Global Facility
for Disaster Reduction
and Recovery

ANNUAL REPORT

'19

BRINGING RESILIENCE TO SCALE

May 1, 2019: Aerial view of devastated fishing village after Cyclone Kenneth in Pemba, northern Mozambique. Photo: fivepointsix.

Bringing resilience to scale

1818 H Street, N.W., Washington, D.C., 20433, U.S.A.

Notes: Fiscal year (FY) runs from July 1 to June 30; the financial contributions and expenditures reported are reflected up to June 30, 2019; all dollar amounts are in U.S. dollars ($) unless otherwise indicated.

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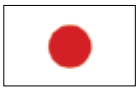
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ISLAMIC DEVELOPMENT BANK


ORGANIZATION OF ISLAMIC COOPERATION


WORLD METEOROLOGICAL ORGANIZATION

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Family in Yemen. Photo DavorLovincic.

Foreword

Stefano Signore
GFDRR CG Co-chair

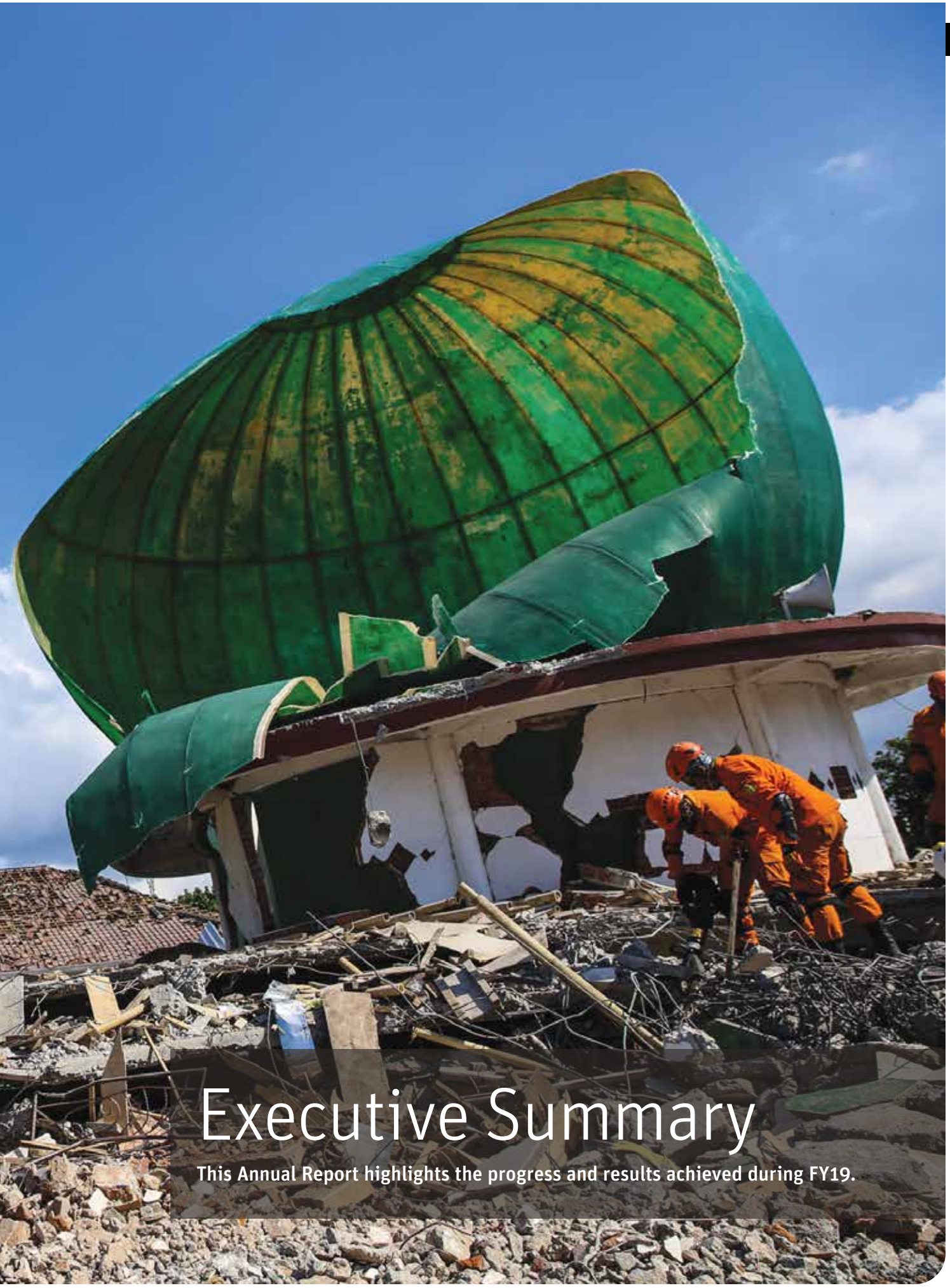
Ambassador Leonard-Emile Ognimba
GFDRR CG Co-chair

Bernice van Bronkhorst
Director, Climate Change Group World Bank

Fiscal year 2019 (FY19) was marked by a large number of climate-related disasters across the world, exacerbated by human factors such as conflict and urbanization. Early in the year, Mozambique, Malawi, and Zimbabwe were devastated by Cyclone Idai and Cyclone Kenneth. Mozambique, was especially hard hit, with almost 700 lives lost and damages close to a billion dollars. In India, flooding and landslides in Kerala killed over 480 people and recovery needs reached $4.4 billion. Ahead of Cyclone Fani in Odisha, 1.2 million people were evacuated as the subcontinent sustained its worst cyclone season on record, with seven named storms. Sulawesi in Indonesia was hit by the triple shock of an earthquake and a resulting tsunami and landslides, and countries such as Myanmar, Papua New Guinea, Lao PDR, and the Philippines experienced severe climate-related disasters. In the Middle East and North Africa region, weather extremes such as torrential rains and floods, affected tens of thousands—with many events occurring in contexts of fragility arising from conflict, such as in Libya, Syria, and Yemen.

Against this backdrop, disaster risk management (DRM) and resilience are becoming more fundamental for development than ever before. Countries continue to ask for solutions tailored to their particular needs, and this requires deep regional knowledge, an ability to adapt global best practices, and technical experience, all of which are facilitated through GFDRR grants. The complexity of today's DRM challenges requires continuous innovation. In FY19, GFDRR's Labs team and partnerships with universities, scientists, and tech firms, established through the Understanding Risk community, continue to guide our work on innovation. Knowledge exchanges to formulate and share problem statements are helping to bridge the gap between tech solutions and the people around the world who need them. GFDRR's Analytics and Economic Research team continues to identify and address the toughest development questions related to disaster risk management and resilience. This year they published another flagship report *Lifelines: The Resilient Infrastructure Opportunity* in response to increasing need for analysis of the costs of shock-related disruptions to infrastructure services. The report presents a strong case for investing in resilience during the early stages of infrastructure planning and has already been used extensively in other key publications, such as the Global Commission for Adaptation's advocacy report *Adapt Now: A Global Call for Leadership on Climate Resilience*.

The momentum for mainstreaming disaster risk management increased dramatically this year, energized by more global attention on the need for action on climate adaptation. Resilience to climate change is included in everything GFDRR does, and increasing attention is given to ensuring that considerations of gender, inclusion, and fragility are embedded in operations as well. As risks converge and become more complex, so does the architecture of solutions, platforms, and products available to build resilience to both current and future hazards. With the support of the EU and ACP as Co-Chairs in FY 2019, GFDRR's global recognition as a centre of excellence and innovator in the field has been demonstrated by increasing demand for its knowledge, experience, and ability to structure and finance multifaceted solutions that meet specific needs.



Executive Summary

This Annual Report highlights the progress and results achieved during FY19.

Policemen, soldiers and rescue team looking for victims at a collapsed mosque after an earthquake hit North Lombok, Indonesia on August 7, 2018. (Photo by Garry Lotulung/NurPhoto via Getty Images)

Executive Summary

Julie Dana
Head, GFDRR

About This Report

This Annual Report highlights the progress and results achieved during FY19. It provides an overview of grant making activities in six regions and across GFDRR's eight targeted areas of engagement. It explores some areas of the work in greater depth and includes financial statements for the fiscal year. GFDRR is committed to further strengthening its monitoring and evaluation (M&E) systems, ensuring that evidence and lessons from across the portfolio inform management decisions, accountability, and learning. Results of the FY19 program, as measured against the Facility's results indicators, are available in the report's annex.

About GFDRR

GFDRR's portfolio continues to grow in its support for disaster and climate resilience needs. During FY19, the Facility committed $83.6 million in funding to 172 new grants. At the end of the fiscal year, the active portfolio included 369 active grants covering 142 countries, for a total commitment amount of $267.6 million. These grants address a full range of natural hazards, with flooding, earthquakes, and landslides continuing to receive the greatest share of support. All GFDRR grants contribute to achieving the Sendai Framework's goal, as well as its targets and priorities for action.

Regions

Core to GFDRR's vision is helping countries bring resilience to scale. Active grants in FY19 covered 142 countries across all six regions.

The **Africa** region was once again the largest in GFDRR's active portfolio and included 78 active grants worth $77 million. Grants supported the countries of Comoros, Malawi, Mozambique, and Zimbabwe in recovering from the impacts of Cyclones Idai and Kenneth. In Sierra Leone, technical assistance for collecting flood and landslide data allowed the government to reduce the transport sector's vulnerability, and informed the design of an IDA-financed $50 million urban transport project. In Kampala, Uganda, local authorities worked to improve coordination among communities for emergency response. Progress was made in giving countries access to advanced financial instruments, such as Development Policy Loans with a Catastrophe Deferred Drawdown Option (Cat DDO). Emphasis was also placed on strengthening institutional capacity for disaster risk financing.

At the end of FY19, GFDRR had an active portfolio in the **East Asia and Pacific** region of 51 grants, worth a total of $29.4 million. Technical assistance helped to leverage financing for recovery efforts in Sulawesi, Indonesia after a devastating earthquake and tsunami, and in the completion of a post-disaster needs assessment (PDNA) in Lao PDR after severe flooding. Across the region, risk considerations were embedded in infrastructure investments, and progress was made in improving countries' access to regional risk pools, such as Southeast Asia Disaster Risk Insurance Facility (SEADRIF). In Vietnam, GFDRR assisted the government with a pilot for the design and construction of climate-resilient, ultra–high-performance concrete (UHPC) bridges.

At the end of FY19, GFDRR's active portfolio in **Europe and Central Asia** totaled 44 grants worth $30.2 million, supporting work in almost every country in the region. A focus in FY19 was on scaling up DRM initiatives and mainstreaming urban resilience into municipality policies and investment plans. Other priority areas of engagement in the region for FY19 included promoting open access to risk information, advancing resilient infrastructure, supporting effective first response, building DRM capacity, and mainstreaming DRM into policy and legislation. In Bosnia and Herzegovina, GFDRR supported authorities in mainstreaming disaster risk management into the country's road network management practices.

In the **Latin America and Caribbean** region, GFDRR's active FY19 portfolio totaled 48 grants, worth $22 million. DRM considerations were integrated in infrastructure projects throughout the region, including drainage, transit, and school facilities. In Brazil, disaster risk was mainstreamed into territorial planning, public investments, and public finances. In Guatemala, the recovery efforts after 2018's eruption of the Fuego volcano included the preparation of a Development Policy Loan with Catastrophe Deferred Drawdown Option (Cat DDO), in conjunction with support for advancing the government's disaster risk management policy reform agenda.

GFDRR's active FY19 portfolio in the **Middle East and North Africa** totaled 17 grants worth $7.5 million; 70 percent of grant funding contributed to projects in resilient infrastructure. Efforts were made to strengthen the institutional capacity of national meteorological and hydrological services in the region, and to advance innovations in strengthening social resilience and inclusion through comprehensive urban operations in fragile contexts. GFDRR supported rapid post-recovery needs analyses following flooding in Tunisia and Djibouti, and in Beirut, GFDRR worked with the municipality to develop a comprehensive urban resilience master plan, to secure private and public investment to tackle the city's resilience needs.

At the end of FY19, GFDRR's active portfolio in **South Asia** totaled 39 grants worth $28.3 million. GFDRR supported recovery efforts after flooding in Kerala, India, and Cyclone Fani in Anwar Pradesh and Odisha, India. Many countries in the region have expressed interest in developing social safety net systems; Sri Lanka and India are currently strengthening theirs through capacity building and analysis. In Colombo, Sri Lanka, task teams are working with the government to collect, share, and analyze risk data and information that will be key toward moving the city's resilience agenda forward.

Areas of Engagement

GFDRR implements its strategy through eight areas of engagement that support the Sendai Framework's priorities for action. Progress in each of these areas is measured against targets set in the 2018–21 strategy.

In FY19, in the area of **science and innovation**, GFDRR's Labs team supported the Open Cities Africa initiative, connecting experts and communities to collect and distribute risk data for Africa's most disaster-prone areas. It pioneered the first Understanding Risk Field Lab—a month-long "un-conference" learning event in Thailand where participants prototyped new solutions to address urban floods. The Challenge Fund program piloted new and innovative approaches to revolutionize risk financing mechanisms, and GFDRR also stepped up efforts to bring machine learning and earth observation data into the mainstream of DRM. High-profile events included the launch of #VisRisk Challenge, a competition in the use of mapping software and narrative techniques to improve the understanding of risk.

The **Resilient Infrastructure** program continued to mainstream DRM across multiple infrastructure sectors—from schools to transportation, water, and energy; through knowledge and analytics; and technical assistance. The Safer Schools program continued to grow, with the addition of the Global Library of School Infrastructure (GLOSI) database of the structural performance of school buildings. Following up on the launch of the Resilient Transport Program in FY18, GFDRR helped participating countries incorporate innovative solutions into their approaches—for example through the use of geographic information system (GIS)-enabled web visualization tools to quantify climate risk on transport networks. Under the Resilient Water Partnership Program, a total of $1.4 million was provided to countries across all regions to integrate resilience measures in water projects. In Ulaanbaatar, Mongolia, GFDRR is supporting the municipality in building a comprehensive inventory of transport infrastructure to inform their maintenance of and investment in these assets.

As of FY19, 31 percent of GFDRR's active core program grants contributed to **scaling up urban resilience**. These covered 230 cities across 80 countries and included capacity building, improved resilience of urban services, flood risk reduction, coastal resilience, and emergency preparedness activities. A new grant in China is integrating DRM into the World Bank's urban portfolio, enhancing the capacity of cities to manage climate and disaster risks. In Kiribati, an island republic in the Central Pacific, an ongoing grant is supporting climate resilience activities in dense urban settlements in low-lying atolls, and in the Kyrgyz Republic, a new grant is supporting the government to promote resilient development in urban areas. The City Resilience Program has engaged with nearly 60 cities in 39 countries since its inception in 2017. This includes about a dozen new cities in FY19.

GFDRR's program for **strengthening hydromet and early warning systems** supports efforts around the world to build up weather and climate services for improved resilience. GFDRR also continues to support the hydromet program of the World Bank, which grew by about $100 million in FY19. A focus this financial year was on building technical capacity in countries through World Bank hydromet operations, and in forming new partnerships with the public and private sectors and academia. One such partnership is the Global Weather Enterprise (GWE)[1], which leverages private sector innovation and financing in addition to targeted public investments. GFDRR has also facilitated the development of an Action Plan to scale up the collaboration between the WMO and the World Bank. The flagship publication, *Weathering the Change: How to Improve Hydromet Services in Developing Countries*, was published in FY19 and analyzes all phases of the value chain involved in the production and delivery of hydromet services, to improve their skill, efficiency, and cost-effectiveness. In Moldova, GFDRR worked with the national hydromet service to implement improved verification and quality management systems.

Country demand for climate and disaster risk financing solutions has evolved over the last few years, from requests for development of financial protection strategies, to implementation of these strategies. In FY19, the focus under **deepening financial protection** saw a dramatic shift in the way in which GFDRR responds to these demands. Scaled up support from partners moved the agenda beyond stand-alone technical assistance that focused on generating dialogue on this topic and building capacity, to larger investments in structured financial solutions for vulnerable countries. The Global Risk Financing Facility (GRiF) was launched in FY19 as a multi-donor trust fund housed at GFDRR and implemented by the World Bank's Disaster Risk Financing and Insurance Program (DRFIP). The program responds to requests from countries for support in moving beyond the design and development of strategies to actual implementation of these solutions, by providing seed funding necessary to put actual financial instruments in place. This program directly co-finances World Bank's IDA and IBRD projects, with grants to countries that range in the amount of $5–$25 million.

Building social resilience is key to GFDRR's mandate, and over 50 percent of core program grants report communities as beneficiaries. A priority in FY19 was channeling DRM and climate change adaptation (CCA) resources and decision-making power to the local levels. In Kenya, GFDRR is supporting efforts to strengthen capacity of four county governments to integrate locally led disaster and climate risk management into integrated development plans. A newly funded grant in Somalia will support vulnerable populations, particularly women, to address multiple risks in internally displaced people camps through improved livelihoods and economic opportunities. There is also a focus on increasing citizen engagement in managing risk, with case studies underway in Zimbabwe and the Pacific, and the launch of a platform for comprehensive, reliable data on flood-affected people in the floodplain of Asunción, Paraguay. In the Solomon Islands, nearly 70 community-level resilience projects are underway across the provinces of Guadalcanal, Temotu, Malaita, and Central, supported by the ACP-EU Natural Disaster Risk Reduction Program.

GFDRR's program for **addressing climate risk and promoting resilience to climate change (RCC)** concluded in FY19, with all efforts now centered on the implementation of ongoing activities. However, GFDRR continues to promote the integration of climate risks into operations: in FY19, over 90 percent of newly approved grants included climate considerations. In the last two years, GFDRR has experienced a steady increase in the number of requests to support multi-sector and multi-country projects; engage with a wider set of actors; and work across silos and existing boundaries to find new solutions and advance practitioner-based knowledge. RCC-supported activities continue to leverage additional financing to scale up climate resilience in a number of ways. In Uzbekistan, for example, a pilot on operational models for water utilities to better respond to water security issues

[1] The GWE is a global engagement between the public, private, and academic sectors, which shares the common goal of providing accurate and reliable weather information and services that save lives, protect infrastructure, and enhance economic output. It combines the scientific research, technology, observations, modeling, forecasting, and forecast products that need to come together in alignment with the requirements of the universally agreed Sustainable Development Goals of the UN 2030 Agenda for Sustainable Development.

has been scaled into a $215 million country-wide World Bank-financed operation. RCC activities also support the generation of new knowledge to inform the resilience building activities of country partners.

In FY19, GFDRR's efforts in the area of **enabling resilient recovery** focused on the development and distribution of knowledge products, and on fostering partnerships to strengthen the capacity of vulnerable countries for emergency preparedness. During the period, GFDRR trained 304 officials, including 100 women, in six countries; and provided close to $3.5 million for 23 Just-in-Time and other grants to help more than 20 countries respond to disasters and better prepare for future events. An initiative on the nexus between disasters and fragility or conflict-affected situations was launched, beginning to think about how to apply DRM lessons and methodologies to fragility, conflict, and violence (FCV) settings, especially for post-crisis recovery. This new program funded 10 proposals from covering nine countries which will help DRM and FCV experts explore innovative ways to adapt or integrate DRM engagements to specific FCV challenges.

Financing Windows

GFDRR grants are funded through financing received from development partners. While many donors contribute to a common multi-donor trust fund, dedicated financing is received from Japan, the European Union, and the Climate Risks and Early Warning Systems (CREWS) Initiative, and as of FY19, from new financing windows like the Global Risk Financing Facility (GRiF) and the Canada Caribbean Resilience Facility (CRF).

The **Multi-donor Trust Fund (MDTF)** is the main vehicle to support the Facility's governance structure, partnerships, and program management. At the end of FY19, the MDTF and related single-donor trust funds had an active portfolio of nearly $94.5 million through 202 grants. It supported disaster assessments in 13 countries, helping to mobilize over $1.5 billion in additional financing. The MDTF is the main source for GFDRR's analytics work, which has helped provide answers to some of the most pressing questions facing development practitioners. In FY19, the Facility initiated a program on the nexus between DRM and FCV, bringing together experts in both fields to help countries better integrate good practice. It provided financing for knowledge exchange and events, including the fourth World Reconstruction Conference (WRC4), and funding for regional events as part of the Understanding Risk Community. Since FY16, the MDTF has financed approximately 49 percent of GFDRR's activities. The current fund will be closing in December 2020, and a new MDTF is being established to support continuity of the program.

The **European Union (EU)** is a key partner and funds several programs managed by GFDRR. The **ACP–EU Natural Disaster Risk Reduction (ACP–EU NDRR) Program** helps enhance preparedness for natural disasters and mitigate impacts in Africa, Caribbean, and Pacific (ACP) countries by supporting governments integrating risk management approaches into planning. In FY19, the ACP–EU NDRR Program funded 25 grants totaling $10 million, supporting countries in enhancing disaster preparedness and response capacity, forming urban development plans that incorporate DRM, developing DRM legislation and climate resilience strategies, and strengthening coastal zone management. Other programs include: the ACP–EU Building Disaster Resilience in Sub-Saharan Africa (SSA) Program; the EU-WB/GFDRR Global Partnership on Disaster Risk Financing Analytics, which helps countries build financial resilience by improving their understanding of risk; the EU–South Asia Capacity Building for DRM Program, which supports hydromet service delivery and enhances capacity among regional bodies and the national disaster management centers; and the Serbia National Disaster Risk Management Program which is supporting the Republic of Serbia in enhancing DRM and flood prevention systems.

The **Japan–World Bank Program for Mainstreaming Disaster Risk Management in Developing Countries** is a partnership between the government of Japan and the World Bank, managed and implemented through GFDRR's Tokyo DRM Hub. In FY19, the program approved 18 grants amounting to over $12 million, supporting 27 countries and addressing natural hazards such as flooding and other hydromet risks, multi-hazard events, and earthquakes. As a key knowledge center serving the global DRM community, the Tokyo DRM Hub facilitated 29 expert exchanges, which brought together 72 professionals from the public sector, 58 from the private sector, 37 from academia and research institutions, and 16 from civil society.

GFDRR manages other **purpose-built financing windows** which focus on particular areas of engagement or regions, but operate under and are aligned with the umbrella structure of the Facility. In FY19, two new special programs were launched—the Global Risk Financing Facility (GRiF) and the Canada Caribbean Resilience Facility (CRF). In its pilot year of implementation, under GRiF, two IDA grants were approved with World Bank co-financing: a grant of $8 million co-financed a $90 million disaster risk management operation in Mozambique, and in Sierra Leone, a $2.5 million grant co-financed a $35 million Investment Project Finance, strengthening the national safety net program. As of FY19,

the Climate Risk and Early Warning Systems (CREWS) Initiative had approved 13 projects for a total of $32.7 million; these include providing modernized early warning systems in Chad; strengthening the national climate, hydrometeorological, and early warning services in Togo; and enhancing the capacity for weather-, water-, and climate-related early warning services in Afghanistan. The City Resilience Program (CRP) completed more than 50 Rapid Capital Assessments to assess cities' capabilities to mobilize private capital.

Special Features

In recent years, GFDRR-supported analytical work has helped provide answers to some of the most pressing questions in global development. In FY19, GFDRR's analytics team produced Lifelines, which provides a thorough analysis on the intersection of DRM and infrastructure. The report presents a strong case for investing in resilience during the early stages of infrastructure planning, which helps avoid devastating setbacks due to disasters. The team is also developing tools that can provide further insights into how poverty and disaster risks are related in specific contexts at the country levels. These include a set of data collection tools that allow for in-depth analyses of poverty and disaster risk, and a model that measures socioeconomic resilience at the subnational level.

In FY19, GFDRR supported operations in several disaster-affected regions. In Mozambique, after Cyclones Idai and Kenneth, GFDRR support enabled a Global Rapid Post-Disaster Damage Estimation (GRADE) and a PDNA, which informed a $130 million IDA Crisis Response Window grant. In Indonesia, after the earthquake and tsunami in Sulawesi, GFDRR supported a GRADE and provided $3 million in grant funding that will strengthen resilience and preparedness against future disasters. In India, the massive reduction of losses during 2019's Cyclone Fani compared with the devastation sustained during the super cyclone that hit the state of Odisha in 1999 is a testament in part to the progress made by the government with GFDRR support in ex-ante activities, such as disaster preparedness, understanding risk, and risk reduction.

DRM is evolving, and with it, the demand for new approaches and support in new sectors. Globally, GFDRR is helping to meet the rising demand for nature-based solutions by providing technical, analytical, and operational support for related projects in five regions and 24 countries. In FY19, GFDRR also helped six countries—Bhutan, Guatemala, Lao PDR, Myanmar, Tanzania, and Uzbekistanin strengthening the resilience of cultural heritage, local communities, and sustainable tourism.

Going forward, GFDRR is well-positioned and prepared to handle the diversity and scale of growing demand, meeting it with innovative solutions and a growing portfolio of resources that can support the design and implementation of more complex and multi-sectoral solutions.

How GFDRR Works

MISSION To facilitate implementation of the Sendai Framework for Disaster Risk Reduction and to contribute to the achievement of the Sustainable Development Goals and the Paris Agreement, by ensuring that all development policies, plans, and investments—including post-disaster reconstruction—are designed to minimize disaster risks and build the resilience of people and economies to climate change.

OPERATING PRINCIPLES GFDRR's strategy is underpinned by seven operating principles: Demand-driven; Leveraging Finance and Development Policy; Inclusive Approach; Gender; Addressing Disaster and Climate Risk. Knowledge; and Results-oriented.

IN-COUNTRY ENGAGEMENTS GFDRR channels funding to in-country engagements. It awards grant resources based on established criteria aligned with its operating principles. To help countries bring resilience to scale, many of the activities target interventions that leverage larger development programs. GFDRR operates across six regions: Africa; East Asia and Pacific; Europe and Central Asia; Latin America and the Caribbean; Middle East and North Africa; and South Asia.

IMPLEMENTATION GFDRR supports technical assistance and analytical work that leverages financing by international financial institutions—including IBRD, IDA, and the Climate Investment Funds—to test and scale innovations that ensure that investments enhance resilience and reduce risks. The World Bank is GFDRR's main implementing partner, and provides the Facility with the opportunity to leverage development investments well beyond the resources it manages, maximizing development impact.

FINANCING WINDOWS GFDRR is an umbrella trust fund that finances its activities from different sources of funds, including a multi-donor trust fund and special programs.

AREAS OF ENGAGEMENT GFDRR currently executes its strategy through eight areas of engagement that support implementation of the Sendai Framework priorities and the Paris Agreement, and that contribute to the achievement of the Sustainable Development Goals. These are:

- Using science and innovation in disaster risk management
- Promoting resilient infrastructure
- Scaling up engagements for city resilience
- Strengthening hydromet services and early warning systems
- Deepening financial protection through disaster risk financing and insurance
- Building social resilience
- Deepening engagements in resilience to climate change
- Enabling resilient recovery

GFDRR's vision is a world where resilient societies manage and adapt to ever-changing disaster and climate risk, and where the human and economic impact of disasters is reduced.

FY19 IN NUMBERS:
BRINGING RESILIENCE TO SCALE

GFDRR's portfolio continued to grow globally during FY19. Highlights of the portfolio's progress and contributions to resilience are below.

ACTIVE GRANTS (USD $)
$268M

NEW GRANTS (USD $)
$84M

142
countries covered

369
Active grants

172
Newly approved grants

Alignment with Sendai Framework **100%**

Approved grants supporting resilience to climate change **90%***

Approved grants gender informed **59%***

Community beneficiaries **53%***

Latin America & the Caribbean

$22.0M

$8.3M

20 NEW

48
ACTIVE

Global

ACTIVE GRANTS (USD $)

$73.2M

NEW GRANTS (USD $)
$20.8M

ACTIVE GRANTS
92

NEW GRANTS
44

* Analysis is based on data for grants funded through GFDRR Core Programs. It does not include grants funded through Special Programs or Just-in-Time grants.

Middle East and North Africa

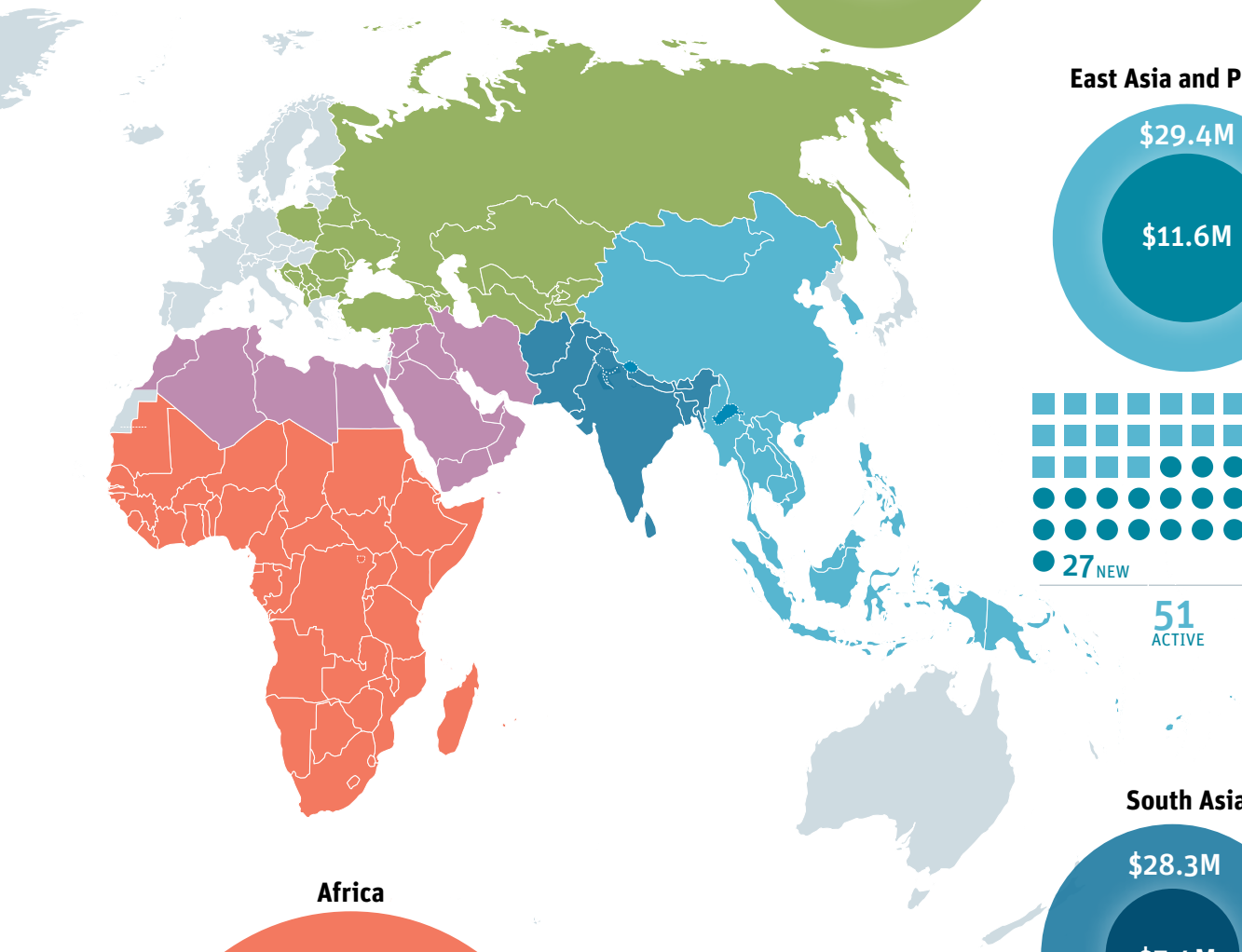
$7.5M
$2.5M

7 NEW
17 ACTIVE

Europe and Central Asia

$30.2M
$9.4M

21 NEW
44 ACTIVE



East Asia and Pacific

$29.4M
$11.6M

27 NEW
51 ACTIVE

South Asia

$28.3M
$7.4M

15 NEW
39 ACTIVE

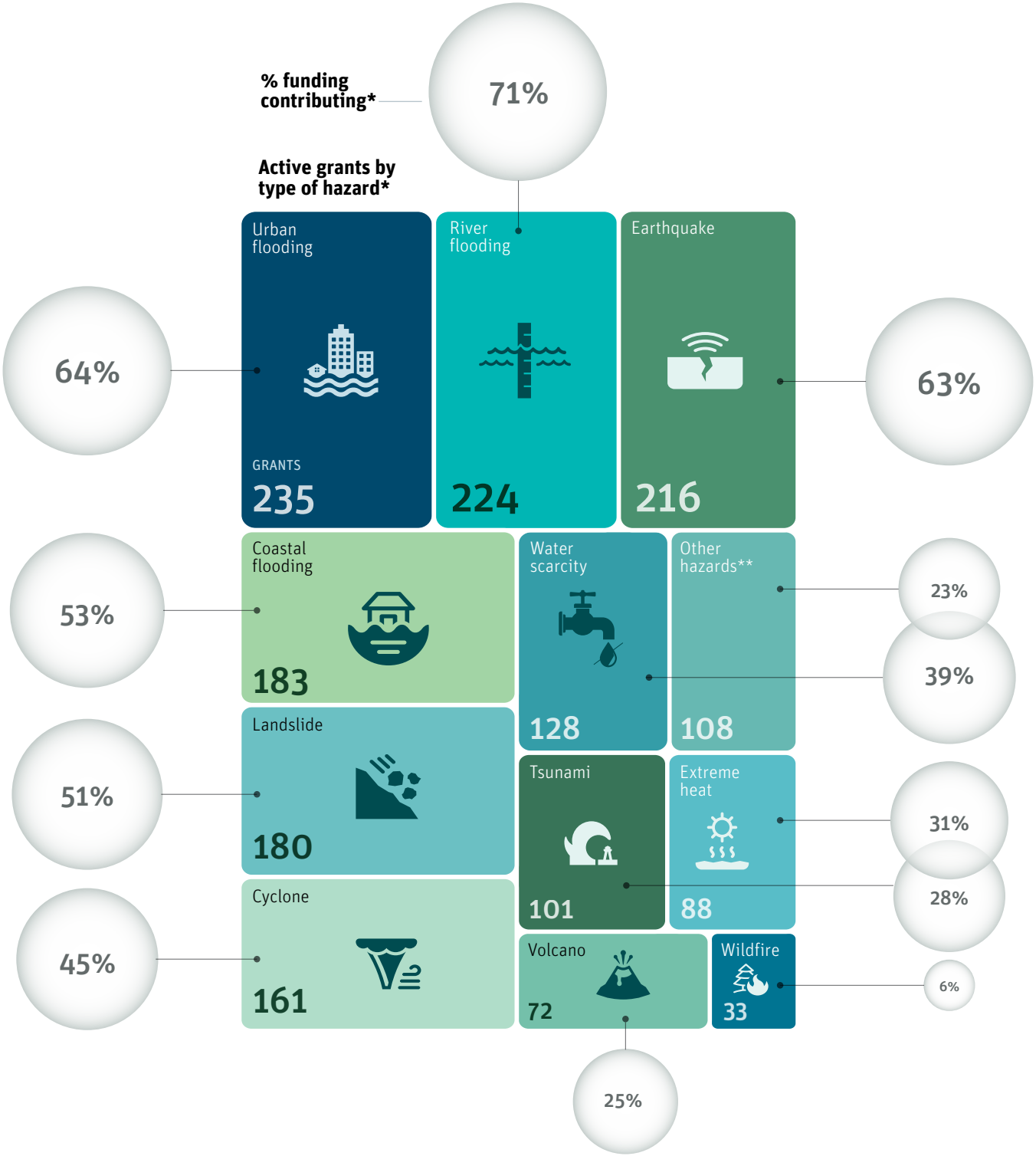
Africa

$77.0M
$23.6M

38 NEW
78 ACTIVE

NATURAL HAZARDS ADDRESSED

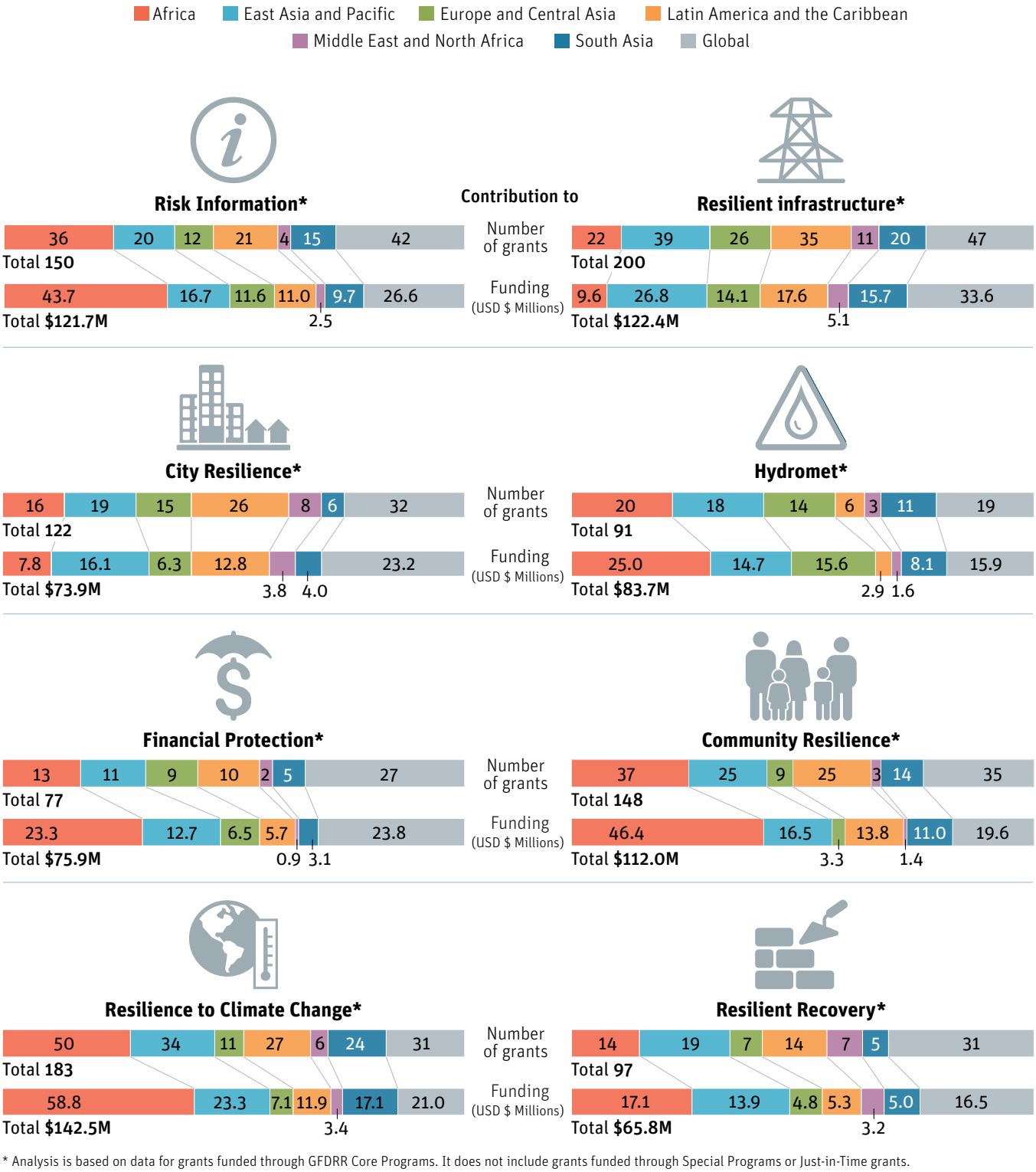
The portfolio targeted the hazards posing the greatest risk to vulnerable countries. Most grants continued to address more than one natural hazard. Within the portfolio, 87 percent of core program funding addressed flooding and 76 percent addressed geohazards. Other hazards addressed by the portfolio include liquefaction, saltwater intrusion, sea-level rise, avalanches, poor air quality, and sand storms.



