



# ANNUAL REPORT

2020



**Progress on Early Warning  
in a Pandemic**



## CREWS Report Series - Annual Report 4 - 2020

Editor: Jemini Pandya

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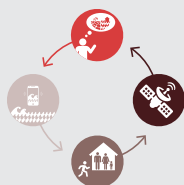
**Progress on Early Warning  
in a Pandemic**

**ANNUAL  
REPORT  
2020**

# THE CREWS INITIATIVE

CREWS, the specialized Climate Risk and Early Warning Systems Initiative, is a unique climate action programme that helps save lives, livelihoods and assets in Least Developed Countries (LDCs) and Small Island Developing States (SIDS) — the world's most vulnerable countries.

## OUR VALUE PROPOSITION



### › UNIQUE

CREWS is a financing mechanism that builds sustained institutional capacity driven by countries and supported by the expertise and specialist networks of its partners.

### › PEOPLE-CENTRED

Local organizations and communities are listened to and engaged so that investments are co-developed and driven by the needs of those dependent on timely and accurate warnings and climate information, especially vulnerable people.



### › SOLUTION-ORIENTED

Effective and innovative practices are applied and shared continuously across national and regional projects.

### › MULTIPLIER

Country portfolios promote a favourable environment for, and leveraging of, life-changing additional financing.



### › GENDER-RESPONSIVE

CREWS recognizes women's empowerment as fundamental for building resilience, with gender influencing the way people access, process and respond to information and warnings.



### › PROMOTES COHERENCE

CREWS projects are designed to complement and build on existing partner initiatives, adding value to national contexts and needs.





## Stronger Together

The World Meteorological Organization (WMO), the World Bank Group/Global Facility for Disaster Reduction and Recovery (GFDRR) and the UN Office for Disaster Risk Reduction (UNDRR) each bring their unique set of expertise and experience when working together as Implementing Partners of the CREWS Initiative. With the direct support of contributing Members of the CREWS Trust Fund, the partnership is an effective alliance that continually delivers on making a difference to people's lives and livelihoods.

### World Bank Group/GFDRR

Through its Action Plan on Adaptation and Resilience, the World Bank Group has committed to substantially increase financing for quality forecasts, early warning systems and climate information services in at least 30 additional countries. As a CREWS Implementing Partner, the World Bank/GFDRR collaborates with WMO and UNDRR to increase access by vulnerable communities around the globe to life-saving early warning systems and services.

### WMO

WMO's vision 2030 is a world where all nations are more resilient to the socio-economic consequences of extreme weather, climate, water and other environmental events. To achieve this, WMO prioritizes closing the capacity gap by enhancing service delivery of developing countries, in particular LDCs and SIDS, to ensure the availability of essential information and services needed by governments, economic sectors and citizens. WMO's engagement in CREWS contributes to meeting these goals by leveraging the technical expertise of its Members in providing enhanced warning services with a seamless approach for climate and weather events.

### UNDRR

UNDRR developed the Sendai Framework Monitor in 2018 as the tool to support countries in measuring their progress against Sendai Targets. This includes 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." UNDRR provides technical guidance inter alia for minimum data standards and methodologies.

## CREWS Members

We gratefully acknowledge the continued and growing support of our Members who contribute to the CREWS Initiative financially and programmatically. In 2020, Finland was the eighth country to join the Initiative. Other Members are Australia, Finland, France, Germany, Luxembourg, the Netherlands, Switzerland and the United Kingdom.

We rate highly the role CREWS plays in responding to the early warning needs of Least Developed Countries and Small Island Developing States. We must ease the burden of those who would otherwise struggle to adapt and build resilience. Finland welcomes the people-centred approach of CREWS as we place high importance on gender equality, non-discrimination and disability inclusion.

*Ville Skinnari*  
*Minister for Development Cooperation and Foreign Trade, Finland*





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# FOREWORD

2020 will be remembered as a year that revealed some important truths for a young CREWS Initiative — but ones that should embolden us.

COVID-19 did impact our work and timelines. It will continue to do so for some time still. The global travel ban tested our business model. Our national and regional partners, supported by our implementing partners — the World Bank/Global Facility for Disaster Reduction and Recovery (GFDRR), the World Meteorological Organization (WMO) and the United Nations Office for Disaster Risk Reduction (UNDRR) — showed resilience and creativity in finding solutions to a new reality. They also took on greater ownership and responsibilities on project activities in a challenging year.

