

# GFDRR on Risk Identification

**GFDRR supports the development and deployment of innovative and collaborative risk identification solutions to improve the availability of relevant risk information for policymakers, communities, and other stakeholders.**

## Why Risk Identification Matters

Recognizing, assessing, and understanding risks from natural hazards and climate change are the first steps toward reducing their adverse effects. With access to comprehensive disaster risk information, policymakers and the public can better understand the potential impacts of natural hazards, and carry out risk-sensitive planning and investment before a disaster strikes.

## What We Do

GFDRR supports the development of risk identification tools and methodologies to help governments, communities, and private actors to collect, analyze, communicate, and apply risk information effectively.

### Community Mapping through Collaborative Tools

Community participation in mapping can create information quickly and accurately on critical infrastructure, such as roads and schools, and mobilize ordinary people interested in improving their communities' resilience. With support from GFDRR, community mapping initiatives have been successfully deployed in Haiti, Indonesia, Nepal, and Sri Lanka, with more than a dozen countries requesting assistance for similar projects. In Nepal alone, structural data has been collected for over 2,250 schools and 350 health facilities.

The success of community mapping projects and other open data initiatives inspired a new partnership, Open Cities, that aims to harness open data to find innovative solutions for urban planning and resilience challenges across South Asia. A publication documenting the design and implementation of Open Cities mapping projects was released in October 2014.

### Sharing Risk Information through GeoNodes

GFDRR supports the development and deployment of GeoNodes in more than 40 countries. This web-based open source platform makes it easier to create, share, manage, and publish geospatial data. Users with little training can create interactive maps without the prohibitive costs of proprietary geospatial software. Since the development of the tool by GFDRR and

Over  
**100 million**  
people in 50 countries gained improved access to risk information through GFDRR-supported national and regional geospatial data sharing platforms since 2010.

partners, GeoNodes have been used in fields beyond disaster risk management, and more than 50 GeoNode platforms have been deployed by partners around the world. In FY2014, GeoNodes were launched in Malawi and Sri Lanka, among others.

### Facilitating Risk Assessments

GFDRR has facilitated the development of risk information in more than 60 countries. Most notably, analyses of national and sub-national risks from floods and earthquakes were undertaken for 40 European and Central Asian countries, in which GFDRR secured access to risk analytics that were substantially below market rate and could be undertaken within a period of less than six months. For a school safety project in Armenia, GFDRR identified Armenian expatriate engineers, who leveraged their expertise and knowledge of local languages and cultures to train local engineers. In the Africa region, GFDRR is facilitating risk assessments and providing technical assistance to client countries in the Indian Ocean Islands, with plans to scale up this leadership to other regions.

### Supporting Ex-Post Disaster Assessments

The Spatial Impact Assessment (SIA) team uses risk information, primarily satellite imagery and local spatial