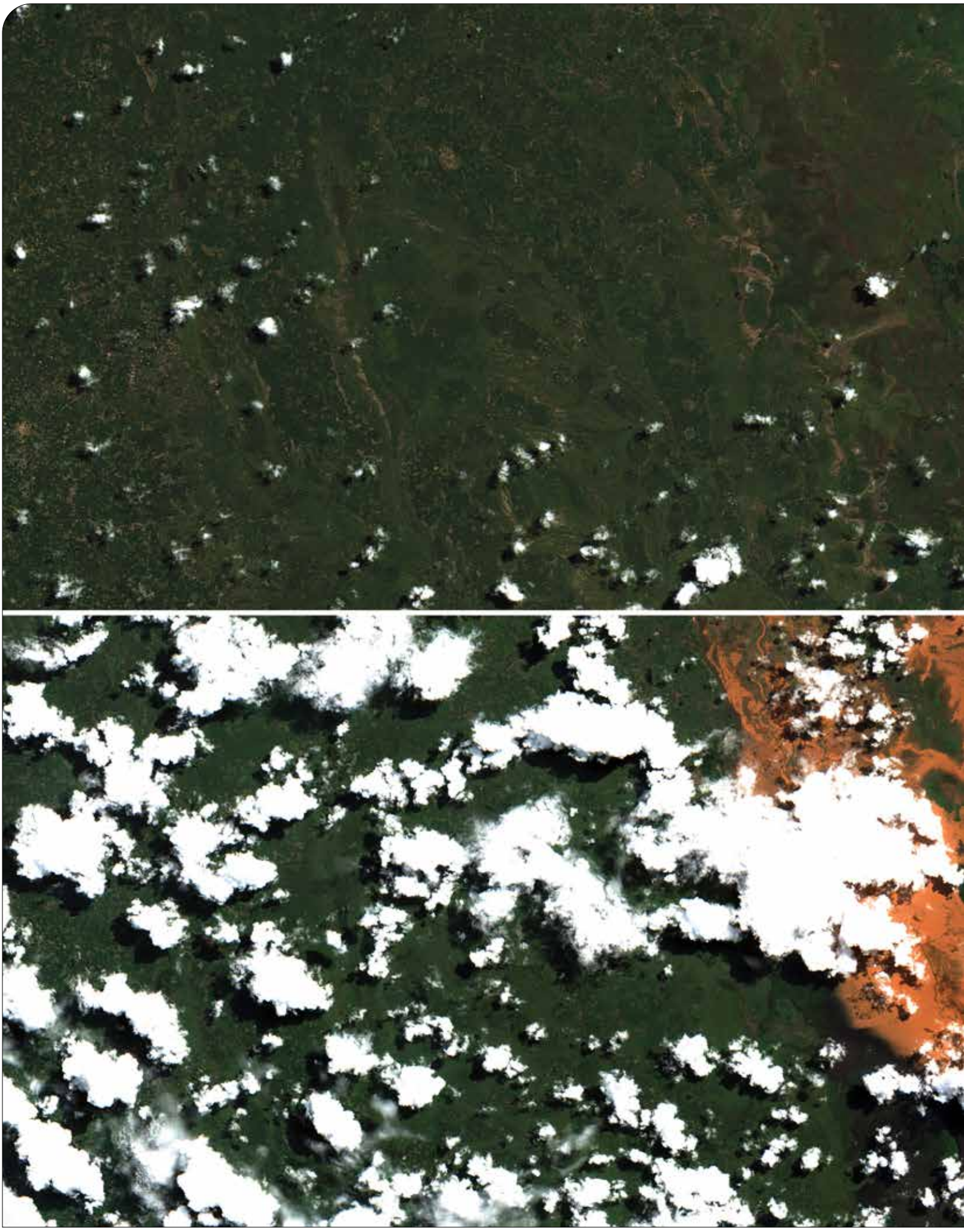
* Analysis is based on data for grants funded through GFDRR Core Programs. It does not include grants funded through Special Programs or Just-in-Time grants.
** Includes liquefaction, radiological contamination, saltwater intrusion, debris flow risk, sea-level rise, pandemics, avalanches, dzud, poor air quality, urban fire, sand storms.

AREAS OF ENGAGEMENT

The portfolio in FY19 continued to address all strategic areas of engagement. Most grants contributed to more than one engagement area and these activities covered all regions.



* Analysis is based on data for grants funded through GFDRR Core Programs. It does not include grants funded through Special Programs or Just-in-Time grants.



FY19 Highlights

A deep dive into how GFDRR and our partners have worked together to advance resilient recovery in the aftermath of disasters in FY19.

Mozambique before and after landfall of Cyclone Idai Photo: ESA, contains modified Copernicus Sentinel Data (2019).

India: Kerala floods and Cyclone Fani

India and its population of over 1.3 billion people are no stranger to natural hazards. In August 2018, the state of Kerala was inundated by the worst monsoon flooding in a century, claiming the lives of nearly 500 people. Even more recently, in May 2019, Cyclone Fani battered Odisha state with torrential rains and winds gusting at more than 120 miles per hour. Sixty-four people lost their lives while 1.2 million people were evacuated to cyclone shelters.

Since 2007, the government of India, as well as over a dozen states including Kerala and Odisha, have partnered with GFDRR in efforts to manage and adapt to ever-changing disaster and climate risk.

Immediately following both the 2018 Kerala floods and Cyclone Fani, GFDRR supported a rapid post-disaster assessment and worked with state authorities, as they developed a road map and mobilized resources for longer-term recovery and reconstruction. Through these engagements and partnership with national and state authorities, the principles of building back better have been embedded at every stage of the recovery process in both Kerala and Odisha.

After the Kerala floods, the government of India, the government of Kerala, and the World Bank forged ahead with the $450 million Resilient Kerala initiative, financed by IDA and IBRD, that will facilitate implementation of a state-led framework for resilient recovery in a range of critical sectors including transport, rural infrastructure, and livelihoods.

In the wake of Cyclone Fani, the government of India, the government of Odisha, and the World Bank signed a $165 million IBRD loan agreement to assist smallholder farmers in strengthening the resilience of production systems—an effort that has become a vital part of Odisha's

People walk through flooded streets in Alleppey, Kerala, India. Photo: AJP / Shutterstock.com.

comprehensive disaster risk management strategy.

These latest initiatives build on India's efforts to advance resilience at both the national and state level, and over a decade of GFDRR and World Bank support toward its commitment. Indian authorities are continuing to operationalize building regulations for resilience, conduct multi-hazard risk and governance assessments, and implement resilient recovery in Kerala and Odisha. The government of India's drive to advance comprehensive disaster and climate risk management are also reflected in joint GFDRR-UNDP support to the Fifteenth Finance Commission on public financial management for disaster risk reduction. Finally, GFDRR is supporting the government's initiative to develop a coalition for disaster resilient infrastructure, and was a key partner in organizing the International Workshop on Disaster Resilient Infrastructure in March 2019.

These efforts together save lives and reduce losses when disaster strikes. In response to devastating floods in Uttarakhand state in 2013, nearly 2,400 homes were reconstructed following disaster-resilient guidelines. In Odisha, the construction of hundreds of multi-purpose cyclone shelters and the development of early warning systems contributed to the sharp reduction in fatalities, in the aftermath of both Cyclone Fani in 2019 and Cyclone Phailin in 2013. Most recently, the state of Andhra Pradesh expanded access to resilient roads and shelters for nearly 300,000 people, of whom almost half are women.

This progress toward a more resilient India has been the result of strong leadership and commitment of the national government. Drawing on its expertise and experience tackling disaster and climate risks at home, India is eager to play a leading role in driving the global resilience agenda.

Indonesia: Central Sulawesi earthquake and tsunami

Following the earthquake and tsunami in Indonesia during 2018, GFDRR's support for rapid assessments—including innovative damage estimations—helped inform $438 million[2] of World Bank assistance for resilient recovery and risk reduction efforts.

The earthquake and tsunami that hit Central Sulawesi in September 2018 were in many ways unique disasters, giving rise to a cascade of hazard events that affected four districts in Central Sulawesi and causing extensive damages. A magnitude 7.5 main shock triggered three nearfield tsunamis that reached the shores of settlements along Palu Bay within six minutes, and ground shaking led to devastating landslides and liquefaction effects in densely populated areas of Palu and Sigi. The disaster led to more than 4,400 fatalities, displaced approximately 170,000 people, and caused over $1.3 billion in economic losses.[3] Previous to that, a series of earthquakes struck Lombok in July and August 2018, causing 561 fatalities and displacing almost 400,000 people. And the eruption and subsequent partial collapse of the Anak Krakatau Volcano in December 2018 led to a tsunami that caused 437 fatalities and displaced almost 34,000.

Immediately following these events, GFDRR's assistance helped to support the process of doing technical assessments for rapid loss estimates, debris waste management, vulnerability assessments of public facilities, and a preliminary assessment of early warning services and disaster preparedness needs in affected areas.

Rapid data assessment

As part of the World Bank's response to the disaster, GFDRR supported a rapid assessment of the damage to affected areas in Central Sulawesi using the Global Rapid Post-Disaster Damage Estimation (GRADE) methodology. The assessment was conducted by the World Bank's Disaster-Resilience Analytics and Solutions (D-RAS) team, a group of technical experts that develops custom-built tools and solutions in the area of disaster risk management.

The advantage of this approach is the speed at which the damage estimation can be produced. Within 10 to 14 days of a disaster event, stakeholders can access loss estimates and visualize the spatial distribution of damages. This can support the development of post-disaster recovery and reconstruction strategies, and inform appropriate, timely, and efficient courses of action. For the Central Sulawesi earthquake and tsunami, the GRADE assessment was the first report to be released globally, providing sector-based preliminary economic damage estimates to inform disaster recovery and reconstruction processes, and informing budgetary considerations.

The speed with which the damage estimation was produced—within 14 days—has proven effective in giving stakeholders quick access to the economic cost and spatial distribution of damages, to help develop post-disaster recovery and reconstruction strategies and inform appropriate, timely, and efficient courses of action. The assessment helped to inform the design of support for the government of Indonesia to supplement relief and reconstruction efforts in the disaster-affected areas of Central Sulawesi.

[2] All IBRD funded: $150 million (CSRRP) + $160 million (IDRIP) + $100 million (CERC NSUP) + $25 million (CERC WINRIP). GFDRR provided $3 million in grant financing.
[3] Central Sulawesi Center of Disaster Data and Information. March 2019.

Jono Oge, Indonesia—Collapsed bridge after the September 2018 earthquake and tsunami that hit Central Sulawesi. Photo: Nurwijaya Hariadi.

Supporting larger interventions

In FY19 GFDRR provided $3 million in grant financing that will strengthen resilience and preparedness in Indonesia against future disasters. The technical assistance activities supported under this grant will enhance project outcomes under the contingency component activated under the IBRD-funded $100 million National Slum Upgrading Project and the IBRD-funded $150 million Central Sulawesi Rehabilitation and Reconstruction Project, which are supporting the reconstruction and strengthening of housing settlements and public facilities in the affected areas. Technical support on disaster- and climate-resilient transport infrastructure recovery in Central Sulawesi and nationally also supports the contingency component activated under the IBRD-funded $25 million Western Indonesia National Roads Improvement Project. In addition, the grant is supporting the preparation of the proposed Indonesia Disaster Resilience Initiatives Project (IBRD-funded $160 million), which will strengthen the capacity of government authorities to prepare for future natural hazards through an integrated end-to-end multi-hazard early warning system, with critical priority investments in geophysical monitoring systems, capacity building, and instrumentation.

GFDRR has also supported the resilient recovery process in Central Sulawesi by helping to assess the post-disaster impacts on the housing, transport, and social infrastructure sectors, including through structural vulnerability assessments of public buildings and an assessment of debris waste management opportunities. Recommendations included seismic retrofitting and strengthening solutions, prioritized investment options for educational and health facilities, preparatory activities for recovery of selected roads and bridges, and deconstruction and debris waste recycling strategies. Rapid assessments of damages and impacts on early warning services and emergency management systems in Palu also helped to identify investment options for the restoration of basic earthquake monitoring and information services, and tsunami early warning services, in areas affected by the disaster events in 2018.

A history of partnership in Indonesia

Following the 2004 tsunami, the World Bank, along with several global partners, contributed to the recovery and reconstruction efforts in Indonesia by establishing the Multi Donor Fund for Aceh and Nias. This fund managed approximately $655 million to rebuild 20,000 homes and a wide range of vital infrastructure to higher construction and resilience standards, including 3,850 km of roads, 677 schools, 72 clinics, and 8,000 wells and clean water sources. These interventions highlighted the importance of building resilience against future disasters into reconstruction efforts—a realization within the World Bank which led directly to the establishment of GFDRR. In addition to the support for resilient recovery, GFDRR's other ongoing support to Indonesia includes efforts to develop investment options for urban flood risk reduction and management in selected cities, and improving preparedness and response planning for dams in selected areas. In FY19, new initiatives include a $3 million grant aimed at identifying priority investments in the transport sector, developing investment plans based on critical needs for multi-hazard early warning system platforms, and integrating resilient principles into resilient transport recovery, as well as a $200,000 grant for implementing a national disaster risk financing and insurance strategy.

Mozambique: Cyclones Idai and Kenneth

Relief efforts in Mozambique after Cyclones Idai and Kenneth in early 2019 showcase GFDRR's holistic approach to disaster risk management (DRM), from projects which strengthened lifesaving infrastructure before the cyclones hit and innovative financial solutions which are helping the government build back better and providing support to small and medium enterprises to continue operations.

On March 14, 2019, Mozambique was hit by Cyclone Idai, the second-deadliest tropical cyclone ever recorded in the South-West Indian Ocean basin. With powerful winds and extensive flooding, it killed more than 600 people in the northern and central parts of the country, directly affected more than 1.8 million people, and devastated infrastructure, with recovery needs exceeding $3 billion. Cyclone Idai also had significant impacts in the neighboring countries of Malawi and Zimbabwe, and the devastation of its aftermath was exacerbated by the impact of Cyclone Kenneth, a less deadly storm which struck on April 23, 2019. Humanitarian agencies responded quickly to the disasters, providing much needed aid to those affected. As they tended to the most urgent human needs, support from GFDRR helped the government of Mozambique and technical teams with early response and planning for next steps.

The immediate aftermath

Shortly after Idai dissipated, an initial damage assessment using the Global Rapid Post-Disaster Damage Estimation (GRADE), a speedy and information-rich remote methodology, was done, drawing on analysis done by World Bank teams with GFDRR support through a Just-in-Time (JIT) grant. Using satellite imagery along with data compiled through the Africa Disaster Risk Financing Initiative (ADRF), the GRADE analysis identified approximately $773 million in damages to buildings, infrastructure, and agriculture. Equipped with this knowledge, the government and recovery teams were able to make more informed decisions about allocation of recovery resources in a much shorter time frame. Following the GRADE, a team was on the ground in Beira supporting a government-led Post-Disaster Needs Assessment (PDNA). The PDNA estimated that Cyclone Idai caused about $1.4 billion in total damage and $1.39 billion in losses, with major impacts in housing and transport infrastructure.

Looking ahead

The findings of the PDNA helped mobilize further support and directly informed the preparation of the Cyclone Idai & Kenneth Emergency Recovery and Resilience Project. The project is a $130 million IDA Crisis Response Window grant, which will be used to repair and reconstruct housing and rebuild public infrastructure while strengthening climate resilience in the areas most affected by Idai and Kenneth. The project also has a first-of-its-kind private sector recovery component that will help micro and small-sized firms get back on their feet and improve access to finance through matching grants, credit lines, and technical assistance to support the implementation of these firms.

May 1, 2019: Aerial view of devastated fishing village after Cyclone Kenneth in Pemba, northern Mozambique. Photo: fivepointsix.

Coming together for a more comprehensive DRM plan

These resilient recovery activities complement existing and long-standing DRM efforts in the country. In the days following Idai, the World Bank approved the Mozambique Disaster Risk Management and Resilience Program, a project which had been under preparation during the previous two years with support from the ADRF initiative. The $90 million project ($84 million from IDA and $6 million from Global Risk Financing Facility, GRiF)[4] is supporting implementation of Mozambique's second DRM master plan, which will strengthen disaster preparedness throughout the country, improve climate resilience in its school infrastructure, and enhance financial protection against disasters through a new Disaster Management Fund.

The project includes two financial instruments for disaster response: (i) a contingency fund capitalized with IDA funds and the national budget, which was first used to respond to the recovery requirements following Cyclone Idai, and (ii) a sovereign risk insurance scheme that is being prepared with the $8 million in grants provided by the GRiF. Of this, $6 million is directly co-financing IDA resources in the project to pay for premium subsidies for cyclone or drought insurance, which is complemented with $2 million in technical assistance to support the government on design and implementation of the instrument.

The master plan is aligned with the priorities of the Sendai Framework for Disaster Risk Reduction, and has five strategic pillars: (i) improving the understanding of risk; (ii) strengthening governance and public and private participation in disaster risk reduction; (iii) mainstreaming DRM in public investment and territorial planning, and consolidating financial protection against disaster; (iv) strengthening disaster preparedness, response, rapid recovery, and resilient reconstruction; and (v) building partnerships and international cooperation.

Successful DRM investments helped strengthen the case for more

The losses could have been even worse. Mozambican cities have high exposure to coastal and river flooding. Fortunately, the city of Beira had recently upgraded its stormwater drainage system. Just six months before Idai made landfall, the first stage of the IDA-supported Mozambique Cities and Climate Change Project was completed. The new drainage system, which benefits over 250,000 people, including over 70,000 people living in informal settlements, helped divert large quantities of storm water out to the sea. The areas that had benefited from drainage rehabilitation investments under the project suffered little to no flood damage compared to areas not serviced by rehabilitated drainage systems.

The success of this intervention has helped drive institutional support in Beira to undertake other resilience-building projects. "The drainage system and water retention basin worked well during heavy rains earlier this year," said Beira Mayor Daviz Simango during the aftermath of the storm. "Even after Cyclone Idai, Beira faced less flooding than other parts of the country. Now we need to extend our drainage network to other parts of the city."

[4] GRiF is co-managed by GFDRR and the World Bank's Finance, Competitiveness, and Innovation Global Practice.

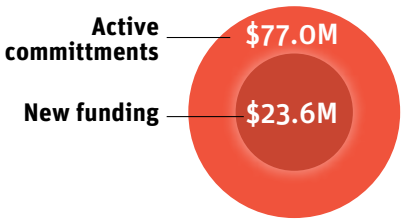
In-Country Engagements

GFDRR channels funds to in-country engagements that help strengthen local capacity, and awards grant resources based on criteria aligned with its operating principles. Core to GFDRR's vision is helping countries bring resilience to scale. As such, many of GFDRR activities target interventions that inform larger development programs.

Fire drill in Puducherry, India. Photo: World Bank.

Africa

Africa is the fastest urbanizing continent and faces mounting challenges as the population rapidly concentrates in under-resourced cities. The rapid processes of urbanization mean that the disaster risk profiles of countries in Africa are evolving from predominantly rural, with drought and food security as the main challenges—to urban, with challenges from floods, cyclones, and earthquakes.



Some highlights of work in the region include:

- In **Comoros, Malawi, Mozambique, and Zimbabwe**, which were all severely damaged by Cyclone Idai and Cyclone Kenneth in early 2019, accelerated post-disaster support helped the four countries mobilize $630 million in IDA grants and credits from the Crisis Response Window to further recovery and reconstruction work.
- In Kampala, **Uganda**, local communities worked to enhance emergency preparedness and response capacity. Formalizing multiagency planning and coordination structures at city, division, and ward levels helped the city constitute the City Disaster Risk Management Technical Committee (CDRMTC), which will improve coordination among communities in emergency responses.
- In Addis Ababa, **Ethiopia**, the Disaster Risk Management (DRM) Mainstreaming Guideline was launched with the goal of operationalizing the DRM strategic investment framework. More than 300 participants representing different sector ministries, regional and subregional office representatives, development partners, and civil society representatives joined this launch event.
- In **Sierra Leone**, the collection of flood and landslide data allowed the government to make evidence-based interventions and investments to reduce the transport sector's vulnerability to floods and landslides. This technical assistance is informing the design of an IDA-financed $50 million urban transport project that will increase mobility and resilience of the urban transport infrastructure in Freetown.
- In the Greater Accra Region in **Ghana**, technical assistance is helping the government to prepare an IDA-funded $200 million Greater Accra Resilient and Integrated Development Project, which includes total planned financing of $1 billion in subsequent phases to improve flood risk management capacity.
- **Cabo Verde** and **Malawi** both advanced work on DRM policies, risk profiles, and disaster risk financing, which informed the preparation of the Development Policy Loans with a Catastrophe Deferred Drawdown Option (Cat DDO), in the amount of $10 million in IDA funding in Cabo Verde and $70 million in IDA funding in Malawi.
- **Benin, Kenya, Lesotho, Madagascar, Mozambique, Sierra Leone**, and **Senegal** all continued to make progress in strengthening institutional capacity for disaster risk financing. In Kenya, this included the design of a shock-responsive component of the IDA-financed $250 million Kenya Social and Economic Inclusion Project (KSEIP) that will use a risk layering approach to develop a contingency fund and insurance coverage.

In Focus Driving resilience policies and ensuring access to post-disaster financing in Africa

Seychelles National Integrated Emergency Management Plan. Department of Risk and Disaster Management. Photo: World Bank

Results in Numbers

98 regulatory, institutional and policy actions for resilience and disaster risk management spanning key areas such as access to information, institutional coordination, asset loss reduction, socio-economic resilience, and resilient territorial and development planning

Governments across Sub-Saharan Africa have often lacked the resources they need to act and respond swiftly when disaster strikes. In response, GFDRR-supported programs are delivering technical assistance to Cabo Verde, Kenya, Malawi, and the Seychelles, as these governments are working to structure and prepare Development Policy Loans with Catastrophe Deferred Drawdown Options (Cat DDOs). These contingent lines of credit, available for the first time to IDA countries through IDA 18, provide immediate liquidity in the aftermath of a disaster and are based on a series of policy actions that are designed to strengthen a country's disaster risk management capacity. Policy-based lending operations help support governments' commitments to implementing comprehensive strategies, policies, legal reforms, and institutional frameworks that provide direction and coherence to country-level DRM programs.

So far, in 17 Sub-Saharan African countries, 98 regulatory, institutional, and policy actions have been formulated and implemented, spanning key areas such as access to information, institutional coordination, asset loss reduction, socioeconomic resilience, and resilient territorial and development planning.

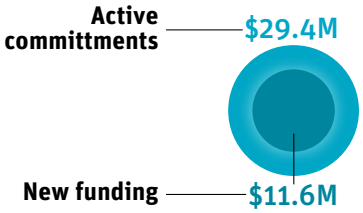
For example, in Malawi, the $70 million IDA-financed Cat DDO, approved in June 2019, has accelerated the implementation of eight high-level reforms in the country's disaster risk management policy and institutional regime. At the top of Malawi's reform agenda is the recent approval by the country's cabinet of ministers of a historic disaster risk management bill that will shift the focus of DRM from emergency response to holistic and longer-term resilience.

Malawi has also adopted policies that will mainstream disaster and climate resilience into the country's urban development, transport, and education programs. The government will also be implementing a plan for the development of a shock responsive social protection system to save the most vulnerable when disaster strikes.

Overall, work in this area in Sub-Saharan Africa has facilitated the approval of $287 million in Cat DDOs—including for Cabo Verde ($10 million), Kenya ($200 million), Malawi ($70 million), and the Seychelles ($7 million)—and helped drive progress that includes monitoring and evaluation systems for the policy frameworks to ensure that they contribute to bolstering resilience over the long term. Preparation work for similar programs is now underway in Benin, Lesotho, and Madagascar as well.

East Asia and Pacific

East Asia and Pacific (EAP) has suffered the costliest disasters of any region as a whole, with disaster losses continuing to outpace economic growth in some subregions.[5] Annualized economic losses amount to more than $300 billion per year[6] when slow-onset disasters are taken into account. FY19 experienced its share of natural disasters. Lao PDR, Myanmar, Papua New Guinea, and the Philippines experienced severe floods, and Central Sulawesi in Indonesia was devastated by an earthquake, subsequent tsunami, and landslides. In terms of climate-related events alone, Southeast Asian countries often rank among the top 10 countries most affected globally.



Some highlights of work in the region include:

- Following the earthquake in September 2018 in Central Sulawesi, existing activities on strengthening urban flood mitigation and emergency preparedness quickly expanded to include priority investments to support at least 7,000 disaster-affected households. Technical assistance was instrumental in mobilizing nearly $100 million in emergency funds to finance immediate recovery, as well as the preparation and implementation of an IBRD-funded $150 million Central Sulawesi Rehabilitation and Reconstruction project.
- In **Lao PDR**, a government-led post-disaster needs assessment (PDNA) was completed following heavy flooding in July and August of 2019. The exercise included the analyses of disaster impacts on employment and livelihoods, with particular attention to gender, disability, and child protection aspects. The PDNA helped mobilize more than $54 million in recovery and reconstruction funds and informed the design of a recovery strategy to support the most vulnerable. It also helped advance policy reforms and strengthen financial preparedness. Also in Lao PDR, GFDRR is supporting technical assistance to guide a $10 million investment program to modernize hydrometeorological services and improve forecasting capacity and early warning systems.
- Risk considerations are now being integrated into existing and planned infrastructure investments in **Indonesia, Samoa, Tonga, and Vanuatu**. A particular area of focus is the construction industry. For example, in Vanuatu, where retrofitting and reconstruction are taking place following Cyclone Pam, new standards are being used to ensure that new infrastructure is cyclone proofed. Additionally, in Indonesia, following the Central Sulawesi earthquake, seismic resistant standards are increasingly being used to ensure the safety of occupants and the business continuity of key buildings.
- In **Cambodia** and **Myanmar**, disaster and climate risk considerations are being integrated into road infrastructure projects. In Yangon, a vulnerability assessment of the water supply network is helping to change thinking about how to protect the functioning of critical municipal services during adverse natural events.
- In **Samoa** and **Tonga**, work is underway to ensure systematic inclusion of gender considerations and universal access in the reconstruction and repair of school infrastructure.
- In the **Philippines**, the government is designing a large program to address seismic risk in the Greater Metro Manila area. Work is underway to prioritize the retrofitting of public infrastructure for schools and hospitals, and to identify critical investments needed to strengthen the capacity of emergency services.
- In **Vietnam**, municipal authorities in Hanoi are developing an investment proposal for drainage and sewage treatment infrastructure meant to strengthen both flood resilience and ensure water quality.
- Ministries of finance in **Cambodia, Lao PDR**, and **Myanmar** continue to work on the development of a regional disaster risk insurance pooling mechanism, under the Southeast Asia Disaster Risk Insurance Facility (SEADRIF). The SEADRIF platform was recently established in Singapore to help countries better access the private catastrophe insurance markets.
- **Indonesia** advanced work on developing its first national disaster risk finance and insurance (DRFI) strategy.

[5] Germanwatch, Global Climate Risk Index 2019.
[6] UN Economic and Social Commission for Asia and the Pacific, 2019.

In Focus Designing and building climate-resilient bridges in Vietnam

Cinematic shot of a bridge near Can Tho. Photo: helivideo.

Results in Numbers

Nearly **200 officials** trained in international best practice on climate-resilient bridge construction

Over the past three decades, Vietnam has come a long way in charting a path toward a sustainable and inclusive future. Determined to maintain and even accelerate this progress, the government has been making big investments in its transport infrastructure to keep up with the country's rapid economic growth and highly ambitious development goals.

The impacts of a changing climate are only heightening the urgency of strengthening Vietnam's transport infrastructure—including the vast network of bridges which provide a vital economic link and mode of travel in this country crisscrossed by rivers and canals. As a result of extreme weather, exacerbated by climate change, the country has been experiencing an increasing number of severe and sometimes fatal accidents involving temporary bridges that have collapsed during monsoon flooding.

Recognizing the need to tackle this challenge, the government of Vietnam, in partnership with GFDRR, is implementing a pilot for the design and construction of climate-resilient, ultra–high-performance concrete (UHPC) bridges. UHPC is a new class of highly durable building material which is more resilient to weather-related deterioration than conventional materials.

A key first step is the ongoing preparatory assessment of the financial and technical requirements of UHPC bridge construction. Once completed, the assessment will inform the development of a handbook detailing comprehensive and country-specific guidance for UHPC bridge construction. A preliminary life-cycle cost analysis has been completed, which will be critical in planning UHPC bridge construction, operation, and maintenance costs. Results from the analysis indicate that the investment costs of UHPC bridges will be comparable to that of traditional concrete bridges in Vietnam.

In keeping with the national government's commitment to ensure that this initiative generates livelihood opportunities, the preparatory assessment is also looking into the feasibility of using Vietnamese materials in the production of UHPC, as well as the capacity of local manufacturers to produce this material.

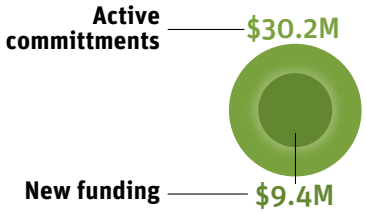
GFDRR has also been supporting government efforts to bolster expertise on climate-resilient bridges. Nearly 200 officials from agencies such as the Ministry of Transport and the Directorate for Roads of Vietnam participated in workshops on best practices for UHPC application to bridge construction, which included a high-level knowledge exchange in Tokyo with Japanese experts.

These preparatory efforts set the stage for the next phase of this initiative: the design and construction of pilot UHPC bridges in three provinces representing different topographies.[7] Construction of one of these bridges has just been completed, while the remaining two bridges are now nearing completion. The government plans to evaluate the outcomes and modify its handbook accordingly, prior to scaling up this initiative elsewhere in Vietnam.

[7] GFDRR's engagement to pilot climate-resilient bridges in Vietnam is closely aligned with the IDA-funded Results-based Operation for Local Bridge Construction and Road Asset Management (LRAMP), which is working to improve road and bridge connectivity in 51 provinces across Vietnam. Pilot bridge construction is being funded under that operation.

Europe and Central Asia

Disaster risks in the Europe and Central Asia (ECA) region are exacerbated by aging, inadequately maintained public infrastructure, lack of awareness of potential risks, and climate change. Where programs are more mature, a range of advanced and innovative measures are now in place. These include the generation of analytics and geographic information system (GIS) layers so that governments and local communities can better understand the risks facing them, mainstreaming of disaster risk management (DRM) into government policies, and the promotion of investments in critical infrastructure resilience to enhance urban and sector resilience.



Some highlights of work in the region include:

- In **Romania**, one grant informed three investment loans (Strengthening DRM in Romania; Strengthening Preparedness and Emergency Preparedness; and Improving Resilience and Emergency Response) which will help make 35 emergency facilities resistant to disasters; provide five million citizens with resilient fire, rescue, and emergency coordination facilities; and enhance preparedness.
- In **Turkey**, $560 million in additional IDA/IBRD financing was mobilized for the Sustainable Cities 2 Project. The project has a particular focus on integrating climate and disaster resilience and reduction in GHG emissions in critical city infrastructure. The grant funded activities to build the capacity of municipalities to assess multi-hazard and climate risk, develop resilient city strategies, and develop prioritized investment plans for risk reduction and enhanced preparedness. Across the region, municipalities are starting to integrate disaster and climate risks into the urban development and investment planning agendas.
- In **Azerbaijan**, the government is developing a comprehensive strategy document that addresses seismic risks faced by the housing sector, incorporating disaster resilience as an integral part of the strategy. The government of Azerbaijan is also committed to considering disaster resilience in a new housing policy which is under development. Disaster risk considerations, particularly earthquake risks, will be included in government interventions to address run-down housing. Certain building types, such as the pre-1990s multifamily apartment buildings, face seismic threats and require significant maintenance and repair. However, they are still highly sought after given their access to public transport and other amenities. There are positive developments—for example, seismic risk is increasingly considered in energy efficiency improvements which are common in these buildings in many ECA countries.

In Focus Tackling disaster vulnerabilities in Bosnia and Herzegovina's road network

Seven days after the flood. Photo: © Alen Ciric | Dreamstime.com.

Results in Numbers

26 senior officials trained on resilient disaster risk management practices

Bosnia and Herzegovina faces a multitude of natural hazards, such as earthquakes, droughts, floods, and landslides. In 2014, catastrophic floods killed more than 20 people, displaced 90,000, and severely disrupted the economy. The country's infrastructure, including the road system, was hit hard by the devastation. The national government has incurred a staggering $286 million in costs associated with repairing damaged roads.

As Bosnia and Herzegovina continues its drive to build back better and stronger after the floods, GFDRR is supporting the national government in strengthening its ability to understand and manage the country's climate and disaster risks, thus paving the way for a risk-informed approach to disaster and emergency preparedness.

In light of the importance of Bosnia and Herzegovina's road network for its growth and development prospects, a principal focus of this initiative has been supporting Bosnian authorities in mainstreaming disaster risk management into their road network management practices. Key first steps include a review of climate and disaster resilience strategies currently used by Bosnian road authorities, as well as a geographic information system (GIS) inventory and visualization of hazard, exposure, and vulnerability data related to the road network.

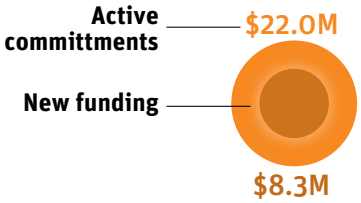
These efforts set the stage for a comprehensive climate and disaster vulnerability assessment of Bosnia and Herzegovina's road network. This assessment informed the World Bank's approval of $65 million in IBRD financing for the Federation Road Sector Modernization Project. Expected to be completed in 2021, the initiative is upgrading Bosnia and Herzegovina's transport infrastructure along priority transport links and bolstering its capacity for sustainable transport asset management.