As this 2020 Annual Report shows, there was progress in our work and achievements. Not least finding that agro-met services for pilot communities in Burkina Faso had led to significantly increased crop yields and profits two years running which farmers had ploughed back into education, health and enterprise.

2020 also marked a new phase for us. First generation projects evolved and expanded — particularly in the Pacific and West Africa — while new activities began elsewhere. By year-end, CREWS projects covered 57 countries globally. The pertinence of a new initiative to strengthen climate resilience in five South West Indian Ocean countries was underscored as Mozambique was hit by more tropical storms and then Cyclone Eloise in early 2021. The green light to help a highly vulnerable Haiti put in place an effective multi-hazard early warning system was also given.

These and other developments demonstrated the growing recognition and relevance of our expertise and services. In 2020, Finland became the 8th CREWS Member, contributing about US\$ 6 million to our Trust Fund. A 10 million Euro contribution announced by the European Commission has increased our financial momentum. We are very grateful that some countries contributing to the CREWS Financial Intermediary Fund (FIF) have renewed their commitments, with France making multiple contributions. Since 2017, total contributions to the Trust Fund have more than tripled. With this growth comes greater accountability and responsibilities. An external evaluation of the CREWS Initiative so far will guide our efforts further by showing if we are on track to achieve our goals.

We continued to contribute our expertise and experience to existing partnerships, while establishing new ones to help save lives. We have teamed up with organizations such as the International Federation of Red Cross and Red Crescent Societies (IFRC) to strengthen the early warning services' role of its national societies in CREWS projects.

Looking ahead, our vision for the next five years is captured in an operational plan to reach more countries and enhance the effectiveness of current operations. The CREWS Operational Plan for 2021-2025 will sustain our efforts in the long-term and ensure our impact is on those most in need. The role of women, as leaders in such efforts, is emphasized.

An enhanced business model will enable greater operational agility and private sector engagement. We will, however, require far greater resources to meet early warning service demand. As it is, US\$ 32 million are sought for existing pipeline projects. An ambitious resource mobilization drive will seek to raise US\$ 107m by 2025. We look forward to your engagement and support.

**Carole Dieschbourg**

Minister for the Environment, Climate and Sustainable Development,  
Government of the Grand Duchy of Luxembourg



Photo credit: Yves Kortum

# 2020 IN NUMBERS

57

Countries assisted through CREWS projects globally



14

CREWS projects in operation — 9 country, 4 regional and 1 global. 12 LDCs, SIDS, or regions with high need, demand and leveraging potential, proposed in the pipeline



8

Contributing Members



Finland became our newest Member, joining Australia, France, Germany, Luxembourg, Netherlands, Switzerland, and the United Kingdom



21%

increase in CREWS funds since 2019

US\$ 66.16 million received in signed contributions since 2015

US\$  
330  
million

additional funds leveraged by CREWS since 2015 and a further US\$ 203 million leveraged through pipeline projects



10

Pacific and West African countries

to have strengthened governance on climate and weather services and early warning mechanisms with legislation, decree, national frameworks and strategic plans adopted, activated or impending



+ 114

million more people to be better protected from drought, sand and dust storm, and community-based early warning and response mechanisms that were developed, established or piloted in Afghanistan, Palau and 6 West African countries through CREWS work in 2020



3

early warning systems for flash floods



Flash Flood Guidance System work initiated, enhanced or piloted to cover 21 countries with +453 million people in West Africa, Afghanistan and DR Congo respectively

265%

income increase



for 85% of farmers from 3 pilot communities in Burkina Faso trained on using climate and weather forecasts for agricultural decision-making, with profits used for education, health and enterprise

