

GLOBAL PARTNERSHIP ON DISASTER RISK FINANCING ANALYTICS

Results and Achievements



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GFDRR
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Implemented by
Disaster Risk Financing
& Insurance Program



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The Global Partnership on Disaster Risk Financing Analytics was launched in December 2015 and is funded by the European Union, implemented by the World Bank's Disaster Risk Financing and Insurance Program, and managed by the Global Facility for Disaster Reduction and Recovery. The project's objective is to bridge the gap between catastrophe risk data and available sovereign disaster risk financing solutions in order to increase financial resilience of countries against natural hazards. This report presents the results and achievements of the Partnership over its five-year implementation period.

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LIST OF ACRONYMS

DRF	Disaster Risk Finance
DRFIP	Disaster Risk Finance and Insurance Program
DRM	Disaster Risk Management
EU	European Union
FCI	Finance, Competitiveness and Innovation (World Bank Global Practice)
GFDRR	Global Facility for Disaster Reduction and Recovery
GRiF	Global Risk Financing Facility
IDF	Insurance Development Forum
M&E	Monitoring and Evaluation

BACKGROUND

The Emergence of Disaster Risk Financing in a Changing World

Societies continue to bear increasing costs from natural hazards as population growth, the geographic concentration of economic and infrastructural assets in vulnerable areas, and the effects of climate change are accelerating exposure to potential losses. As governments try to recover and rebuild in the aftermath of disasters, they are confronted with staggering economic and financial costs because the immediate expenditures needed for reconstruction are compounded by a weakened economy, damaged infrastructure, destroyed businesses, reduced tax revenues, and a rise in poverty levels. These costs are particularly acute for low- and middle-income economies that tend to depend on ad hoc solutions such as emergency loans, retroactive budget realignments that divert limited financial resources from other areas of need, tax increases, or donor assistance to fund reconstruction and recovery efforts. The lack of a disaster-oriented financial resilience mechanism delays economic recovery and prolongs hardships for governments, households, businesses, and vulnerable communities.

Disaster risk financing (DRF) is therefore a critical component in strengthening the resilience of developing countries and in protecting poor and vulnerable communities from the financial and economic impacts

of disasters. Since the 21st Conference of the Parties (COP21) in Paris in 2015, momentum has been growing in establishing partnerships dedicated to DRF and in coordinating the activities of international organizations, donors, governments, civil society organizations, the private sector, and academic institutions, which has led to the emergence of a coordinated international DRF community. Through these partnerships, stakeholders can share research, best practices, technical assistance, and data on risk finance. These multistakeholder networks include the InsuResilience Global Partnership that was launched in 2017 at COP23 in Bonn as an initiative of the G7, G20, and Climate Vulnerable Forum Groups. InsuResilience aims to improve disaster response by implementing climate, disaster risk finance, and insurance-oriented solutions, and promotes the expansion of financial protection in developing countries and the establishment of a common set of standards for its members to adhere to. Networks such as the InsuResilience Global Partnership are crucial for coordinating the agendas and implementation efforts of DRF stakeholders coming from different fields of expertise.

The international DRF community has shifted the way financial responses to disasters are designed, moving away from a focus on reactive post-disaster responses

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to a more proactive approach focusing on prevention and preparedness. Initiatives such as the Disaster Risk Financing and Insurance Program (DRFIP)¹, a partnership between the World Bank Group's Finance, Competitiveness, and Innovation (FCI) Global Practice and the Global Facility for Disaster Reduction and Recovery (GFDRR), are helping governments negotiate the transition from handling emergencies to planning ahead for risk.

Instruments such as the Global Risk Financing Facility (GRiF)² demonstrate the added value of establishing pre-arranged risk finance mechanisms in accelerating recovery from disaster shocks not only for the poor and vulnerable populations within the country but also for the economy, government services, and infrastructure. GRiF helps countries overcome financial barriers to implement early risk financing solutions that mitigate climate and disaster shocks. By providing pre-arranged funding, GRiF incentivizes risk preparedness and resilience by investing in countries' safety net mechanisms and pre-established national disaster funds. The focus on early risk financing as evidenced by initiatives such as GRiF and the DRFIP also allows countries to plan for the delivery of recovery assets to the more vulnerable groups of their population.

