various governments and international agencies. The maps will be updated regularly with new data and refinements to the model software. The publication of both maps represents a major milestone in seismic hazard and tectonic studies as other efforts to develop a global database have been unsuccessful. The USAID/OFDA-supported database will inform worldwide earthquake hazard and risk analysis efforts by governments, relief actors, and other stakeholders.

USAID/OFDA Geological Hazards Activities

FY 2019 FUNDING

Standalone Global and Regional Geological Hazards Programs	**$8,032,787**
Geological Hazards Interventions Worldwide	**$3,118,305**

$11,151,092[1]

Sector Overview

Geological hazards—including earthquakes, landslides, and volcanoes—threaten millions of people worldwide and can devastate communities in a matter of seconds by destroying homes, causing food and water shortages, disrupting livelihoods, and killing or injuring numerous individuals. Although many geological hazards cannot be prevented, proper mitigation and preparedness efforts can minimize the impact of disasters by saving lives, promoting resilience, and reducing the negative economic effects of geological events.

USAID's Office of U.S. Foreign Disaster Assistance (USAID/OFDA) supports geological hazard preparedness and response activities, including disaster risk reduction programming, that emphasize a comprehensive approach to reducing the impact of geological disasters.

[1] USAID/OFDA FY 2019 geological hazards sector funding supported activities in Asia and Latin America and the Caribbean, including programs in the Dominican Republic, Ecuador, Indonesia, Nepal, and other countries.

GEM encourages the design, development, and deployment of state-of-the-art tools for earthquake risk assessment and produces decision-making models that allow users to process earthquake risk information, inform decision-making, and reduce potential loss of life and damage to livelihoods and economies. The GEM models are available at: http://www.globalquakemodel.org.

Improving the USGS PAGER System to Include Secondary Events

USAID/OFDA continues to support improvements to the United States Geological Survey (USGS) Prompt Assessment of Global Earthquakes for Response (PAGER) system, which allows for near real-time updates on the possible impacts of earthquakes. The automated PAGER system interprets seismic data from remote stations to rapidly estimate the scope and impact of earthquakes worldwide and issues color-coded alerts. The PAGER system provides both casualty and economic damage estimates, typically within 20 to 30 minutes of the earthquake, often providing information for responders and relief actors before eyewitness accounts are available.

In FY 2019, USGS staff made significant progress toward upgrading the PAGER system to include landslide and soil liquefaction risks. Secondary effects of an earthquake—including landslides, liquefaction, and tsunamis—represent considerable additional threats to earthquake-affected communities and can often cause greater damage than ground shaking alone. With USAID/OFDA support, the USGS will continue to improve the PAGER system to incorporate near real-time predictions of secondary threats in FY 2020. PAGER alerts are available at: https://earthquake.usgs.gov/data/pager.

Supporting Earthquake DRR in Indonesia

With support from USAID/OFDA, the USGS is reducing the risks posed by earthquakes through the use of the Earthquake Disaster Assistance Team (EDAT)—comprising USGS geologists, seismologists, and tsunami and landslide experts. In FY 2019, EDAT continued to conduct disaster risk reduction (DRR) programs around the world, including in response to earthquakes in Indonesia.

On September 28, 2018, a magnitude 7.5 earthquake hit Indonesia's Sulawesi Island, triggering widespread liquefaction, landslides, and a resultant tsunami that resulted in 2,081 deaths and displaced approximately 206,000 people. Following the disaster, the Government of Indonesia's Meteorology, Climatology, and Geophysics Agency (BMKG) requested technical assistance from the USGS to improve the Indonesian Earthquake Information and Tsunami Warning System. With funding from USAID/OFDA, a USGS EDAT assessed the BMKG earthquake monitoring network and conducted field visits to Sulawesi. The EDAT plans to help BMKG improve Indonesia's network of earthquake monitoring stations and provide technical training for BMKG staff in 2020.

VDAP Responds to Volcanic Crises Worldwide

For more than 30 years, USGS has implemented the USAID/OFDA-funded Volcano Disaster Assistance Program (VDAP), the world's only international volcano crisis response program. USAID/OFDA and USGS established VDAP following the 1985 eruption of Nevado del Ruiz Volcano in Colombia, which resulted in an estimated 23,000 deaths. Since 1986, USAID/OFDA has provided more than $52.9 million to support VDAP, including nearly $7 million in FY 2019. VDAP scientific teams travel to volcanoes throughout the world at the request of host governments and, using volcano monitoring equipment, work with local and national counterparts to quickly assess hazards and generate eruption forecasts. More information about VDAP is available at: http://volcanoes.usgs.gov/vdap.

On June 26, 2019, Ulawun Volcano on Papua New Guinea's New Britain Island began to erupt, emitting ash columns rising more than 42,000 feet above sea level, as well as gases and rocks. The eruption halted or diverted regional air traffic and resulted in the evacuation of several nearby villages. By July 2, approximately l3,000 people were sheltering in nine care centers in the region. A VDAP team which was already present at Papua New Guinea's nearby Rabaul Volcano Observatory (RVO) for a capacity building training assisted local counterparts in the Ulawun eruption response. In addition, VDAP staff installed a new monitoring station near the volcano and trained RVO staff on its use and the interpretation of gas and volcano related earthquake data to increase preparedness for future volcanic events.

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