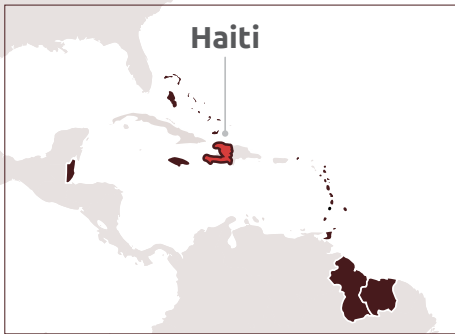
US\$107 million

needed to meet funding needs for next 5 years



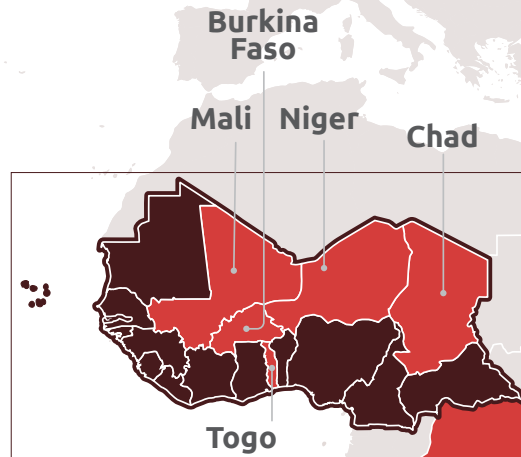


# CREWS INITIATIVE IN ACTION



## Caribbean Regional Project

Anguilla, Antigua and Barbuda, Bahamas, Barbados, Belize, Dominica, Dominican Republic, Grenada, Guyana, Haiti, Jamaica, Montserrat, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Trinidad and Tobago