Global DRF policy makers and stakeholders have increasingly solicited expertise from and leveraged partnerships with the private sector to improve the effectiveness of risk financing strategies. This is especially true of the role of insurance in risk finance because access to insurance markets and the quality of insurance coverage can determine how resilient economies are against disasters and how quickly they can recover. Yet in many developing economies significant gaps exist in insurance coverage for vulnerable economic assets, which threaten gains from development and place vulnerable livelihoods, communities, businesses, and public services at risk of significant financial loss.

This challenge has inspired the formation of partnerships between international organizations, governments, and the private sector, such as the Insurance Development Forum (IDF), a public-private partnership launched in 2016 by representatives from the United Nations, the World Bank, and the insurance industry. The IDF provides (i) expertise on the insurance sector and its related risk management capabilities to international organizations, and (ii) insight on how this key industry can support solutions that close the coverage gap between insured losses and vulnerable assets. Other actors developing

¹ For more details about the DRFIP see: <http://www.worldbank.org/en/programs/disaster-risk-financing-and-insurance-program/>

² GRiF is jointly implemented by FCI and GFDRR. For more details see: <https://www.globalriskfinancing.org/>



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insurance-based resilience financing include the World Bank's Global Index Insurance Facility, which facilitates access to insurance financing for individual beneficiaries such as smallholder farmers, microentrepreneurs, and microfinance institutions.

The European Union (EU) has been at the forefront of supporting innovations in DRF and provided funding for several important DRF-related programs. The Africa Disaster Risk Financing Initiative for instance, was implemented between 2015 and 2020, and worked with 21 African countries to design and implement tailored financial protection policies and instruments tailored to each national context such as helping countries establish shock-responsive social safety nets. The EU also supports the Strengthen Financial Resilience and Accelerating Risk Reduction in Central Asia Program, which was launched in July 2019 to improve financial resilience and risk-informed investment planning in Kazakhstan, the Kyrgyz Republic, Tajikistan, Turkmenistan, and Uzbekistan.

With the emergence of several fields of expertise within the DRF community, the availability and quality of data has substantially improved, laying an essential foundation for the development of effective

financial protection solutions against disaster risk. However, in the context of the highly complex nature of disasters and crises, new trends and shifting patterns related to climate change, and constantly changing socioeconomic exposures, these technical data still need to be aggregated, processed, analysed, and refined into actionable information so it can be used by stakeholders to develop and implement risk financing strategies.

Without suitable background knowledge and the right quantitative tools, governments would be unable to properly determine whether certain strategies provide more effective financial protection over others, how cost effective they would be, and how suitable these would be in a country-specific context. As a result, a gap has emerged between the availability of raw technical data and the capacity of stakeholders to adequately use this data to plan the best financial resilience strategy. For this reason, there has been significant demand from governments and other DRF stakeholders for high quality analytics that translate technical data into useable information so they can be empowered to make decisions based on a sound analysis of economic, financial, and disaster data.

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“The data needs to speak to you and you need to find a way to make it relevant. There are a lot of information, a lot of data available but you have to contextualize it and make it relevant for your situation.”

Mr. Ruel Edwards, Ministry of Finance, Grenada
Participant of the Executive Education Program in Cambridge, UK in July 2018

Bridging the Gap between Data and Decision Making

In response to the growing demand for expertise and advisory services to bridge the gap between raw data and decision making, the EU, the World Bank and GFDRR signed a partnership in December 2015 to help governments improve their understanding of DRF and to increase their financial resilience against disaster risk. The resulting Global Partnership on Disaster Risk Financing Analytics (DRF Analytics) project was funded by a six-million euro contribution from the EU, managed by GFDRR, and implemented by DRFIP. The DRF Analytics project formally began its operations in March 2016 and completed its activities by the end of December 2020.

By connecting expertise on topics such as insurance, risk modeling, development economics, and finance with

risk management, the DRF Analytics project assisted governments of low- and middle-income countries in designing and adopting innovative tools for risk identification and financing, and delivering these as part of a broad capacity-building package for DRF. In doing so, the project advised governments on how to shift their disaster risk management (DRM) approach from a reactive posture to proactive management of disaster risk. The DRF Analytics project provided the missing link between raw disaster data and governments’ understanding of the financial costs of disasters so they can implement their own financial protection solutions, thus providing an essential service to the global DRF agenda.