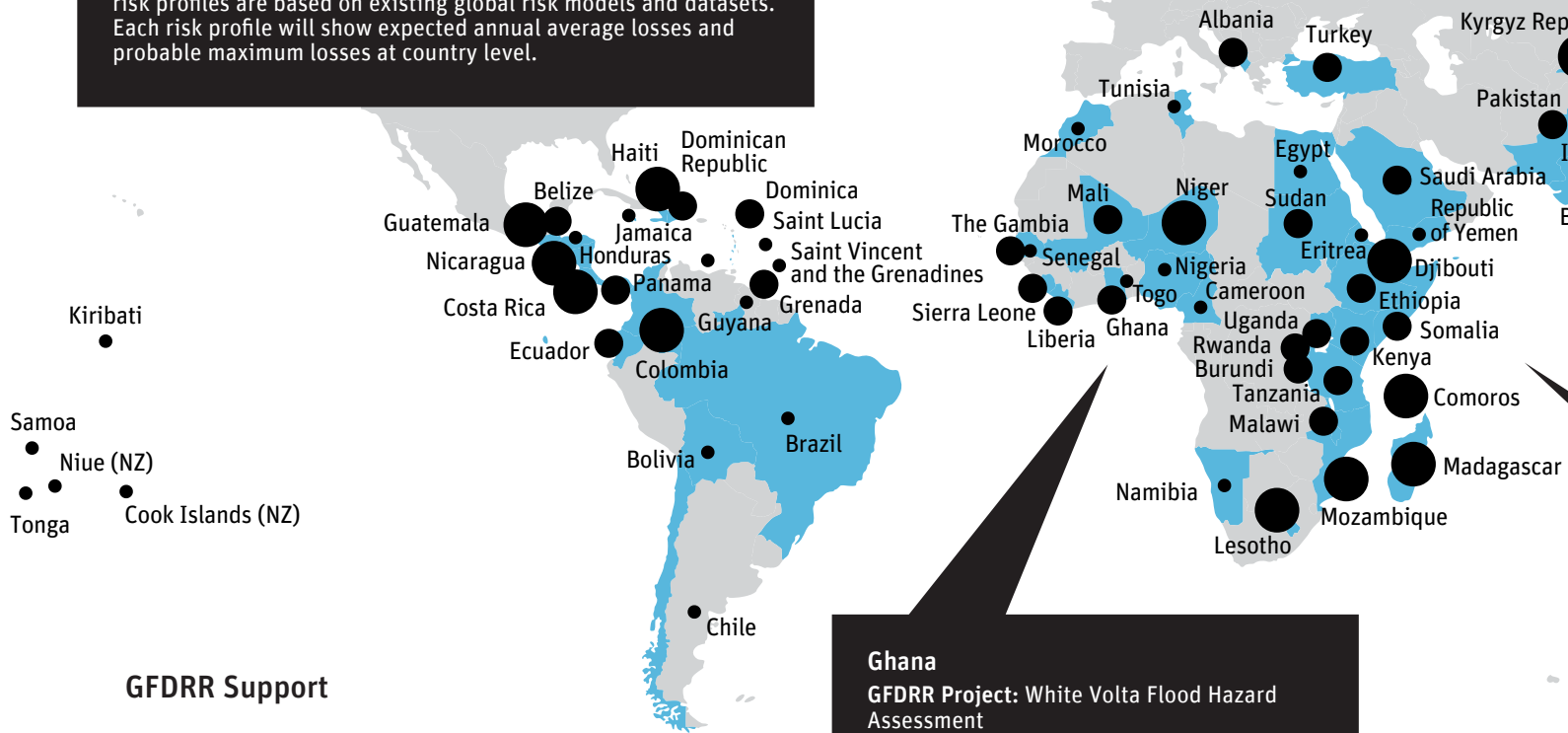
**GFDRR**  
Global Facility for Disaster Reduction and Recovery

## Europe and Central Asia

**GFDRR Project:** Advancing the DRM Agenda in ECA

**Partners:** World Bank Group, international research institutions

**Description:** GFDRR is facilitating the development of national probabilistic risk profiles for 30 ECA countries as a first step in the process of initiating a dialogue with ministries of finance on prioritizing disaster risk management (DRM). These quantitative risk profiles are based on existing global risk models and datasets. Each risk profile will show expected annual average losses and probable maximum losses at country level.



## GFDRR Support

- \$500,000 or Less
- \$500,000 to \$1,000,000
- More than \$1,000,000
- Risk Identification Engagement<sup>1</sup>

### Ghana

**GFDRR Project:** White Volta Flood Hazard Assessment

**Partners:** Government of Ghana, World Bank Group

**Description:** Following the October 2010 floods in Northern Ghana's White Volta River Basin, the government requested a flood hazard assessment to better understand and manage the country's flood risks. With the assessment, as well as other technical and financial support from GFDRR, the country has built a highly effective early warning system and is considering additional investments to reduce flood risks.

## Risk Identification Supports Work Across GFDRR's Pillars



### Pillar 1 –

**Risk Identification:** People in vulnerable countries will have improved access to information about disaster and climate risks, and greater capacity to create, manage, and use this information.



### Pillar 2 –

**Risk Reduction:** Risk identification supports decision makers in vulnerable countries to avoid creating new risks and to reduce current risks through smart investments.



### Pillar 3 –

**Preparedness:** Hazard and risk information enables decision makers to understand potential disaster impacts through dynamic scenario analysis.