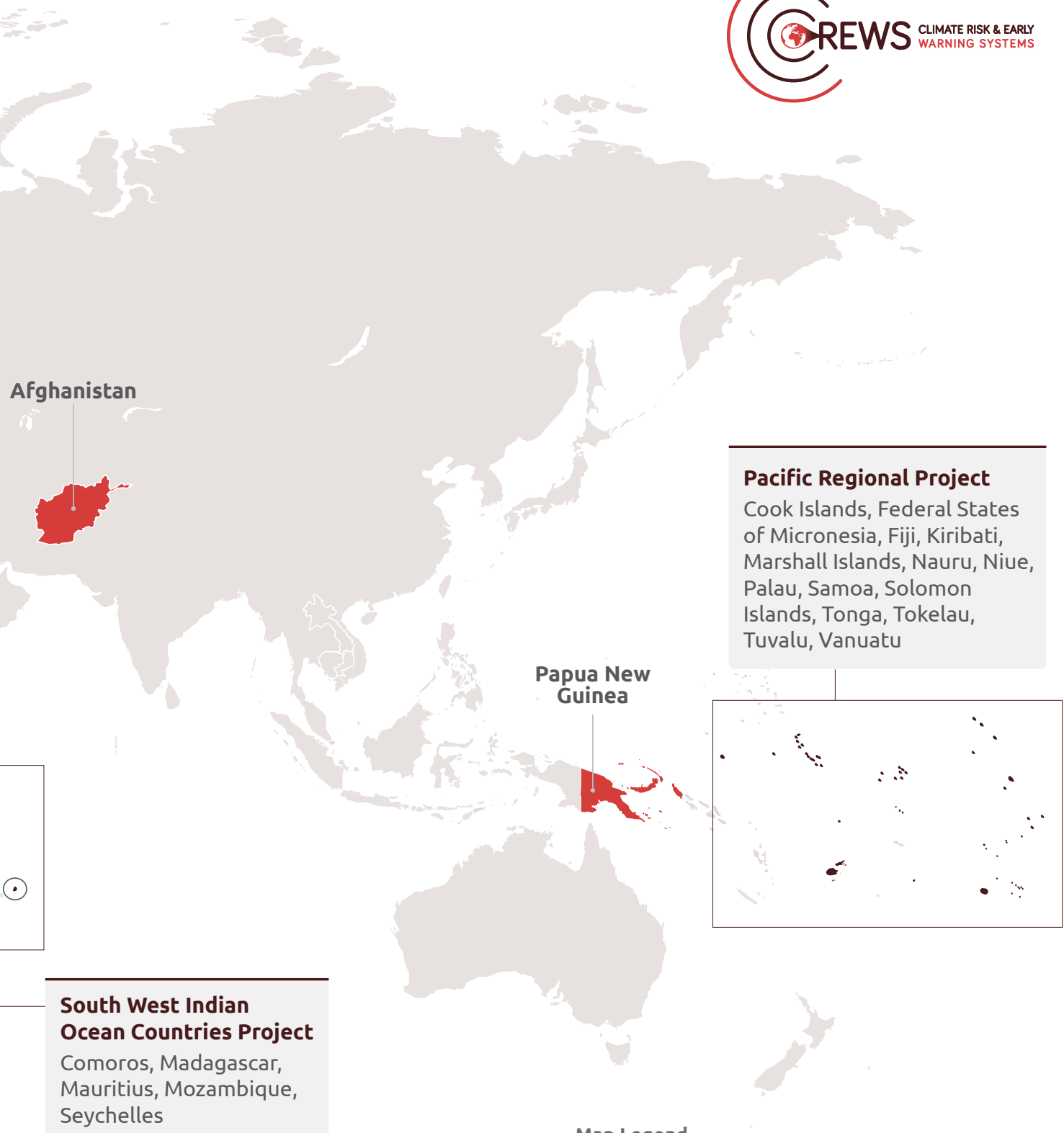
## West Africa Regional Project

Benin, Burkina Faso, Cabo Verde, Cameroon, Central African Republic, Chad, Côte d'Ivoire, Gambia, Ghana, Guinea, Guinea Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra Leone, Togo

Democratic Republic of Congo

## Pipeline Projects

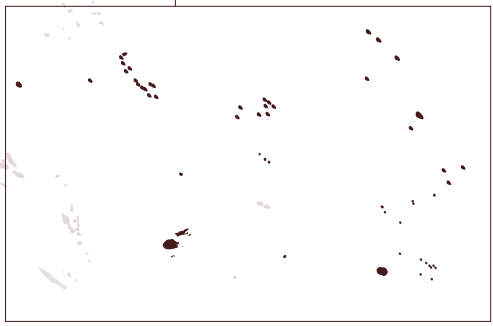
CREWS currently has 12 country, sub-regional or regional projects in the pipeline, ready for implementation and awaiting funding.



**Afghanistan**

**Pacific Regional Project**  
 Cook Islands, Federal States of Micronesia, Fiji, Kiribati, Marshall Islands, Nauru, Niue, Palau, Samoa, Solomon Islands, Tonga, Tokelau, Tuvalu, Vanuatu

**Papua New Guinea**



**South West Indian Ocean Countries Project**  
 Comoros, Madagascar, Mauritius, Mozambique, Seychelles

**Map Legend**  
■ Country Projects  
■ Regional Projects\*

\* The Caribbean and Pacific Regional projects are co-funded by Canada. The Dominican Republic, Cambodia and Lao People’s Democratic Republic are also CREWS-supported with Canadian funding.

# 2020 PROGRAMME OVERVIEW

There is no doubt that COVID-19 affected CREWS projects globally in the timing and progress of activities and the mode of their delivery. National institutions' capacities to operate as normal were hampered, while travel restrictions affected abilities of both national and international partners to provide services. However, each CREWS project found ways to keep going to some degree.

Our ambition, nevertheless, remained undimmed. By year end, the CREWS Initiative was supporting 57 countries directly or through regional projects. Another three — Cambodia, Dominican Republic and Lao People's Democratic Republic — are supported through Canadian government funding.

In addition, Pacific and West Africa regional projects were extended in scope, duration and participation with all three implementing partners now involved. For Pacific Island States, although COVID-19 delayed matters, phase II includes activities to improve hydro-met governance. In West Africa, CREWS is strengthening capacities for sustainable regional climate early warning and piloting local warning services in Sierra Leone.

Twelve country, sub-regional and regional proposed pipeline projects and additional funding for the Caribbean underline both the need for, and growing recognition of, effective early warning and climate services in delivering multiple global and national goals.

**Bridging the capacity gap among our LDC and SIDS Members to deal with climate change impact is a high WMO priority. At its heart is technical cooperation provided by countries with higher capacity for observation networks, weather and climate predictions and early warning services. The CREWS Initiative has enabled WMO to accelerate support to countries most in need, working closely with the World Bank and UNDRR.**

**Petteri Taalas,**  
*WMO Secretary General*



## NEW PROJECTS FOR THE YEAR

A new project in **Haiti** implemented by WMO should have started in 2020, but the onset of COVID-19 pushed back implementation to early 2021. With the highest exposure to multiple hazards in the Caribbean, Haiti is in urgent need of a robust hydrometeorological warning system. More than 100 disasters — from earthquakes, hurricanes and floods to landslides and droughts — affected the country between 1900-2016. A statistic made more compelling given that virtually the entire population is at risk from at least two types of natural hazards and nearly 90% of people are either poor or extremely poor.