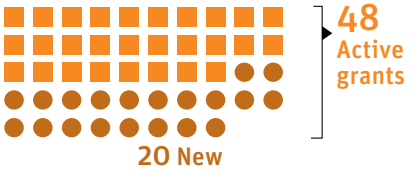
Strengthening the capacity and expertise of key government officials to understand and manage disaster and climate risks more broadly—beyond the country's road network—has also been a critical piece of our engagement. Over 24 senior officials from the country's civil protection and road sector authorities, including Public Company Roads of the Federation of Bosnia and Herzegovina (PC Roads), have participated in intensive workshops on critical disaster risk management issues ranging from vulnerability assessment to urban search and rescue.

Recognizing the value of taking lessons from Bosnia and Herzegovina's worst natural disaster in decades, the workshops have given participants the opportunity to take stock of the national and international response to the 2014 floods. Drawing on their enhanced understanding of the country's climate and disaster risks, Bosnian road sector officials have since taken the lead in formulating and implementing an action plan for resilience, covering areas such as governance, coordination, knowledge management, and asset management.

Latin America and the Caribbean

By recent estimates, Latin America and the Caribbean (LAC) is one of the most vulnerable regions to extreme weather events—five of the top ten countries most affected by climate globally are in the LAC region. The work that is being done to reconstruct entire nations and strengthen resilience, particularly in the Caribbean, is continuous. Efforts to mainstream resilience across development sectors are making significant progress, with ongoing country engagements broadening to include more in-depth policy reforms, as well as innovative applications of solutions for safer housing, insurance, quality infrastructure, and more resilient cities.





Some highlights of work in the region include:

- In the Commonwealth of **Dominica**, work is underway on resilient reconstruction and recovery planning in the housing sector, which was heavily damaged by Hurricane Maria in 2018. Technical assistance to support what is needed for a successful national housing recovery program are contributing to implementation of the $40 million IDA-financed Housing Recovery Project. The development of a Management Information System (MIS) through the grant will help improve adequate and transparent project beneficiary selection and support record keeping, compliance, and monitoring of project recovery activities.
- In the **Dominican Republic**, the government is working to broaden understanding of hazard risk and the potential financial and fiscal implications, the link between DRM policies and socioeconomic well-being, and the impact of adverse natural events on poverty. During the fiscal year, a Disaster Loss Assessment Tool—Sistema de Recopilación y Evaluación de Daños para la República Dominicana (SIRED-RD)—was developed and launched, providing users with the ability to quantify direct economic losses from adverse natural events in the country. Additionally, an econometric model was developed to improve understanding of the impact of disasters and climate-related shocks on poverty and other socioeconomic indicators in the Dominican Republic. Following this, the Ministry of Finance created a mechanism for the fiscal management of contingent liabilities associated with disasters.
- In Central America, stakeholders are working to analyze the most significant advances and shortcomings in key areas of disaster risk management (DRM). Integrating resilience into key infrastructure sectors has been identified as critical in facilitating policy dialogue on enhanced regional cooperation and promoting inter-sectoral resilience investments in the subregion. As a first step, a competition was launched for integrated designs of affordable resilient housing prototypes, which has provided solutions that can be applied globally.
- In **Colombia**, the Municipality of Cali is designing the first municipal school infrastructure plan, including programs to reduce seismic vulnerability.
- In **El Salvador**, an assessment identified local public investment projects that can boost sustainable economic development and resilience in select municipalities. These activities are serving as preparatory inputs into the IBRD-funded $200 million El Salvador Local Economic Resilience Project.
- In **Brazil**, state and city governments are strengthening institutional and technical capacities to mainstream disaster risk reduction into territorial planning, public investments, and public finances. This has further strengthened a partnership with the Southern Brazil Regional Development Bank (BRDE) in Porto Alegre to address the social impacts of floods.
- In **Bolivia**, national-, municipal-, and city-level entities are conducting technical evaluations of Santa Cruz's drainage network vulnerability and a preliminary linear park design for green spaces in El Alto, with the objective of increasing capacity to manage rapid urbanization, improve living conditions, and reduce hazards. Technical outputs have been used in preparing the IDA-financed Bolivia Urban Resilience Project, a $70 million operation to reduce vulnerability to hydrometeorological hazards and improve living conditions in specific municipalities.

In Focus Building volcanic resilience in Guatemala

Recovery efforts following the June 2018 eruption of Guatemala's Volcán de Fuego. Photo: World Bank.

Results in Numbers

Nearly **800 people trained** in volcanic resilience capacity building

In June 2018, Guatemala's Volcán de Fuego erupted violently, claiming the lives of at least 159 people and forcing the evacuation of over 3,000 people from their homes. Guatemala's deadliest volcanic disaster since 1902, the eruption also destroyed an estimated 8,500 hectares of corn, bean, and coffee crops, disrupting the livelihoods of families living close to the volcano.

Within days of the eruption, GFDRR supported the implementation of a rapid assessment that leveraged satellite data to estimate damages in affected areas. This was followed by a more comprehensive damage and needs assessment, which further informed the government of Guatemala's disaster recovery framework. These assessments proved invaluable to key national and international actors as they mobilized relief and recovery efforts in the immediate aftermath of the disaster.

Recognizing the importance of longer term volcanic risk reduction, the Facility was a key partner of the government of Guatemala as it embarked on the development of a national road map for volcanic resilience. Since adopted by the government, the plan outlines specific actions for achieving volcanic resilience in a range of critical areas, such as land use planning; strengthening the National Institute of Seismology, Volcanology, Meteorology and Hydrology (INSIVUMEH); fiscal risk management; and risk communication with local communities.

Guatemala's volcanic resilience road map proved critical to the Ministry of Finance's successful efforts to increase INSIVUMEH's 2019 budget. It also facilitated the preparation of Guatemala's second Catastrophe Deferred Drawdown Option (Cat DDO), a contingent line of credit which provides immediate liquidity following a disaster and, at the same time, supports key policy reforms to advance disaster risk management and climate adaptation.

Strengthening the capacity of local actors, from the national to the subnational levels, has been front and center at every stage of GFDRR's engagement. Four months after the eruption, more than 200 delegates from the Guatemalan government, private sector, and civil society attended an international volcanic resilience workshop in Guatemala City, which featured volcanic risk experts from eight countries. In total, nearly 800 people have participated in the volcanic resilience capacity building and training activities in Guatemala since the Fuego eruption.

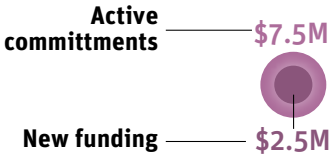
In line with the volcanic resilience road map, the technical assistance has enabled six municipalities close to the Fuego volcano to strengthen their land use planning. At the national level, GFDRR's support has facilitated the development of INSIVUMEH's institutional diagnostic that will inform its strategic planning, as well as the Ministry of Culture's integration of disaster risk management in the protection of the country's cultural heritage sites.

" It was not just an isolated activity but a comprehensive process that led to key institutional support. Our dream is that this help can be materialized in becoming a stronger scientific institution."

Juan Pablo Oliva, Director, National Institute of Seismology, Volcanology, Meteorology and Hydrology (INSIVUMEH)

Middle East and North Africa

Across the Middle East and North Africa (MNA) region, droughts, earthquakes, water scarcity, and heat waves continue to hamper development efforts and adversely impact livelihoods and economies. In FY19, weather extremes, such as torrential rains and floods, have affected tens of thousands—with many events occurring in contexts of fragility arising from conflict. Disaster recovery efforts have been underway in such countries, presenting more complex challenges and a need for coordinated efforts among additional development partners. Disaster risk reduction in urban areas remains a priority in this heavily urbanized region where many cities are significantly exposed to natural hazards.



Some highlights of work in the region include:

- In **Jordan**, technical assistance is helping to strengthen resilience in municipalities impacted by the Syrian refugee crisis. In addition to addressing concerns surrounding natural hazard risks and social tensions between refugees and host communities, national and municipal authorities received assistance in developing local solid waste management plans for all Jordanian municipalities, and stormwater management assessments were conducted for Mafraq and Irbid municipalities.
- In **Yemen**, as part of strengthening social resilience and inclusion, women and local communities are working to identify risk management mechanisms for conflict and disaster. They are also guiding decision-making processes for the restoration of critical urban services for water supply and sanitation, electricity, and transportation.
- Based on a first-of-its-kind regional capacity assessment of **Algeria, Bahrain, Djibouti, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Saudi Arabia, Tunisia,** and **West Bank Gaza**, governments are improving the institutional capacity of national meteorological and hydrological services. In partnership with the World Meteorological Organization (WMO), governments have drawn on analytical and advisory support as they formulate strategic capacity-building frameworks and deliver technical and management training of staff supporting operational change management. While initial gains may seem modest, the effort nevertheless represents a major milestone, with countries increasingly agreeing to promote interagency data sharing and management of climate-related data.
- On September 22, 2018, flash floods resulted from torrential rains, and almost one-third of the average annual precipitation fell in roughly five hours in northeast **Tunisia**. In the aftermath, a government-led rapid needs assessment, conducted in close partnership with the World Bank, the United Nations, and the European Union, identified nearly $100 million in recovery needs, primarily in the transport, housing, and agriculture sectors. In just one week, government officials were trained in assessment methodology, while data were collected during field visits and analyzed. Since completion of the assessment, disaster risk management (DRM) engagements in Tunisia have broadened to include discussions on developing comprehensive programs involving flood risk management, hydrometeorology and risk finance.
- In **Djibouti**, a rapid needs assessment conducted just after Tropical Storm Sagar in May 2018 identified approximately $30 million in recovery needs, primarily in the transport, water and sanitation, and housing sectors. The country has also developed an institutional framework for national disaster response and a national disaster communication strategy, and received advisory support in creating a disaster response fund. Efforts are also underway to update, streamline, and improve Djibouti's existing Civil Protection Disaster Emergency Plan to improve interagency coordination in future disaster responses.

In Focus Taking stock of challenges and opportunities for urban resilience in MNA: lessons from Beirut

Delegates at the Middle East and North Africa (MNA) Regional Urban Resilience Conference. Photo: World Bank.

Results in Numbers

49 high-level municipal and national representatives from 13 countries across the MNA region at the MNA Regional Urban Resilience Conference

(Djibouti, Egypt, Iraq, Jordan, Kuwait, Lebanon, Morocco, Oman, Saudi Arabia, Somalia, Tunisia, West Bank-Gaza, and Yemen)

Beirut, Lebanon's capital and home to more than a third of the country's citizens, is vulnerable to many natural hazards, including earthquakes, drought, flooding, and tsunamis. This exposure is further exacerbated by the impacts of climate change and the city's continuously growing population.

Recognizing the importance of addressing these challenges, the Municipality of Beirut worked with GFDRR and the World Bank to develop the Comprehensive Urban Resilience Master Plan for Beirut. The plan provides a road map for a resilient Beirut, and serves as a platform for securing both private and public investments to tackle the city's resilience needs.

Informed by a comprehensive analysis of the city's vulnerabilities and by inputs from a wide range of public, private, and nongovernmental stakeholders, the plan identified three priority areas for action: enhancing risk governance across the entire resilience cycle; reducing the risks posed by a multitude of shocks and stresses; and bolstering preparedness for major disasters by developing early warning systems and comprehensive plans for response and recovery.

As part of the initiative's second phase, the Municipality of Beirut, with support from the Facility and the World Bank, has been building on the information and risks identified thus far to conduct detailed micro-level hazard assessments. Seismic, tsunami, and coastal and urban flooding risks are now being assessed to inform Beirut's long-term development plan.

To share lessons learned from its Comprehensive Urban Resilience Master Plan, and to glean critical resilience insights from its peers in the region, the Municipality of Beirut organized the first Middle East and North Africa (MNA) Regional Urban Resilience Conference in April 2019. Supported by GFDRR, the World Bank, and the 100 Resilient Cities program, the conference provided an invaluable opportunity for 49 high-level municipal and national representatives from 13 countries across MNA, and resilience experts from beyond the region, to exchange perspectives and discuss solutions on how to chart a more resilient future for cities in the MNA region.

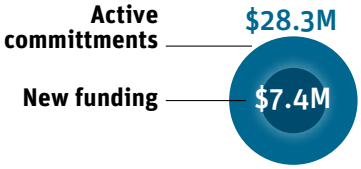
The conference concluded with a communique which distilled participants' shared understanding of urban resilience challenges, as well as practical recommendations for tackling these challenges. These recommendations offer a foundation for promoting and advancing the urban resilience agenda regionally, and evaluating progress in the discipline as it matures.

"The MNA Regional Urban Resilience Conference is the first of its kind in the region and will become, in its successive editions, an important platform for exchanging experiences and presenting successful international practices to build resilient societies capable of meeting the challenges of development and climate change."

—H.E. Ms. Raya El Hassan, Minister of Interior and Municipalities, Lebanon

South Asia

South Asia (SA) is prone to a range of seismic and hydromet hazards. Bangladesh, Nepal, and Sri Lanka are in the top 10 vulnerable countries to climate change. In India alone, FY19 saw devastating floods in Kerala and the landfall of tropical Cyclone Fani in Odisha state. The impacts of disasters are amplified by the region's rapidly growing cities, but progress is being made as countries and communities continue to invest in pre-disaster planning. GFDRR, for its part, is providing technical assistance to modernize hydromet systems, develop urban disaster risk management plans, plan and implement resilient reconstruction, support recovery planning, and introduce adaptive social protection solutions.



South Asia's urban population grew by 130 million between 2001 and 2011 and is poised to rise by almost 250 million by 2030.[8] This rapid growth presents multiple challenges, including pressure on critical infrastructure, an increase in multidimensional poverty, and lower capacity to cope with shocks. In FY19, technical assistance grants enabled countries and municipal authorities to assess vulnerabilities of critical infrastructure systems and to better target, design, and finance the preparation and implementation of urban resilience programs.

[8] World Bank: Leveraging Urbanization in South Asia: Managing Spatial Transformation for Prosperity and Livability (2016)

Some highlights of work in the region include:

- **Afghanistan, Bhutan, Pakistan,** and **Sri Lanka** all implemented measures to build capacity in utilities' inventory management and to comply with seismic building standards, following design and preparation in FY18. **Bangladesh** developed a guideline for Green and Resilient Special Economic Zones (SEZs) that will highlight ways to improve the use of natural resources, scale up competitiveness, and improve resilience to natural disasters and the impacts of climate change.
- In **Bangladesh** and **Bhutan**, investments in capacity development have been critical for the preparation of IDA-funded investment operations, such as the $3.8 million Hydromet Service and Disaster Resilience Regional Project. Building coastal resilience, strengthening climate information systems, and modernizing hydrometeorological systems have been the key elements of technical engagements in the region.
- In September 2018, the first South Asia Hydromet Forum, held in Geneva in partnership with the World Meteorological Organization, brought together key stakeholders such as heads of national meteorological agencies from eight South Asian countries to build on linkages of common interests, promote knowledge exchange, and foster innovation in hydromet, early warning, and climate services. The forum establishes an important milestone of closer collaboration among countries in the region, particularly given the political economy and the fact that it is the least integrated region globally.
- **Sri Lanka** and **India** are strengthening social protection systems through capacity building and analysis. India is supporting the integration of disaster assistance into the country's safety nets, particularly in coastal regions like Odisha and Andhra Pradesh. Not only India and Sri Lanka, but many countries in the region, such as **Maldives, Nepal**, and **Pakistan**, continue to express strong interest in exploring opportunities and developing strategies in disaster risk finance and structuring disaster responsive safety net systems to increase the resilience of poor and vulnerable households. Many countries are developing national social safety net systems, although investments in these are lower at 0.9 percent of GDP compared with the global average of 1.5 percent. By investing in preparedness and greater flexibility and scalability of the programs, safety nets can be very efficient to transfer resources to disaster-affected people.

In Focus Improving risk data for urban resilience in Colombo, Sri Lanka

Results in Numbers

175 risk data sets made available, including hazard information layers and exposure data layers

Built on a low-lying river estuary overlooking the sea, Sri Lanka's capital of Colombo is highly vulnerable to the risk of flooding, threatening the lives and livelihoods of over 5 million people who call the city and wider metropolitan area home. Changing weather patterns combined with haphazard land use are intensifying this risk. In recent years, flash floods have occurred in Colombo with worrying frequency, even before the onset of the monsoon season.

In response to these challenges, the Sri Lankan government has embarked on a highly ambitious urban resilience agenda for the Colombo Megapolis Region. Under the Japan–World Bank Program for Mainstreaming DRM, and with the support of GFDRR, task teams are working with the government to collect, share, and analyze risk data that will be key to moving this agenda forward.

Because of the significant uncertainty about the exposure of the Colombo Megapolis Region's assets to disaster, a top priority has been the development of a region-wide geo-database of exposed assets. Drawing on extensive stakeholder consultations, a first version of this geo-database, the Metro Colombo Spatial Data Platform (MCSDP), has been developed. Once completed, the platform will be a key tool in the government of Sri Lanka's efforts to integrate disaster risk into infrastructure planning.

The Facility has also supported efforts to strengthen the Sri Lanka government's national risk data platform called RiskInfo, which was initially developed in partnership with the Open Data for Resilience Initiative (OpenDRI). Since it was first piloted in 2012, RiskInfo has become a one-stop shop for collecting and sharing hazard, exposure, and risk data in Sri Lanka. RiskInfo now includes nationwide impact maps for floods, landslides, and droughts from over the past three decades, and is available in GIS-compatible formats that can be used by relevant government agencies for their resilient planning efforts.

In conjunction with initiatives to expand the government's repository of risk data, GFDRR has also worked to strengthen the capacity of key development planners from various sectors to develop sector plans informed by disaster risk information. In FY19 alone, over 24 technical officers received training on mapping disaster exposure and using the maps for sector-specific development plans.

To ensure the long-term sustainability of its efforts, the Facility is striving to align its activities with the Sri Lanka National Spatial Data Infrastructure (SL-NSDI), the national government's program for optimizing the development and sharing of geospatial data across public agencies and institutions.

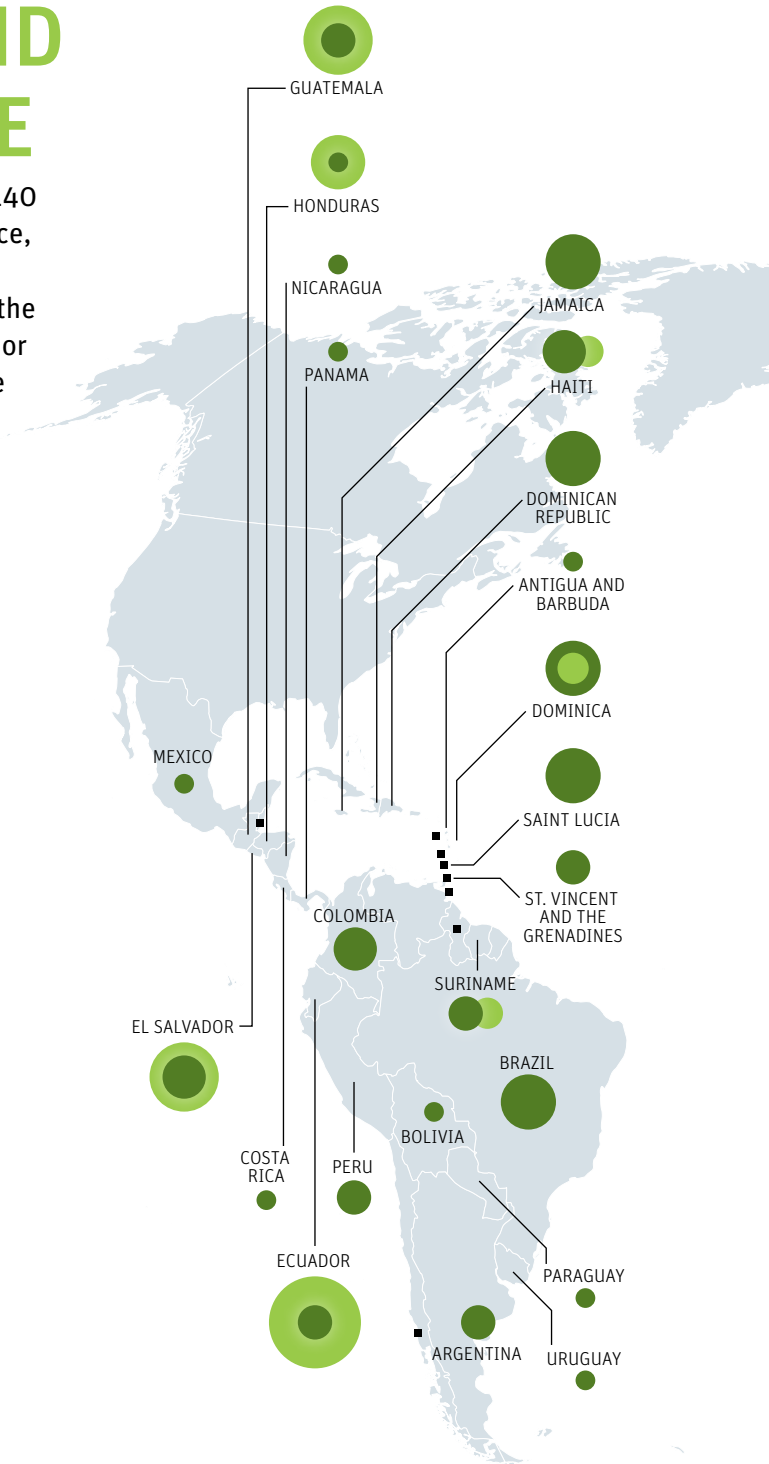
GFDRR support has also informed the World Bank's recently approved $310 million loan to improve weather forecasting and early warning systems in priority river basins, and to reduce flood risks in the Colombo's lower Kelani basin.

"RiskInfo transformed the sharing of disaster-related spatial data among different agencies. Earlier, these data were scattered among many agencies and not accessible at one place online. This platform will encourage people to use hazard and exposure data in planning and designing of development investments to make them more resilient to natural hazards."

—Srimal Samansiri, Assistant Director—Research and Development, at Sri Lanka's Disaster Management Center.

FY19 PORTFOLIO AND LEVERAGED FINANCE

GFDRR's FY19 portfolio of nearly 370 grants covered over 140 countries. Many of these grants leveraged additional finance, helping to bring resilience to scale. This map illustrates GFDRR's FY19 in-country and regional grant activities and the $7.6 billion in leveraging they have helped inform, enable, or co-finance. For more information on leveraging through the FY19 portfolio, see page 98.



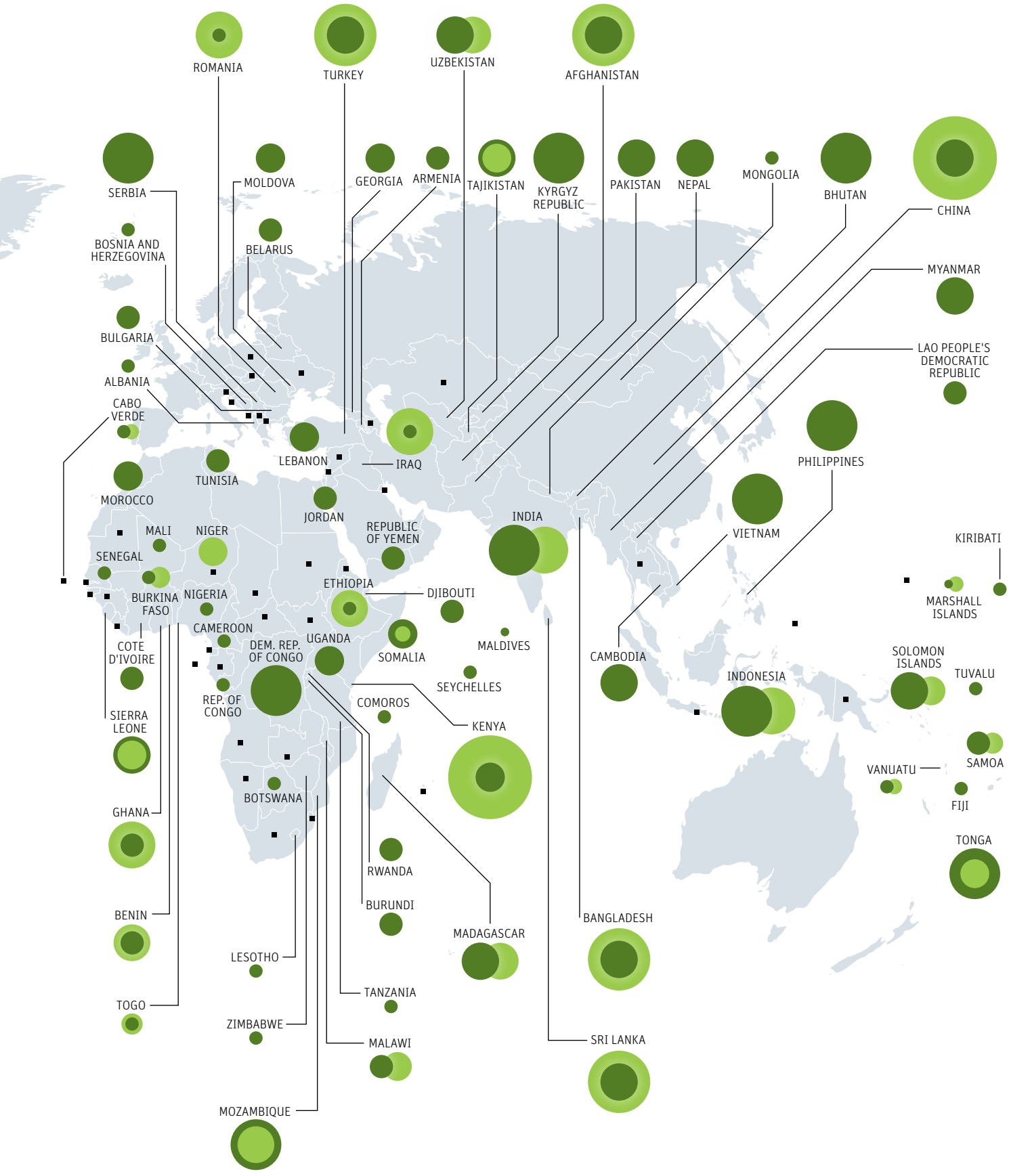
GRANT AMOUNT
(dark circles)

- < 100k
- 100-499k
- 500-999k
- 1-1.4m
- 1.5-2.9m
- 3-9.9m
- > 10m

FY19 APPROVED LEVERAGED FINANCE
Million $
(light circles)

- ≤ 10m
- 10-35m
- 36-89m
- 90-149m
- 150-299m
- 300-999m
- > 1000m

■ Countries benefitting from global or regional grant activities


ROMANIA
TURKEY
UZBEKISTAN
AFGHANISTAN
SERBIA
MOLDOVA
GEORGIA
ARMENIA
TAJIKISTAN
KYRGYZ REPUBLIC
PAKISTAN
NEPAL
MONGOLIA
BHUTAN
CHINA
BOSNIA AND HERZEGOVINA
BELARUS
MYANMAR
BULGARIA
LAO PEOPLE'S DEMOCRATIC REPUBLIC
ALBANIA
CABO VERDE
LEBANON
IRAQ
PHILIPPINES
TUNISIA
MOROCCO
JORDAN
INDIA
VIETNAM
MALI
NIGER
REPUBLIC OF YEMEN
KIRIBATI
SENEGAL
ETHIOPIA
DJIBOUTI
MARSHALL ISLANDS
BURKINA FASO
NIGERIA
CAMEROON
UGANDA
SOMALIA
MALDIVES
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SOLOMON ISLANDS
COTE D'IVOIRE
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INDONESIA
TUVALU
SEYCHELLES
REP. OF CONGO
COMOROS
KENYA
SIERRA LEONE
SAMOA
VANUATU
GHANA
BOTSWANA
FIJI
TONGA
RWANDA
BENIN
BURUNDI
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TOGO
ZIMBABWE
SRI LANKA
MALAWI
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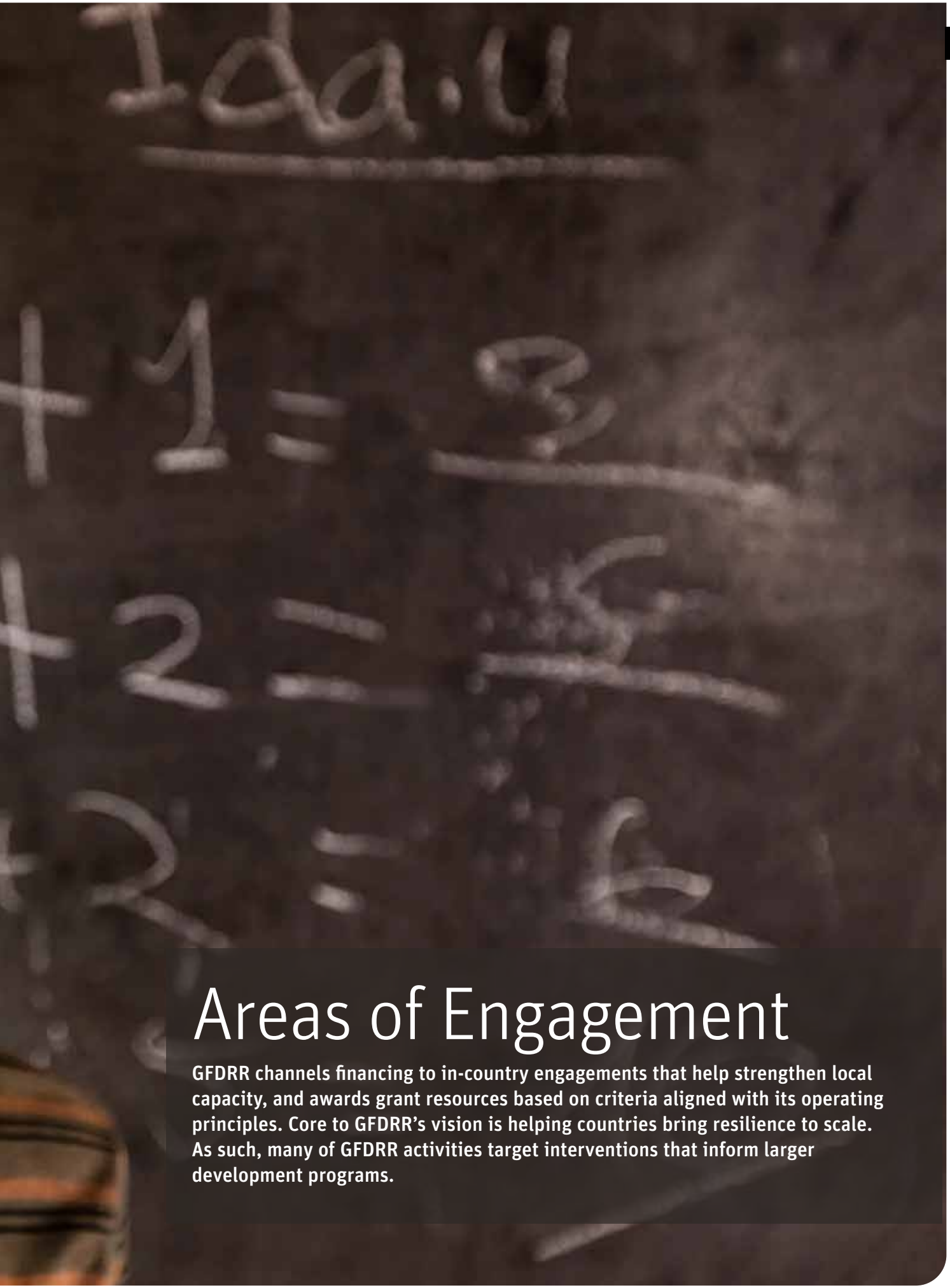


Areas of Engagement

GFDRR channels financing to in-country engagements that help strengthen local capacity, and awards grant resources based on criteria aligned with its operating principles. Core to GFDRR's vision is helping countries bring resilience to scale. As such, many of GFDRR activities target interventions that inform larger development programs.

Photo: hadynyah.

GFDRR Labs: Exploring New Solutions to Address Disaster Risk Challenges

The growing scale of disaster risk globally calls for a continued commitment to find new innovative approaches and promote interdisciplinary thinking. GFDRR Labs tests and applies promising new solutions from across the world to tackle disaster and climate risks. In FY19, Labs piloted new approaches from machine learning to design thinking in partnership with researchers, NGOs, and the private sector.

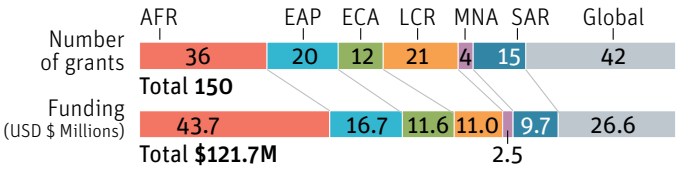
Helping local communities drive innovation

Partnering with community groups in 12 African cities, the Open Cities Africa initiative took on the task of collecting data on more than 500,000 buildings. The task of collecting data strengthened the next generation of African mapping and technology professionals.

The Labs team also explored new methods to foster innovation in response to urban flooding—a persistent challenge that hinders economic growth and quality of life in cities globally—through the first Understanding Risk Field Lab. Held in Chiang Mai, **Thailand**, in June, this month-long "un-conference" brought together 150 participants from 20 Asian countries to prototype new solutions to address urban floods: from participatory mapping techniques to 3D drone imagery.

The team continues to support spin-off Understanding Risk events across the world, with events held in **Barbados, Serbia, Tanzania,** and **Vanuatu** in FY19, and manages the online Understanding Risk community, which has grown to 9,000 members.

By region



Bringing new technologies to scale

The Challenge Fund program piloted new and innovative approaches to revolutionize risk financing mechanisms and better target funds to vulnerable communities. Projects focused on the implementation of early-action mechanisms into disaster risk financing instruments in **Indonesia**, use of big data and machine learning to optimize parametric risk transfer mechanisms in the **Dominican Republic**, and application to largely untapped risks, such as food insecurity in East Africa.

GFDRR also stepped up efforts to bring machine learning and earth observation data into the mainstream of disaster risk management. The team developed open-source tools to map historical flood extents, deforestation, and urban growth patterns using free satellite imagery from NASA and the European Space Agency and applied them to support some 35 cities in planning resilience actions. A new report, *Machine Learning for Disaster Risk Management: Using Data to Protect People Across the Globe*, published in March, aims to promote the responsible use of machine learning technologies.

The team organized two study tours to Silicon Valley for government delegations from **Bangladesh, Colombia, India, Romania,** and **Tanzania** to showcase the latest innovations in mapping, social media, drones, 3D printing, and artificial intelligence. Delegates visited Google, Facebook, Stanford University, Mapbox, and Planet, as well as local organizations that use these technologies in their work, such as the San Francisco Neighborhood Empowerment Network and the San Francisco Department of Emergency Management. These tours provided an opportunity for government counterparts to have access to information on the latest innovations and for tech companies to better understand local conditions and challenges in these countries.

Open tools for informed decision making

GFDRR's Labs team manages a number of open source tools to support decision makers in accessing information on disaster risk, including the Thinkhazard! platform and the GeoNode. Thinkhazard! had more than 192,000 users since May 2016 and more than 97,000 users in FY19 alone. The team also contributes to the global knowledge on learning and best practices in risk assessment methodologies. A review of risk assessment projects funded by GFDRR over five years was undertaken to understand the emerging challenges and trends. The review provided practical recommendations for conducting risk assessments that will inform future activities.

FY19 marked the launch of the #VizRisk Challenge, a partnership with Mapbox and the Data Visualization Society which explores the use of maps in creating narratives about disaster risk, with 250 participants from 60 countries. Participants used the latest in mapping software and narrative techniques to build compelling examples of how a detailed and visual understanding of risk can save lives and livelihoods in the aftermath of disaster.

In Focus Open data for urban resilience and disaster risk management in Africa

Africa Drone Service. Photo: Courtesy of Aziz Kountche.

Results in Numbers

Attributed data for more than 500,000 buildings

Mapped over 30,000 kilometers of road

Trained over **500 people** in digital cartography

Captured hundreds of square kilometers of drone imagery

Across Africa, urbanization is growing at an unprecedented rate. Urban populations are expected to double in the next 20 years, with some of the continent's largest cities now growing as fast as 4 percent each year. Lacking vital information on who, what, and where is at risk, urban planners and community leaders often struggle to manage urban growth in a way that fosters resilience to natural hazards and climate change.

Open Cities Africa supports locally led efforts in 12 Sub-Saharan African cities to systematically gather and share critical risk data. Led by the GFDRR Labs, the initiative connects local community members with geospatial experts and enthusiasts, catalyzing partnerships that have collected risk data in several of Africa's most disaster-prone areas, and subsequently making the data open and accessible through a range of user-centered platforms, from web applications like OpenStreetMap to paper atlases.