ACHIEVEMENTS


Pilot country
implementation


Generic Analytics
Tools


Knowledge
Management


Monitoring and
Evaluation (M&E)

The DRF Analytics project was implemented through four activity pillars, focusing on: pilot country implementation, the development of generic analytics tools, knowledge management, and monitoring and evaluation (M&E). The following section will showcase the achievements of the DRF Analytics project under each pillar and will highlight the results and outputs from its activities and how the wider DRF community benefits from the lessons learned from each of these pillars.



Pilot Country Implementation

Key finding: In-depth country engagement is a prerequisite to develop relevant, demand driven analytics and customized DRF solutions.

Governments that are evaluating strategies to strengthen their financial resilience against disaster risk require adequate economic and statistical methodologies with the purpose to understand and accurately estimate their countries' economic and financial vulnerability to risk, to review the effectiveness of their existing financial protection strategies, and to undertake a thorough cost-benefit analysis of the risk financing options that are available to them.

The DRF Analytics project provided those methodologies. Governments in pilot countries received access to improved tools and well-communicated technical information to support informed DRF decision making. For instance, as part of a capacity-building package, the project conducted a financial disaster risk assessment to quantify the financial and fiscal impacts of disasters and to review the financial protection strategy of the pilot country against disasters. This package also provided technical support to design a new sovereign insurance program, and quantified key variables including the value of uninsured economic assets and the cost of social protection mechanisms.

In coordination with EU delegations, the project rolled out capacity-building packages to three pilot countries: Fiji, Pakistan, and the Philippines. In each of these countries, local World Bank teams held an extensive dialogue with their government counterparts to determine the precise needs of each and which financial products would be the most appropriate.

This comprehensive support is best illustrated by the example of the Philippines. Initial consultations with the government resulted in a financial disaster risk assessment that helped prepare a customized country analytics tool that included a training session and customized user manual. This tool supported the placement of a US\$600-million catastrophe risk insurance program for typhoon and earthquake risks. A second tool was developed to address needs for broader and more comprehensive risk financing strategies at city, state, and provincial levels by aggregating and evaluating catastrophe risk data. The Philippine government was able to quickly identify inaccurate data regarding geographic locations and the value of assets to provide a more accurate image when designing a

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“The catastrophe risk insurance tool will support the Government of the Philippines in making informed decisions regarding different disaster risk financing instruments, allowing us to design comprehensive strategies for building our financial resilience against disaster events.”

Erwin D. Sta. Ana, Deputy Treasurer of the Philippines

© Shannen Nicole Chua, Bureau of the Treasury of the Philippines.

new risk insurance program for critical infrastructure. Contributions from the EU through the DRF Analytics project helped guide the government’s decision making on risk financing layers, instruments, and coverage.

The results obtained and the DRF products developed under each of the pilot countries show the importance of cooperation with government stakeholders to guide the development of precise tools that are tailored to that country’s DRM needs, as demonstrated by the Philippine government when it corrected the inaccurate data inputs mentioned above. Soliciting inputs from the beneficiary countries of these capacity-building packages also allowed the DRF Analytics project to determine historical patterns for disaster and financial data and provide an accurate estimate of the eventual cost of risk financing instruments.

A key lesson learned from the work with pilot countries is that an in-depth DRF engagement is considered a prerequisite to develop relevant, demand-driven analytics. Without national ownership in the agenda and sufficient institutional capacities, investments in DRF may be uninformed, unable to meet expectations, and carry high reputational risk.



Philippines Catastrophe Risk Tool: User Manual

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Generic Analytics Tools

Key finding: Disruptive technologies show promising potential but developing analytics tools is a long-term iterative process.

Based on the lessons learned from pilot country engagements, the DRF Analytics project supported the design of a suit of generic analytics tools to assist governments in evaluating the information and data necessary for their DRF decision making. Stakeholders looking to strengthen their financial management capacities are now able to determine their DRF needs with much greater precision by using these new tools.

Three generic DRF Analytics tools were designed in early 2019 and full development and validation took

place over the subsequent 12 months. Building on these functional products, enhanced versions of the tools to be made publicly available were then developed, with significant focus on robustness, accessibility, and user friendliness. The main objective of these tools is to support stakeholders on DRF decision making by processing complex calculations and assumptions into simplified, visual representations of risk. The tools help users focus on benefits and savings made through financial preparedness.

These tools include:

- Tool 1.** A risk assessment tool to estimate financing needs such as emergency response following a disaster and quantify the fiscal funding gap.”
- Tool 2.** A financing strategy design tool to determine cost-effective use of DRF instruments in view of identified risks.
- Tool 3.** A financing crisis response tool to estimate the potential coverage and cost of a social safety net program.