Over four years, we will build capacity of the Hydrometeorological Unit of Haiti and strengthen its cooperation with key government ministries, economic sectors and communities. This is to ensure sustainable and effective early warning in the country. The project builds on existing WMO and **Environment and Climate Change Canada (ECCC)** activities in Haiti that include new infrastructure, equipment and forecast training. We will also work with targeted communities, farmers and civil society on using climate forecasts to safeguard lives and livelihoods.

Elsewhere, a new five-year regional project for **South West Indian Ocean Countries (SWIOC)** covering the Comoros, Madagascar, Mauritius, Mozambique and the Seychelles began in late 2020. Led by the Indian Ocean Commission, involving all CREWS Initiative implementing partners, and working with national agencies, the project focuses on improving regional cooperation on climate and weather forecasting and helping each country advance on providing timely and accurate early warning information. National hydro-met services have already engaged in initiatives to improve production and delivery of weather and climate services to their populations. The aim now is to move forecasting from what the weather will be to what the weather will do to make vulnerable communities and economic sectors more resilient to its impacts.

The CREWS project informs and contributes to the effectiveness of a **French Development Agency** initiative financed by the Green Climate Fund and the European Union Intra-ACP programme, as well as a **World Bank Disaster Risk Management and Resilience Program** in Mozambique.







© UNICEF/Ricardo Franco

Early warnings are an essential part of disaster risk reduction, but systems need to be in place for them to be effective and actionable. The CREWS Initiative is helping us advance the work in early warning and early action in ways that consider the systemic and linked nature of climate and disaster risks. Interconnected multi-hazard risks require interconnected actions and partnerships.

**Mami Mizutori**  
*Special Representative of the Secretary-General for Disaster Risk Reduction and Head of UNDRR*

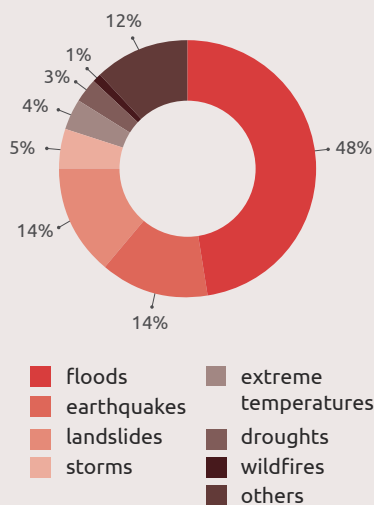


The CREWS Initiative and the World Bank are working in tandem to improve the quality and accessibility of early warning systems throughout the COVID-19 pandemic, and have adapted their work to reflect the new challenges in facilitating access to vital information. Despite the pandemic, our efforts to strengthen early warning resources have continued unabated and investments in this area are growing. The threats countries face from recurring extreme weather events illustrate the necessity for effective early warning systems, and we remain committed to use our knowledge and experience to support an inclusive and resilient recovery across sectors.

**Sameh Wahba,**  
*Global Director, Urban, Disaster Risk Management, Resilience and Land Global Practice, World Bank*



## Natural Hazards 1990–2020



52% deaths due to weather-related disasters

US\$ 87 million damages from floods, US\$ 142 million in damages from droughts<sup>1</sup>

10.5 million people severely affected by 2018 drought<sup>2</sup>

World Bank Group/GFDRR  
WMO

2019 -2023

Project Funds

**US\$ 3.66 million**

Expenditure Rate

**7.4%**

Leverage Factor<sup>3</sup>

**12.3 x**

Background photo credit:  
UNEP/Anssi Kullberg

<sup>1</sup> EM-DAT

<sup>2</sup> [https://media.ifrc.org/ifrc/wp-content/uploads/2020/11/IFRC\\_wdr2020/20201113\\_WorldDisasters\\_0.pdf](https://media.ifrc.org/ifrc/wp-content/uploads/2020/11/IFRC_wdr2020/20201113_WorldDisasters_0.pdf)

<sup>3</sup> Figures for all projects in the Annual Report based on information submitted by Implementing Partners in progress reports and represent total expenditures, including obligations, by year end.