Using innovative approaches such as drone imagery capture and open source community mapping techniques, Open Cities Africa teams have collected data on more than half a million buildings, mapped over 30,000 kilometers of roads, and captured hundreds of square kilometers of drone imagery.

In conjunction with these efforts, 500 people have been trained in digital cartography. For young people among the ranks of Open Cities Africa teams, this serves as an invaluable opportunity to hone tangible skills that they can leverage in the growing geospatial technologies job market.

Through its commitment to nurture a vibrant community of practice for geospatial data practitioners across Africa, the initiative is laying the foundation for local citizens to sustain these efforts for the long haul. One example is the Pointe-Noire OpenStreetMap community in the Democratic Republic of Congo that went from zero local contributors in 2018 to over 50 mappers half a year later, all eager to continue the effort.

Governments, civil society, and the private sector are turning to the data in their efforts to address Africa's most pressing resilience challenges. In Tanzania, for instance, the local Red Cross is using real-time flood data to respond more effectively to flooding. In Liberia, the Monrovia City Council is now using Open Cities Africa maps to identify garbage collection points, thus strengthening its waste management practices. Meanwhile, in Ngaoundéré, Cameroon, community groups are utilizing paper atlases, also developed as part of this initiative to facilitate risk reduction efforts at the local level. The Open Cities Africa program is supported by Africa Disaster Risk Financing Initiative.

"Nothing can be done without the right information or the right data. The Africa of tomorrow is data."

—Gisèle Yela Hortense, in Charge of the Local Development Project, DURQuaP

Promoting Resilient Infrastructure

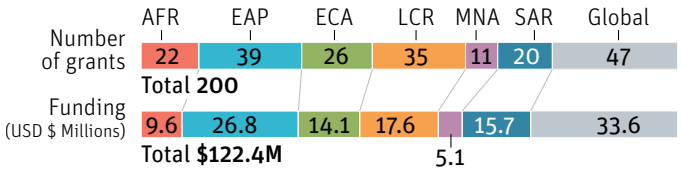
Infrastructure that is planned and designed without considering disaster risks is a major threat to life and assets and can delay recovery and have economic impacts. Disaster risks can worsen if the maintenance and the operation of existing infrastructure are inadequate. Without contingency plans, disasters can disrupt the continuity of public services and critical utilities, increasing societal and economic impacts (see *Lifelines* report pg. 67). GFDRR's Resilient Infrastructure program is mainstreaming disaster risk management (DRM) across multiple infrastructure sectors—from schools to transportation, water, and energy—promoting resilient infrastructure through knowledge and analytics and technical assistance.

Protecting children through safer schools

In FY19, the Global Program for Safer Schools developed global knowledge products and expanded in-country activities in 15 countries—**Benin, Cabo Verde, Colombia, the Dominican Republic, El Salvador, Jamaica, Malawi, Mexico, Morocco, Nepal, Samoa, Tonga, Vanuatu**, and in Europe and in Central Asia, including the **Kyrgyz Republic** and **Uzbekistan**.

During this period, the Global Library of School Infrastructure (GLoSI) taxonomy was expanded to include data about school infrastructure covering over 57,000 schools and 8 million students in **El Salvador, Nepal, Peru,** and the **Kyrgyz Republic**. GLoSI will provide increased access to knowledge and tools for governments to conduct risk analytics and design risk reduction solutions at scale.

By region



The program initiated a global study to identify the number of schools and students at risk, and investments needed to address the problem of school safety. Global estimates indicate there are 1.6 billion students, 124 million teachers, and 6.6 million schools. With many being at direct risk, it is estimated that the education sector may face on average 2,500 fatalities and $3–4 billion in economic losses annually due to earthquake and tropical cyclone events.

Scaling up the Resilient Transport Program

In FY18, the first phase of the Resilient Transport Program provided support to **Argentina, Brazil, Central Asia, Haiti, Mongolia, the Philippines,** and **Vietnam** to improve resilience across the life cycle of infrastructure investments. In FY19, these country engagements were enhanced to incorporate innovative solutions, such as quantifying the growing climate risks on transport networks with geographic information system (GIS)-enabled web visualization tools.

GFDRR also began supporting Small Island Developing States (SIDS) in the development of strategies and transition plans for strengthening the resilience of transport asset management systems in **Cabo Verde, Saint Vincent, the Solomon Islands,** and **Vanuatu**. This technical assistance will focus on enhancing resilience across all forms of transport infrastructure, and will expand technical assistance for roads, aviation, marine transport, railways, and intermodal connectivity, which is critical for logistics and emergency response activities in case of disasters.

Mainstreaming DRM in the water sector

In FY19, the Resilient Water Partnership Program was launched to mainstream DRM in Water Supply and Sanitation (WSS) systems, and in hydraulic infrastructure such as dams. In FY19, a total of $1.4 million was provided to **Bangladesh, Colombia, Indonesia, Botswana, Mozambique, Uzbekistan,** and **Vietnam** to integrate resilience measures in water projects. For example, the Participatory Gender Vulnerability Assessment was completed to assess the impacts of flooding and malfunction of WSS systems on vulnerable populations in Bangladesh, especially for women.

Under the Resilient Water Partnership Program, technical support was provided to **Lao PDR, India, the Philippines,** and **Sri Lanka** to increase the resilience of critical hydraulic infrastructure to natural disasters and improve the safety of communities downstream. Given the high hydrological and seismic risks of the project areas, activities are developing comprehensive risk assessment frameworks and probability failure models to protect nearly 30 million beneficiaries. Approved in FY19, grant support is informing $538 million in World Bank IBRD/IDA investments, including the perpetration of a new $167 million operation for enhancing integrated watershed and water resource management in Sri Lanka.

In Focus Managing transport assets for resilience in Ulaanbaatar, Mongolia

The panoramic view of the entire city of Ulaanbaatar. Photo: jaturunp.

Results in Numbers

Mapped **1,100 kilometers** of all paved streets and collected 340,000 street-view images

Ulaanbaatar, Mongolia, is a dynamic urban center in one of the least densely populated countries in the world. The city has seen marked population growth over the past decade, buoyed by a steady stream of internal migrants who are drawn to the opportunities of living and working in the country's political, financial, and economic hub. Since 2010, over 125,000 people have arrived in Ulaanbaatar, bringing its total population to 1.4 million.

A linchpin of the city's economic development, Ulaanbaatar's transport system is facing increasing stress from its rising population, which is likely to be exacerbated by the impacts of climate change. Despite improvements in recent years, its transport infrastructure still faces major challenges in access and connectivity, including in its underdeveloped road network.

Both the central government of Mongolia and the Municipality of Ulaanbaatar strongly recognize the importance of bolstering the long-term resilience of the city's transport infrastructure. GFDRR is supporting the municipality in building the city's first-ever comprehensive inventory of transport assets, such as roads, traffic signals and signs, pedestrian facilities, and bridges. This inventory will help officials track the location and condition of these assets, and maintain them and invest accordingly.

As a first step, this initiative piloted a crowdsourced mapping campaign, which mobilized residents of Ulaanbaatar to take street-view images of their city. Combined with the efforts of hired drivers, the public campaign mapped all 1,100 kilometers of paved streets in Ulaanbaatar and collected 340,000 street-view images.

Following the mapping campaign, a technical team is partnering with a consulting firm to build a tool to automate the process of classifying the conditions of these transport assets using street-view images. The city will be able to use the tool in the future to update the conditions of assets in the inventory with transparency and little cost.

In conjunction with this work, the technical team is also helping the municipality develop its first-ever transport asset management plan for climate resilience. This plan, of which a first draft has been completed, will help municipal authorities optimize the use of financial resources in the maintenance and repairs of their transport assets, thus minimizing risks and losses in the transport sector from climate-related disasters.

"In recent years, the Municipality of Ulaanbaatar has initiated and implemented a number of transport infrastructure investment projects. With the harsh climatic conditions and increasing frequency of climate-related disasters, the existing infrastructure is prone to rapid degradation. The World Bank support in this regard is timely and will benefit both public officials managing the city's transport assets and residents who rely on them daily."

—J. Togtokhbayar, Director of the Road Development Authority of Ulaanbaatar.

Scaling Up Engagements for the Resilience of Cities

Rapid urbanization is transforming the planet and the way we live: 3 million people move into cities every week, and by 2050, urban areas are projected to add an additional 2.5 billion residents. The greater concentration of people and assets can amplify the impact of disasters and a changing climate. Poorer segments of the economy are often particularly vulnerable, inhabiting more hazard-prone areas and lacking essential safety nets to recover from economic or environmental shocks.

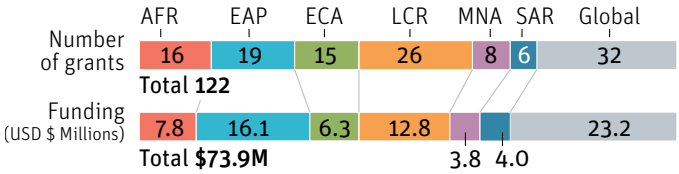
Investing in urban resilience is key to sustainable development and poverty reduction but the lack of financial and technical resources could hold cities back from pursuing a resilient future. The global need for urban infrastructure investment amounts to over $4.5 trillion per year, of which an estimated premium of 9–27 percent is required to make this infrastructure low carbon and climate resilient.[9]

As of FY19, 31 percent of GFDRR's active core program grants contributed to scaling up urban resilience. These covered 230 cities across 80 countries and included capacity building, improved resilience of urban services, flood risk reduction, coastal resilience, and emergency preparedness activities.

Some highlights of the work in FY19 include:

- In **Kiribati**, an ongoing grant is supporting climate resilience activities in dense urban settlements in low-lying atolls and helping inform the design of the pipeline IDA-funded South Tarawa Water Supply Project. Government officials were trained in the use of innovative technologies for urban management. Analysis and options were applied to evaluate the resilience of urban expansion/ settlement developments, helping to address vulnerability, urbanization, and climate adaptation.
- In the **Kyrgyz Republic**, government officials are working to promote resilient development in urban areas. Technical assistance funded by GFDRR has contributed to increased government awareness and knowledge of resilience principles in the areas of water management, seismic reduction in schools, and urban planning. Recently, a spatial and regional analysis was completed to establish a regional development framework for mainstreaming resilience.
- A new grant in **China** is integrating disaster risk management (DRM) into the World Bank's urban portfolio by enhancing the capacity of cities and related entities to manage climate and disaster risks. The grant has leveraged $4 billion in financing through 16 new, ongoing, and pipeline World Bank investment projects focused on China's urban areas. All leveraged projects plan to adopt three or more disaster risk reduction and recovery principles into their activities and promote resilient infrastructure and governance for risk-based planning and management.

By region



City Resilience Program (CRP)

The City Resilience Program has engaged with nearly 60 cities in 39 countries. This includes about a dozen new cities that were added in FY19. To help cities achieve bigger and better investments for a resilient future, the CRP has developed two programmatic tracks: Planning for Resilience Track which helps cities with project design and the Financing for Resilience Track which focuses on mobilization of funds for investment projects. In FY19 these two tracks were supported through special CRP events that created a platform for building partnerships and crowding in the private sector.

Building Regulation for Resilience (BRR)

In FY19, the BRR Program conducted localized and calibrated Building Regulatory Capacity Assessments in **India, Kenya, Malawi, the Maldives, Sri Lanka,** and **Zanzibar**, many of which informed ongoing or new World Bank DRM and urban lending operations to promote the effective building of regulatory frameworks. An assessment in Malawi supported in-depth policy and regulatory dialogues on the building code and is informing long-term implementation activities through the Malawi Flood Protection Project and IDA Development Policy Loan with Catastrophe Deferred Drawdown. In **Jamaica**, BRR published a study of informal builders to support the Jamaican vocational training system in developing effective training strategies for builders currently operating in the unregulated construction sector.

[9] GFDRR: Investing in Urban Resilience Report (2016).

In Focus Understanding and tackling disaster risks in Central American municipalities

Guatemala City. Photo: World Bank.

Results in Numbers

Nearly **1,000 people** trained on risk assessments and methodologies

Well above half of Central America's people now reside in urban areas, and that figure is projected to rise to 7 out of 10 people within a generation. This rapid process of often unplanned urbanization, compounded by the impacts of climate change, is leaving more people and assets exposed and vulnerable to natural hazards.

Funded through the Japan–World Bank Program for Mainstreaming DRM, assistance for national and local authorities to strengthen resilience at the municipal level is underway in Costa Rica, El Salvador, Guatemala, Honduras, and Panama. These efforts include development of disaster risk management frameworks and draw upon the Central America Urbanization Review, which provided a comprehensive assessment of country-level strategies and priorities.

National and local authorities across the region are increasingly taking action toward assessing and understanding disaster risks. Examples include a pilot study of landslide hazards in metropolitan Guatemala City and a flooding risk analysis of the Tocumen River watershed in Panama. In Honduras's Sulla Valley, municipal authorities are undertaking a risk analysis which considers the hazards that affect indigenous populations, an approach which could be replicated elsewhere in the region.

The development of municipal risk information is driving policy planning and dialogue for resilience at every level of government. In Guatemala, the pilot study of landslide hazards in Guatemala City is beginning to inform land use and risk reduction planning by the Mancomunidad del Sur, an association of six municipalities. At the same time, the pilot study has also helped cast the spotlight on the importance of understanding risk at the municipal level, informing ongoing discussions around proposed reforms to the country's disaster risk management law.

Technical assistance and training activities are also helping national and local leaders improve risk assessment and territorial planning, and to make better use of the information collected in order to advance municipal resilience. Nearly 1,000 officials and other key stakeholders from the private sector and civil society have participated in training activities on risk assessments and methodologies. In both Honduras and Guatemala, these activities have proved critical to ongoing efforts to institutionalize minimum standards for assessing local risks at the municipal level.

GFDRR funding for this initiative has informed the following World Bank lending operations: an IBRD-funded Disaster Risk Management Development Policy Loan with a Catastrophe Deferred Drawdown Option (Cat DDO) for Guatemala, the IDA-funded Honduras Disaster Risk Management Project, and the IBRD-funded Panama City Waterfront Redevelopment and Resilience Program.

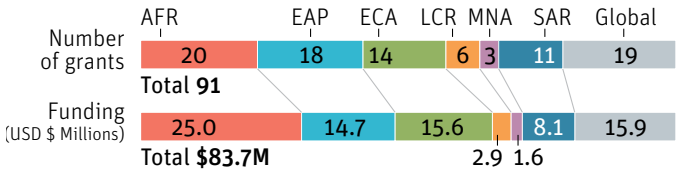
Strengthening Hydromet Services and Early Warning Systems

From record heat, wildfires, and rainfall in South America and Australia to extreme cold in North America, heavy snowfall in the Alps and Himalayas and from the warmest winter to the wettest summer, 2019 has been a year of extremes. Natural disasters have become a part of life for millions of people who need adequate, accurate, and timely weather information and early warning systems to help them make informed decisions to protect lives and livelihoods. Closing the capacity gap between the hydromet services of developed and developing nations remains one of the main objectives of the hydromet program and activities of the World Bank in collaboration with other partners, including the World Meteorological Organization (WMO).

Growing and modernizing the hydromet portfolio

GFDRR continues to support the hydromet program of the World Bank, which has grown by about $100 million in FY19, by providing technical expertise for project preparation and implementation, as well as financial support. One of the first-ever multi-phase programs was approved in **Sri Lanka** (IBRD-funded Climate Resilience Multi-Phase Programmatic Approach) which contains a hydromet component of $50 million and is focused on building the capacity of multiple government stakeholders to provide an impact-based forecast of high-impact weather, floods, and landslides. To help countries build robust early warning systems to address climate risks, GFDRR is also actively engaged in the Climate Risk & Early Warning Systems (CREWS) initiative by managing the program on behalf of the Bank, as well as providing technical inputs to the projects in the **Democratic Republic of Congo, Mali, Niger,** and the **Caribbean region**. In FY19, $10 million of CREWS became available for three new operations—**Afghanistan, Chad,** and **Togo**—led by the World Bank.

By region



Extending services through new partnerships and vision

In addition to building fundamental technical capacity in countries through World Bank hydromet operations, GFDRR has been instrumental in forming new partnerships with the public and private sectors and with academia within the Global Weather Enterprise (GWE). The Facility supported the work of the GWE Forum, an informal consultative body that includes representatives from public, private, and academic sectors, focusing on topics like operational sustainability of national meteorological services, as well as data access and management.

Through a grant, GFDRR supported a pilot in **Myanmar**, where the Department of Meteorology and Hydrology (DMH) worked together with a private company to learn how to use new tools to improve the quality and visualization of DMH's services to better address the needs of users. The results of the pilot have been positive and helped identify next steps for the public-private engagement.

This and other work on the public and private engagement (PPE) in hydromet services inspired the Facility to research how the PPE could be structured to increase countries' ability to provide weather services. The report, called *The Power of Partnership: Public and private engagement in hydromet services*, will be released in FY20. In FY19, GFDRR also launched a flagship publication called *Weathering the Change: How to Improve Hydromet Services in Developing Countries*, which built on the accumulated experience on how to modernize hydromet in low- and middle-income countries. It analyzes all phases of the value chain involved in the production and delivery of hydromet services, and provides insights into how to improve the skill, efficiency, and cost-effectiveness of national meteorological and hydrological services (NMHSs). The report explores new ways to build modern and efficient hydromet services that provide timely and adequate service to users. It was presented at various international events and was complemented by a tailored learning course for technical teams working on the hydromet operations.

In April 2019, GFDRR also facilitated the development of an Action Plan with the WMO and the World Bank to scale up and streamline collaboration between the two institutions. Key activities for the upcoming year are better coordination of activities in countries; greater use of the WMO technical expertise in the World Bank operations; and a more strategic approach to the modernization process of NMHSs, supported by development of clear benchmarks, roadmaps, and strategies.

In Focus Improving hydromet services in Moldova

Training of radar specialists and forecasters from the State Hydrometeorological Service of Moldova *Source:* R. Keene, Enterprise Electronics Corporation (EEC), 2018.

Results in Numbers

53 percent: percentage of key users fully satisfied with the hydromet information provided by the Moldova State Hydrometeorological Service (SHS)

Source: Zoï Environment Network

A landlocked country in Eastern Europe, Moldova is exposed to a myriad of natural hazards. Since 2008, floods and droughts alone have caused $1.2 billion in damage to the country's economy. An outsized portion of Moldova's population are dependent on agriculture for their livelihoods, making them highly vulnerable to weather-related hazards.

As Moldova braces for the impacts of climate change, timely and accurate weather information will be critical toward its efforts to prepare for and respond to the country's intensifying disaster risk. Against this backdrop, GFDRR has been working with the Moldova State Hydrometeorological Service (SHS) to improve the delivery of hydrological and meteorological (hydromet) services across the country.

A key focus of our most recent initiatives has been making hydromet services more relevant and responsive through the establishment of regular, multi-sectoral exchanges between information providers, led by SHS, and users of hydromet information. Following national consultation workshops, the government of Moldova's efforts to modernize its hydromet systems are now informed by a comprehensive national framework and action plan on weather and climate services, which was developed with the input of a wide array of providers and users from both the public and private sector.

Building on long-standing support for strengthening Moldova's hydromet observation infrastructure, including the installation of a modern Doppler weather radar at the Chisinau International Airport, GFDRR recently worked with SHS to implement improved verification and quality management systems. The promotion of transboundary cooperation with Romania, including through twinning arrangements which facilitate knowledge sharing, has been key in these efforts.

SHS is now better positioned to forecast severe weather and monitor its forecasting performance. It can also more reliably ensure that its products and services meet user demand and legal and regulatory requirements. According to a recent survey by the Zoï Environment Network, 53 percent of key users are now fully satisfied with the weather and climate information from SHS, which is a considerable improvement from years before.

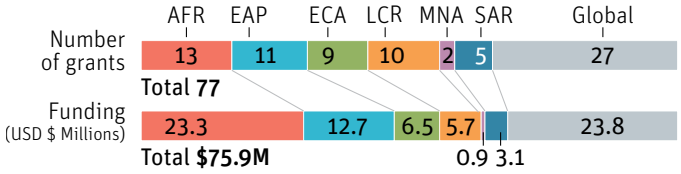
"GFDRR's support has allowed us to improve our service delivery and engagement with users, while also strengthening our technical capacities and working relationships with peers in Romania and beyond. The technical assistance was not only well-designed, but also integrated the most recent advances from the global hydrometeorological community."

—Dr. Violeta Balan, Acting Director, State Hydrometeorological Service

Deepening Financial Protection

Natural disasters inflict an average of $165 billion in financial losses worldwide each year, far exceeding available development funds. Country demand for climate and disaster risk financing solutions has evolved over the last few years, and now ranges from requests for developing financial protection strategies to implementing these strategies. FY19 saw a dramatic shift in the way in which GFDRR responds to these demands as scaled up support from partners allowed the program to move beyond stand-alone technical assistance focused on generating dialogue on this topic and building capacity, to larger investments in structured financial solutions for vulnerable countries.

By region



Over the last decade, resources from GFDRR have played an important role in initiating dialogue on the importance of prearranging financial solutions through a variety of different programs.[10] In collaboration with the World Bank's Disaster Risk Financing and Insurance Program (DRFIP), this has required working alongside countries to develop the analytics and tools needed for a stronger understanding of contingent liabilities. It has also required support for developing strategies that outline what countries can do to better plan their finances for smaller disaster events that they experience periodically, as well as less frequent larger events that, although less frequent, tend to impose higher financial impacts on economies and on people.

The nature of this technical work has varied across countries, depending on geographic and economic vulnerabilities. In middle-income countries such as the **Philippines**, where the notion of financial protection has matured with years of investment by government and development partners, the focus has been on sophisticated actuarial analyses that have increased government understanding on the country's exposure to natural disasters at the national and subnational levels. This work has in turn informed the design and development of a variety of financial solutions in which the country is investing, including the placement of a pilot subnational insurance transaction, where $206 million of insurance coverage against typhoon and earthquake risk was placed on the international reinsurance market a few years ago.

In lower-income countries, progress has been made on generating interest on the topic, and includes the design of risk-financing strategies and upstream analytics for monitoring hazards. In Africa alone, six countries—**Benin, Kenya, Lesotho, Malawi, Mozambique,** and **Senegal**—are either currently developing or already have fully developed strategies. At the same time, the uptake on developing actual financial solutions has been low for two main reasons: (i) a lack of financing for solutions such as reserve funds/ contingency budgets, contingent credit lines, parametric insurance schemes, catastrophe bonds, and so on, which require a significant upfront commitment of funds; and (ii) low technical capacity for design and implementation of financial solutions, which can be technically complex, particularly when countries first embark on a process to develop them.

To address these challenges and continue to move the financial protection agenda forward in countries where there is demand for these solutions, the Global Risk Financing Facility (GRiF)—a multi-donor trust fund housed at GFDRR and implemented by DRFIP—was launched last year. The primary objective of this program is to respond to requests from countries to move beyond the design and development of strategies to the tangible implementation of these solutions by providing the seed funding necessary to put actual financial instruments in place. This program directly co-finances the World Bank Group's IDA and IBRD projects, with grants to countries that range in the amount of $5–$25 million to support development of financial solutions. To ensure robust technical design and implementation support of instruments, the program also makes up to $4 million available for technical assistance that links directly to a financial solution being prepared by a country through the larger development operation.[11]

The topic of financial protection continues to gain momentum as a result of the increasing awareness of the need for early finance that can support early action, which can lower the devastating costs that disasters impose on lives, livelihoods, and economies.

[10] More information on EU-funded programs is available in the section on Financing Windows.

[11] More information on the program is available in the section on Special Programs.

In Focus Supporting the scale-up of post-disaster, social safety nets

Children from Samburu tribe, Kenya, Africa. Photo: hadynyah.

Results in Numbers

Analysis of macro fiscal impacts for post-disaster social safety nets in **7 countries**

Increasing recognition is seen across the globe about the importance of social safety net systems in strengthening the resilience of all people. In nearly a dozen countries in Africa, and East Asia and the Pacific, GFDRR works with governments so that they can make more informed financing decisions about how to adopt or scale up social safety nets that can respond to the needs of the most vulnerable in the aftermath of a disaster.

GFDRR's engagement focuses on helping countries navigate the issues and challenges surrounding the financing of post-disaster social safety nets. In seven countries (Eswatini, Fiji, Lesotho, Kenya, Malawi, Senegal, and Uganda), support from the Facility has made possible the development of macro-level analyses that broadly quantifies the fiscal impacts of adopting or scaling up post-disaster social safety nets possible. These analyses are already informing ongoing dialogue on post-disaster social protection in each of these countries.

In Kenya, the government is now using analytical tools that are helping decision makers assess the trade-offs between various options to finance the costs of safety net response. Under the umbrella of the country's flagship Hunger Safety Net Programme, a tailored assessment tool is now being used by the national government to determine the optimal financing instruments for scaling up post-disaster social protection in northern Kenya. This tool analyzes multiple financing instruments—such as contingency funds, sovereign insurance, post-disaster budget reallocation, and external donor support—to determine the optimal financing mix.

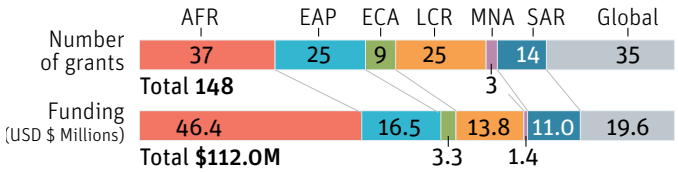
Recognizing that financing post-disaster social safety nets is a complex and evolving area of work, GFDRR's engagement also puts a heavy emphasis on gathering and sharing practical and relevant knowledge. In Cambodia, Kenya, Malawi, and Sierra Leone, for instance, the Facility has supported the development of comprehensive policy notes that consolidate lessons learned from the field. A six-step guide that offers guidance on how to develop shock-responsive safety nets has also been prepared. In addition, an interactive game has been developed that gives users hands-on experience in navigating the challenges and opportunities of financing a disaster or emergency response through a safety net.

Financing issues and challenges are only one piece of the puzzle for governments striving to leverage social safety nets for resilience. These efforts are designed to complement country-led initiatives, undertaken with World Bank support, which advance other critical building blocks for developing post-disaster safety nets such as the appropriate targeting and delivery of social protection systems. These initiatives include the Kenya Social and Economic Inclusion Project (KSEIP) and the National Safety Net Project in Sierra Leone, both of which are funded by IDA.

Building Social Resilience

Poor communities and groups that are socially marginalized are particularly vulnerable to the impacts of natural hazards and climate change. GFDRR is working to improve understanding of the social dimensions of risk and the drivers of vulnerability to enhance resilience strengthening investments. This involves promoting socially inclusive processes to mobilize and make visible the expertise of communities in strengthening resilience so that they work in partnership with local and national authorities.

By region



Support for social resilience and community-focused activities is core to GFDRR's mandate. Throughout the portfolio, 15 percent of core program funding supported activities at the local level, and over 50 percent of core program grants report communities as beneficiaries. Additionally, nearly 40 percent of core program–funded grants contributed to building resilience at the community level.

Empowering communities at local level

In **Kenya**, GFDRR is supporting efforts to strengthen the capacity of four county governments to combine locally led disaster and climate risk management into integrated development plans in partnership with communities. The grant is complementing funding for the Kenya Accountable Devolution Program (KADP) trust fund, which has introduced a County Climate Change Fund mechanism and will support efforts to help communities understand climate and disaster risk and jointly plan to address identified risks.

In **Somalia**, a newly funded grant will address multiple risks that vulnerable people, particularly women, face in internally displaced people (IDP) camps by improving livelihoods and economic opportunities. Economic empowerment activities will be a focus for strengthening household financial stability and minimizing exposure to violence; while the project will also work to address underlying gender norms, dynamics, and behaviors that perpetuate violence in the home.

Increasing citizen engagement in managing risk

In Asuncion, **Paraguay**, GFDRR is supporting citizen engagement to build resilience of poor and marginalized families living in the urban slums of the Paraguay River floodplain (Bañados). For the first time, comprehensive, reliable data on flood-affected people in the Bañados and temporary shelters are publicly available through a digital AsuParticipa platform. Additionally, improved tools for effective community participation are being developed for management of flooding at the local level. So far, a comprehensive municipal regulation on Consultation and Redress Mechanisms and Resettlement for Asuncion is being prepared, which includes a plan for the coastal strip.

In **Zimbabwe**, the Facility supported efforts to enhance citizen engagement in local service delivery and disaster response. Case studies were developed to document citizen-state interactions around water, agriculture, and disaster response, including access to and satisfaction with services and channels for feedback. In addition, a national survey of 2,400 households on service delivery and citizen engagement served as an input to the Joint Needs Assessment for Zimbabwe conducted by the World Bank, the African Development Bank, and the United Nations. Finally, citizen engagement inputs informed the preparation and design of the $72 million IDA-funded Zimbabwe Idai Recovery Project, which is addressing resilient disaster recovery needs of cyclone-affected people in the country.

In FY19, technical support on social resilience has influenced a regional study on community resilience in the Pacific, covering **Kiribati, Samoa, the Solomon Islands,** and **Vanuatu**. The objective of the study is to assess and compile lessons learned from the design and implementation of community-led projects incorporating climate and disaster resilience in the Pacific. Once the study is finalized, it is expected to inform future community climate and disaster resilience engagements in the Pacific and other regions.

In Focus Building resilience from the bottom up in the Solomon Islands

A household in the Solomon. Photo: World Bank.

Results in Numbers

Overall, **64,000** people benefited from community-led resilience projects

Nearly **70** community-led resilience projects were supported

7 seismic and volcano monitoring stations were supported

Located in the Pacific Ring of Fire, the Solomon Islands are highly prone to natural hazards. Each year, the country incurs an average loss of $20 million as a result of earthquakes and tropical cyclones alone. Ranked among the top 10 countries with the greatest exposure and vulnerability to disaster, the Solomon Islands face the specter of more severe weather extremes as a result of climate change.

Recognizing the importance of building resilience from the bottom up, GFDRR supports efforts by the government of the Solomon Islands and select provincial governments to engage with communities in the Pacific Island nation so that they can take the lead in managing disaster and climate risks closest to home.

With the support of the ACP-EU Natural Disaster Risk Reduction Program, nearly 70 community-level resilience projects are underway across the provinces of Central, Guadalcanal, Malaita, and Temotu. Local communities are at the helm of these efforts, helping to ensure that results and outcomes are sustainable over the long term.

One example of what has been achieved so far is a community-led effort in the village of Nanggu that has built 15 water standpipes, which provided water to 700 residents and strengthened their ability to cope with natural hazards. Overall, 64,000 people have benefited from the community-level projects, which also include earthquake retrofit strengthening or cyclone strengthening of buildings, foundation raising for flood alleviation, safe footbridges, community safe houses, and shoreline protection measures.

In view of the particular needs and vulnerabilities of women, the community-level projects put a heavy focus on ensuring that they have a key role to play in decision making during the project identification and selection process, as well as during design and implementation. Women are estimated to comprise nearly half of the direct beneficiaries of the project.

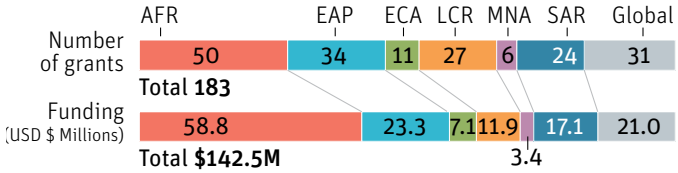
Taking a comprehensive approach to community resilience, the Facility is also supporting the national and select provincial governments in integrating disaster risk management in their policies and practices, including at the community level. For instance, this engagement has facilitated the development of nearly 80 community-based disaster risk management plans. It has also enabled the implementation of a revised national disaster management plan designed to strengthen the governance of this sector at the national, provincial, and local levels.

Further, technical assistance is also being provided to strengthen the Solomon Islands' climate and disaster risk information. The country's seismic monitoring infrastructure has been enhanced significantly, beefing up authorities' ability to detect seismic activity and disseminate early warnings to communities. A milestone achievement has been the modernization of the Ministry of Environment, Climate Change, Disaster Management and Meteorology (MECDM)'s risk information management system, making climate and disaster risk data much more usable and accessible for end users.

Promoting Resilience to Climate Change

Climate-induced disasters are having a profound impact in developing countries—either via extreme weather events or slow onset effects, such as rising sea levels and increasing temperatures. GFDRR helps countries reduce damages by increasing their understanding of risks under current and future climate conditions, promoting innovative solutions to reduce these risks, and assisting in the planning and design of climate resilient policies and investments.

By region



Integrating climate and disaster risks

The Resilience to Climate Change (RCC) initiative was set up in 2014 with funding from the Swiss Agency for Development and Cooperation Global Program for Climate Change (SDC-GPCC). In FY19, the RCC initiative came to an end. However, GFDRR continues to promote the integration of climate risks in its operations. In FY19, over 90 percent of newly approved grants included climate considerations, a significant increase from 77 percent in FY17 and 83 percent in FY18.

Since inception, the RCC initiative has financed a total of $13.5 million in grants—of which $9.2 million are under implementation until June 2020. The initiative has financed 26 technical assistance grants supporting nineteen countries, four regional projects, and three global projects for a total of $7.5 million. Further, the RCC Initiative has financed 65 Just-in-Time (JIT) grants amounting to $3 million, and provided an additional $3 million in support for three global programs: the Small Islands States Resilience Initiative (SISRI); the Nature-Based Solutions Initiative; and CityCORE Africa, a program aimed at enhancing coastal protection in urban areas in Africa.

Supporting a wider range of vulnerable sectors

In the last two years, GFDRR had a steady increase in the number of requests to support multi-sector and multi-country projects, engage with a wider set of actors, and work across silos and existing boundaries to find new solutions and advance practitioner-based knowledge. For example, in **Zimbabwe**, the Ministry of Water Resources and Climate, and the Ministry of Agriculture, together with the Zimbabwe National Water Authority, have taken an integrated approach to strengthening climate resilience in rural areas. A Climate Change Program and National Water Project is being implemented to improve resilience in watershed management and irrigation infrastructure, and to promote climate smart agriculture to address lower levels of rainfall and increasing temperatures.

Influencing World Bank operations

Many RCC-supported activities are still under implementation, but early results indicate that they are leveraging additional financing to scale up climate resilience in a number of ways. They are, for example, supporting investment projects that finance large physical and social infrastructure projects. In Uzbekistan, RCC helped pilot operational models for water utilities to better respond to water security issues that have now been scaled up to support the entire country through the $232 million[12] Water Services and Institutional Support Program funded by IDA. They are also supporting the development of policies to favor a more sustainable development agenda. In **Bolivia**, GFDRR financed a study on the immediate impacts of droughts and floods on welfare, assets, and livelihoods of the poorest population. This informed the $197 million Bolivia Disaster Risk Management Development Policy Loan funded on equal shares by IDA and IBRD to strengthen Bolivia's legal and institutional framework for managing disaster and climate risk.

RCC activities also support the generation of new knowledge to inform the resilience building activities of country clients. In the **Seychelles**, an integrated coastal risk assessment led to a better understanding of the current and future climate impacts on coastal waste management systems, informing the government's plans for future waste management activities, and the third phase of the $15.3 million Third South West Indian Ocean Fisheries Governance and Shared Growth Project funded by IBRD Trust Funds.

In FY19, a major contribution of this window of the Facility was influencing the design of World Bank policy frameworks, such as the second phase of the World Bank's Climate Change Action Plan 2019–2025, and the World Bank Action Plan on Climate Change Adaptation and Resilience, launched in January 2019.

[12] Financing includes $8 million from trust funds.

In Focus Making transportation climate resilient in Freetown

Freetown, Sierra Leone. Photo: World Bank.

"I see we are going in the right direction. We need to use more data for decision making. And we need more people locally that can collect and analyze the data to make the decisions."

—Professor Obafemi Davies, Head of Civil Engineering Department, Fourah Bay College

Freetown is a vibrant city of 1 million inhabitants, contributing to 30 percent of Sierra Leone's GDP, and located on a hilly peninsula surrounded by the Atlantic Ocean. It is one of the world's most vulnerable cities to the impacts of climate change, with floods and landslides compromising its transport system, which is so important for its economic development. During the rainy season, the already inadequate transport services, badly maintained infrastructure, and chronic congestion are exacerbated by floods, which hinder access to jobs, universities, and overall mobility in the city. The public transport services in Freetown are growing rapidly—both formally and informally. Lack of data and a poor understanding of the vulnerabilities of the transport system to climate-related hazards is preventing city planners from improving and developing a sound and resilient transport system to meet the growing demand.

To address those challenges the government of Sierra Leone, with support from the Facility, worked to gain a better understanding of the roads' vulnerability to floods and landslides and how climate change would affect the patterns and characteristics of those events. They collected data on public mobility on formal and informal transport systems and identified interventions to enhance the resilience of transport systems.