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Subsequently, experience from the development of these tools has been implemented in selected countries, and lessons learned have in turn fed back into the refinement of generic tools. In Kenya, tool 2 simulated and derived the most cost-efficient way to finance drought and flood-related response expenditures. A layered financial strategy was then produced, combining line of credit and insurance while minimizing overall annual cost for arranging these instruments.

In Senegal, a historical loss data estimation tool was built to help the government design a scalable safety net against drought risk, and complement scarce historical data on crop yields and population affected. The tool is

making use of satellite-based soil moisture and rainfall data and provides indicative information on the severity of drought beyond reported years (before 2014) from correlation analyses with satellite indices.

In Morocco, a comprehensive national disaster risk financing strategy was developed based on tool 2, and included detailed applications on the dimensioning of the public solidarity fund Fonds de Solidarité Contre les Événements Catastrophiques (FSEC), where the Moroccan Treasury required a cost-benefit analysis of reserves, insurance, and credit as ex ante response mechanisms to a broad range of natural hazards.



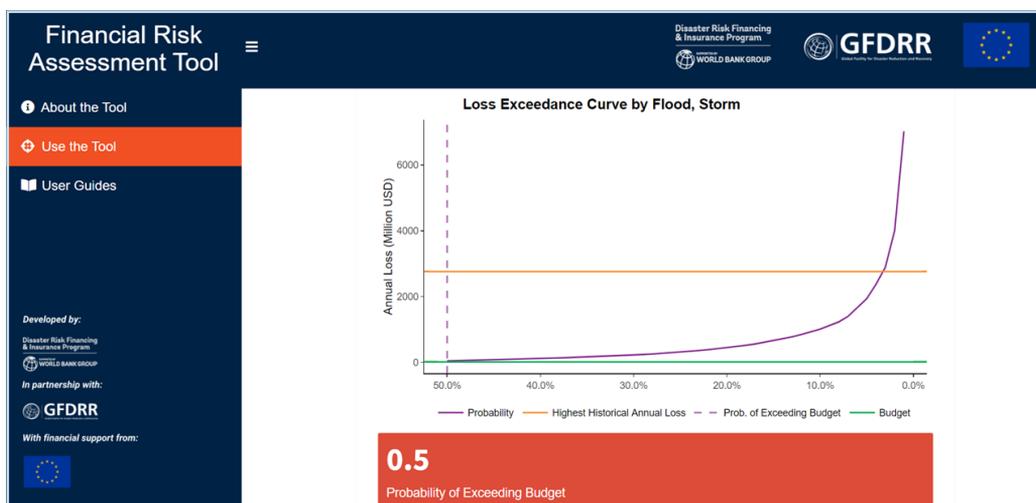
“The tools developed by the World Bank with support from the EU have been an important contribution to our project. The first tool allows us to determine maximum probable loss scenarios. This helps dimension and structure our financial protection scheme, with information on how it should be implemented and what level of financing is necessary for coverage. The second tool informed on the optimal product design to respond to those levels of financial losses we are facing.”

Mr. Abderrahim Chaffai, Director, Fonds de Solidarité Contre les Événements Catastrophique Maroc

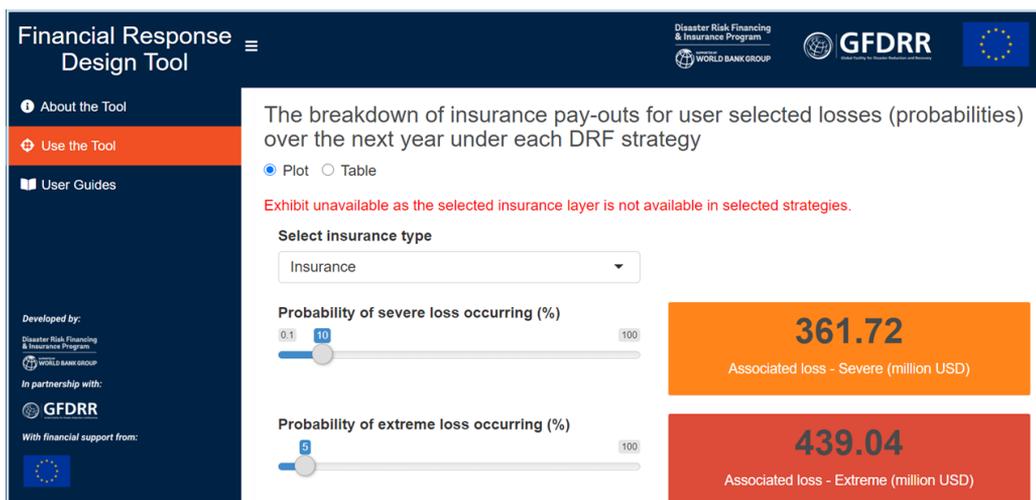
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In parallel with and in addition to these generic tools, the DRF Analytics project team developed a set of tools that was more exploratory in nature. These innovative tools made use of disruptive technologies and included: (i) a global flood monitoring platform, developed in close consultation with the European Commission’s Joint Research Center and deployed in Southeast Asia; (ii) satellite-based financial exposure mapping; (iii) next generation drought indices; and (iv) artificial intelligence, big data, and machine learning for rainfall and impact-level loss estimation. The development of this second set of tools has been demand driven and proven to be of high impact and scale for all in-country applications supported.