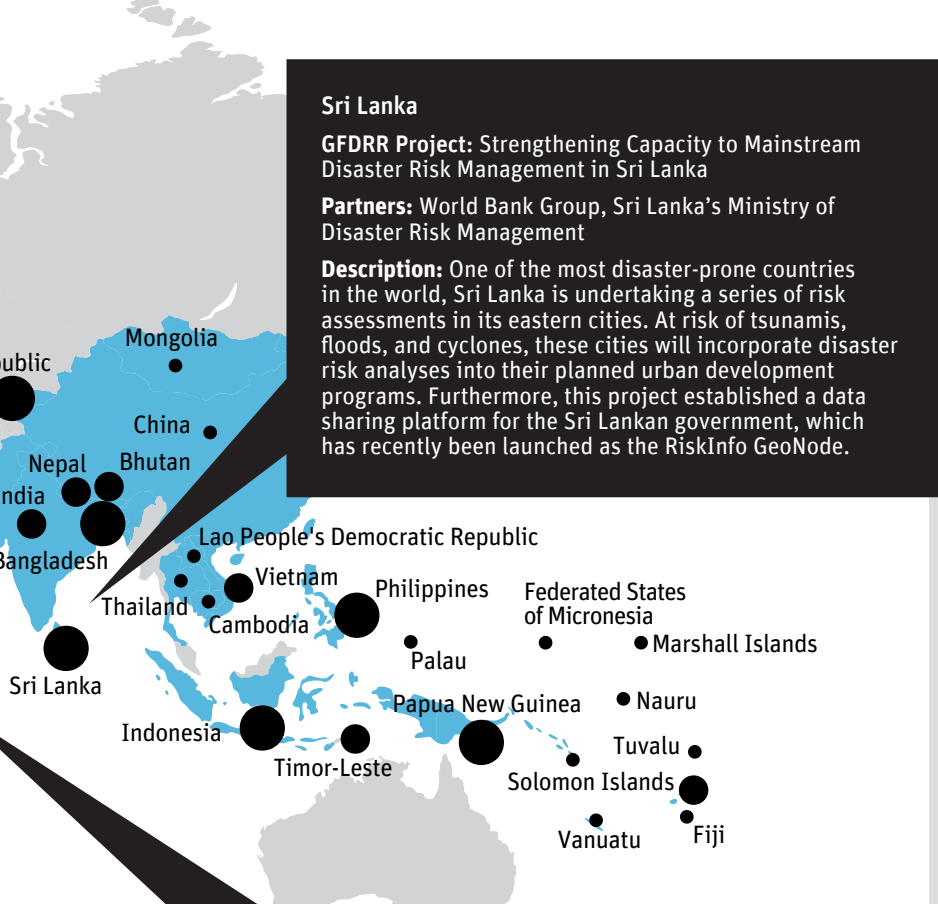
### Pillar 4 –

**Financial Protection:** Risk information is a critical component in the development of robust financial protection strategies.



### Pillar 5 –

**Resilient Recovery:** Risk identification can improve post-disaster reconstruction and recovery efforts by rapidly assessing damage and providing information to guide resilient recovery.



### Sri Lanka

**GFDRR Project:** Strengthening Capacity to Mainstream Disaster Risk Management in Sri Lanka

**Partners:** World Bank Group, Sri Lanka’s Ministry of Disaster Risk Management

**Description:** One of the most disaster-prone countries in the world, Sri Lanka is undertaking a series of risk assessments in its eastern cities. At risk of tsunamis, floods, and cyclones, these cities will incorporate disaster risk analyses into their planned urban development programs. Furthermore, this project established a data sharing platform for the Sri Lankan government, which has recently been launched as the RiskInfo GeoNode.