To promote the use of innovative approaches for data collection, the World Bank transport team in Sierra Leone partnered with students from the Fourah Bay College, the engineering university in Freetown, and the WBG's WhereIsMyTransport initiative. Mobile applications, such as the RoadLabPro, were used by local civil engineering students to map 4,038 km of formal and informal transportation systems. Flooded areas and the locations of critical road infrastructures, such as drainage and culverts, were also mapped. With this information, together with climate change projections for rainfall and sea level rise, researchers at the University of California Berkley developed risk maps for several scenarios and computed risk reduction for different road interventions.

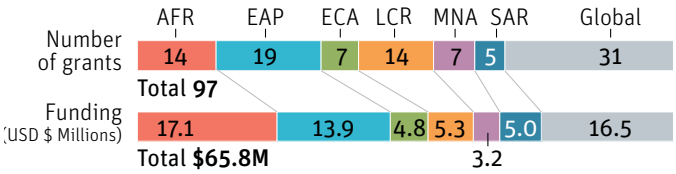
A Resilient Urban Mobility Hackathon was also organized in collaboration with the Directorate of Science Technology and Innovation. More than 110 talented young people mentored by experts gathered for three days to produce innovative solutions for challenges related to resilient urban mobility. Winning solutions that will be developed include an app for cashless payment systems for public transport with adapted features for people with disabilities; a platform that reports on important information for flood mitigation; and a bus routing system with emergency response features.

This work resulted in the first comprehensive climate risk–informed transport map of Freetown and will support decision making on everything from infrastructure and policies to journey planning. It has already informed the $50 million Integrated and Resilient Urban Mobility Project funded by IDA that will address identified challenges. Because the transport map is also publicly available, several developers across West Africa are building apps to support decision making and journey planning.

Enabling Resilient Recovery

As disasters increase, proactive planning to prepare for and respond to future emergencies, and to lay the groundwork for resilient recovery has become more critical. In FY19, efforts focused on the development and distribution of knowledge products to build the capacity of key stakeholders in planning for rapid and resilient recovery, and on strengthening the capacity of vulnerable countries for emergency preparedness. Of the active core program grants, 25 percent contributed to enabling resilient recovery in Africa.

By region



Supporting quicker recovery and preparedness for future disasters

In FY19, GFDRR trained 304 officials, including 100 women, on Post Disaster Needs Assessment (PDNA) and Disaster Recovery Framework (DRF) in six countries. The Facility also provided close to $3.5 million for 23 Just-in-Time and other grants to help more than 20 countries respond to disasters and better prepare for future events. This work informed $1.15 billion of World Bank investments in recovery during the year. The Facility also trained 267 client country participants and 466 World Bank staff on how to better use the Contingent Emergency Response Component (CERC). This is a new financing instrument which can be integrated into Investment Project Financing (IPF) in order to ensure that funds are available for urgent recovery needs in the aftermath of a disaster without the initial need for formal project restructuring.

Countries were also able to strengthen emergency preparedness and response systems through technical assistance and advisory activities. These focused on supporting the implementation of an investment planning exercise and the development of institutional arrangements, policies, and financing mechanisms. A total of 120 participants from client countries and 105 World Bank staff took part in emergency preparedness capacity building activities in FY19, which helped in designing practical but detailed strategies for resilience that address issues related to decision-making and set in place approaches to facilitate timely, adequate, effective, and efficient responses in the first hours following a disaster.

Informing more effective recovery

In collaboration with UNDP, the European Union, and the International Recovery Platform, in FY19 GFDRR helped to produce a set of recovery guidance notes outlining good practices for recovery focusing on social protection systems, private sector participation, communications, and the agriculture sector. An initiative on the nexus between disasters and fragility or conflict-affected situations was launched to begin applying disaster risk management (DRM) lessons and methodologies to fragility, conflict, and violence (FCV) settings, especially for post-crisis recovery. In FY19, this new program funded ten proposals from nine countries, and results will help to orient the scaling up of this initiative.

Finally, a new type of DRM workshop, called a Lessons Learned Exercise, was designed for **Tanzania**, which focused on revisiting the experience of the 2014/2016 floods events to develop recommendations for capacity improvements in the country based on the gaps identified by key stakeholders.

Coordinating global partnerships

The EU, UN, and GFDRR/World Bank continue to closely collaborate to mobilize partners and resources, and to better harmonize and coordinate post-crisis and post-disaster response frameworks. The coordination of resources for resilient recovery among these institutions and in close consultation with national governments ensures clear lines of communication and a shared approach during potentially chaotic post-disaster periods. In FY19, the World Bank, the UN, and the EU marked the 10-year anniversary of the adoption of a declaration that put standard procedures in place across the three institutions for post-crisis response, covering all activities from assessment to recovery. In May 2019, more than 1,000 stakeholders, practitioners, and policy makers came together in Geneva for the fourth World Reconstruction Conference (WRC4), to discuss inclusion for resilient recovery. The event coincided with the Global Platform for Disaster Risk Reduction and was jointly funded and organized by GFDRR, UNDP, and the European Commission, and hosted by the UNDRR.

In Focus Recovery and resilience in Lao PDR

The Old Bridge in Luang Prabang, Lao PDR. Photo: holgs.

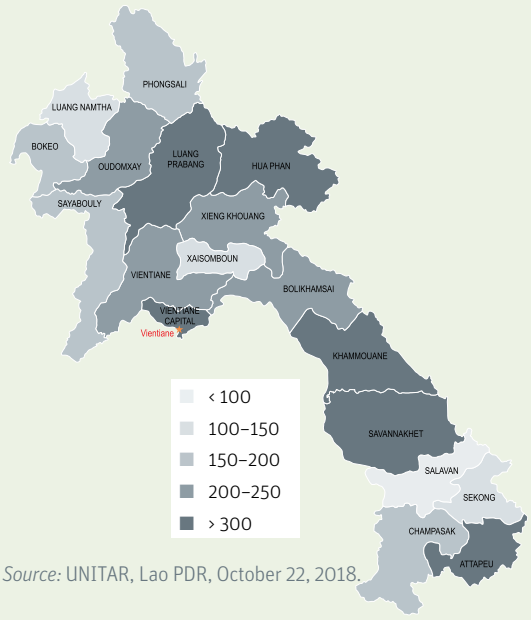
In 2018, Lao PDR suffered its most damaging and costly floods in a decade. Heavy rains from two tropical cyclones resulted in the collapse of a saddle dam in Attapeu province, which caused flash floods. Overall, 64 people lost their lives and more than 600,000 people across the country were affected. The destruction of farms and microenterprises, along with the disruption to social services, affected income sources and increased debt levels for the 70 percent of households already in debt. Vulnerable communities were particularly affected, especially with the displacement caused by the destruction of almost 1,700 houses.

GFDRR provided a Just-in-Time grant of $100,000 to help identify priority needs following the floods, together with technical support for a government-led Post Disaster Needs Assessment (PDNA). With support from the Facility, teams from the World Bank, the UN, and EU, worked with civil society organizations to assist the government with the assessment.

With close cooperation between the partners, an assessment was completed in less than a month. The PDNA report estimated total damages of $371.5 million, equivalent to 2.1 percent of the country's projected 2018 GDP, and 10.2 percent of Lao PDR's annual budget in 2018. Recovery needs were estimated at $520 million, with the highest impacts identified in the transport, agriculture, and waterways sectors. The PDNA highlighted actions for improving gender equality and child protection in the recovery process.

Since the assessment, the World Bank and the government of Lao PDR have been working to implement recommendations from the PDNA. The two hardest hit public sectors were transport and waterways, making up 75 percent of total damages. To provide immediate support for recovery and reconstruction, the World Bank is providing $51 million through project restructuring and special funding from the IDA Crisis Response Window for the rehabilitation of roads and embankments. The government allocated approximately $58 million in its budget, with specific actions based on the PDNA's findings. In addition, in line with the assessment's recommendation, the World Bank is preparing a Development Policy Operation (DPO) with a Catastrophe Deferred Drawdown Option (Cat DDO), which seeks to advance the disaster risk management policy agenda and provide immediate liquidity in the aftermath of a disaster.

Overall damage and losses by province (billion kips)



Source: UNITAR, Lao PDR, October 22, 2018.

Financing Windows

GFDRR is an umbrella trust fund that finances its activities from different sources of funds, including the multi-donor trust fund and special programs.

Flash floods the dangerous new normal in Bhutan. Photo: World Bank.

Multi-Donor Trust Fund

The Multi-Donor Trust Fund (MDTF) is the primary financing window for achieving GFDRR's mission and for implementing the Facility's strategy. A comingled pool of funding resources from Consultative Group (CG) members, the MDTF structure allows for the Facility to flexibly respond to country demand to scale disaster and climate resilience, and to respond and recover from disaster events. The MDTF provides funding for in-country engagements across all regions and thematic areas. It also supports analytical work, which continues to build the evidence base for building resilience; global dialogue on emerging themes in hydromet and early warning services for preparedness; continuous exploration of data science and innovative solutions for disaster risk management (DRM); and efforts to expand social inclusion and gender empowerment.

The MDTF is the main vehicle to support the Facility's governance structure, partnerships, and program management. Most grants are for in-country activities or engagements at the regional level, and they also provide funding for global public goods. At the end of FY19, the MDTF and related single-donor trust funds had an active portfolio of nearly $94.5 million through 202 grants.

Enabling disaster recovery and response

Drawing on its flexible nature, the MDTF often funds rapid response and recovery activities, such as the completion of post-disaster assessments and other essential diagnostic work. It also gives grants that assist countries in developing frameworks for resilient recovery and in strengthened capacity to manage future events. In FY19, GFDRR funded disaster assessments in 13 countries, including **Mozambique** and **Rwanda**. These activities helped mobilize over $1.5 billion in additional financing for recovery, reconstruction, and resilience.

Generating and sharing knowledge; driving solutions in resilience

GFDRR continues to invest in generating new evidence, tools, and analytics for better decision making around DRM and climate adaptation. The MDTF is the main source for GFDRR's analytics work, which has helped provide answers to some of the most pressing questions facing development practitioners.

In FY19, the Facility initiated a program on the nexus between DRM and fragility, conflict, and violence (FCV), bringing together experts in both fields to help countries better integrate good practices. The program has financed 10 projects, of which half are in Africa. In **Zimbabwe**, an FCV risk framework is helping to ensure that the ongoing cyclone recovery activities contribute to peace and stability. The MDTF has also helped GFDRR's Labs team explore the application of open-source machine learning and artificial intelligence to risk assessment. In FY19, the Labs team piloted use of new technologies for the development of risk financing mechanisms through a Challenge Fund competition.

Shaping partnerships and advancing the resilience agenda

The MDTF allows GFDRR to engage in the global resilience agenda and convene stakeholders to act. In FY19, it provided financing for knowledge exchange and events, including the 4th World Reconstruction Conference (WRC4), where over 1,000 practitioners gathered to share best practices and measure progress against the Sendai Framework. The MDTF also provided financing for regional events as part of the Understanding Risk Community, such as events held in **Barbados, Serbia, Tanzania,** and **Vanuatu** in FY19. The MDTF also funds partnership activities with bodies like the Global Weather Enterprise, an emerging association of the public, private, and academic sector for more accurate and reliable weather information.

Facilitating governance activities and measuring results

The MDTF funds core Secretariat activities, including those related to governance, monitoring and evaluation (M&E), and knowledge management. A multiyear effort to revamp its M&E system has enhanced the capacity to monitor portfolio progress, including the development of an evaluation policy for the Facility in FY19. M&E also tracks portfolio contributions to help developing countries achieve targets and priorities set out within the Sendai Framework for Disaster Risk Reduction.

MDTF for future resilience needs

Since FY16, MDTF has financed approximately 49 percent of the Facility's program. The current fund will be closing in December 2020, and a new MDTF is being established to support continuity of the program and to be the foundation of the financial architecture which GFDRR uses to help countries respond to, recover from, and build resilience to disaster events.

In Focus Building a resilient energy sector in Afghanistan

A team of specialists supported by GFDRR organized a training course in Kabul for the Afghanistan Land Authority (ARAZI). Photo: World Bank.

Results in Numbers

Risk projections for Afghan energy sector for up to **100 years**

In its drive to achieve broad-based and inclusive development, Afghanistan has been making marked progress in ensuring a reliable and sustainable energy supply for its citizens. The country is particularly susceptible to natural hazards like floods, droughts, and earthquakes, and the national power supply remains highly vulnerable to disaster risk; in 2015, an earthquake of 7.5 magnitude on the Richter scale caused widespread power outages in the capital of Kabul.

In partnership with the Afghan government, including the Ministry of Energy and Water and the national power utility (DABS), GFDRR has been supporting efforts to enhance the resilience of the country's energy system. In view of Afghanistan's diverse energy mix, these engagements span the country's power sector, from the grid-based system to solar to hydropower.

GFDRR is supporting vulnerability assessments of the resilience of the country's preexisting and planned energy facilities, including solar power plants, wind farms, and hydropower plants. The assessments are designed to analyze the impacts of natural hazards and climate change and include projections of risk over a 50- to 100-year period that covers the expected lifespan of these facilities.

Several technical vulnerability assessments have been completed, and these are already beginning to shape energy sector planning and investments by the Afghan government, as well as key development partners such as the World Bank and the International Finance Corporation. For example, the identification of hazard risk levels in an assessment of planned solar plants and wind farms is helping the Afghan government to identify the most suitable sites for these facilities, and to design appropriate climate adaptation and risk mitigation measures.

A team of specialists supported by GFDRR is providing technical assistance to Afghan government officials to help them apply the findings from the assessments. For instance, the team organized a training course in Kabul for the Afghanistan Land Authority (ARAZI), which covers social, environmental, and geophysical criteria for siting new solar plants and wind farms, among other key topics.

As this initiative enters a new phase, a key focus moving forward will be the development of an action plan for resilient energy in Afghanistan in collaboration with local partners. The plan will define and prioritize a set of measures to enhance the resilience of energy systems, covering key areas such as energy production diversification, renewable energy development, and water resource management. A vision paper for the resilient development of solar power in Afghanistan has already been produced and will inform the broader action plan.

EU-Funded Programs

The European Union (EU) has been a key partner of GFDRR since 2008. The EU is currently funding eight programs managed by GFDRR, three of which are managed in close collaboration with the Secretariat of the Africa Caribbean and Pacific (ACP) Group of States.

The **ACP–EU Natural Disaster Risk Reduction (ACP–EU NDRR) Program** was launched as an initiative of the ACP Group of States in 2011, with $74.6 million in contributions from the EU. The program helps enhance preparedness for natural disasters and mitigate impacts in ACP countries by supporting governments integrating risk management approaches into planning. In FY19, the ACP–EU NDRR Program awarded 25 projects, totaling $10 million. The program influenced over $108 million through five grants in additional financing from the World Bank and other development partners in FY19, and $3.2 billion since the program's inception. It is set to close in 2020,

In FY19, the program supported countries working to enhance disaster preparedness and response capacity, form urban development plans that incorporate disaster risk management (DRM), develop DRM legislation and climate resilience strategies, and strengthen coastal zone management. This support was given to **Benin, Dominica, Fiji, Grenada, Haiti, Kenya, Lesotho, Madagascar, Malawi, Mozambique, Senegal, the Seychelles, St. Kitts and Nevis, St. Lucia, St. Vincent and Grenadines, Tuvalu, Uganda,** and **Vanuatu**. In **Côte d'Ivoire** and **Mali**, governments received support for assessments following flood events, and in Sierra Leone, resilient recovery activities were implemented following mudslides.

The ACP–EU Building Disaster Resilience in Sub-Saharan Africa (SSA) Program was launched in 2015. It includes five result areas implemented by the African Development Bank (AfDB), African Union Commission (AUC), United Nations Office for Disaster Risk Reduction (UNDRR), World Bank, and GFDRR. The Facility implements the following two result areas, each worth $22 million:

(1) The **African Regional Economic Communities (RECs) DRM Program** contributes to disaster risk reduction (DRR) coordination, planning, and policy advisory capacities of four RECs—the Economic Community of Central African States (ECCAS), Economic Community of West African States (ECOWAS), the Intergovernmental Authority on Development (IGAD), and the Southern African Development Community (SADC). In FY19, the REC-led activities included facilitating the drafting of an ECCAS Strategy and Action Plan for mainstreaming gender in DRR and climate change adaptation policies. ECOWAS supported **Burkina Faso, Cabo Verde, The Gambia, Guinea, Mali,** and **Niger** to strengthen their DRR coordination mechanism and led a consultative process to form the regional flood management strategy. The IGAD team delivered trainings on hazard assessment and monitoring by using earth observation and GIS technologies in **Sudan, Somalia,** and **South Sudan**. SADC hosted meetings of the Regional Interagency Standing Committee on Disasters to coordinate responses to cyclones, droughts, and epidemics.

(2) The **Africa Disaster Risk Financing (ADRF)** Initiative is developing and implementing tailored financial protection policies and instruments in over 20 SSA countries to help them mitigate the socioeconomic, fiscal, and financial impacts of disasters. In FY19, the ADRF supported the development of a risk financing strategy in **Malawi**; new approaches for strengthening shock responsive safety nets in **Kenya**; and the establishment of similar programs in **Benin, Malawi, Niger, Sierra Leone, and Uganda**. It also continued the development of agriculture insurance programs in Kenya, and new agricultural insurance programs in **Rwanda, Uganda,** and **Zambia**. As of today, the ADRF Initiative has leveraged $516.27 million of financing from the World Bank and other donors.

The $6.6 million **EU-WB/GFDRR Global Partnership on Disaster Risk Financing Analytics** helps countries build financial resilience by improving their understanding of risk, and increasing their capacity to make informed decisions based on sound financial analysis.

The $11 million **EU–South Asia Capacity Building for DRM Program** supports hydromet service delivery and enhances capacity among regional bodies and the national disaster management centers. In FY19, most activities under landslide and geo-hazard risk management plans, particularly risk assessment and investment planning in **Afghanistan**, have been completed, along with pilot studies of satellite monitoring of deforming slopes in **Bhutan, India,** and **Nepal**. In Bangladesh, a technical assistance on landslide risk assessment and hotspots identification for mitigation were initiated in the Chittagong and Sylhet regions.

The $6.5 million **Serbia National Disaster Risk Management Program** is supporting the Republic of Serbia to enhance DRM and flood prevention systems. In FY19, technical assistance included flood hazard and risk mapping, initiation of hazard and risk assessment for the Tisa Basin, light detection and ranging (LiDAR) surveys and digital terrain model (DTM) production.

Two **additional programs for the Caribbean** were launched during FY19—see the "In Focus" section.

In Focus Partnership with the EU boosts resilience and adaptation in the Caribbean

Hurricane Irma destruction in the Caribbean. Photo: cdwheatley.

In 2017, the Caribbean was struck by two devastating Category 5 hurricanes, Maria and Irma. The storms again highlighted the need for enhancing capacity and cooperation in the region to respond to major disasters. Caribbean nations are actively working to strengthen resilience to the impacts of disasters and climate change, and while there has been significant progress in DRM, much work remains to be done. In FY19, GFDRR strengthened its partnership with the EU and the World Bank with the launch of two programs that will enhance the long-term resilience and adaptation capacity in the Caribbean to the benefit of the most vulnerable populations.

The €27.7 million Caribbean Regional Resilience Building Facility will support 15 countries with financial and technical assistance, enhancing regulatory and policy design capacity to mainstream resilience in key sectors; and the resilience of critical physical infrastructure, financial resilience, and availability of innovative disaster risk financing tools. It will also increase the affordability and uptake of the Caribbean Catastrophe Risk Insurance Facility. Activities will be coordinated with other ongoing programs in the Caribbean, such as the Global Risk Financing Facility (GRiF) and the Canada Caribbean Resilience Facility, and will include support for emergency preparedness in identifying and preparing financially viable investment projects, and for identifying financial protection at both regional and national levels.

The €3 million Technical Assistance Program for Disaster Risk Financing and Insurance in Caribbean Overseas Countries and Territories (OCTs), will help Caribbean OCTs better understand their contingent liability to disasters; provide an overview of financial protection tools available; assess the feasibility of participating in insurance mechanisms; develop innovative disaster risk financing options; and facilitate knowledge sharing among OCTs. This program will be conducted under the Caribbean OCTs' €36.7 million Resilience, Sustainable Energy and Marine Biodiversity (ReSEMBiD) program implemented by Expertise France, that aims to strengthen environmentally sustainable economic development in Caribbean OCTs.

In FY19, the focus has been to launch and set up the programs, draft implementation arrangements, and prepare the work plan for FY20.

"These programs are a token of solidarity of the European people, and recognition of the very difficult challenges the Caribbean nations face. Hopefully this support will enable people and businesses to be more resilient to climate change."

—Daniela Tramacere, EU Ambassador to Barbados, Eastern Caribbean States, the OECS and CARICOM/CARIFORUM.

Japan–World Bank Program
for Mainstreaming Disaster Risk Management in Developing Countries

The Japan-World Bank Program for Mainstreaming Disaster Risk Management in Developing Countries is a partnership between the government of Japan and the World Bank. The program is managed and implemented by GFDRR through its Tokyo DRM Hub. The program—launched in March 2014 with a cumulative $200 million contribution from the Ministry of Finance, Japan—has two objectives: support developing countries in mainstreaming disaster risk management (DRM) in national development planning and investment programs through World Bank operations, and connect Japanese and global expertise in DRM with developing countries and World Bank teams.

In five years of implementation, the program has supported 55 countries through 95 technical assistance projects now totaling over $100 million in grants. These projects have been key toward increasing country capacity for assessing and designing disaster risk management policy and solutions. This includes, for example, supporting the adoption of national policy frameworks for mainstreaming disaster and climate resilience across infrastructure and social sectors, and strengthening building codes and land use planning systems. Most notably, program activities have helped countries mobilize World Bank financing for resilient infrastructure investments.

In April 2018, building on these positive results, the government of Japan and the World Bank agreed to renew the Program for an additional five years through 2024. During this renewed phase, the program will continue to prioritize country demand for investment support in three key areas: (i) resilient infrastructure; (ii) risk identification, risk reduction, and preparedness; and (iii) disaster risk financing and insurance.

Technical assistance for developing countries

In FY19, the program approved 18 grants amounting to over $12 million. These new grant activities support 27 countries and address natural hazards that are of the greatest risk to client countries, such as flooding and other hydromet risks, multi-hazard events, and earthquakes. The program leveraged an estimated $2.9 billion in new, ongoing, and planned World Bank investment lending operations in FY19, amounting to more than 32 percent of the $9.2 billion that the overall portfolio has leveraged since its inception in 2014.

Sharing expertise and promoting partnerships

In FY19, as a key knowledge center serving the global DRM community, the Tokyo DRM Hub facilitated 29 expert exchanges bringing together 72 professionals from the public sector, 58 from the private sector, 37 from academia and research institutions, and 16 from civil society. The Hub also mobilized several Japanese experts from Tokyo University, Public Works Research Institute Japan, and Taisei Corporation, among others, to support the preparation and implementation of World Bank investment programs. Examples include:

In August 2018, the Hub deployed representatives of the Development Bank of Japan to **Indonesia** to present new and innovative approaches to green infrastructure and the financing of urban flood risk reduction investments in Bogor.

In November 2018, the Hub hosted a knowledge exchange with the government of **Vietnam** on the building of resilient bridges. Japanese professionals shared their expertise in and experiences of improving the disaster and climate resilience of infrastructure, and in particular, the construction of ultra, high performance concrete bridges.

- In April 2019, the World Bank's Urban Floods Community of Practice, the Tokyo Development Learning Center, and the Tokyo DRM Hub jointly organized a five-day workshop with World Bank teams and clients to develop a deeper understanding of urban flood risks, and to inform the design and implementation of ongoing or planned World Bank investments. Representatives from **Albania**, **Angola, the Democratic Republic of Congo, Jordan, Lao PDR, Myanmar, Panama, Paraguay, Turkey,** and **Vietnam**, participated in the training.

In Focus Railways to resilience: strengthening climate resilience of freight corridors in India

Railway station platform in New Alipur, Kolkata. India's national railway system is the fourth largest in the world. Photo: S B Stock / Shutterstock.com.

India is accustomed to dealing with major, recurring disasters, especially floods—the most common natural hazard in the country—and has for decades been investing in disaster management, reducing risk, and building resilience. One particular area of focus is the country's rail network, which is one of the most extensive in the world, transporting as many as 8 billion passengers annually, and 1.1 billion tons of freight (2016). Through initiatives under its priority area of Resilient Infrastructure, the Japan–World Bank Program provided significant inputs to increase the resilience of the rail network through the Climate and Disaster Resilient Rails Development Project.

A key area of this support is technical assistance that complements a $2.1 billion IBRD-financed Eastern Dedicated Freight Corridor (EDFC) Project. The grant is supporting the production of guidelines to incorporate disaster risk considerations into urban rail projects, and has also enabled the development of a report on weather hazards and levels of resilience of the existing railway infrastructure. The report, *Strengthening Climate Resilience of EDFC*, provides recommendations for appropriate early warning systems and measures for strengthening operational emergency preparedness and weather hazard resilience.

In addition, Makoto Shimamura, Director General of the National Research Institute for Earth Science and Disaster Resilience, travelled to India to share how Japanese railways are addressing disaster risks throughout the life cycle of infrastructure assets. Measures include improvements to inspection procedures, asset protection, repair and replacement processes, and the establishment of countermeasures at the operational and regulatory level. He also participated in stakeholder consultations focused on assessing the resilience of existing Indian rail infrastructure and practices to temperature variation, floods and fog, and shared international best practices. He contributed to the discussions on strengthening early warning systems and operational emergency preparedness across the 1193 km of the EDFC.

In March 2019, the recommendations of the *Strengthening Climate Resilience of EDFC* report were presented as key inputs at a session on Resilience of Ports, Railways & Freight Corridors during the 2nd International Workshop on Resilient Infrastructure in New Delhi. These recommendations are now playing a foundational role in guiding the government of India's investment decision to increase disaster and climate resilience under the EDFC. The engagement itself has potential to be scaled across the entire EDFC and into other Dedicated Freight Corridor sections across India, and is generating considerable interest within the rails sector.

Women working at a nutmeg factory in Grenada. Photo: Ana del Castillo / Shutterstock.com.

Special Programs

In addition to the GFDRR MDTF, Japan-World Bank Program, and EU-funded programs, GFDRR manages other purpose-built financing windows which focus on particular areas of engagement or regions, but operate under, and are aligned with, the umbrella structure of the Facility. In FY19, two new financing windows were launched—the Global Risk Financing Facility (GRiF) and the Canada Caribbean Resilience Facility (CRF). These two new programs join the Climate Risk and Early Warning Systems Initiative and City Resilience Program.

The Global Risk Financing Facility (GRiF)

GRiF was launched in 2018 with an objective of helping to strengthen the financial resilience of vulnerable countries by supporting earlier and more reliable response and recovery to climate and disaster shocks and, over time, to a wider range of crises. Within the World Bank, the program is jointly led by GFDRR and by the Disaster Risk Financing and Insurance Program in the Finance, Competitiveness, and Innovation Global Practice. Grants co-finance World Bank investments that: (i) establish risk financing mechanisms (e.g., up-front costs of setting up different instruments); (ii) share the cost of risk financing mechanisms (e.g., co-payment of insurance premiums); and (iii) provide technical/financial resources to improve delivery channels for response and recovery.

In its pilot year of implementation, two IDA grants were approved with World Bank co-financing. In **Mozambique**, a grant of $8 million co-financed a $90 million disaster risk management operation that was approved in March 2019. This project, a Program for Results (P4R) operation, includes two financial instruments for disaster response. One is a contingency fund capitalized with IDA funds and the national budget, and mobilized to respond to recovery costs of Cyclone Idai. The other is a sovereign risk insurance scheme, which is being prepared with the GRiF grant. The grant is providing technical assistance of $2 million to set up a sovereign risk insurance scheme for either cyclone or drought, and co-financing premium payments of $6 million. In **Sierra Leone**, a $2.5 million grant to co-finance a $35 million IDA Investment Project Finance is strengthening the national safety net to respond quickly to help people following natural disasters and health emergencies.

Canada Caribbean Resilience Facility (CRF)

In May 2019, in partnership with Canada, GFDRR launched a new program to support Caribbean countries in achieving more effective and coordinated gender-responsive and climate-resilient preparedness, recovery, and public financial management practices. The CRF will work to increase implementation capacity in the region by transferring knowledge to government staff and

addressing implementation bottlenecks. The program also strives to strengthen public financial management (PFM) practices to enhance the responsiveness of PFM systems, allowing countries to be better prepared for, and able to respond to, increasingly frequent and economically costly extreme events. Gender studies will inform all activities to enhance the consideration of gender aspects in the preparedness and recovery processes. The program will support work in **Antigua and Barbuda, Belize, Dominica, Grenada, Guyana, Jamaica, St. Lucia, Suriname,** and **St. Vincent and the Grenadines**, with activities set to start in FY20.

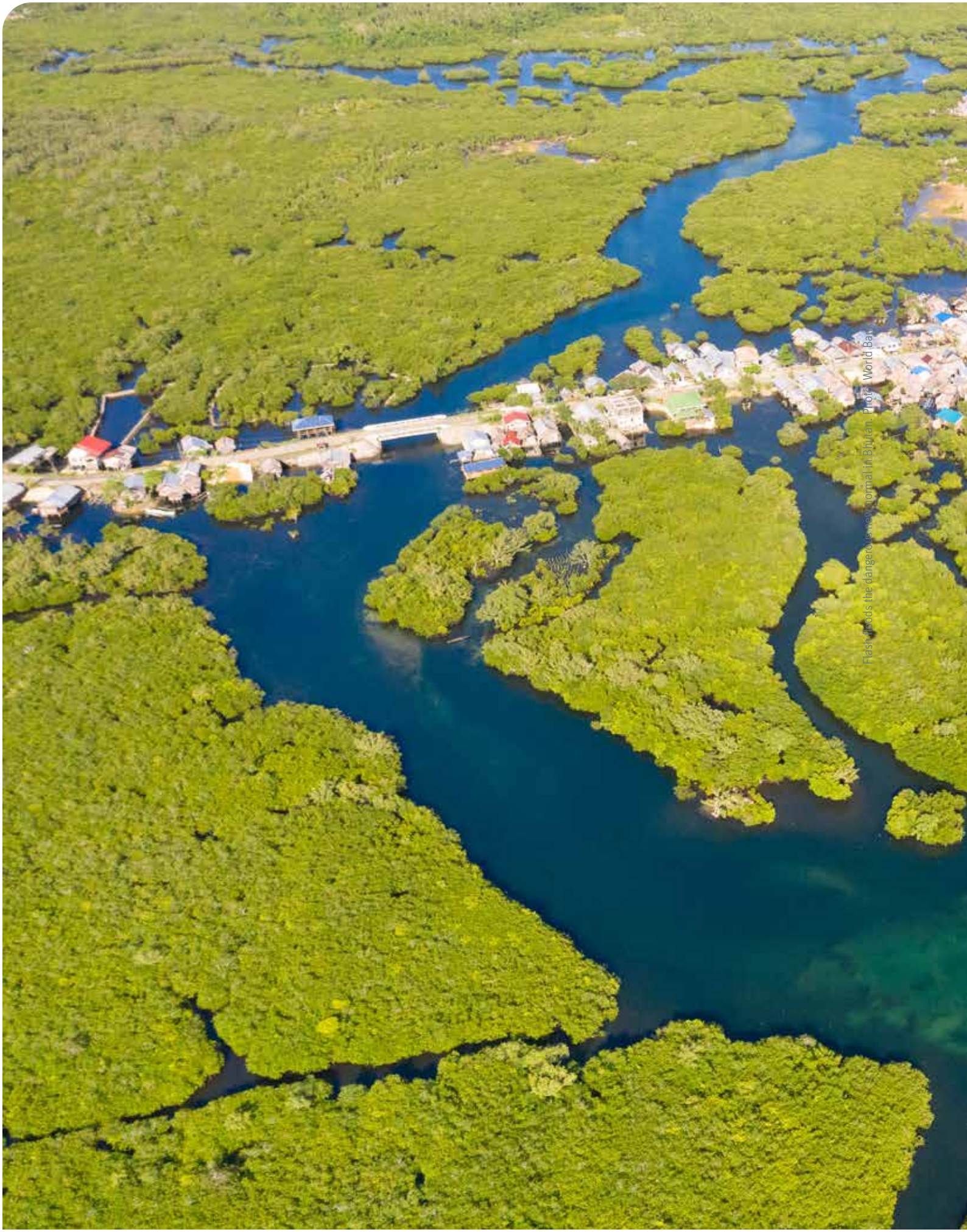
Climate Risk and Early Warning Systems (CREWS) Initiative

Established in 2015 by the French government as part of the COP21 Solutions agenda, CREWS contributes to the Sendai Framework for Disaster Risk Reduction by increasing access to multi-hazard early warning systems and disaster risk information and assessments. It advances the disaster risk reduction priority area of the Global Framework for Climate Services, and supports the International Network on Multi-Hazard Early Warning Systems. CREWS projects are implemented by the World Meteorological Organization (WMO), UN Office for Disaster Risk Reduction (UNDRR), and the World Bank through GFDRR.

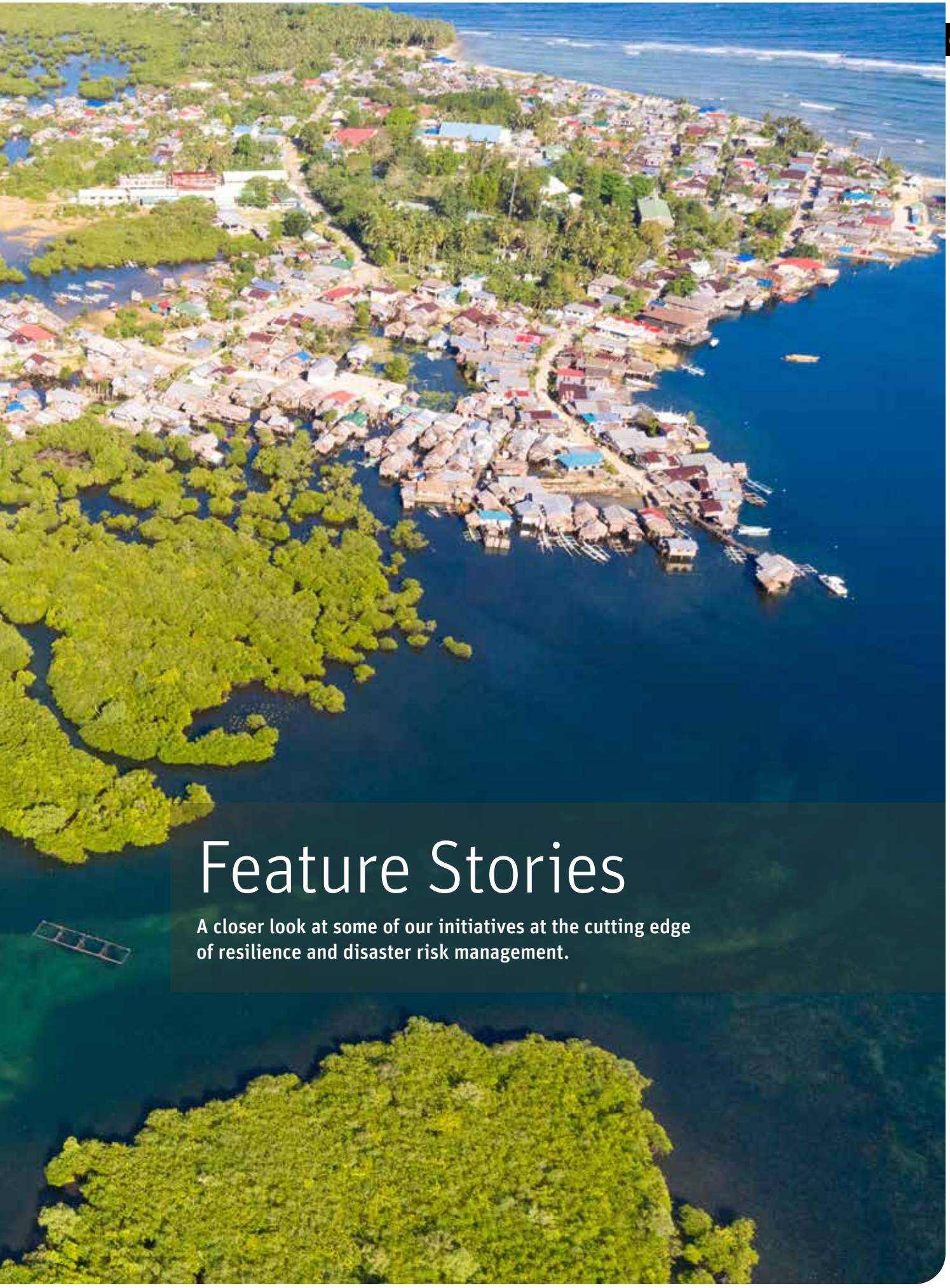
As of FY19, the CREWS Steering Committee has approved thirteen projects for a total of $32.7 million; seven of these projects are implemented by the World Bank. Ongoing projects include activities to improve forecasting in mainly urban areas of the **Democratic Republic of Congo**; the strengthening of early warning systems in **Niger**; the modernization of hydrological and meteorological services in **Mali**; and the streamlining of regional and national weather forecasting and hydrological systems in the Caribbean. Three new World Bank–led projects are under preparation which will help to provide modernized early warning systems to vulnerable communities in **Chad**; strengthen the national climate, hydrometeorological, and early warning services in **Togo**; and enhance the capacity of provider and user agencies for weather-, water-, and climate-related early warning services in **Afghanistan**.