<sup>4</sup> <https://www.wfp.org/countries/afghanistan>

- All 34 Afghan provinces highly prone to natural hazards
- Nearly a third of Afghans food insecure<sup>4</sup>
- **CREWS Afghanistan** strengthens national institutions' capacity to provide early warning climate information to minimize impacts of weather hazards on vulnerable communities.

## KEY ACHIEVEMENTS

**Blueprint developed** by national authorities to modernize national hydro-met operations and strengthen capacity on multi-hazard early warning services to 38 million people.

- Concept of Operations (CONOPS) developed to define, establish and maintain modern hydro-met systems and services that meet user needs and investment needs mapped.



**Prototype drought early warning system in place and 30 staff** trained from national hydro-met and disaster management agencies on daily rain and monthly temperature forecasts, and drought indicators.

- The system supports timely and targeted humanitarian relief by determining drought severity nationally and ranking affected districts for priority action. It adds to the **World Bank Drought early warning, early finance and early action project (ENETAWF)** to improve food security.



**2 Afghan technical experts** trained on innovative 3D printing technology design and assembly of weather stations that cost US\$ 200-400 to produce.

- Sustainable warning systems at a fraction of normal cost, 3D-Printed Automatic Weather Stations will provide nationwide surface observation for flood and landslide early warning and agricultural monitoring.

**Low-cost, sustainable weather stations** and weatherboards installed in 10 communities comprising 10,495 people to pilot community-based disaster risk management value chain approach.

- Impact surveys found nearly 9 out of 10 people in pilot communities said they can better protect women, men and crops by frequently using weather data to make decisions.



© Meer Abdullah Rasikh/ARCS



## 2020 KEY DEVELOPMENTS

**Flash flood prediction** of Afghanistan's Met Service enhanced with new interface, and capacity built to produce high quality **seasonal climate outlooks** through regional cooperation.

- National forecasters able to analyze hydro-met information to predict flash floods and other climate-related hazards and warn communities on likely impacts.



**Institutional capacity needs** for hydro-met services and disaster management mapped in consultation with national authorities.

- Investment plans in the ENETAWF project are under preparation to modernize hydro-met and disaster risk management agencies to meet user needs.



© FAO Giulio Napolitano

## SUSTAINING MOMENTUM DURING COVID-19



Despite COVID-19, CREWS Afghanistan took significant strides forward. Meetings were virtualized where possible and online training sourced for capacity building to continue. The development of a prototype drought early warning system is critical for a country where agricultural productivity is a core driver of GDP. Women are also being engaged more on disaster mitigation through community surveys, training and solutions.



*3D printing technology will play a highly effective role in hydrometeorology for Afghanistan. Low-cost production, easy transportation and installation, reliable operation and convenient maintenance make it superior to other options.*

**Soma Popalzai**  
**Head of Research**  
**Afghanistan Meteorology**  
**Department**

© Afghanistan Civil Aviation Authority



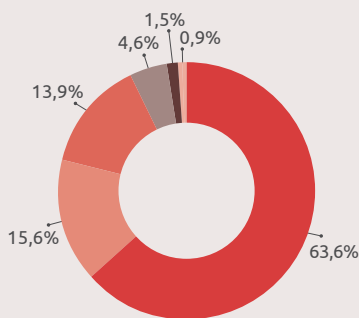
*In the past, we didn't understand when it was the best time to plant vegetables. Fortunately, today we do our work according to the weather information that is written on the board.*

**Community mobilizer from**  
**a pilot community**

© UNDP/S. Omer Sadaat



## Hydrometeorological Hazards 1974–2016



- heavy rains
- floods
- droughts
- rain/strong winds
- strong winds
- other

**12.6 million** people directly and indirectly affected by droughts<sup>1</sup>

**US\$ 130 million** economic losses from 2009 floods<sup>2</sup>

WMO

2017 -2020

Project Funds

**US\$ 2.19 million**

Expenditure Rate

**79%**

Leverage Factor

**16x**

Background photo credit: Shutterstock

<sup>1</sup> <https://www.desinventar.net/Desinventar/profiletab.jsp?countrycode=bfa>

<sup>2</sup> World Bank Strengthening Climate Resilience in Burkina Faso Project (P164078)

<sup>3</sup> <https://spark.adobe.com/page/CiQq5c048eC7D/>

- 80% of 20 million-strong population<sup>3</sup> engaged in subsistence farming
- Agriculture accounts for one third of GDP
- **CREWS Burkina Faso** builds national hydro-met capacity and strengthens cooperation between key sectors, ministries, communities and the media to provide timely and accurate climate and weather warning services.