### Indian Ocean Islands

**GFDRR Project:** South West Indian Ocean Risk Assessment & Financing Initiative (SWIO-RAFI)

**Partners:** EU Delegation to Mauritius, Comoros, and Seychelles, UNISDR, l’Agence Française de Développement (AFD)

**Description:** GFDRR is in the process of collecting, collating, developing, and sharing risk information for five Indian Ocean Islands: Comoros, Madagascar, Mauritius, Seychelles, and Zanzibar. Furthermore, national and regional catastrophe risk financing strategies will be assessed and recommended for each country. This work is building on the success of past initiatives: the Pacific Catastrophe Risk Assessment and Financing Initiative (PCRAFI) and the Caribbean Catastrophe Risk Insurance Facility (CCRIF).

datasets, to efficiently evaluate the extent of damage from a disaster and facilitate the development of a financial estimate for a country’s recovery. This work supports GFDRR’s resilient recovery efforts process by providing information before a damage assessment is undertaken and by providing independent validation.

## Where GFDRR Works

Since its inception, GFDRR has supported risk identification and related capacity building in 100 countries in every World Bank operational region.

## How GFDRR Leverages Impact

Working with partners, GFDRR promotes risk identification as the first step toward leveraging targeted investments in risk reduction, preparedness, financial protection, and resilient recovery, providing evidence for informed decision making.

## Snapshot: Leveraging in Practice



**Colombia:** A \$700,000 GFDRR investment in risk assessment helped secure an \$80 million World Bank project to reduce buildings’ seismic vulnerability in Bogota. One component of the project helped retrofit nearly 40 schools to meet improved seismic standards, while leveraging public and other financing to retrofit an additional 200 schools, benefitting nearly 250,000 students in total.<sup>2</sup>



**Indonesia:** Officials in Jakarta wanted to create flood risk contingency plans, but lacked data. In 2011, the Indonesian government, working with the Australian government and GFDRR, partnered with the Humanitarian OpenStreetMap Team to train over 500 Indonesians through local governments, civil society organizations, and universities. Together, they mapped over 250,000 buildings. Indonesia’s geospatial information agency and academic experts at Gadjah Mada University have helped scale up the program, mapping over one million buildings to date.

Building on this, GFDRR, the Indonesian government, the Australia-Indonesia Facility for Disaster Reduction, the East Asia AusAID Infrastructure for Growth Trust Fund, and the World Bank partnered to create the Indonesian Scenario Assessment for Emergencies (InaSAFE). This free open-source software produces realistic natural hazard impact scenarios for better planning, preparedness, and response. Countries are increasingly requesting to develop initiatives similar to InaSAFE, which now features the ability to provide flood impact analysis and earthquake fatality predictions. The development of a similar tool in the Philippines, WebSAFE, is currently underway.



**Pacific:** The Pacific Catastrophe Risk Assessment and Financing Initiative (PCRAFI)—a joint program with GFDRR, the World Bank, the Asian Development Bank, the Secretariat of the Pacific Community, Australia, and Japan—has helped member countries in the Pacific access and manage detailed risk information, allowing them to implement financial protection solutions. This geospatial risk information is stored on one of the largest GeoNodes, with nearly 500 datasets for 15 countries in the Pacific. Various Pacific countries secured \$67 million of earthquake, tsunami, and tropical cyclone risk coverage for the 2013 pilot period, based on information from the Initiative.

## Highlights

GFDRR, working with local and international partners, supports programs that improve access to information about disaster and climate risks and increase capacity to create, manage, and use this information.

### Understanding Risk

Understanding Risk (UR) is an open and global community of 3,200 experts and practitioners in disaster risk assessment from more than 125 countries, representing government agencies, the private sector, multilateral organizations, NGOs, research institutions, academia, and civil society. GFDRR convenes the UR community every two years at UR Forums, five-day events that showcase best practices and the latest

technical know-how in disaster risk assessment. Understanding Risk has become the preeminent platform for collaboration, knowledge sharing, and innovation in identifying and assessing disaster risk.

The most recent global forum was held in July 2014 in London, U.K., and convened more than 850 experts and practitioners representing over 280 institutions. Under the theme “Producing Actionable Information,” nearly 60 sessions and workshops offered a wide range of topics, including decision-making under uncertainty, risk modeling in the financial sector, earth observation systems, risk communication, community-based risk assessments, and how to assess risk in a changing climate.