City Resilience Program (CRP)

The City Resilience Program (CRP), established in June 2017, continues empowering cities to pursue resilience-building investments and to access the financing necessary to ensure that those investments come to fruition. Over the past year, there was strong interest from client cities to engage in CRP's capital mobilization efforts to catalyze investments in urban infrastructure and to support work further upstream to prioritize resilience in their long-term investment planning. The CRP team completed more than 50 Rapid Capital Assessments to assess cities' capabilities to mobilize private capital; more than 15 cities received City Scans and were exposed to resilience enhancing technical assistance; and a further 16 cities had deployed geospatial solutions.



Flash floods the dangerous new normal in Bhutan. Photo: World Bank



Feature Stories

A closer look at some of our initiatives at the cutting edge of resilience and disaster risk management.

Siargao Island, Philippines. Photo: TatianaNurieva.

Analytical Work at GFDRR

When disasters strike, people not only lose assets, but also incomes, health, and welfare. While asset losses may be financially assessed quickly and directly, the long-term consequences of severe or successive disasters may also be measured in reduced educational attainment, stunting, depressed macroeconomic growth, and transient or even chronic poverty. The GFDRR analytics team uses—and in some cases generates—data to understand these long-term effects of natural disasters, as granularly as possible, and advises Bank teams and their clients on how to integrate disaster risk management (DRM) into portfolios with poverty reduction and other development goals.

In recent years, GFDRR-supported analytical work has helped provide answers to some of the most pressing questions in global development. The *Shock Waves* (2015) report linked poverty reduction efforts with those that address climate change and showed how the two can work together to a greater effect. *Unbreakable*, released in 2016, built on this research to demonstrate the impact of disasters on people's well-being, rather than just asset losses. With well-being losses characterized as the trade-offs people are forced to make after a disaster, GFDRR's analytics team found that the effects of floods, windstorms, earthquakes, and tsunamis on well-being are equivalent to a $520 billion drop in consumption—60 percent more than the widely reported asset losses caused by disasters annually. In 2018, the *Unbreakable* follow-up, *Building Back Better*, took the findings of its predecessor and illustrated how those well-being losses could be greatly reduced after a disaster by building back stronger, faster, and more inclusively.

In FY19, GFDRR's analytics team produced *Lifelines* in response to increasing demand throughout the development community for a thorough analysis on the intersection of DRM and infrastructure. Using rigorously peer-reviewed research, the report presents a strong case for investing in resilience during the early stages of infrastructure planning to avoid devastating setbacks due to disasters.

In addition to original research done for this report, the GFDRR analytics team is also developing tools that can provide even further insights into how poverty and disaster risks are related in specific contexts at the country levels. These include a set of data collection tools that allow for in-depth analyses of poverty and disaster risk, and a model that measures socioeconomic resilience at the subnational level. These requests have also led to deep country engagements involving, in many cases, country teams, governments, and other stakeholders.

- As part of the **Philippines** Development Plan, the government has committed to measuring and building resilience to natural disasters. To support this effort, the analytics team worked with the National Economic Development Authority (NEDA) to measure socioeconomic resilience to shocks at the provincial level. This work focuses on links between natural disaster exposure and chronic poverty in the Philippines, and is intended to help NEDA's capacity to understand and meet the needs of the poor in its investment portfolio.
- In **Sri Lanka**, we are contributing to consultations with the government on how adaptive social safety nets could be used to help poor households cope with and recover from disasters. In this context, we have developed a cost-benefit analysis of post-disaster support architectures, which incorporate data on flood risks; household incomes and expenditures; and existing enrollment in Sri Lankan social protection systems.
- In the city of Accra, **Ghana**, city officials requested evidence on the relation between poverty and flood risk to understand how to better serve the city's most vulnerable residents. Our team responded to this request and carried out a study in the city. The findings, published in *Road to Recovery* in 2018 supported the preparation of the $200 million IDA investment, the Greater Accra Resilient and Integrated Development project, approved in FY19.
- As part of the Tanzanian Urban Resilience Program, we carried out a citywide analysis of poverty and flood risk in Dar es Salaam. The report, *Wading Out the Storm*, published in August 2019, helped improve understanding of how households experience and cope with floods, which helped inform flood damage calculations and supported ongoing discussions with the government on the implementation of a flood prevention action plan report, the Msimbazi Opportunity.

In Focus Resilient infrastructure

New GFDRR report finds that $4.2 trillion can be saved by investing in more resilient infrastructure

High voltage power lines passes in Dhaka City where power is a constant crisis. Photo: saif6996.

From serving our most basic needs to enabling our most ambitious ventures in trade and technology, infrastructure services are essential for raising and maintaining quality of life. Yet millions of people, especially in low- and middle-income countries, are facing the consequences of unreliable electricity grids, inadequate water and sanitation systems, and overstrained transport networks. Natural hazards magnify the challenges faced by these fragile systems.

Lifelines: The Resilient Infrastructure Opportunity (2019), a new report from GFDRR and the World Bank, lays out a framework for understanding infrastructure resilience—the ability of infrastructure systems to function and meet users' needs during and after a natural shock—and makes an economic case for building more resilient infrastructure. The report builds on a wide range of case studies, global empirical analyses, and modeling exercises, and estimates that on average the net benefit of investing in more resilient infrastructure in low- and middle-income countries would be $4.2 trillion, with $4 in benefits for each $1 invested.

Lifelines examines four essential infrastructure systems: power, water and sanitation, transport, and telecommunications. Making these systems more resilient is critical, the report finds, not only to avoid costly repairs but also to minimize the consequences of natural disasters for the livelihoods and well-being of people. Outages or disruptions to power, water, communications, and transport affect the productivity of firms, and the incomes and jobs they provide, which directly impact people's quality of life. Such disruptions may, for example, make it impossible for children to go to school or study, and may contribute to the spread of waterborne diseases, such as cholera.

"Resilient infrastructure is not about roads or bridges or powerplants alone. It is about the people, the households and the communities for whom this quality infrastructure is a lifeline to better health, better education and better livelihoods," says World Bank Group President, David Malpass. "Investing in resilient infrastructure is about unlocking economic opportunities for people. This report offers a pathway for countries to follow for a safer, more secure, inclusive and prosperous future for all."

Lifelines offers concrete recommendations and specific actions that can be taken by governments, stakeholders, and the international community to improve the quality and resilience of these essential services, and thereby contribute to more resilient and prosperous societies. GFDRR will work with World Bank teams across sectors and countries to apply the tools and recommendations from *Lifelines*, engaging private and public partners to mainstream its key messages into infrastructure planning.

Nature-Based Solutions

Nature-based solutions (NBS) are interventions that harness natural systems to reduce the impact of disasters, such as flooding, erosion, landslides, and drought. These solutions are often implemented in combination with traditional resilient infrastructure and have the comparative advantage of providing additional benefits, including livelihood generation, biodiversity conservation, recreational opportunities, carbon storage, and improved quality of life. Support for NBS is increasing, and they are now prominently featured as a crucial track of action by the UN, the European Commission, and the Global Commission on Adaptation.

Informing resilient development across regions

GFDRR is supporting the rising demand for NBS by providing technical, analytical, and operational support for related projects in five regions and 24 countries.

For instance, in Africa the Facility is supporting eight countries, including **Ghana, Madagascar, the Seychelles,** and **Tanzania**. This year, the Seychelles Coastal Management Plan (CMP), which includes coral reef restoration, was developed as part of recent policy work supporting the 2015 IBRD Development Policy Loan with Catastrophe Deferred Drawdown—a contingent financing line that provides immediate liquidity to address shocks related to natural disasters—and ultimately strengthening the Seychelles' preparedness. In Madagascar an ongoing assessment of NBS to reduce urban flood risks in underserved communities will be included as part of the Integrated Urban Development and Resilience Project for Greater Antananarivo and will be supported by a $75 million IDA credit. In Tanzania, the government of Zanzibar is using grant resources to integrate the use of natural wetlands and green corridors for low-impact stormwater management and public space revitalization.

In the East Asia and Pacific region, GFDRR is providing technical assistance to nine countries, including **Myanmar**, where the project team is working with the government to identify NBS to address regional disaster risk management issues related to rapid urbanization and coastal management. In South Asia, an economic assessment in Colombo, **Sri Lanka**, determined that conserving wetlands for flood mitigation was a desirable option and could result in 39 percent of floodwaters flowing into wetlands and construction of parks in the area generating $13 million in recreational income.

In Latin America and the Caribbean, work is advancing in **Haiti**, where NBS investment plans for resilient transport are being developed. Finally, in Central Asia, the Facility's support is making it possible for **Mongolia's** capital, Ulaanbaatar, to develop risk-informed urban planning through the integration of NBS into the planning, design, and management of public spaces.

Supporting, building capacity, and leading the way forward with analytical work

In FY19, GFDRR supported the research and publication of the flagship report, "*Integrating Green and Gray: Creating Next Generation Infrastructure*," which was prepared jointly with the World Resources Institute. The report highlights how the integration of green infrastructure into projects can generate services at lower total costs and boost resilience, while achieving a "triple-win" for communities, the environment, and the economy. More importantly, the report outlines social, environmental, financial, and technical considerations for decision makers and practitioners to optimally seize the opportunities green infrastructure can provide. The flagship report further catalyzed dialogue between the World Bank and other multilateral development banks and NGOs on carving a wider role for NBS.

Other knowledge products produced this year include the "*Nature-Based Solutions for Disaster Risk Management*" guidance booklet and a set of ready-to-use PowerPoint decks for communicating nature-based solutions concepts, costs, and benefits to practitioners and decision makers. These products add to the growing set of tools and guidelines developed with GFDRR's private and public sector partners to effectively assist governments and development institutions in implementing NBS for disaster risk management.

In Focus Redeveloping the Panama City waterfront to create a resilient, inclusive, and sustainable city

Left to right: Potential enhancement and conservation of green spaces along the waterfront of Panama City. Photo: World Bank. Panama City's Mangroves. Photo: Juliana Castano Isaza.

In the past 25 years, Panama City, Panama, has undergone a process of rapid and unplanned urbanization. The city is now three times the size it was in 1990, and almost half of the population and economic assets of the whole country are concentrated in 4 percent of the territory. Its proximity to the coast, extensive river network, and heavy annual precipitation means that the city is vulnerable to floods and sea level rise. This vulnerability is exacerbated by the lack of adequate land-use planning, scattered institutional responsibilities, a deficient drainage system, and the loss of natural wetlands in the Tocumen and Tapia basins. As a result, floods have become more frequent and intense, posing a significant challenge to socioeconomic development, especially in disadvantaged neighborhoods.

Creating a more resilient and sustainable future for Panama City will require investments that address these issues through a comprehensive and multi-sectoral approach. GFDRR is providing financial and technical support to Panama City's efforts to strengthen resilience, sustainability, and connectivity through the Waterfront Redevelopment and Resilience Program. This program works to inform urban design of existing and future developments that include continuous multi-modal waterfront access, comprehensive wetland management and ecosystem services, and neighborhood upgrading.

An integral part of this work has been the identification of NBS for disaster risk management and resilience. As such, a strategic flood risk assessment of the Tocumen and Tapia basins has been developed to understand the key flood mechanisms, create hazard exposure and risk maps, and determine flood risks in four future scenarios. In parallel, an assessment of coastal biophysical conditions, including the status of mangroves and riverine vegetation, and the use of native plants for urban green spaces, was conducted to determine structural and nonstructural measures. These assessments have been used to identify a range of possible interventions that include nature-based and hybrid solutions, such as modifying the distribution of mangroves and riparian vegetation, restoring river channel routes to more natural configurations, and using urban parks to serve as water storage areas in different city locations, while also reducing heat island effects and enhancing biodiversity. Sophisticated computer modeling will be undertaken to provide insight into the sustainability of these proposed interventions.

These results are building capacity at the municipality and national levels, and will inform larger, cost-effective investments by city and national governments that will catalyze socioeconomic development through enhancing resilience and revitalizing the urban environment.

"Nature-based solutions are a key part of our city Resilience Strategy. The presence of rich ecosystems, such as our watersheds and wetlands, offers us unique opportunities for flood risk mitigation and recreational activities, while providing climate protection and biodiversity conservation."

—Marcos Marengo, Resilience Director of the Municipality of Panama

Resilient Cultural Heritage and Tourism

Natural hazards can cause dramatic losses to cultural heritage, disrupting economies and the identity and community resilience of cities and countries around the world. The 2017 Mexico earthquake damaged 1,847 heritage buildings, causing 20 percent of the direct economic losses, as well as significant indirect losses to tourism and other sectors.[13] The 2015 Nepal earthquake saw tourism drop by more than 250,000 people—a 30 percent reduction compared to 2014. Globally, travel and tourism contribute 10.4 percent of GDP, and disasters can significantly disrupt this sector and damage the cultural heritage assets underlying it.[14] Cultural heritage assets are often irreplaceable; their losses include a loss of values, history, identity, and social cohesion. In FY19, GFDRR support helped six countries—Bhutan, Guatemala, Lao PDR, Myanmar, Tanzania, and Uzbekistan—strengthen the resilience of cultural heritage, local communities, and sustainable tourism.

Integrating cultural heritage and tourism into disaster risk management (DRM)

More than 60 percent of World Heritage Sites are exposed to geo-hazards.[15] At the same time, climate change is significantly increasing risks to cultural heritage sites worldwide.[16] The integration of cultural heritage and tourism assets into DRM projects and the development of DRM strategies for these can inform important policy enhancements and investments to protect the people, places, and economies that cultural heritage and tourism represent.

In many countries, cultural heritage has been an efficient entry point to connect DRM with urban development, especially in fragility, conflict, and violence (FCV) contexts. With nearly 100 UNESCO World Heritage Sites located in FCV settings, and growing development support for these countries, developing countries are seeking approaches that advance disaster resilience, economic development, cultural integration, and social inclusion. Climate change and unplanned development, among other factors, will continue to increase pressure on countries' abilities to protect their heritage and integrate it into their development planning.

Geospatial and other disruptive technologies, such as remote sensing and 3D modeling, offer critical new options to visualize and manage the vulnerabilities of complex and dispersed cultural heritage and tourism sites. Adaptive social resilience approaches can help build the support and development of communities inextricably linked to meaningful heritage.

Strengthening resilience of heritage and communities

Since 2017, GFDRR has worked to engage Japanese and global expertise on the Cultural Heritage of Disaster Risk Management to support countries in improving the resilience of their cultural heritage sites and local communities with key results in FY19. In **Bhutan**, the government is developing its risk-informed heritage asset inventory and completing hands-on renovation works with continued capacity building of artisans and officials to enhance the resilience of structures and sites, which is part of a wider policy for integrating disaster risk and cultural heritage management. GFDRR's support in **Uzbekistan** helped the State Committee for Tourism Development engage international experts and key partners in the Ministry of Culture, the Ministry of Construction, the Ministry of Emergency Situations, local administrations, and UNESCO to assess the country's capacity gaps for risk identification, emergency preparedness and response, and overall site management and risk reduction investments. Authorities are now beginning to integrate DRM in the conservation of cultural heritage sites and the development of sustainable tourism, working through an interdisciplinary and multiagency approach through the World Bank–supported $100 million secondary cities development project. In **Guatemala**, after the 2018 volcanic eruption of Volcán de Fuego which affected the World Heritage City of Antigua Guatemala, the Executive Secretariat of the National Coordinator for Disaster Reduction engaged the Ministry of Culture to protect the country's heritage and ensure a resilient recovery. They are working to include cultural heritage in Guatemala's National Recovery Strategy.

[13] National Institute of Anthropology and History (NIAH) and UNESCO, Mexico.
[14] World Travel & Tourism Council (WTTC). 2019. Knoema.
[15] Pavlova, I. et al. 2015. "Global overview of the geological hazard exposure and disaster risk awareness at world heritage sites." *Journal of Cultural Heritage* December 2015, doi: 10.1016/j.culher.2015.11.001
[16] ICOMOS. 2017. "Resolution 19GA 2017/30—Mobilizing ICOMOS and the cultural heritage community to help meet the challenge of climate change." pp. 18–20.

In Focus Culture in city reconstruction and recovery

Mobile Mini Circus for Children, Bamiyan, Afghanistan.Photo: © Seth Bloom.

In FY19, GFDRR supported the preparation and launching of a joint World Bank–UNESCO position paper on Culture in City Reconstruction and Recovery (CURE), which reflects the shared commitment of these two organizations to place culture at the forefront of post-crisis resilient recovery processes.

Despite relevance and importance for local communities, culture and cultural heritage are sometimes seen as luxuries in the aftermath of disasters. Attention to these issues has usually focused on the reconstruction of architectural assets, but incorporating intangible cultural heritage—including traditional practices, skills, and knowledge transmitted across generations—is equally important to comprehensive, community-focused recovery.

The CURE Framework fosters the integration of people-centered and place-based approaches into sustainable urban policies, to help cities effectively address the impact of disasters and strengthen resilience in their communities. The key ideas state that (1) culture plays a key role in post-crisis reconstruction and recovery processes; (2) culture should be acknowledged as the foundation that integrates people-centered and place-based policies; and (3) effective city reconstruction and recovery programs require culture to be mainstreamed across the damage and needs assessment and scoping, and when setting policy and strategy, financing, and implementation phases.

"When there is a disaster or a trauma, people really need to hold on to their cultural landmarks, their symbols. Heritage is the glue that binds people together as a community."

Giovanni Boccardi, Chief of the Emergency Preparedness and Response Unit for the Culture Sector of UNESCO.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LEADER
CRITICAL

Events and Publications

GFDRR actively engages in global dialogue and works with partners to ensure that the resilience agenda remains central to global policy discussions—and that the ideas keep coming.

UR Caribbean Conference. Photo: World Bank.

Summary of Events

The Open Data for Resilience Initiative (OpenDRI) Mapathon

Building Resilience

City Resilience Program (CRP): Financial Solutions for City Resilience Conference, 2nd Cohort
The Financial Solutions for City Resilience Conference in July 2018 brought together delegates from 20 cities, along with development professionals, financial advisers, and private developers to discuss and refine infrastructure financing options in the urban resilience agenda. The conference, led by the City Resilience Program, culminated with a "shark tank" event in which city leaders presented their investment ideas to a panel of financial advisers, who then gave feedback on how to structure the resilience investment opportunities.

CRP: Resilience Planning Workshop
The City Resilience Program's first Resilience Planning Workshop, held in Durban, South Africa, in November 2018, brought together officials from 11 African cities to discuss the urban resilience agenda and refine their infrastructure investments. The week-long event featured a mix of presentations, risk mapping, identification of investment opportunities, and capital investment plans. Each participant left with a list of priority infrastructure investments and at least one project proposal, complete with preliminary technical and financial specifications.

Middle East and North Africa (MNA) Regional Urban Resilience Conference
The World Bank and the Municipality of Beirut organized and hosted the MNA Regional Urban Resilience Conference in April 2019, with support from GFDRR and in partnership with 100 Resilient Cities. The conference responded to the need for regional cooperation and common frameworks for city resilience strategies, and drew fresh insights from Beirut's urban resilience master plan.

Resilient Homes Challenge
Architects, engineers, designers, and students from all over the world took part in the GFDRR-supported Resilient Homes Challenge—a design competition that generated designs for disaster-resilient and sustainable houses. Entries put forth a diversity of construction materials and approaches, and were judged on factors such as resilience, sustainability, replicability, and use of local materials and labor. Nine winners—three each for three given scenarios—were selected out of more than 300 team submissions.

Small Island States Resilience Initiative (SISRI) Practitioners Meeting
Held on the sidelines of the 6th Global Platform for Disaster Risk Reduction in Geneva, GFDRR's SISRI held the fourth meeting of its Practitioners' Network in May 2019. Representatives from 29 small island states exchanged helpful insights and experience related to risk identification, risk financing, capacity building, and inclusive resilience planning.

Risk Information

OpenDRI Mapathon
GFDRR's Open Data for Resilience Initiative hosted a Mapathon—a combined exhibition and training event for community and crowdsourced mapping initiatives—at World Bank headquarters in November 2018. The well attended event brought attention to the numerous benefits of using geospatial data in providing solutions to development and disaster risk reduction

In Focus Inclusion for resilient recovery: The 2019 World Reconstruction Conference

On May 13–14, 2019, more than 1,000 stakeholders and practitioners from government, international organizations, community-based organizations, and the private sector came together in Geneva for the 4th World Reconstruction Conference (WRC4). The theme of the conference, "Inclusion for Resilient Recovery," drew attention to disparate recovery outcomes during a time of accelerating disaster risk. WRC4 presented an opportunity to share best practices and account for progress on the pledges made concerning inclusion through the 2030 Agenda, particularly the Sendai Framework for Disaster Risk Reduction. The event was held in conjunction with the Global Platform for Disaster Risk Reduction, ensuring that the issue of inclusion was fresh in the minds of those attending the latter event. The conference was hosted by the United Nations Office for Disaster Risk Reduction (UNDRR), and GFDRR partnered with the United Nations Development Programme (UNDP) and the European Commission to fund and organize the event.

Inclusion for Resilient Recovery

Disability rights activist Eddie Ndopu set the tone for the conference in an inspiring opening address in which he invited attendees to "not just reconstruct buildings, but to reconstruct communities—to reconstruct the world and fashion it in such a way that it is truly open to all."

There is a longstanding consensus that vulnerable and marginalized groups get hit harder by disasters and are frequently excluded from the recovery process. Unfortunately, that consensus has not led to concerted action for more inclusive recovery. WRC4 attendees came to the conference with renewed determination to change that. Across 20 sessions, participants approached the problem by diving deep into the underlying issues, examining intersections between recovery and other challenges, and dissecting case studies to better understand what works and what does not.

Many sessions provided a close look at the interests and considerations of a range of groups, including women, the elderly, and those with disabilities. In a plenary session, Ecuador's Minister of Disaster Risk Management Alexandra Ocles explained how the needs and perspectives of people with disabilities are represented at the national level through a team of women that work with them daily in every province. This has helped ensure that their voices are heard even if they are unable or unwilling to leave their homes.

Other sessions illuminated intersections between disaster recovery and factors such as conflict, displacement, and geography. For example, in a session on disaster recovery in fragile and conflict-affected contexts, Mohammed Danjuma of the Nigerian Presidential Committee on the North East Initiatives described how inclusivity is helping recovery in Northeastern Nigeria following paramilitary conflict that was compounded by recurring droughts and floods. He noted that Nigeria's North East Recovery and Stability Program helps to stave off new tensions by involving communities in both recovery planning and implementation, which in turn helps ensure that scarce natural resources are managed according to the needs of each state.

Some sessions provided an opportunity to explore specific examples of inclusive recovery in greater depth. Following the 2018 floods in the Indian state of Kerala, the government conducted a Post-Disaster Needs Assessment (PDNA) that deliberately emphasized inclusive recovery. The government of Kerala approached this PDNA, in part, by disaggregating impact data across different segments of the population, including gender, disability, tribal affiliation, age, and more. In a session centered on the Kerala recovery, Dr. Venu Vasudevan, Chief Executive of the Rebuild Kerala Initiative, explained how this disaggregated information illustrated the extent to which different groups experienced different impacts from the disaster, helping to ensure that each of them was taken into consideration when planning the recovery. Importantly, he also noted that there should be a constant monitoring process to respond to inevitable gaps in information.

The discussions surrounding these goals and ideas were summarized in a joint communique, affirming a strong commitment to:

- supporting marginalized groups that are especially vulnerable to the impacts of natural hazards and that risk being made even more vulnerable during the recovery process;
- adopting and promoting more inclusive approaches for recovery, and promoting greater resilience for the community as a whole;
- ensuring a more resilient future for all by acting on the commitments made in the 2030 Agenda, the Sendai Framework, the Paris Agreement, and other key accords; and
- changing the behavior and actions of all development partners to be more inclusive in planning, implementing, and monitoring recovery.

initiatives. Guest speakers from Mapbox, USAID, American Red Cross, and the World Bank Group Geospatial Team gave ignite presentations that demonstrated the many possibilities of the technology.

Python for Data Science Course

In March 2019, GFDRR partnered with the World Bank data science and geospatial teams to train other disaster risk management colleagues on the use of Python, the world's most popular programming language for data manipulation. A cohort of more than 40 practitioners, many of whom had never coded before, emerged from the course with a newfound ability of processing and presenting data in actionable ways that could improve their team's business outcomes.

VizRisk Challenge

In partnership with Mapbox and the Data Visualization Society, GFDRR and the World Bank hosted the 2019 VizRisk Challenge in May, which invited participants to explore how maps and visualization techniques can help citizens and governments better understand and use data on natural hazards, exposure, and vulnerability. Selecting one of four locations, more than 260 people from around 60 countries participated, pulling insights from recommended datasets, designing interactive maps and visualizations, and blogging throughout the process.

Understanding Risk (UR) Conferences

UR Balkans

Belgrade hosted the first Understanding Risk Balkans Conference in September 2018, bringing together experts and practitioners from around the Balkans to address the region's urgent need for a better understanding of disaster risks and share innovative solutions that promote a sustainable future. In 12 technical sessions, 353 attendees from 46 countries in the region and beyond explored different sectoral needs for disaster risk management (DRM) and engaged in lively discussions of experiences and lessons learned in coping with disaster risks.

UR Finance Pacific Forum

More than 200 stakeholders and practitioners from around the Pacific region came together in Vanuatu for the first-ever UR Finance Pacific Forum in October 2018. During the event, private sector voices, disaster risk experts, and governments explored new approaches to quantify and build comprehensive financial protection, such as insurance instruments, against rising climate and disaster risk.

UR Caribbean

GFDRR partnered with the World Bank, the EU, and the Caribbean Disaster Emergency Management Agency (CDEMA) to host the Understanding Risk Caribbean Conference in Barbados in May 2019. Over the five-day conference, three regional programs were launched, which will focus on supporting long-term resilience planning and climate-smart growth strategies. The week also featured creative alternative means of communicating risk, including art installations representing risk data and a special disaster risk-themed cricket match featuring players from the region. Over 500 delegates from more than 20 countries attended.

Global Conferences

24th Conference of Parties (COP24)

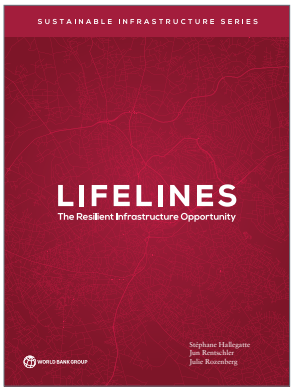
During the 2018 COP24 conference held in Katowice, Poland in December, GFDRR partnered with the World Bank and the World Resources Institute for a high-level panel discussion on ways to enhance resilience through nature-based solutions. The event served as a preview for the GFDRR-supported report, *Integrating Green and Gray—Creating Next Generation Infrastructure*, which highlights ways that nature-based solutions can be integrated with traditional infrastructure to reduce disaster impacts and costs.

World Reconstruction Conference (WRC4)

The 4th WRC4 was held in Geneva on May 13–14, 2019, under the theme "Inclusion for Resilient Recovery." Held in conjunction with the 6th Global Platform for Disaster Risk Reduction, WRC4 built on the recognition and consensus of previous WRCs that recovery should not reinforce existing inequalities. Resilient recovery is imperative to sustainable development and poverty reduction; and that to be resilient, recovery must build back better.

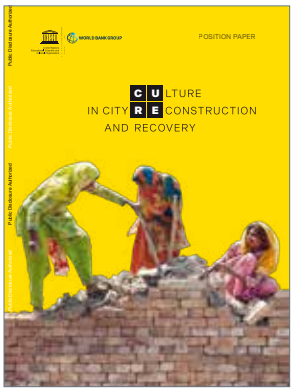
Geneva, Switzerland on May 12-13, 2019 for the Fourth Meeting of the Small Island States Resilience Initiative (SISRI) Practitioners' Network

Key Publications FY19



A Lifelines: The Resilient Infrastructure Opportunity

Building on a wide range of case studies, global empirical analyses, and modeling exercises, Lifelines lays out a framework for understanding infrastructure resilience. Making an economic case for investing in infrastructure resilience, the report finds that the net benefit of building more resilient infrastructure in low- and middle-income countries would be $4.2 trillion.



Culture in City Reconstruction and Recovery (CURE)

Drawing on a culture-based approach that accounts for the needs, values, and priorities of people, this document serves as a guide for how to integrate culture into all phases of city reconstruction and recovery. It also provides a road map for post-crisis economic development and the management of complex social, spatial, and economic transformations.

E-Book: Resilient Homes Challenge

Over 3,000 participants from over 120 countries entered the Resilient Homes Challenge, which called on architects, engineers, designers, and students to design proposals for disaster-resilient housing. This e-book explores insights and lessons learned from the winning designs, which were selected based on resilience, sustainability, replicability, and suitability to the local cultural context.

Guidance Note: Education Sector Recovery

This note provides practical guidance to national governments about how to ensure that the education sector can maintain its core functions in the midst of a disaster or crisis, allow for streamlined recovery from shocks, minimize disaster and conflict risks, and improve the sector's adaptation and resilience to future crises.

Guidance Note: Machine Learning for Disaster Risk Management

This note provides practical guidance on how machine learning can be used for disaster risk management, including key definitions, case studies, and key considerations for implementation. This document also serves as a concise, demystifying reference for better understanding of how machine learning can be applied in disaster risk management projects.

Guidance Note: Transport Sector Recovery: Opportunities to Build Resilience

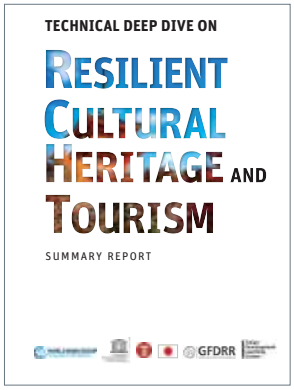
This guidance note provides action-oriented guidance to government officials facing post-disaster recovery challenges related to the transport sector. It frames the scope of recovery work, including the administrative elements for setting up a planned and organized recovery of the transport sector, as well as the implementation activities required to restore the transport network.

Tectonic Shift RIFT 2018 Report

This report summarizes the key findings discussed during the East Africa Regional Seismic Risk and Resilience Workshop in September 2018. Representatives from six countries, together with technical experts, convened in Nairobi, Kenya, to enable action to strengthen frameworks for seismic risk management and to build the capacity of select national and local governments in the region.

Guidance Note: Gender Equality and Women's Empowerment in Disaster Recovery: Disaster Recovery Guidance Series

This guide provides action-oriented guidance to local and national government officials and key decision makers who face post-disaster challenges. Critically, this note assists them in incorporating gender-responsive recovery and reconstruction efforts across all sectors through robust gender assessments that lead to concrete needs identification and gender-specific recovery strategies and frameworks.

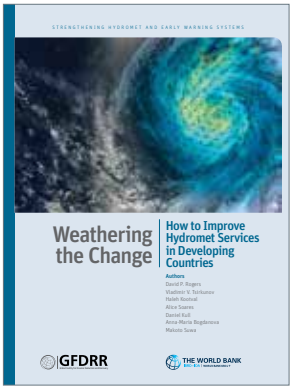


Summary Report: Technical Deep Dive on Resilient Cultural Heritage and Tourism

This report summarizes a Technical Deep Dive (TDD), held in April 2017 in Japan, which brought together officials and experts from nine developing countries, to share insights and lessons learned on ensuring the resilience of cultural heritage and tourism sites. Topics covered included disaster risk management for cultural heritage, as well as community engagement in cultural heritage preservation.

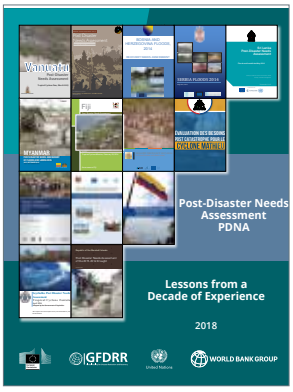
Integrating Green and Gray: Creating Next Generation Infrastructure

This report guides developing country service providers and their partners on how to harness the power of nature to help achieve development goals, including water security and climate resilience. It provides approaches and examples of how to integrate green infrastructure, such as mangroves and wetlands, into mainstream project appraisal processes and investments.



Weathering the Change: How to Improve Hydromet Services in Developing Countries

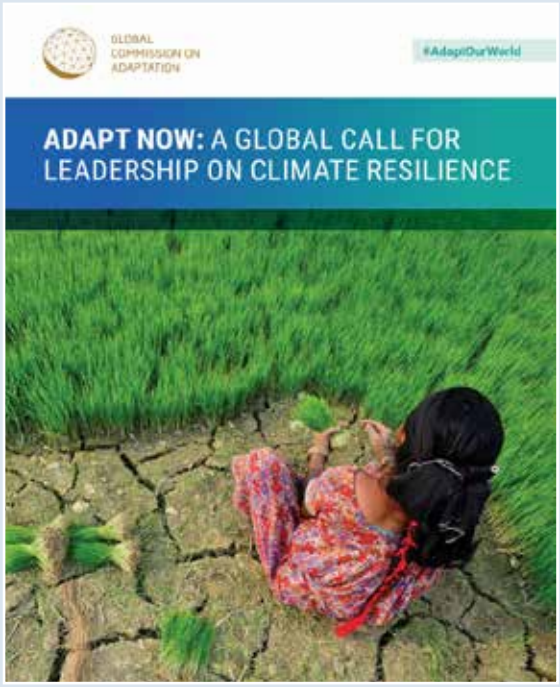
This comprehensive guide provides critical insights for how development practitioners and national meteorological and hydrological services (NMHSs) can improve the delivery of national meteorological and hydrological services. It touches on all actors involved in the production and delivery of these services, with an emphasis on the role of the public sector.



Post-Disaster Needs Assessment: Lessons from a Decade of Experience

Over the past decade, post-disaster needs assessments (PDNAs) have transformed how resilience and disaster risk management practitioners prepare for and respond to disaster. Drawing on the analyses of 14 PDNAs, this guide examines the strengths, opportunities, limitations, and challenges of the PDNA process, and also provides recommendations for PDNAs moving forward.

In Focus Global Commission on Adaptation (GCA)



In FY19, GFDRR joined global partners in the launch of an important new initiative, the Global Commission on Adaptation (GCA), which accelerates action on climate change adaptation, elevates the political visibility of adaptation, and highlights tangible solutions. GCA is co-chaired by former World Bank CEO and now IMF Managing Director Kristalina Georgieva; Ban Ki-moon, 8th Secretary-General of the United Nations; and Bill Gates of the Bill & Melinda Gates Foundation. It was convened by 19 countries, guided by 33 commissioners, and supported by a global network of research partners and advisers, including the World Bank, who provides scientific, economic, and policy analyses. The managing partners of the Commission are the Global Center on Adaptation and the World Resources Institute, and the World Bank's Patrick Verkooijen is the CEO of the Global Center on Adaptation.

In September 2019, the GCA launched its flagship advocacy report *Adapt Now: A Global Call for Leadership on Climate Resilience*. As a partner of the GCA, GFDRR played a key role in developing and drafting the report's messages—thus helping to make the case that global momentum for adaptation action can build on the foundation of over 10 years of work on disaster risk management and disaster risk reduction. The report details the priorities and principles of adaptation action in sectors such as food security, the natural environment, water, cities, infrastructure, and finance—and draws on several of the Facility's analytical outputs, such as *Lifelines* (2019), *Unbreakable* (2016), and *The Triple Dividend of Resilience* (2016). Additionally, our approach of mainstreaming risk management across sectors lies at the heart of the GCA's call for action.

The GCA's report is centered around a key argument put forward by prior analytical work supported by GFDRR: that adaption action is a financially sound investment with multiple development dividends. Drawing on the *Triple Dividend of Resilience* report, the GCA emphasizes that adaptation investments not only prevent disaster losses, but also create socioeconomic opportunities. The report suggests that adaptation investments could yield benefits of $7.1 trillion by 2030, compared to a cost of $1.8 trillion. To arrive at this estimate, the authors of the report drew on findings from our *Lifelines* report, which concluded that $4 trillion of these benefits could be derived from investments in resilient infrastructure. Other adaptation priorities and benefits put forward by the GCA also draw on our contribution to shaping the agenda over the years, for instance in the areas of nature-based solutions, early warning systems, resilient cities, and financial protection. Additionally, approaches such as decision making under uncertainty and system-level resilience planning, which were developed over the years in part through our support, are now also advocated by the GCA.