## KEY ACHIEVEMENTS

**Sand and Dust Storm Warning Advisory System** with 1 daily bulletin disseminated by national Met Service forecasters.

- The system ensures more effective national daily weather bulletins, with early warning mitigating impact on health, agriculture and transport through timely information.



**9 synoptic stations** issuing 8 daily forecasts — up from 1 previously — that feed into global weather data collection and exchange.

- Improved forecasting skills will benefit the population and enable more accurate modelling of global weather through numerical weather predictions (NWP).



**1,681 farmers** (including 500 women) and local agents at 3 pilot sites, trained to use daily and weekly climate and weather forecasts and disseminate information to communities.

- 85% of farmers regularly receiving climate information during crop season in 2020 used seasonal forecasts for decision-making. Result: lower production costs, higher yields and 265% income increase compared to non-pilot farmers, with money used for education, health care and enterprise.



© WMO/ANAM

## 2020 KEY DEVELOPMENTS

**Early warning system for flash floods** (Flash Floods Guidance System) enhanced with new interface and implementation of system begun through data collection.

- Training of 4 hydro-meteorologists in 2021 to use the system will ensure stronger understanding of flash flood impacts and deliver effective flood forecasts and warnings.



**10 agrometeorologists and climatologists trained** to develop crop calendars and use weather-based crop calendar (R-INSTAT) tool.

- Crop calendar and R-INSTAT will enable producers and herders to better define the onset and end of cropping season for optimal use of available water and successful yields and harvests.



© CIFOR/Ollivier Girard

## SUSTAINING MOMENTUM DURING COVID-19



2020 developments highlight how an early warning system in Burkina Faso is evolving from drought and locust monitoring for food security into a multi-hazard system responding to urban and rural communities and businesses alike. Evaluation of agrometeorological services at pilot sites showed the potential to reduce poverty, strengthen food security and resilience, and invest in women's empowerment through climate services. COVID-19 did impact training and equipment delivery, which affected the full operationality of some services. A two-year extension is needed to complete the project.



*The daily weather forecast is always good and that is a very good thing for us. We still want support next year. It was a good experience.*

**Fatimata Kagone**  
woman farmer

© WMO/ANAM

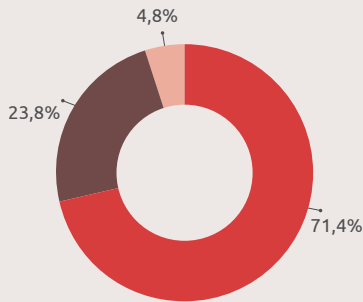
*The weather allowed us to sow the rice on time. We monitor weather information every day and this allows us to fertilize and apply phytosanitary treatment at the right time. In this way, we produce 65-70 tonnes a year. It allows us to feed ourselves and pay the school fees.*

**Bamouni Balma**  
farmer





## Hydrometeorological Hazards 1990–2014



■ floods ■ storms  
■ droughts

**US\$ 38.75 million** in average annual losses from floods<sup>1</sup>

**2.4 million people** exposed to drought risk

**Nearly 400,000** people affected by floods in 2020<sup>2</sup>

World Bank Group/GFDRR  
WMO

2019 -2024

Project Funds

**US\$ 3.15 million**

Expenditure Rate

**20.4%**

Background photo credit: Shutterstock

<sup>1</sup> <https://www.preventionweb.net/countries/tcd/data/>

<sup>2</sup> <https://reliefweb.int/report/chad/chad-situation-report-10-nov-2020>

<sup>3</sup> <https://data.worldbank.org/country/chad>

- More than 80% of 16 million population<sup>3</sup> work in agriculture, which makes up 20% of GDP
- Early warning currently focused on drought and locust impact on food security
- No existing warnings available for rapid-onset hazards such as flash floods, sand and dust storms, and other extreme events
- **CREWS Chad** focuses on strengthening national capacity to deliver warning services for climate, water and weather extremes with a seamless approach to target communities.

## KEY ACHIEVEMENTS

**Diagnostic of national capacities** on multi-hazard forecasting and warning ongoing by 5 national partners responsible for meteorology, agriculture, food security, water and civil protection.