### Code for Resilience

To strengthen community resilience to natural disasters through innovation, GFDRR supports Code for Resilience, an initiative that partners local technologists with disaster risk management experts to create civic-minded digital and hardware solutions. In its inaugural year, over 2,000 participants in eight countries attended hackathons to generate innovative solutions to real-world disaster risk management problems submitted by experts from 20 different countries.

GFDRR has helped make  
**more than 1,300**  
**natural hazard risk**  
**datasets**  
freely available through geospatial data  
sharing platforms.

## Advancing Risk Identification Knowledge

GFDRR brings together CSOs, governments, and development partners:

- › **Understanding Risk in an Evolving World: Emerging Best Practices in Natural Disaster Risk Assessment:** This 2014 publication examines the role of risk assessment over the last ten years in reducing the impacts of natural disasters, and captures the knowledge, expertise, and experiences of more than 50 institutions around the world. Its accompanying Policy Note highlights actionable recommendations to achieve higher quality, lower cost disaster risk information intended to inform those who ultimately influence disaster risk management policies. The reference guide will inform the UN 2015 Global Assessment Report on Disaster Risk Reduction.
- › **Open Data for Resilience Initiative Field Guide:** GFDRR launched the Open Data for Resilience Initiative Field Guide in March 2014 to advance knowledge on how to prepare, reduce, and transfer the potential risks from natural hazards through open data. The rationale, methods, and technical assistance for data collection (including OpenStreetMap), data sharing (including GeoNode), and data visualization and analysis (including InaSAFE) are outlined in the guide. Using this publication, decision-makers can better understand the process

and value of generating new data, creating a central repository for existing data, and encouraging a community that turns data into decisions. The publication was developed in close collaboration with American Red Cross, World Bank, UNOCHA, USAID and UNISDR.

- › **Crowdsourced Geographic Information Use in Government:** At the 2014 Understanding Risk Forum in London, GFDRR released a publication on the use of volunteered geospatial information (VGI), Crowdsourced Geographic Information Use in Government. The report, developed in collaboration with University College London, provides a guide to the implementation of VGI in government, particularly in identifying barriers and success factors. Lessons learned and successful models from 29 case studies across different government sectors and scales were documented. These studies demonstrate that government and public collaboration to advance geographic information is possible through commitment and investment by both parties. Through this report, it is hoped that more VGI programs are instituted and can learn from and build upon the success and challenges of other initiatives.

Over 65 projects resulted that encompassed all five GFDRR pillars of action.

### **InaSAFE (Indonesian Scenario Assessment for Emergencies)**

GFDRR supports InaSAFE, an innovative realistic impact scenario software that collects data from scientists, local governments, and communities to provide insights into the likely effects of future disaster events. With its easy-to-use interface and minimal need for training, InaSAFE engages communities and decision makers, and advances their understanding of risk through the effective communication of disaster risk.

Indonesia has successfully used InaSAFE since 2012, and GFDRR and its partners have held 40 trainings with local stakeholders on the use of the tool. Taking advantage of its open-source development, experts in the Philippines have developed a tool, known as WebSAFE, which meets local needs.

### **Philippines: Assessment Results in the Manila Master Flood Plan**

Manila is exposed to frequent flooding, including the 2009 typhoons that brought extensive rainfall, putting most of the city underwater. After economic losses totaling \$4.4 billion—or 2.7 percent of the country's gross domestic product—GFDRR and the World Bank assisted the government in preparing an integrated flood management master plan based on flood hazard mapping.

In 2012, the government formally endorsed an \$8.6 billion investment plan to better protect Manila's population and economic assets from flood risk, planning to leverage funding from the World Bank and

other sources. The government has begun dredging water ways and modernizing pumping stations and is planning longer-term investments, including a dam in the upper catchment of Marikina city, northeast of Manila, and improvements in the area's river systems.

### **Probabilistic Risk Assessment (CAPRA)**

GFDRR supports CAPRA, an innovative disaster risk analysis system that uses geographic data and probability techniques so that users can quantify and visualize risk from earthquakes, tsunamis, hurricanes, floods, landslides, and volcanoes in the Latin America and Caribbean region. In many GFDRR projects, local experts are trained in the use of CAPRA to design risk mitigation measures, assess different investment options, support contingency planning, and evaluate risk financing strategies.