In addition to helping to frame the main report, GFDRR also contributed to the background papers that helped shape the GCA's exploration of risk and adaptation financing in several areas, for instance how perceived funding gaps associated with the private sector might be overcome; how risk can be made visible as a way to mobilize climate finance; and the need to price risk in different stages of project design and implementation. These included "*All Is Not Green: Climate Change Adaptation and Small Business Resilience in Low- and Middle-Income Countries*" and "*Business Adaptation to Climate Change and Global Supply Chains.*"

The report includes a focus on the three revolutions needed to increase climate adaptation investments: a change in how we understand risks; a transformation in planning for more robust policy and investment decisions; and a restructuring in finance to mobilize the necessary resources. It commits to at least eight concrete "action tracks" to overcome the key obstacles to effective climate change adaptation and has identified GFDRR as a key implementing partner for several of these action tracks, including those on finance and investment, nature-based solutions, resilient cities, infrastructure, and disaster prevention.

Annex

This annex provides information about GFDRR's portfolio in FY19. This includes commitments, disbursements, donor resources available, and results progress. It is a financial report covering the period of July 1, 2018 to June 30, 2019.

Crowded train about to depart from Dhaka. Photo: Tarzan9280.

Portfolio Summary

GFDRR's total portfolio as of June 30, 2019, included 369 active grants covering 142 countries,[1] for a total commitment amount of $267.6 million.

Of the active grant portfolio as of close of FY19, 202 grants were funded through the Multi-Donor Trust Fund (MDTF) and related core funding windows (55 percent) (see figures 1.1 and 1.2). Seventy-nine grants were funded through the Japan–World Bank Program (21 percent). Fifty-two grants were funded through the ACP-EU Natural Disaster Risk Reduction Program (14 percent) and 20 grants were funded through other EU programs (6 percent). In addition to the activities funded by core funding windows, 16 grants were funded through the Special Programs (4 percent).

Total funding commitments of the active grant portfolio from the MDTF and related core funding windows amounted to $94.5 million (35 percent), the largest proportion of the portfolio. The Japan–World Bank Program accounted for $70.1 million (26 percent). The ACP–EU NDRR Program accounted for $44.3 million (17 percent) and other EU-funded programs were $37.7 million in active commitments (14 percent). In addition to activities funded by core funding programs, Special Programs accounted for $21.1 million (8 percent).

Across regions, the largest share of active grants covered Sub-Saharan Africa, representing 29 percent of active funding (see figure 2). This was followed by East Asia and Pacific, Europe and Central Asia, and South Asia, which each were supported through approximately 11 percent of active funding. Smaller proportions of active funding supported Latin America and Caribbean (8 percent); and the Middle East and North Africa (3 percent). Global and cross-regional activities represented 27 percent of active funding.

Throughout the fiscal year, 92 grants ($38.2 million) reached completion (see figure 3). This is a 41 percent decrease from FY18, when three MDTFs reached completion, which drove the closing of a higher number of grants during that timeframe.[2]

[1] This includes countries receiving benefits from GFDRR grants either through activities directly implemented in-country or covered through global or regional activities.

[2] In FY18, the MDTF TF070611, TF070868, and TF070948 reached completion.

Figure 1.1 Distribution of Active Commitments by Funding Window, FY19 = $267.6 M

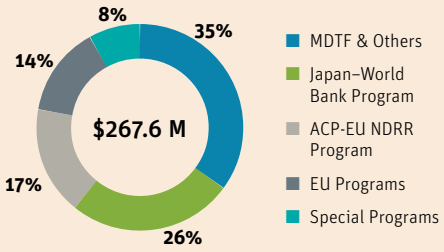


Figure 1.2 Distribution of Active Grants by Funding Window, FY19 = 369

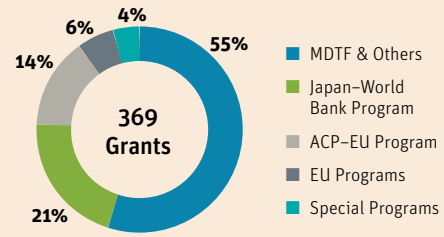


Figure 2. Distribution of Active Funding by Region, FY19

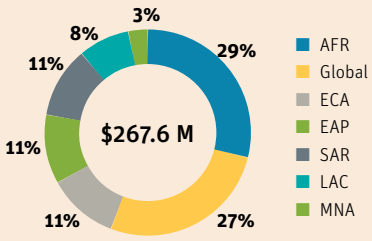
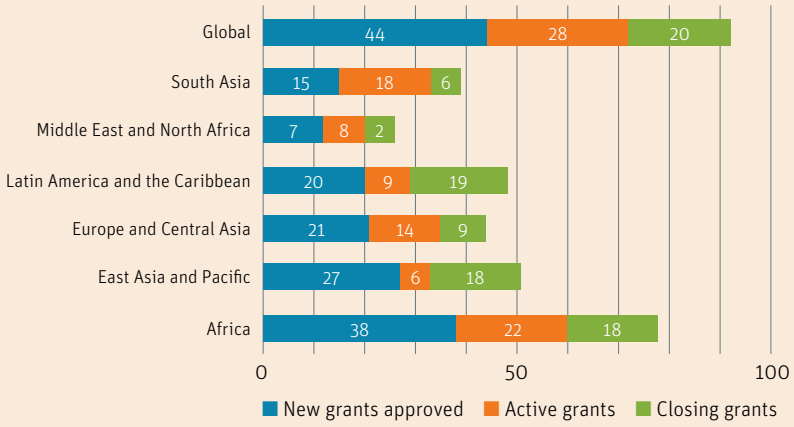


Figure 3. Distribution of Grants, FY19 Total = 369

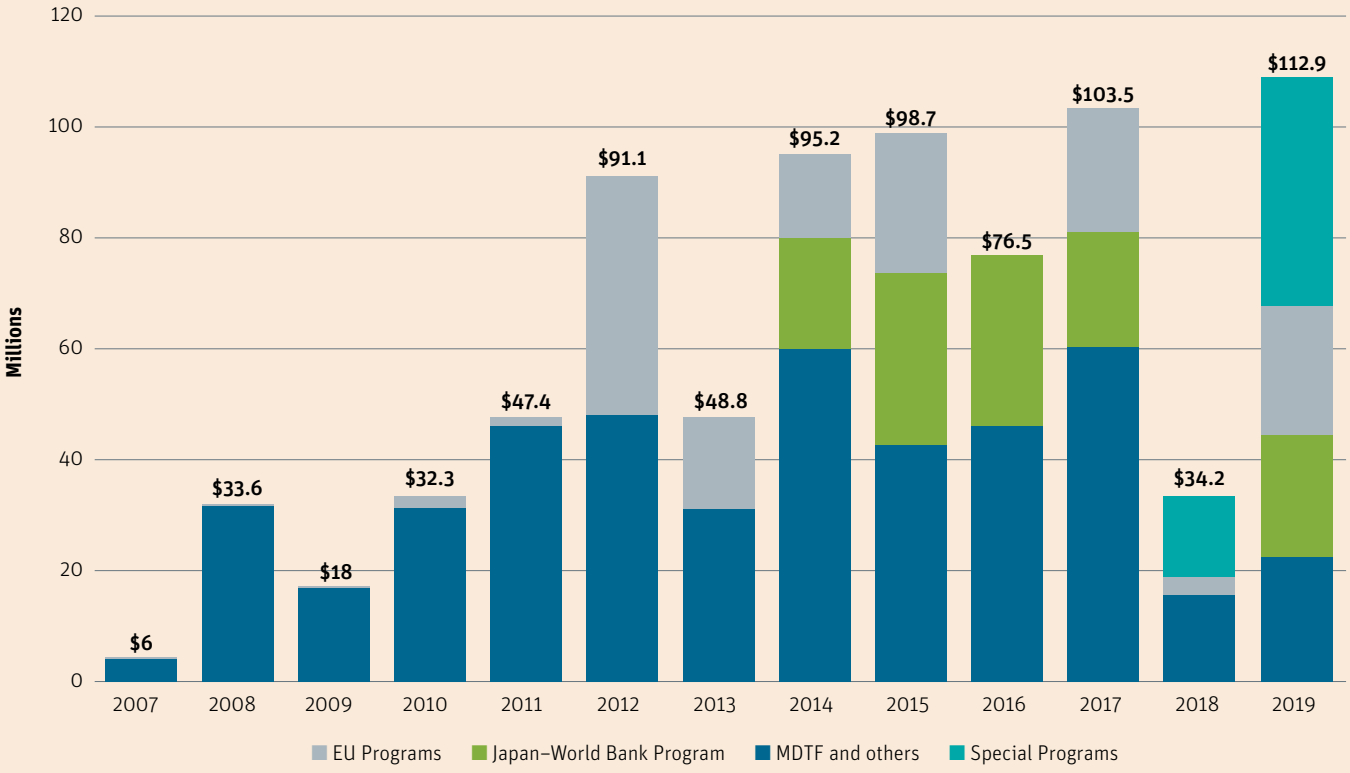


Sources of Funding

Over the fiscal year, 12 donors contributed an additional $112.9 million[3] in support of GFDRR's broad-based disaster resilience program (see figure 4). Core funding into the MDTF during the fiscal year amounted to $23.4 million, or 21 percent of overall contributions. During the same period, $50.4 million was received for other core programs, representing 45 percent of contributions in FY19. This includes $22.8 million in contributions for two new Single-Donor Trust Funds (SDTF), the EU-Caribbean SDTF and EU-Caribbean OCTs SDTF. $39.1 million, or 35 percent of FY19 contributions, supported Special Programs. This includes $34.1 million in contributions for GRiF and $3 million in contributions for a new Canada-Caribbean SDTF. Overall contributions were approximately 53 percent higher than average annual contributions received by GFDRR over the prior three years ($71.5 million). Increased funding amounts primarily went to single donor trust funds and special programs.

[3] Before trust fund administration fees of $0.67 million.

Figure 4. Contributions to GFDRR, FY07–19 ($ M)



Uses of Funding

In FY19, overall GFDRR trust fund disbursements, amounted to approximately $90 million. 90 percent ($80.3 million) of disbursements were project related (see figure 5). FY19 project disbursements represented a 5 percent increase compared to FY18. GFDRR achieved an annual disbursement rate of 60 percent, its highest in the last six years. This was driven by continued progress in implementation across most activities in the portfolio, coupled with proactive actions taken by the Secretariat to address slower disbursing activities.[4]

GFDRR's program management and administration expenditures, which include staff, consultancy fees, travel, rent, communications, information technology, equipment, and other non-overhead costs, were $6.9 million (see figure 6). The share of program management and administration expenditures when compared to total expenditures increased slightly to 8 percent from 7 percent in FY18, when Program Management Administration (PMA) stood at $6 million. This increase is due to a deliberate acceleration in shifting the cost of some activities (including workshops, partnership events, knowledge exchange, and travel) to PMA from project resources in anticipation of the forthcoming closure of three large trust funds in FY20–21.[5]

[4] This included regular monitoring of existing commitments to ensure timely disbursements; reallocation of grant resources to faster disbursing activities; and restructuring of grants, for example.

[5] In FY20 and FY21, GFDRR's three largest main funds—the MDTF (TF072236, parallel fund TF072584), the ACP–EU NDRR SDTF, and the

Figure 5. Project Disbursements, FY14–FY19

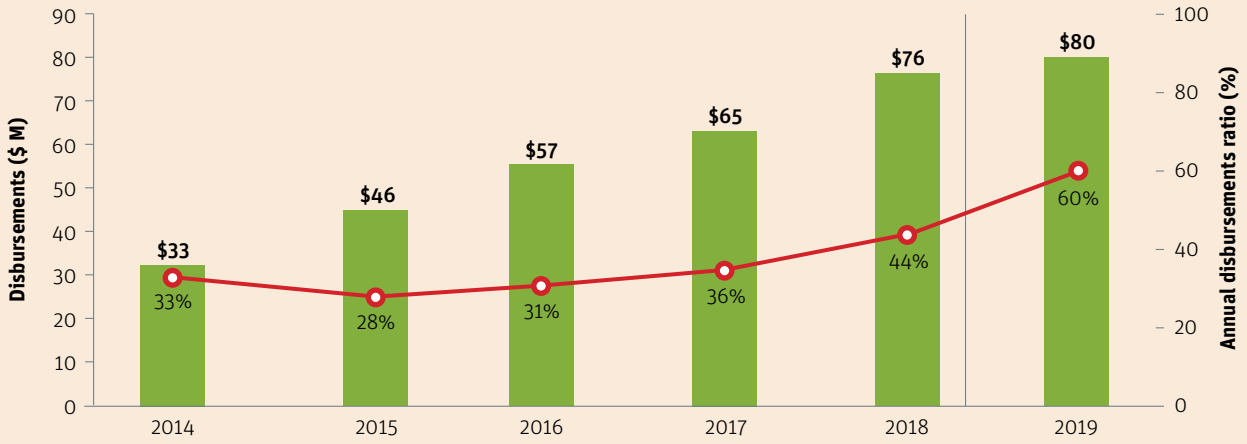
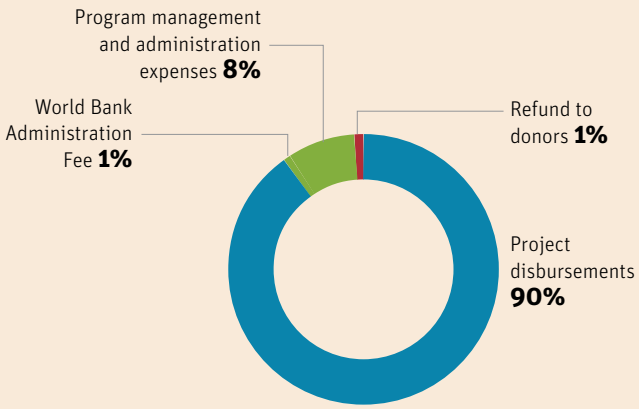


Figure 6. Distribution of Disbursements, FY19



New Grant Commitments in FY19

Throughout FY19, the Secretariat committed a total of $95.3 million to grant activities. This included $83.6 million to 172 new grants[6] and $11.7 million provided as additional funds to scale up 41 ongoing activities.

During the fiscal year 2019, Africa received the largest share of new support (28 percent new commitments in dollar terms; 22 percent of new grants), which is consistent with FY18 (see figure 7). This was followed by the East Asia and Pacific region (14 percent of new commitments in dollar terms; 16 percent of new grants); Europe and Central Asia (11 percent of new commitments in dollar terms; 12 percent of new grants); Latin America and the Caribbean (10 percent of new commitments in dollar terms; 12 percent of new grants); and the South Asia region (9 percent of new commitments in dollar terms; 9 percent of new grants). The Middle East and North Africa received the smallest share of new support (3 percent of new commitments in dollar terms; 4 percent of new grants). Global activities represented 25 of new commitments in dollar terms and 26 percent of new grants.

From a funding perspective, the MDTF and related funds accounted for $39 million (47 percent) of funding for new grant commitments (see figure 8). The Japan–World Bank Program accounted for $14.8 million (18 percent) of funding. The ACP–EU NDRR Program accounted for $13.3 million (16 percent) and other EU-funded programs accounted for $2.1 million in new funding (3 percent). Special programs provided $14.4 million in funding for new grant commitments during FY19 (17 percent).

The average activity size for grant activities approved in FY19 was approximately $543,000 for both country-based activities and global engagements.[7] Since FY16, the annual average grant size has been between $420,000 and $590,000.

Of the $83.6 million newly committed during FY19, about 93 percent ($77.7 million; 90 percent of new grants) related broadly to mainstreaming ex-ante DRM and climate change adaptation activities, while about 7 percent ($5.9 million; 10 percent of new grants) went toward activities linked to post-disaster and resilient recovery interventions (see figure 9). This is on par with previous fiscal years and represents continued emphasis on helping countries strengthen resilience to shocks before disaster strikes.

first phase of the Japan–World Bank Program SDTF (TF072129)—will come to completion.

[6] This includes 22 Just-In-Time grants.

[7] This does not include in Just-in-Time grants, which had an average size of $95,000. Core program grants had an average size of $488,000. Special program grants had an average size of $1,247,000.

Figure 7. Distribution of Financing for New Commitments by Region ($ M)

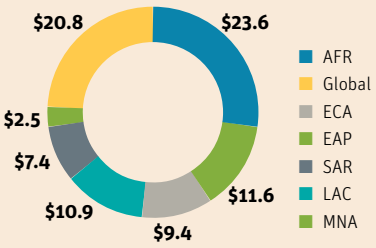


Figure 8. Distribution of Financing for New Commitments by Region ($ M)

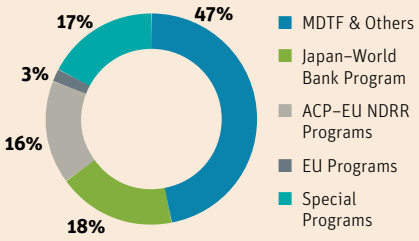
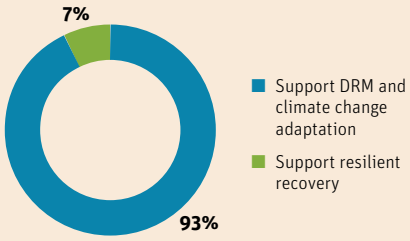


Figure 9. New Commitments Approved in FY19



Portfolio Profile and Beneficiaries

During FY19, GFDRR-funded active grants targeted natural hazards that pose the greatest risks to vulnerable countries. The main natural hazards addressed through core program grant activities were river flooding (58 percent), earthquake (56 percent), urban flooding (61 percent), and landslide (46 percent) (see figure 10). Most grant activities address more than one natural hazard, so the numbers shown do not sum to 100 percent.

GFDRR-supported activities had a range of beneficiary types in FY19 (see figure 11). Nearly all core program active grants (98 percent) benefited government partners through support to, and engagement with, ministries of finance, ministries of public works, national disaster management agencies, and other partners within partner countries. Communities were beneficiaries in over half of the activities (53 percent) and CSOs benefited from about 16 percent of activities. The private sector was also engaged in nearly 25 percent of activities in FY19.

Additionally, over 70 percent of grants active in FY19 supported activities at the national level, and over 25 percent of activities strengthened resilience at the regional level (34 percent of funding) (see figure 12). Twenty-seven percent of funding went toward activities with some engagement at the

Figure 10. FY19 Portfolio—Natural Hazards Addressed

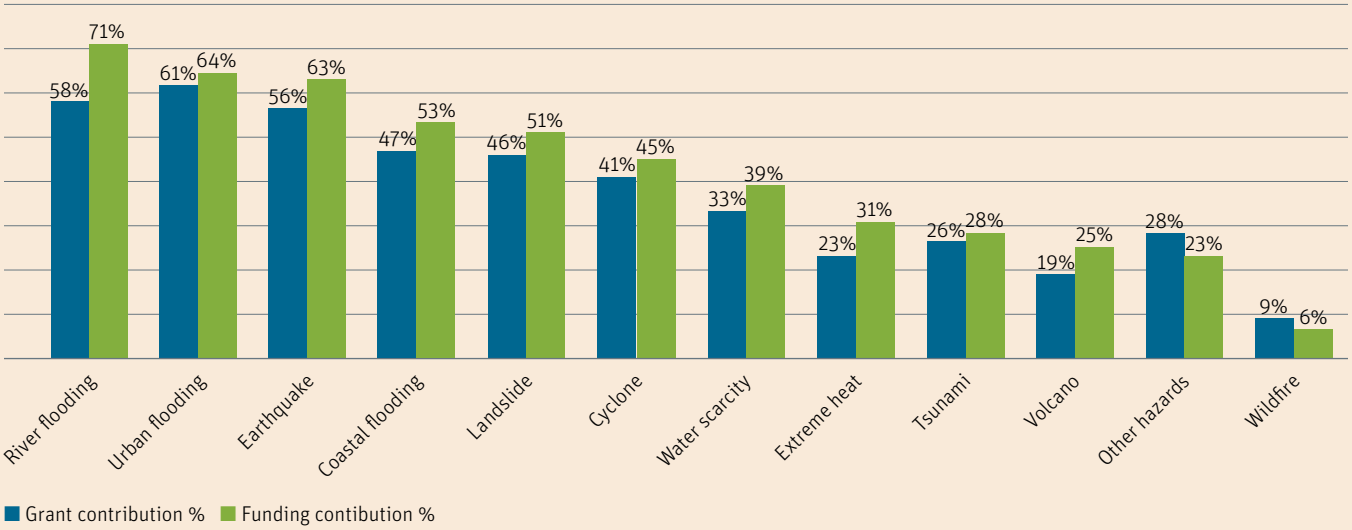


Figure 11. Beneficiaries of FY19 Grant Activities (by portfolio $)

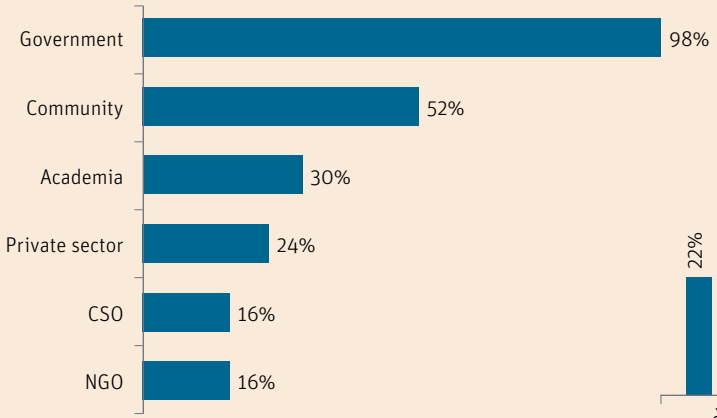
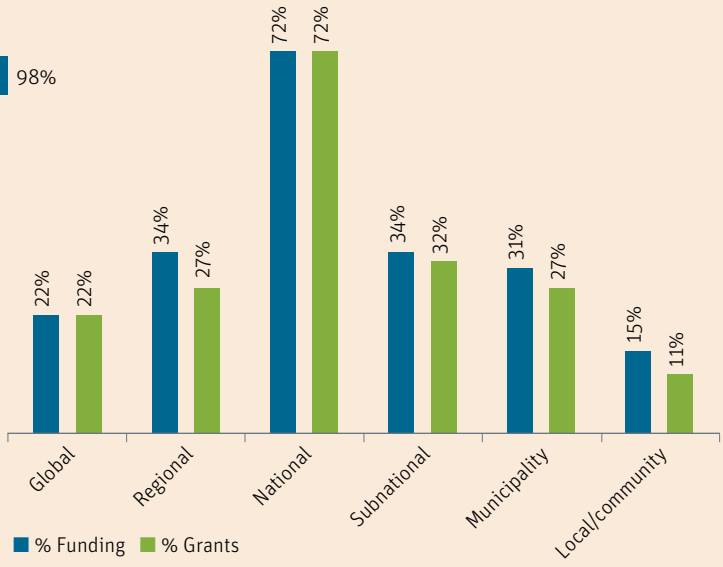


Figure 12. FY19 Portfolio Coverage Level



municipal level, a 15 percent increase over FY18.

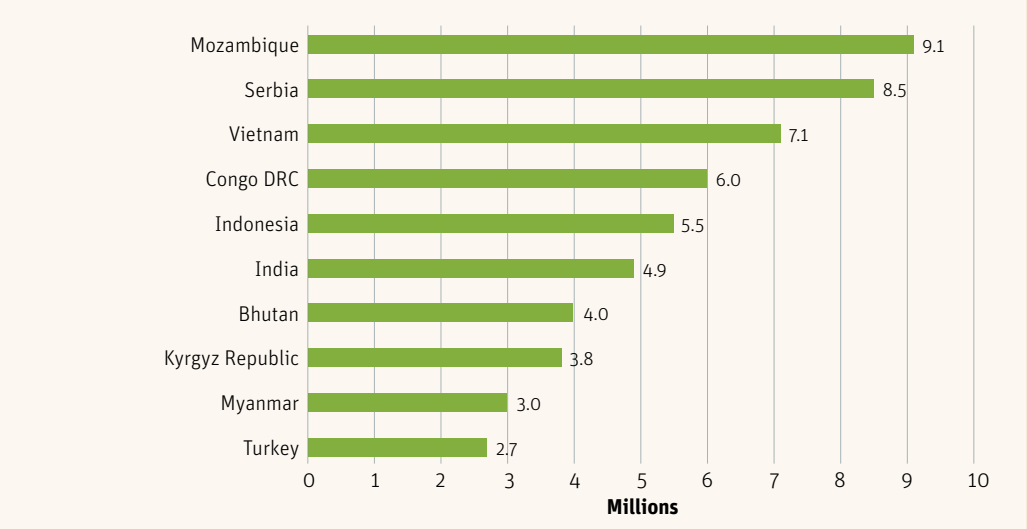
Ten countries accounted for $54.5 million of in-country grant support (20 percent of overall commitments) (see figure 13). Many of these grant activities support integrated risk information and preparedness efforts, with an increased focus on financial protection and urban resilience. Examples include a newly funded activity to strengthen financial protection in Mozambique; support to build urban resilience and strengthen critical infrastructure in Turkey; and ongoing engagements to strengthen hydrometeorological and early warning services in Bhutan, the DRC, and Serbia. As in FY18, many other activities helping countries within the top 10 group went toward supporting recovery and reconstruction efforts emerging from recent disaster events. For example, funding supported the government of Mozambique's response and recovery following Cyclone Idai; the government of India in recovery planning in Kerala and Odisha following flooding events; and the government of Indonesia following the Sulawesi earthquake.

During FY19, top recipients of new in-country commitments were Mozambique ($9.1 million for seven grants), Indonesia ($3.2 million for three grants), Vietnam ($2.4 for four grants), Turkey ($2.2 million for five grants), India ($1.7 million for four grants), and Somalia ($1.4 million for two grants). Examples of newly funded activities include those increasing the resilience of Vietnam's urban and coastal areas; enhancing the capacity and awareness of stakeholders to incorporate disaster risks in infrastructure and service improvements in vulnerable communities in Tajikistan; and strengthening synergies between DRM and social protection in Mozambique.

In-kind Support via Staff Exchanges and Secondments

GFDRR's program benefits from in-kind resources that several donors have made available in the form of secondments and staff exchanges. In FY19, GFDRR hosted four staff members from the governments of Germany, Japan, Sweden, and Switzerland. This exchange of staff helped strengthen GFDRR's technical expertise, particularly its thematic initiatives, and provided partners with opportunities to establish more direct connections with the Secretariat's work.

Figure 13. FY19 Active Commitments: Top In-Country Support
Total = $54.5 M



Portfolio Results

This is the second fiscal year of reporting results on the GFDRR partnership, as anchored in implementing the Facility's FY18–21 Strategy. This section outlines progress and achievements of the partnership, as measured against GFDRR's results framework and targets. It also highlights where there is high demand for GFDRR support to help countries build greater resilience to natural hazards and climate change, and notes where improvements are needed. The goal of this results section is to inform the partnership about progress during FY19 and facilitate decision making. It is not to assess longer term impact, which is a role performed by commissioned evaluations.

This section presents results based on monitoring data from GFDRR core programs. It does not include special programs or just-in-time grants, which use a separate M&E system. It includes:

- Evidence of contributions to support developing countries in implementing the Sendai Framework for Disaster Risk Reduction 2015–2030;
- Intermediate outcome results mapped to each GFDRR strategic objective;
- Evidence of portfolio progress for each Area of Engagement, as measured against FY21 targets; and
- An update on GFDRR's evaluation program.

GFDRR's Logical Framework and Results Framework

Developed in FY18 to guide its strategy, GFDRR's Logical Framework establishes four objectives for the Facility. These are:

- **Strategic Objective 1:** Evidence and knowledge on effective disaster and climate resilience approaches are shared for improved policy and practice.
- **Strategic Objective 2:** Risk-informed development is adopted at national, subnational, and community levels, using integrated and participatory approaches.
- **Strategic Objective 3:** Governments in vulnerable countries have access to additional investments for scaling up disaster and climate resilience building.
- **Strategic Objective 4:** Disaster preparedness and resilient recovery capacity is increased at national, subnational, and community levels.

The Logical Framework outlines the causal pathway through which the Facility expects to make progress toward these objectives and its vision (see figure 14). Through its vision and objectives, the Logical Framework is aligned to the Sendai Framework for Disaster Risk Reduction 2015–2030.

GFDRR's results framework includes a results chain of inputs, outputs, and outcomes with indicators for monitoring output- and outcome-level grant performance. With the use of its internal grant monitoring platform, GFDRR tracks the progress of its core program–funded grant portfolio.

Monitoring Grant Progress

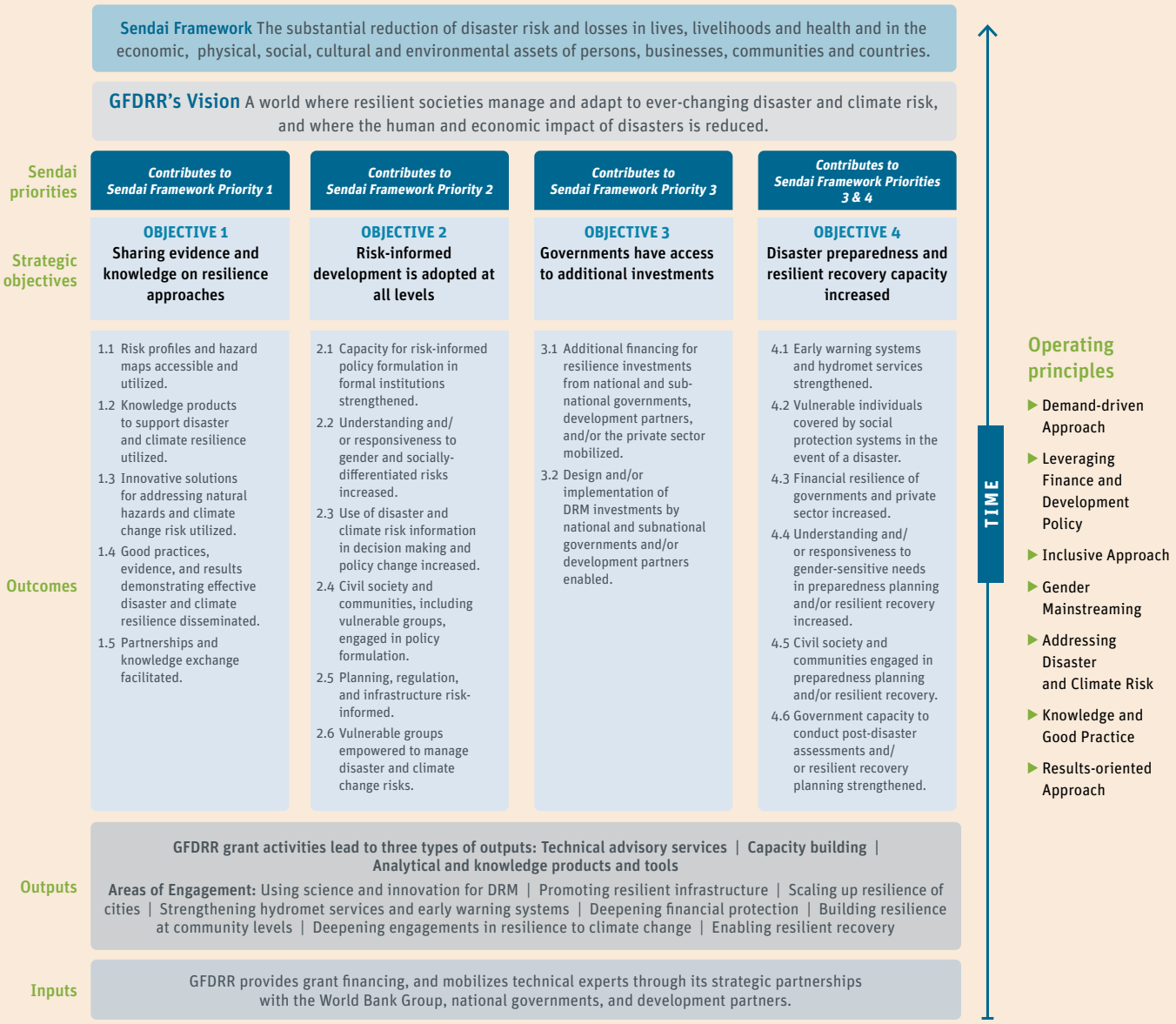
The data presented in this section is derived primarily from monitoring reports for core program–funded grants active in FY19. During the fiscal year, GFDRR had two reporting periods covering July to December 2018 and January to June 2019. Grant recipients submitted progress updates against GFDRR's results framework and key data points through the Facility's grant monitoring platform at each reporting period.

This platform is an internal tool for monitoring grant progress and collecting lessons learned from grant implementation. It includes real-time financial data linked directly to World Bank systems, and output and outcome data that are self-reported by GFDRR grant recipients. Grant recipients routinely attach project documentation to verify grant performance claims. The data collected through the platform are reviewed for quality and analyzed by a team within the Secretariat.

Contributions to Implementing the Sendai Framework for Disaster Risk Reduction, 2015–2030

The Secretariat monitors how the GFDRR partnership indirectly contributes to helping developing countries implement the Sendai Framework for Disaster Risk Reduction. This includes tracking indirect contributions to both the Sendai Framework's seven global

Figure 14. GFDRR Logical Framework



targets[8] and four Priorities for Action (see tables 1 and 2). The targets assess global progress toward the Framework's expected long-term outcomes, whereas the priorities outline areas requiring focused action by countries within and across sectors at local, national, regional, and global levels.

Data analyses confirm that all GFDRR-funded grants contribute to at least one Sendai Framework target and Priority for Action (see tables 1 and 2), demonstrating that the full portfolio is aligned with helping countries achieve this global agreement by 2030. Additionally, 3 percent of the portfolio contributed to all seven targets, including grant activities building inclusive flood management in Sri Lanka, increasing the safety and resilience of critical infrastructure in Colombia, and enabling risk reduction investments in the Philippines. Thirteen percent contributed to all Priorities for Action, including grant activities strengthening emergency response management and resilience in the Seychelles, improving the resilience

[8] In FY18, indicators were announced for the global community to track progress toward achieving the Sendai Framework's seven targets. Due to the role of the Facility within the Sendai Framework and the target's long timeframe, GFDRR does not use these indicators to monitor the progress of its portfolio overall. See 48(d) in the Sendai Framework https://www.preventionweb.net/publications/view/43291.

and affordability of roads and bridges in Latin America, and helping develop strategies and options for scaling DRM in ECA countries.

In addition, analyses indicate growth in indirect contributions to most Sendai Framework targets. This was led by indirect grant contributions to Target B, which grew 13 percent, from 46 percent in FY18 to 52 percent in FY19, and Target D, which grew 9 percent, from 45 percent in FY18 to 49 percent in FY19. This increase was also seen in funding support, including a 14 percent growth in indirect contributions to Target B, from 51 percent in FY18 to 58 percent in FY19.

Analysis shows there was a 2 percent average increase from FY18 levels in funding support contributing to all Sendai Framework Priorities for Action. It also shows a rise in the number of countries covered within each priority area, for an average of 134 countries in FY19 from 125 countries in FY18.[9] This includes GFDRR support to strengthen resilience to disaster and climate risk for conflict and fragile states with inherently complex operating environments, including Afghanistan, Somalia, Sudan, and Yemen.

[9] Unless otherwise indicated, numbers of countries presented in this results section include countries that receive benefits from GFDRR grants, either through activities directly implemented in-country or covered through global or regional activities.