Disruptive technologies like Earth observation, online media mining, or artificial intelligence have shown promising potential when specifically connected to concrete, short-term benefits, and adapted to partner countries’ technical capacities. Trade-offs need to be made however, between enabling analytics—innovative risk data which empowers decision makers to make better informed decisions—and accessible analytics—wealth of data is fully understood by clients and embedded and integrated within their decision-making processes. Another lesson learned is that designing generic tools has proven to be very difficult, given the diverse group of users and countries, which required an iterative development process as well as customizable versions. In this regard, cross-country applications feedback was highly valuable.



Financial Risk Assessment Tool: Loss Exceedance Curve by Flood, Storm



Financial Response Design Tool: Breakdown of Insurance Pay-outs

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Knowledge Management

Key finding: Like DRF Strategies, capacity development and training programs must be tailored to country needs.

Before the DRF Analytics project began its operations, relatively few analytical products and resources were readily available to the wider DRF community, including policymakers and country technical DRF practitioners. Funding from the EU for the DRF Analytics project has in this regard made a considerable difference in the increased availability of analytics-based knowledge products which have been in high demand. The project focused on designing and delivering face-to-face training programs, developing e-learning modules, and producing outreach materials such as flyers and brochures.

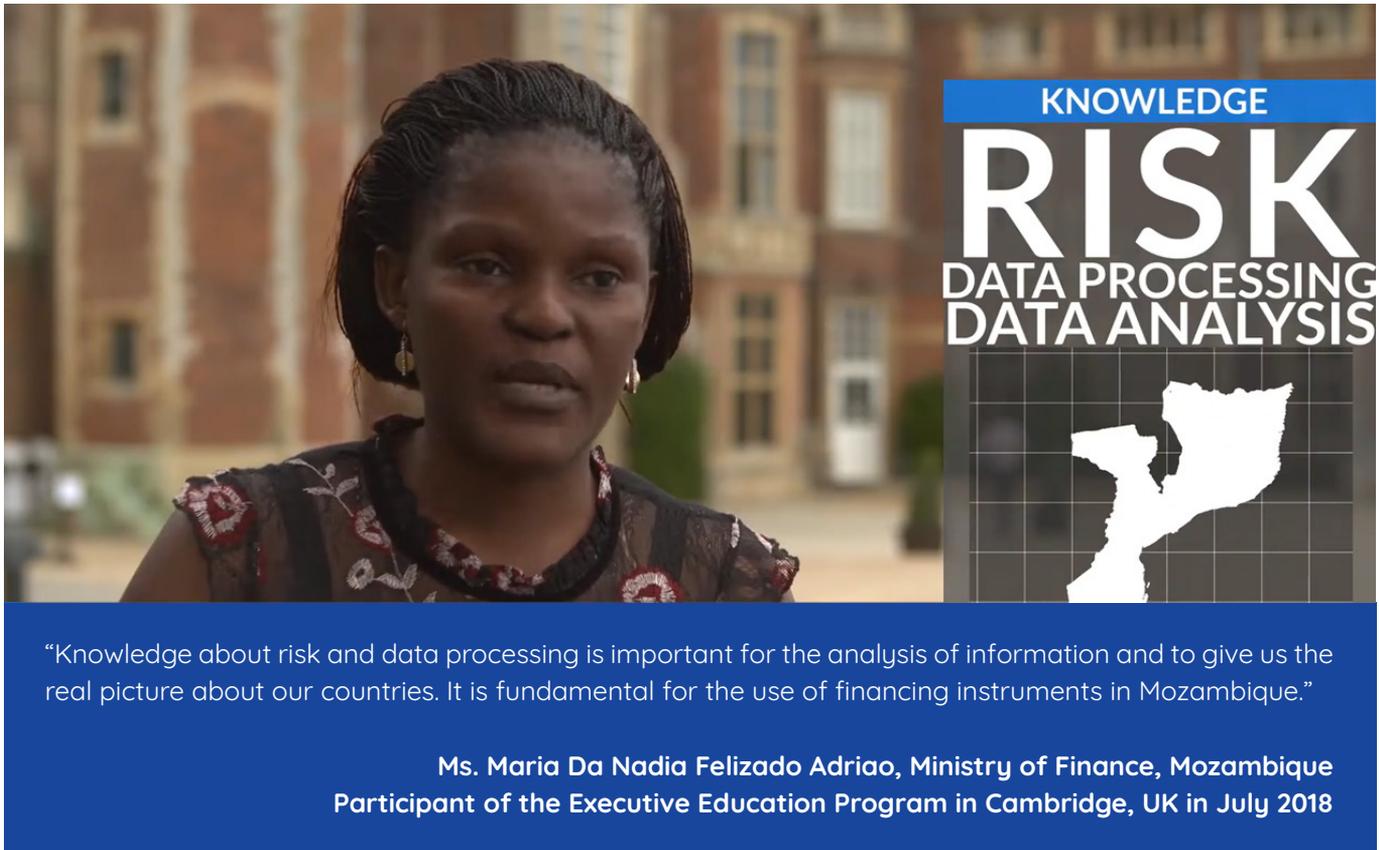