Starting with GFDRR seed funding in Nicaragua in 2008, the initiative has grown into a partnership between the World Bank, the Inter-American Development Bank, the United Nations Office for Disaster Risk Reduction (UNISDR), Central America's regional coordination body for disaster prevention (CEPREDENAC), and the governments of Belize, Costa Rica, El Salvador, Guatemala, Honduras, and Nicaragua.



*GFDRR, the American Red Cross, and the Humanitarian OpenStreetMap Team (HOT) mobilized community mapping to guide reconstruction in the Philippines after Typhoon Yolanda.*

## **Community-Based Mapping Results<sup>3</sup>**

**Nepal** mapped 2,256 schools and 350 health facilities with participation from over 2,300 individuals.

**Sri Lanka** mapped over 30,000 buildings and 450 km of roads.

**Bangladesh** mapped 8,500 buildings, and roads and drainage works totaling 93 km.

## Lessons Learned

### **Clearly define the purpose of the risk assessment before analysis starts.**

Without a clearly defined purpose and end-user, a risk assessment may become a scientific and engineering exercise without a readily identifiable application. Moreover, a risk assessment that is not properly targeted may not effectively address its intended purpose, or may become over-engineered/over-resourced. Where risk assessments have been commissioned in response to a clear and specific request for information, they have been effective in reducing fiscal or physical risk.

### **Promote and enable ownership of the risk assessment process and efforts to mitigate risk.**

Experience shows that successful projects often partner risk specialists with country counterparts to design, implement, and communicate the results of the risk assessment. In Indonesia, the development team created InaSAFE in close collaboration with Jakarta government officials, increasing its impact and sustainability and driving demand for similar tools globally.

### **Build credibility with a rigorous and transparent approach that articulates uncertainty.**

Risk information that lacks a rigorous scientific approach or produces erroneous results can result in poor investment decisions, and damage the credibility of government officials and disaster risk experts. For example, several studies judged Haiti to have low

seismic risk—an assessment tragically contradicted by the January 2010 earthquake.

### **Cultivate and promote the generation and use of open data.**

The analysis of natural hazards and their risks is a highly resource- and data-intensive process, whereby the return on expended resources (time and money) can be maximized if the data are created once and used often, and if they are iteratively improved. In Nepal, for example, the government had received risk information in the form of paper reports several times, without receiving the input data or final results in a digital format that is accessible for later use and development. GFDRR's strategy aims to reduce these missed opportunities.

### **Prioritize the communication of risk information.**

Clear communication throughout the risk assessment process—from initiation of the assessment to delivery of results and the development of plans in response—is critical for successfully mitigating disaster risk. For example, an exceptionally planned and implemented “Build Back Better” campaign led by the government of Indonesia in the aftermath of the 2009 Padang earthquake demonstrated conclusively that well-targeted education and communication of risk information can increase awareness of natural hazards and their potential impacts.

**“InaSAFE tools improve disaster preparedness in Indonesia by providing a new way to combine scientific hazard information and community knowledge on disaster risk.”**

—Dody Ruswandi, Deputy for Disaster Reduction and Preparedness, Indonesia's National Agency for Disaster

## Strategic Partners

### **Our Partners In-Country:**

National, provincial, district, and city disaster management authorities

Ministries of finance

Departments of public works and highways

National development and planning departments

Water resources, agriculture, surveys, geology/geospatial and remote sensing agencies, and national statistics offices

## Our International Partners

GFDRR works with a wide variety of partners, including:



### NOTES

<sup>1</sup> Denotes countries where GFDRR grant or team engagement has supported risk identification.

<sup>2</sup> All monetary amounts are in US dollars unless otherwise indicated.

<sup>3</sup> GFDRR'S Fiscal Year 2013-14 (FY14) covers work during July 1, 2013 – June 30, 2014.



## Contact

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### **GFDRR PILLAR: Risk Identification**

People in vulnerable countries will have improved access to information about disaster and climate risks, and greater capacity to create, manage, and use this information.