Table 1. GFDRR Contributions to Sendai Framework Global Targets

Sendai Framework Global Targets	GFDRR Portfolio
Target A: Substantially reduce global disaster mortality by 2030, aiming to lower average per 100,000 global mortality between 2020–2030 compared with 2005–2015.	• 30 percent of grants indirectly contribute • Supported through 37 percent of funding • Grants covering 122 countries
Target B: Substantially reduce the number of affected people globally by 2030, aiming to lower the average global figure per 100,000 between 2020–2030 compared with 2005–2015.	• 52 percent of grants indirectly contribute • Supported through 58 percent funding • Grants covering 129 countries
Target C: Reduce direct disaster economic loss in relation to global GDP by 2030.	• 42 percent of grants indirectly contribute • Supported through 45 percent funding • Grants covering 119 countries
Target D: Substantially reduce disaster damage to critical infrastructure and disruption of basic services, among them health and educational facilities, including through developing their resilience by 2030.	• 49 percent of grants indirectly contribute • Supported through 46 percent funding • Grants covering 117 countries
Target E: Substantially increase the number of countries with national and local disaster risk reduction strategies by 2020.	• 28 percent of grants indirectly contribute • Supported through 34 percent funding • Grants covering 125 countries
Target F: Substantially enhance international cooperation to developing countries through adequate and sustainable support to complement their national actions for implementation of this framework by 2030.	• 17 percent of grants indirectly contribute • Supported through 16 percent funding • Grants covering 109 countries
Target G: Substantially increase the availability of and access to multi-hazard early warning systems and disaster risk information and assessments to the people by 2030.	• 35 percent of grants indirectly contribute • Supported through 45 percent funding • Grants covering 122 countries

Table 2. GFDRR Alignment with Sendai Framework Priorities for Action

Sendai Framework Priorities for Action	GFDRR Contributions
Priority 1: Understanding disaster risk	• Aligns with GFDRR Strategic Objectives 1 and 2 • 62 percent of GFDRR grants contribute through 71 percent of funding • Grants covering 134 countries
Priority 2: Strengthening disaster risk governance to manage disaster risk	• Aligns with GFDRR Strategic Objective 2 • 54 percent of GFDRR grants contribute through 66 percent of funding • Grants covering 135 countries
Priority 3: Investing in disaster risk reduction for resilience	• Aligns with GFDRR Strategic Objectives 3 and 4 • 59 percent of GFDRR grants contribute through 65 percent of funding • Grants covering 131 countries
Priority 4: Enhancing disaster preparedness for effective response, and to "Build Back Better" in recovery, rehabilitation, and reconstruction	• Aligns with GFDRR Strategic Objective 4 • 42 percent of GFDRR grants contribute through 43 percent of funding • Grants covering 138 countries

Outcome-Level Results

Table 3 outlines GFDRR's intermediate outcome-level results of grant activities funded through core programs, as mapped against the Logical Framework's four strategic objectives. Most grants report progress toward multiple strategic objectives.

Toward Strategic Objective 1, 47 percent of grants helped make risk or hazard information accessible and utilized. The results data show continued high demand from developing countries for grant support for DRM activities around identification and communication of risk information.

The data also confirm a high demand for assistance to use new technologies, with 41 percent of grants reporting support of this kind. Many of these grants are utilizing technology and nature-based solutions in innovative ways to tackle risk. For example, a grant supporting the integration of climate and disaster risk considerations into spatial planning in Cameroon is utilizing drones and crowdsourcing data to obtain information for developing hazard maps. An analysis of the data also demonstrates a continued high demand for knowledge exchange activities, with 44 percent of grants reporting support of this kind.

Toward **Strategic Objective 2**, over 50 percent of grants supported country-level risk-informed policy formulation. As noted in table 3, activities have contributed to helping 128 countries improve government institutional capacity in disaster and climate risk–informed policy design and analysis. Additionally, grant activities have contributed to helping 130 countries improve risk governance. For example, a GFDRR-funded grant helping scale up and improve the safety of school infrastructure in Eastern Europe has implemented a risk-based prioritization framework for investment plans to maximize child safety in the event of an earthquake. In Brazil's Porto Alegre municipality, a GFDRR grant has supported the creation of a joint community and city government action group leading to improved risk governance.

For progress toward **Strategic Objective 3**, please see the section on "Leveraging Development Financing" (pg. 98).

Toward **Strategic Objective 4**, data analyses showed that 17 percent of in-country and global grant activities contributed to strengthening early warning systems and hydromet services, covering 102 countries. This is an increase over FY18, where grant activities helped 88 countries in this area. Additionally, results indicate grants have continued helping developing countries increase financial resilience through supporting risk insurance programs, sovereign disaster risk financing, and establishing emergency contingency financing mechanisms. During the FY19, 12 percent of grant activities contributed to increased financial protection of governments in case of natural disasters.

An analysis of FY19 results shines a light on underrepresented areas where there is opportunity for

the Facility to scale up further. Specifically:

- Five percent of grant activities supported resilient recovery training and capacity building.
- Five percent of grant support has contributed to disaster risk–informed social protection systems. This is a relatively new area of grant support for GFDRR, but one that is widely acknowledged as critically important to resilience building.
- Seven percent of grant activities supported policy and/or planning documents that included the needs of individuals based on gender, disability, and socioeconomic status.
- 18 percent of grants supported increased citizen engagement in disaster and climate resilience–related policy reform.

Table 3. FY19 Outcome-Level Results

Strategic Objective 1: Evidence and knowledge on effective disaster and climate resilience approaches are shared for improved policy and practice.

Intermediate Outcomes	FY19 Results
1.1 Risk profiles and hazard maps accessible and utilized.	• 139 countries supported to have accessible, understandable, and usable disaster risk information and assessments • 47 percent of grants contributed to making risk or hazard information accessible and utilized • 26 percent of grants supported the creation or utilization of risk profiles or hazard maps
1.2 Knowledge products to support disaster and climate resilience utilized.	• 33 percent of grant activities supported the utilization of knowledge products for disaster and climate resilience
1.3 Innovative solutions for addressing natural hazards and climate change risk utilized.	• 41 percent of grant activities supported utilizing innovative solutions for addressing natural hazard and/or climate change risk
1.4 Good practices, evidence, and results demonstrating effective disaster and climate resilience disseminated.	• 44 GFDRR commissioned publications were made available and accessible on the Facility's website
1.5 Knowledge exchange activities facilitated.	• 44 percent of grants supported facilitating international, regional, and/or bilateral knowledge exchange activities • Approximately 1,100 international, regional, and/or bilateral knowledge exchange activities facilitated

Table 3. FY19 Outcome-Level Results (cont)

Strategic Objective 2: Risk-informed development is adopted at national, subnational, and community levels, using integrated and participatory approaches.

Intermediate Outcomes	FY19 Results
2.1 Capacity for risk-informed policy formulation in formal institutions strengthened.	• 130 countries supported for improved disaster risk governance • 128 countries supported for improved government institutional capacity in disaster and climate risk–informed policy design and analysis
2.2 Understanding and/or responsiveness to gender and socially differentiated risks increased.	• 7 percent of grant activities supported policy and/or planning documents that include the needs of individuals based on gender, disability, and socioeconomic status
2.3 Use of disaster and climate risk information in decision making and policy change increased.	• 51 percent of grant activities contributed to risk-informed policy formulation or decision making
2.4 Civil society and communities, including vulnerable groups, engaged in policy formulation.	• 18 percent of grant activities supported increased citizen engagement in disaster and climate resilience–related policy reform
2.5 Planning, regulation, and infrastructure risk-informed.	• 44 percent of grants supported risk-informed planning, regulation, and/or infrastructure – 38 grant activities helped strengthened building codes at the national or local government level – 55 grant activities helped strengthen land use planning systems at national or local government level – 124 grant activities helped incorporate DRM measures into infrastructure at national or local government level
2.6 Vulnerable groups empowered to manage disaster and climate change risks.	• 48 grant activities helped empower vulnerable groups to manage disaster and climate change risks

Strategic Objective 3: Governments in vulnerable countries have access to additional investments for scaling up disaster and climate resilience building.

Intermediate Outcomes	FY19 Results
3.1 Additional financing for resilience investments from national and subnational governments, and/or development partners mobilized.	• $7.6 billion leveraged through $26.1 million in GFDRR funding (35 grants)[10]

[10] This figure captures additional development financing approved in FY19 leveraged by new or ongoing grants. Please see the "Leveraging Development Financing" section (pg. 98) for a description of the methodology used and a list of projects leveraged by GFDRR grants in FY19.

Table 3. FY19 Outcome-Level Results (cont)

Strategic Objective 4: Disaster preparedness and resilient recovery capacity is increased at national, subnational, and community levels.

Intermediate Outcomes	FY19 Results
4.1 Early warning systems and hydromet services strengthened.	• 17 percent of grant activities contributed to increased access to high-quality early warning systems (EWS) and hydromet services • 102 countries supported to strengthen EWS and hydromet services
4.2 Vulnerable individuals covered by social protection systems in the event of disaster.	• 5 percent of grant activities contributed to disaster risk-informed social protection systems
4.3 Financial resilience of governments and private sector increased.	• 12 percent of grant activities contributed to increased financial protection of governments in case of natural disasters
4.4 Understanding and/or responsiveness to gender-sensitive needs in preparedness planning and/or resilient recovery increased.	• 1,202 people trained through participation in gender-sensitive post-disaster assessment, and/or recovery planning methodologies
4.5 Civil society and communities engaged in preparedness planning and/or resilient recovery.	• 16 percent of grant activities engaged on preparedness planning and/or resilient recovery included civil society or community groups
4.6 Capacity to conduct post-disaster assessments and/or resilient recovery planning strengthened.	• 5 percent of grant activities supported resilient recovery training and capacity building

Areas of Engagement Progress

GFDRR has measured the progress of its FY19 portfolio against the targets set in the FY18–21 Strategy for the eight Areas of Engagement. As shown in table 4, nearly all targets have been met or exceeded. This finding indicates the following:

- Some FY21 targets now look to be conservative.
- In some areas, there has been greater demand than anticipated when targets were established in FY17, for example, in the areas of risk information, urban resilience, financial protection, and climate resilient investments.
- Certain programs, such as safer schools engagements, achieved greater scale than originally anticipated due to strategic use of resources and efficiency gains.
- The fast pace of progress against these targets suggests they need to be revisited. That will be done as part of the ongoing work developing the next GFDRR strategy, a process which is being accelerated per agreement by Consultative Group (CG) members in May 2019.

Table 4. Progress toward FY21 Targets

Areas of Engagement	Results Indicator	FY18 Results	FY19 Results	Target (FY21)
Promoting open access to risk information	Hazard, exposure, and risk datasets and/or geospatial layers developed (#)	2,100	1,171	500
	People trained to use risk tools for decision making (#)	5,375	8,088	2,000
Promoting resilient infrastructure	Countries with safer school engagements (#)	44	45	30
	Classrooms made safer from disasters (#)	28,750	766,830	200,000
	Expected student beneficiaries (#)	4.8 million	18 million	7 million
Scaling up the resilience of cities	Cities working on resilient development investments (#)	45+	60	30
Deepening financial protection	Government officials trained in financial protection and direct and indirect insurance programs (#)	966	1,251	500
Building resilience at community levels	People that have access to coverage of adaptive social protection (#)	3.1 million	5 million	15 million
Strengthening hydromet services and early warning systems	Expected final beneficiaries (#)	51 million	75 million	100 million
Enabling resilient recovery	Government officials trained on PDNA and/or recovery planning and coordination (#)	615	691	1,000
Deepening engagements in resilience to climate change	Total climate resilience investments enabled by development partners ($)	$1.7 billion	$2.8 billion[11]	$3 billion
	Countries with climate resilience investments enabled (#)	51	31	25

Evaluation

In FY19, GFDRR increased its focus on understanding the impact of the partnership through evaluation. In consultation with the Technical Advisory Group (TAG) on Monitoring and Evaluation (M&E), the Secretariat developed an evaluation policy for GFDRR. This policy articulates how and why evaluation is used within GFDRR, with a focus on learning. It will support increased communication and dissemination of evaluation findings to stakeholders to maximize the use of and improve the overall quality of GFDRR's programming. The evaluation policy was endorsed by the CG in May 2019 and will be implemented beginning FY20.

During FY19, an independent evaluation was completed on the first phase of the Small Island States Resilience Initiative (SISRI). It found the initiative moderately satisfactory at meeting its planned objectives during the first three years of operation (2015–2018). While evaluation findings showed the initiative did not meet its target to scale up climate finance for small island developing states (SIDS) nor significantly improve donor fragmentation, it was found to support evidence-based analytical work. This resulted in innovative methodologies to plan for long-term resilient development, mobilize financial resources from the Green Climate Fund, and establish a robust community of practitioners from small island states to share innovative and transformative climate resilience practices. Findings are being used to inform future activities focused on SIDS.

A review of GFDRR-funded risk assessment projects over 2014–19 was conducted to understand emerging challenges and trends, and to formulate best practice guidelines for future activities. The review provides practical recommendations and best practice for conducting risk assessments for the World Bank and global community. Some of the findings include the importance of agreement by all stakeholders on the purpose and scope of the risk assessments; full transparency into model results—including on

[11] FY19 results based on analysis of World Bank climate co-benefits data.

the uncertainties, limitations, and assumptions; an open data policy for organizations conducting risk assessments; the development of interoperable data and data portals targeted at non-experts; and the need to develop open source risk models and build the capacity of countries to develop and maintain their own risk models.

Additionally, an evaluation pipeline for FY19–21 was developed. Ongoing and forthcoming evaluations include:

- A review of the FY18–21 strategy that will inform development of a new strategy.
- An evaluation of the GFDRR MDTF, which will come to completion in December 2020. Findings of the evaluation will inform implementation of the new MDTF.
- A mid-term review of the Disaster Risk Finance Analytics Program SDTF.
- An inaugural review of closed GFDRR grants that will look at grants funded through GFDRR's Social Resilience Program.
- A retrospective review of DRM projects in the Pacific with community resilience measures incorporated into their design.

Mainstreaming Gender and Citizen Engagement

Portfolio Performance Mainstreaming of Gender and Citizen Engagement

GFDRR monitors the progress and results on mainstreaming gender equality, women's empowerment, and citizen engagement through its grants to ensure that the GFDRR Gender Action Plan 2016–2021 (GAP) and GFDRR Citizen Engagement Action Plan 2019–2023 (CEAP) are implemented.

Mainstreaming Gender Equality and Women's Empowerment within the GFDRR Portfolio

The GAP accompanies the World Bank Group's Gender Strategy FY16–23 with the objective to move the World Bank's development work beyond gender mainstreaming to outcomes and results. In FY19, 59 percent of new grants were gender-informed. Of these, 59 percent of new grants had undertaken gender analysis or considered existing gender analysis to inform the grant's design and/or implementation. Thirty-six percent of new grants included specific actions to reduce gender gaps. Finally, 13 percent of the approved grants included indicators to measure the progress in outcomes between women and men.

The FY19 portfolio shows a slower rate of improvement in gender mainstreaming among newly approved grants compared to FY17 and FY18 (see table 5). Progress made in FY17 and FY18 helped raise awareness on the need for a more inclusive gender approach to DRM. However, the Secretariat found the lack of meaningful data, analytics, and understanding of what engendered DRM entails constrained the Facility's ability to measure the depth of gender work within the portfolio and advance the agenda at the pace expected.

As a corrective measure, in FY19 GFDRR funded analytical products in the Caribbean, Pacific, and Europe and Central Asia that will provide a better understanding of gender dynamics and social norms affecting DRM interventions in specific countries and regions, allow for the collection of sex disaggregated data, and identify entry points to empower women and increase their representation in decision-making bodies. This evidence will help inform more inclusive and gender-responsive DRM interventions on the ground. Additionally, GFDRR developed a Gender and DRM online training, which will help practitioners design more gender-responsive operations and better assess the quality of those interventions.

Mainstreaming Citizen Engagement within the GFDRR Portfolio

The CEAP's objective is to promote a more systematic and results-focused approach to the analysis, design, implementation, and monitoring and evaluation of the integration of citizen engagement within GFDRR's activities. The monitoring and results reporting of the CEAP is aligned with the updated Logical Framework and Results Framework to ensure GFDRR-wide monitoring and reporting of progress on citizen engagement. In FY19, 65 percent of new grants included citizen engagement in their design, an increase of 8 percent compared to FY18 (see table 6). Of those, 41 percent included consultations with citizens/communities, 27 percent included citizens/communities in planning and decision making, and 17 percent of the grants supported citizen/community control over planning decisions and investment resources.

Table 5. Gender Engagement

Gender	Gender Results Indicators	FY17	FY18	FY19
Percentage of approved gender-informed grants (%)		70	72	59
Percentage of approved grants that include gender actions (%)		42	39	56

Table 6. Citizen Engagement

Results indicators	FY18	FY19
Percentage of grants that include citizen engagement in their design (%)	57	65
Percentage of grants that include consultations with citizens (%)	37	41
Percentage of grants that engaged citizens in planning and decision making (%)	25	27
Percentage of grants that support citizen control over planning decisions and investment resources (%)	15	17

Leveraging Development Financing

GFDRR strategically focuses its grant financing in areas where there is a high likelihood to leverage other resources for scaling up disaster and climate resilience operations. In FY19, GFDRR's funding and/or technical assistance leveraged over **$7.6 billion** in additional financing (see table 7). This is a 25 percent increase over FY18. Of this, nearly $5.3 billion (69 percent) was leveraged through GFDRR's partnership with the World Bank. About $2.3 billion (31 percent) was leveraged from national governments (e.g., governments of Kenya and India), bilateral donors and other development banks (e.g., KfW), and other partners (e.g., private sector).

Since FY17, GFDRR has asked grant recipients to self-report on the way grant activities have leveraged additional funding by the World Bank, national governments, and/or other development partners. GFDRR categorizes the way in which its activities have leveraged in three ways: (i) informing; (ii) enabling; or (iii) co-finance investments. These categories are defined below.

(i) ***Informing*** *the mobilization of resources from national governments or development partners.* For example, a GFDRR grant funds the development of a knowledge product, risk assessment, post-disaster assessment, or recovery plan that provides analytical work or evidence which helps to influence the design of a larger investment. This occurs when a GFDRR-funded activity or product lays the groundwork for conceiving a larger investment. It occurs at early stages of project preparation, while the larger investment is being designed, developed, and discussed with government counterparts.

In FY19, GFDRR activities **informed nearly $4.5 billion** in leveraging (59 percent of total leveraging). Of this, a significant amount of financing was related to a social and economic inclusion project in Kenya and urban development–related projects in China.

(ii) ***Enabling*** *development financing by directly supporting the design and/or implementation of a DRM operation from national governments or development partners.* For example, funding staff time to work on designing DRM projects at the World Bank or integrating DRM as a component in a development project. This occurs when a GFDRR grant funds analytical work or technical advisory inputs that complement the preparation or implementation of a project.

In FY19, GFDRR activities helped **enable $2.7 billion** in DRM financing (39 percent of total leveraging). Of this, most financing occurred through a project in Indonesia reconstructing public facilities and housing following the Sulawesi earthquake; a project in India improving the safety and operational performance of dams; and projects in Sub-Saharan Africa addressing urban development, social safety nets, and livelihoods.

(iii) ***Co-financing*** *DRM operations with other development partners to increase the scale of interventions.* For example, GFDRR funds may complement financing from the World Bank, donor countries, and/or UN agencies. This typically occurs at the time the project is being designed and structured.

In FY19, GFDRR engagements were linked to nearly **$452 million in co-financing** activities (6 percent of total leveraging). This includes co-financing a project in Iraq improving the realization and commercial efficiency of electricity services, and a project in Honduras improving access to markets and climate-smart practices for economic inclusion.

Detailed information on funding leveraged during FY19 can be found in table 7.

Table 7. Development Finance Leveraged through FY19 Portfolio by Region and Leveraging Type

Leveraging Type	Country	Project Name	Funding Source ($M)			
			$	WB	$	Non-WB
Africa						
Informing	Ethiopia	Ethiopia Resilient Landscapes and Livelihoods Project (P163383)	100	IDA	10/6.3	Government of Ethiopia/ Free-Standing Trust Fund For SDN
	Ghana	Greater Accra Resilient and Integrated Development Project (P164330)	200	IDA		
	Kenya	Kenya Social and Economic Inclusion Project (P164654)	250	IDA	1,010.4 /85.8	Government of Kenya/ Free-standing Co-financing Trust Fund
	Mozambique	2nd Additional Financing to Emergency Resilient Recovery Project (P166063)	13	IDA		
	Niger	Niger Adaptive Safety Net Project 2 (P166602)	80	IDA		
	Somalia	Somalia Urban Resilience Project (P163857)			9	Somalia Multi-Partner Fund
Enabling	Benin	Benin Stormwater Management and Urban Resilience Project (P167359)	100	IDA	2.3	Government of Benin
	Burkina Faso	Strengthening Climate Resilience in Burkina Faso (P164078)	8.5	IDA	2	Government of Burkina Faso
	Cabo Verde	Cabo Verde Disaster Risk Management Development Policy Financing with CAT DDO (P160628)	5 / 5	IDA/ IBRD		
	Madagascar	Madagascar Social Safety Net Project Additional Financing (P167881)	90	IDA		
	Malawi	Malawi Disaster Risk Management Development Policy Financing with CAT DDO (P165056)	70	IDA		
	Mozambique	Mozambique Disaster Risk Management and Resilience Program (P166437)	90	IDA	36.3	Government of Mozambique
	Sierra Leone	Integrated and Resilient Urban Mobility Project (P164353)	50	IDA	2	Government of Sierra Leone
	Togo	Togo Infrastructure and Urban Development Project (P161772)	30	IDA		
Subtotal			**1,091.5**		**1170.1**	
Region Total				**2,261.6**		

Leveraging Type	Country	Project Name	Funding Source ($M)			
			$	WB	$	Non-WB
East Asia and Pacific						
Informing	China	Shaanxi Sustainable Towns Development Project (P162623)	100	IBRD	88.6/50	Government of China/Germany: Kreditanstalt Fur Wiederaufbau (KFW)
	China	Gansu Revitalization and Innovation Project (P158215)	180	IBRD	132.6	Government of China
	China	Green Urban Financing and Innovation Project (P158124)	200	IBRD	148/172	Government of China/Germany: KFW
	Solomon Islands	Solomon Islands Roads and Aviation Project (P166622)	51	IDA	3.6	Government of Solomon Islands
Enabling	Indonesia	Central Sulawesi Rehabilitation and Reconstruction Project (P169403)	150	IBRD		
	Marshall Islands	Additional Financing for the Pacific Resilience Project under the Pacific Resilience Program (P166974)	2.5	IDA	0.4	Government of Marshall Islands
	Samoa	Second Resilience Development Policy Operation with CAT DDO (P165928)	13.7	IDA		
	Samoa	Samoa Pacific Resilience Project under Pacific Resilience Program Additional Finance (P167152)	2.5	IDA	0.4	Government of Samoa
	Tonga	Additional Financing for The Pacific Resilience Project Under the Pacific Resilience Program (P167166)	15	IDA	0.4/2	Government of Tonga/Australia-Pacific Islands Partnership
	Tonga	Skills and Employment for Tongans (P161541)	18.5	IDA	2.4	Australia-Pacific Islands Partnership
	Vanuatu	Vanuatu Disaster Risk Management Development Policy Grant with CAT DDO (P168749)	10	IDA		
Co-financing	China	Integrating Disaster Risk Management in the China Urban Portfolio (P169232)			50	Germany: KFW
Subtotal			**880.2**		**714.5**	
Region Total				**1,594.7**		

Leveraging Type	Country	Project Name	Funding Source ($M)			
			$	WB	$	Non-WB
Europe and Central Asia						
Informing	Central Asia	Central Asia Hydrometeorology Modernization Project Additional Financing (P164780)	11.5	IDA		
	Romania	Strengthening Preparedness and Critical Emergency Infrastructure Project (P168120)	45.6	IBRD		
	Romania	Improving Resilience and Emergency Response Project (P168119)	57	IBRD		
	Tajikistan	Tajikistan Socio-Economic Resilience Strengthening Project (P168052)	37	IDA		
	Uzbekistan	Medium-Size Cities Integrated Urban Development Project (P162929)	100	IBRD	20	Government of Uzbekistan
	Western Balkans	Western Balkans Trade and Transport Facilitation (P162043)	90	IBRD		
Enabling	Romania	Strengthening Disaster Risk Management Project (P166302)	60.5	IBRD		
	Turkey	Sustainable Cities Project 2—Additional Financing (P170612)	560.6	IBRD	1.1	Government of Turkey
Co-financing	Central Asia	Third Phase of The Central Asia Regional Links Program (P159220)	55	IDA		
Subtotal			**1,017.2**		**21.1**	
Region Total				**1,038.3**		
Latin America and the Caribbean						
Informing	Dominica	Additional Financing Dominica Disaster Vulnerability Reduction Project (P166540)	31	IDA		
	Ecuador	Social Safety Net (P167416)	350	IBRD	37.3	Government of Ecuador
	Guatemala	Guatemala DRM Development Policy Loan with CAT DDO II (P159710)	200	IBRD		
Enabling	El Salvador	El Salvador Local Economic Resilience Project (P169125)	200	IBRD		Government
	Haiti	Strengthening DRM and Climate Resilience Project (P165870)	35	IDA		Government of Turkey
	Suriname	Saramacca Canal System Rehabilitation Project (P165973)	35	IBRD		
Co-financing	Honduras	Integrating Innovation for Rural Competitiveness in Honduras—Comrural II (P168385)	75	IDA	18.4/53.5	Government of Honduras/ private capital and commercial financing
Subtotal			**926**		**109.2**	
Region Total				**1,035.2**		

Leveraging Type	Country	Project Name	Funding Source ($M)			
			$	WB	$	Non-WB
Middle East and North Africa						
Co-financing	Iraq	Iraq Electricity Services Reconstruction and Enhancement Project (P162454)	200	IBRD		
Subtotal			**200**			
Region Total			**200**			
South Asia						
Informing	Afghanistan	EQRA (P159378)	100	IDA	198	Afghanistan Reconstruction Trust Fund; Education for All Supervising Entity
	Bangladesh	Bangladesh Sustainable Coastal and Marine Fisheries (P161568)	240	IDA	41.6	Government of Bangladesh
Enabling	Afghanistan	AF-ECLIM: Enhancing Hydromet, Early Warning and Climate Services for Resilience (P168141)			2.4	CREWS
	Bangladesh	Livestock and Dairy Development Project (P161246)	500	IDA	78.7	Government of Bangladesh
	India	Dam Rehabilitation & Improvement Project—Restructuring and Additional Financing (P166977)	137	IBRD	64.1	Government of India
	Sri Lanka	Climate Resilience Multi-Phase Programmatic Approach (P160005)	310	IBRD	7	Government of Sri Lanka
Subtotal			**1,287**		**391.7**	
Region Total				**1,678.7**		

Financial Statements

STATEMENTS OF RECEIPTS, DISBURSEMENTS AND FUND BALANCE

All dollar amounts expressed in US dollars (US) unless otherwise indicated.

Financial data of trustees with EUR holding currency are converted to USD for reporting purpose based on the exchange rate on June 30, 2019 (1 EUR = 1.11 USD)

	Notes	For the fiscal year ended June 30th, 2019	For the fiscal year ended June 30th, 2018	For the fiscal year ended June 30th, 2017
Opening Balance:		221,259,738	271,516,113	237,243,639
Receipts:				
Donor contributions	1	112,881,807	34,204,842	103,553,038
Net investment and other incomes	2	5,117,900	1,906,735	1,843,186
Total Receipts		**117,999,707**	**36,111,577**	**105,396,224**
Disbursements:				
Project disbursements	3	80,295,773	76,378,696	64,868,223
World Bank administration fee	4	669,617	39,959	769,523
Program management and administration expenses	5	6,909,498	6,025,935	4,947,050
Refund to donors	6	1,085,439	1,923,362	538,954.00
Trustee allocation	7	–	2,000,000	–
Total Disbursements		**88,960,327**	86,367,952	71,123,750
Excess of (disbursements over receipts)/ receipts over disbursements		29,039,380	-50,256,375	34,272,474
Ending Balance:				
Ending balance		**250,299,118**	221,259,738	271,516,113
Less: Undisbursed commitments	8	144,703,081	106,328,114	115,980,261
Fund Available for new grants	9	**102,519,462**	114,931,624	155,535,852

NOTE 1: DONOR CONTRIBUTIONS

The following table provides details of contributions receivable by donor.

Donor	For the fiscal year ended June 30th, 2019 in US$	For the fiscal year ended June 30th, 2018 in US$	For the fiscal year ended June 30th, 2017 in US$	Contribution Receivable Amount in US$ equivalent
Australia	2,879,020	5,999,090	3,713,683	–
Austria	–	3,208,950	-	–
Belgium	–	–	627,088	
Canada	2,970,512	–	-	12,183,050
European Union	25,977,575	3,810,169	23,362,306	22,185,162
Germany	44,405,567	5,977,407	35,697,500	34,137,000
India	167,000	–	–	333,000
Italy	4,553,200	–	2,116,840	–
Japan	20,000,000	2,000,000	20,000,000	80,000,000
Luxembourg	–	367,321	315,450	
Norway	2,661,975	1,614,087	1,538,680	–
Serbia	158,267	368,000	–	178,467
Sweden	2,755,428	-	5,406,003	5,391,882
Switzerland	4,011,263	8,076,252	7,378,694	1,000,000
United Kingdom	–	2,783,565	1,196,794	7,629,300
United States	2,342,000	-	2,200,000	1,428,000
Total	**112,881,807**	**34,204,841**	**103,553,038**	**164,465,861**

* Amount in US$ equivalent. The actual US$ equivalent will be based on the exchange rate on the date of the transfer of funds.

The following table provides details of contribution received by main fund

Main Fund	For the fiscal year ended June 30th, 2019	For the fiscal year ended June 30th, 2018	For the fiscal year ended June 30th, 2017	Contribution Receivable
Track II-MDTF (TF070611)	–	–	531,250	–
Core MDTF (TF072236)	–	2,000,000	9,876,525	–
Parallel Core MDTF (TF072584)	23,371,500	11,254,283	24,148,523	5,903,349
Japan Program (TF072129)	–	–	20,000,000	–
Japan Program Phase II (TF073236)	20,000,000	–	–	80,000,000
ACP-EU NDRR (TF071630)	–	–	13,123,206	4,100,480
Africa DRF SDTF (TF072281)	1,113,500	–	9,707,850	–
EU-SAR SDTF (TF072458)	–	2,336,600	–	4,551,600
EU-SERBIA NDRMP SDTF (TF072528)	–	1,473,569	–	589,470
EU-DRAF SDTF (TF072535)	2,010,150	–	–	682,740
EU-Caribbean OCTs SDTF (TF073230)	1,700,100	–	–	1,706,850
EU-Caribbean SDTF (TF073227)	21,153,825	–	–	10,554,022
Australia Indo-Pacific SDTF (TF072835)	2,879,020	2,433,590	3,713,683	–
GRiF MDTF (TF072858)	34,111,200	8,706,800	22,452,000	41,766,300
USAID-SDTF (TF072896)	1,572,000	–	–	1,428,000
Canada-Caribbean SDTF (TF073283)	2,970,512	–	–	12,183,050
City Resilience MDTF (TF072921)	2,000,000	6,000,000	–	1,000,000
Total	**112,881,807**	**34,204,842**	**103,553,037**	**164,465,861**

NOTE 2: INVESTMENT AND OTHER INCOME
Net investment and other incomes in the amount of $5,117,900 for the fiscal year ended June 30th, 2019.

NOTE 4: WORLD BANK ADMINISTRATIVE FEE
In the fiscal year ended June 30th, 2019, The World Bank charged an administrative fee of $669,617 as agreed in the signed Admin Agreements.

NOTE 6: REFUND TO DONORS
In fiscal year ended June 30th, 2019, funds in the amont of $1,085,439 were refunded to donors on pro-rata basis.

NOTE 7: TRUSTEE ALLOCATION
In the fiscal year ended June 30th, 2019 no funds were transferred from other Trust Funds.

NOTE 3: PROJECT DISBURSEMENTS
The following table provides details of the project disbursements by region.

Region	For the fiscal year ended June 30th, 2019	For the fiscal year ended June 30th, 2018	For the fiscal year ended June 30th, 2017
Africa	22,800,948	18,627,302	18,987,785
East Asia and Pacific	8,234,429	9,341,374	9,197,151
Europe and Central Asia	8,800,434	9,975,229	4,704,869
Latin America and Caribbean	9,165,888	7,351,273	6,324,919
Middle East and North Africa	2,169,638	3,031,436	2,804,263
South Asia	6,674,510	6,407,826	6,353,708
Global	22,449,926	21,644,256	16,495,528
Total	**80,295,773**	**76,378,696**	**64,868,223**

The following table provides details of the project disbursements by execution type.

Execution type	For the fiscal year ended June 30th, 2019	For the fiscal year ended June 30th, 2018	For the fiscal year ended June 30th, 2017
Bank executed	71,731,080	69,144,773	56,053,219
Recipient executed	8,564,693	7,233,923	8,815,004
Total	**80,295,773**	**76,378,696**	**64,868,223**

NOTE 5: PROGRAM MANAGEMENT AND ADMINISTRATION DISBURSEMENTS

Program management and administration expenses for the fiscal year 2019 were in the amount of $6,909,498.

The following table provides details of the program management and administration disbursement by expense category.

Expense category		For the fiscal year ended June 30th, 2019	For the fiscal year ended June 30, 2018	For the fiscal year ended June 30, 2017
Staff cost	(1)	5,145,524	4,390,287	3,662,345
Short term consultants/ temporary		576,354	684,319	576,345
Travel	(2)	455,467	390,314	408,717
Other expenses	(3)	732,153	561,015	299,642
Total		**6,909,498**	**6,025,935**	**4,947,049**

(1) Staff Costs included salaries and benefits for GFDRR staff and short term consultant and short term temporary.

(2) Travel included travel expenses of GFDRR staff, candidates/interviewees for GFDRR positions, and participants in GFDRR- sponsored events.

(3) Other Expenses included overhead expenses, contractual services (e.g., editing, graphic design, translation, publishing and printing), representation, and hospitality.

NOTE 8: UNDISBURSED COMMITMENTS

Commitments in the amount of $144,703,081 are outstanding as of end of fiscal year 2019.

These are the remaining balance of the funds that GFDRR has approved and committed to implementing units and recipients.

The following table provides details of undisbursed commitments by main fund.

Main Fund	For the fiscal year ended June 30th, 2019
ACP-EU (TF071630)	22,135,242
Japan Program Phase I (TF072129)	30,754,321
Japan Program Phase II (TF073236)	9,068,245
Core MDTF (TF072236)	10,966,891
Parallel Core MDTF (TF072584)	32,709,217
Africa DRF SDTF (TF072281)	3,328,701
EU-SAR SDTF (TF072458)	2,036,097
EU-SERBIA NDRMP SDTF (TF072528)	2,270,406
EU-DRAF SDTF (TF072535)	3,283,645
EU-Caribbean OCTs SDTF (TF073230)	1,065,154
EU-Caribbean SDTF (TF073227)	1,327,147
Australia Indo-Pacific SDTF (TF072835)	2,371,398
USAID SDTF (TF072896)	862,894
GRiF MDTF (TF072858)	16,126,182
Canada-Caribbean SDTF (TF073283)	1,378,321
City Resilience MDTF (TF072921)	5,019,220
Total	**144,703,081**

The following table provides details of undisbursed commitments by region.

Region	For the fiscal year ended June 30th, 2019
AFRICA	34,745,603
EAST ASIA AND PACIFIC	20,326,186
EUROPE AND CENTRAL ASIA	16,538,386
LATIN AMERICA AND CARIBBEAN	12,052,966
MIDDLE EAST AND NORTH AFRICA	3,408,525
SOUTH ASIA	17,236,865
GLOBAL	40,394,550
Total	**144,703,081**

The following table provides details of undisbursed commitments by execution type.

Execution Type	For the fiscal year ended June 30th, 2019
Bank-Executed TF	122,462,071
Recipient-Executed TF	22,241,010
Total	**144,703,081**

NOTE 9: FUND AVAILABLE FOR NEW GRANTS

Fund available for new grants in the amount of $102,519,462 are outstanding as of end of fiscal year 2019.

These can be used to finance new operational grants, and program management and administration activities.

The break-up by main fund is available in the table below.

Main Fund	For the fiscal year ended June 30th, 2019
Core MDTF (TF072236)	149,746
Parallel Core MDTF (TF072584)	5,249,738
Japan Program (TF072129)	4,200,535
Japan Program Phase II (TF073236)	11,390,219
ACP-EU NDRR (TF071630)	4,941,654
Africa DRF SDTF (TF072281)	1,116,925
EU-SAR SDTF (TF072458)	245,363
EU-SERBIA NDRMP SDTF (TF072528)	506
EU-DRAF SDTF (TF072535)	10,244
EU-Caribbean OCTs SDTF (TF073230)	427,824
EU-Caribbean SDTF (TF073227)	19,592,430
Australia Indo-Pacific SDTF (TF072835)	6,130,046
GRiF MDTF (TF072858)	47,426,957
USAID-SDTF (TF072896)	213,511
City Resilience MDTF (TF072921)	22,252
Canada-Caribbean SDTF (TF073283)	1,401,512
Total	**102,519,462**

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The Global Facility for Disaster Reduction and Recovery (GFDRR) is a global partnership that helps developing countries better understand and reduce their vulnerabilities to natural hazards and adapt to climate change. Working with over 400 local, national, regional, and international partners, GFDRR provides grant financing, technical assistance, training and knowledge sharing activities to mainstream disaster and climate risk management in national and regional policies, strategies, and investment plans. Managed by the World Bank, GFDRR is supported and directed by a Consultative Group that has 18 members and 12 observers.