In 2018, the DRFIP formed a partnership with Cambridge University to develop a five-day DRF executive education training program with the first running of the course taking place in July 2018 in Cambridge, UK. The DRF Analytics project funded the development of a dedicated module on DRF analytics—one of the five days—and co-financed the delivery of the training in Cambridge. The second executive education training was held in Cape Town, South Africa, in partnership with the Stellenbosch University in September 2019—the event was organized in the frame of the EU-funded Africa DRF Initiative—which the DRF Analytics project helped co-finance as well. A third edition planned in Singapore toward the end of 2020 did not materialize because of the COVID-19 pandemic.



Participants of Executive Education Training Program in Stellenbosch, South Africa

© Stellenbosch University

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The project team also developed a set of e-learning modules on several DRF topics. These modules introduced participants to the basics and key concepts of DRF analytics, and presented information as general concepts, supported by interactive exercises that allowed participants to explore the practical application of the presented concepts. The modules include fundamentals of DRF, fundamentals of DRF analytics, and exercises using data and analytics. These

are available on the Financial Protection Forum web platform³ as well as the World Bank’s Open Learning Campus⁴.

Given the diverse group of users and countries, it is important to tailor capacity development programs to meet the needs of individual countries, and to inform design and accompany development and delivery of tools throughout the implementation phase.

³ The Financial Protection Forum is a joint initiative of FCI and GFDRR. For more details see: <https://www.financialprotectionforum.org/>

⁴ The World Bank’s Open Learning Campus provides dynamic learning opportunities. To access the list of courses, go to: <https://olc.worldbank.org/>

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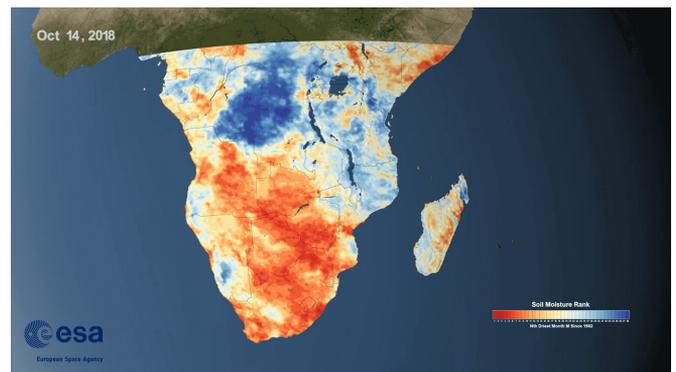
Monitoring and Evaluation (M&E)

Key finding: M&E of DRF strategies is a spiral of recurrent processes of designing, implementing, and improving based on critical learning.

As part of a separate project, the World Bank developed and published a theoretical framework in 2016 to evaluate sovereign DRF strategies⁵. This framework has been used to support DRF analyses in countries where the DRF Analytics project has formed partnerships with national governments, including Fiji, Kenya, Morocco, and the Philippines, and its methodology has informed the development of generic analytics tools.

The DRF Analytics project supported the design of a universal M&E Guide, which builds on the original framework and helps practitioners understand the specifics of M&E for DRF strategies. The M&E Guide was designed to help stakeholders align their efforts in designing, implementing, and improving DRF strategies, and was intended to provide a high-level framework for performance measurement. It allows for a universal base design, which can then be customized to evaluate any national DRF strategy. The M&E Guide was also designed to facilitate policy dialogue between financial and nonfinancial experts toward conceptualizing a DRF strategy with a country's specific DRM priorities in mind, providing a global definition of DRF strategies.

Toward the end of the project, the DRF Analytics team started converting the findings and recommendations of the M&E Guide into a dedicated training session, which will be incorporated into the core analytics tools training program. This is being fully integrated into upcoming regional training sessions, starting in the second quarter of 2021.



Exploring simple moisture-based drought indicators that leverage latest satellite technology to complement DRF/ DRM technical frameworks

©European Space Agency

⁵ Clarke DJ, Mahul O, Poulter R & The TL, 2016. Evaluating Sovereign Disaster Risk Finance Strategies: A Framework. World Bank: Washington, DC, USA. Available at: <https://openknowledge.worldbank.org/handle/10986/24637>

OUTCOMES

Over the course of the five-year implementation period, the DRF Analytics project successfully accomplished its overall objective of increasing countries' financial resilience against disaster risk. Concretely, it helped governments and decision makers in beneficiary countries achieve the following four outcomes.



Outputs produced under the DRF Analytics project have already been integrated into the World Bank's wider DRFIP and their continuous application is thereby sustained.

The developed generic analytics tools for example, have already been mobilized for countries that are not part of the project's list of pilot countries, including Albania, Kenya, Morocco, Niger, Serbia, Senegal, Tunisia, and Vietnam. The tools constitute an integral part of the DRFIP's country-level engagement, and it is expected that they will be rolled out in many more countries.

In pilot countries, the provided technical assistance also has had long-term impacts. In the Philippines for example, the contribution of the DRF Analytics project will be guiding the national government's decisions on risk financing layers, instruments and coverage at least for the medium-term. It will inform the preparation of a new national indemnity insurance program, providing protection to critical infrastructure assets which will

be placed on international insurance markets in 2021. This placement, when eventually realized, will contribute to greater financial resilience of the Philippines in the foreseeable future.

Likewise, the produced e-learning modules on analytics are publicly available and are being accessed by people interested in DRF from around the globe on a daily basis. These training programs help build necessary capacities and contribute to shaping the DRF agenda going forward.

The achievements of the DRF Analytics project are deeply rooted in the institutional partnership between the EU, the World Bank and GFDRR. International cooperation is crucial in advancing the DRF agenda and the partners behind the DRF Analytics project are committed to proliferate such collaboration to increase protection of the most vulnerable members of society in countries across the globe.

European Union

The European Union (EU) is the leading donor of development aid and climate finance. The EU is at the forefront of the international agenda on climate resilience, supporting developing countries in preparing for, withstanding and recovering from disaster events. The EU is fully engaged in supporting the implementation of the Agenda 2030 and the Sustainable Development Goals, the Paris Agreement and the Sendai Framework for Disaster Risk Reduction.

For more information: www.europa.eu

World Bank

With 189 member countries, staff from more than 170 countries, and offices in over 130 locations, the World Bank Group is a unique global partnership: five institutions working for sustainable solutions that reduce poverty and build shared prosperity in developing countries.

The World Bank's Disaster Risk Financing and Insurance Program (DRFIP) helps countries ensure that their populations are financially protected in the event of a disaster. Through funding and expertise, DRFIP supports countries to develop and implement tailored financial protection strategies that increase the ability of national and local governments, homeowners, businesses, agricultural producers, and low-income populations to respond more quickly and resiliently to disasters.

For more information: www.worldbank.org

Global Facility for Disaster Reduction and Recovery

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 17 members and 14 observers.

For more information: www.gfdrr.org



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