- 5 national institutions' capacity to alert Chadian population to risk will be strengthened through follow-up targeted action.



## 2020 KEY DEVELOPMENTS

**Support to National Met Service** on identifying priority hydro-met activities for financing to improve drought early warning and food security.

- Activities would be financed through a **World Bank regional food security program**. Synergies created between the World Bank, WMO, the food security program and 5 national partners, will enable them to help an estimated 600,000 people at risk of food insecurity and extreme poverty.

**3 pilot sites** covering 200 women and men and 3 women producers' associations identified for enhanced early warning services. 1 automatic weather station and 1 rain gauge installed.

- Assessment of user needs at Mani, Linia and Mailao-Tchendjou pilot sites and installation of weather monitoring equipment will ensure delivery of initial and relevant hydro-met services that help improve crop yields and reduce impacts of weather-related hazards on both men and women.

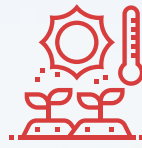


© Red Cross Society of Chad



**2 agro-meteorologists trained** to use weather-based crop calendar (R-INSTAT) tool to monitor drought and 1 crop calendar developed with input from 3 women producers' groups.

- 200 people, including 100 women producers, would have improved crop yields and more secure income by using the calendar. It defines the onset and end of cropping season for optimal use of water.



**100 village producers**, including 52 women, from Mani, Linia and Mailao-Tchendjou given preliminary training on agrometeorology and expressed requirements on agrometeorological bulletins and warnings.

- Farmers from pilot villages will be better able to use science-based climate information to improve crop quality and yield.



© IFRC

## SUSTAINING MOMENTUM DURING COVID-19



Like other CREWS projects in the first full year of operation, COVID-19 took its toll on the 2020 workplan and goals, particularly in the first six months. An estimated 30% of planned activities were carried out over the year. Poor communication networks, travel restrictions and curfews in the capital, N'Djamena, impacted implementation of activities or affected monitoring of progress. Regular contact between five Chadian national partner institutions and CREWS Implementing Partners was, however, maintained through weekly briefings with focal points. Work that could be carried out remotely, went ahead.



© Pieter Edelman

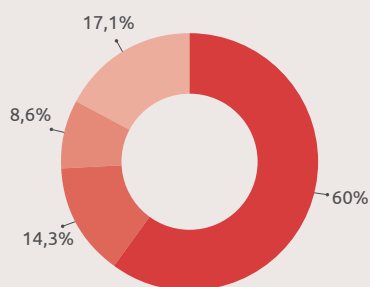
*2020 showed many advantages of the CREWS project. We can already better communicate with our stakeholders. CREWS fulfilled the very basic needs of a functional office by providing computers, machines and scanners.*

**Djergo Gaya**  
**Engineer & CREWS Focal Point**  
**National Met Agency (ANAM)**



# DEMOCRATIC REPUBLIC OF CONGO

## Natural Hazards 1990–2014



- floods
- storms
- landslides
- others

**US\$ 64.2 million** average annual losses from floods<sup>1</sup>

**54.6% of deaths** from natural hazards 2020-2021 caused by floods

Floods responsible for **85.8%** of people affected by disasters 2020-2021<sup>2</sup>

World Bank Group/GFDRR  
WMO

2017 -2022

Project Funds

**US\$ 3.09 million**

Expenditure Rate

**34.8%**

Leverage Factor

**2.5x**

Background photo credit:  
UN Photo/Marie Frechon

<sup>1</sup> <https://www.preventionweb.net/countries/cod/data/>

<sup>2</sup> Compilation from EM-DAT Database, CRED, [www.emdat.be](http://www.emdat.be) data retrieved March 16, 2021

<sup>3</sup> <https://data.worldbank.org/country/congo-dem-rep?view=chart>

<sup>4</sup> [https://www.ifad.org/en/web/operations/country/id/dr\\_congo](https://www.ifad.org/en/web/operations/country/id/dr_congo)

- More than 70% of DR Congo's 87 million<sup>3</sup> population live in extreme poverty
- Agriculture accounts for 40% of the GDP and employs 70% of the population<sup>4</sup>
- **CREWS DR Congo** works to strengthen regulatory frameworks, partnerships and national hydrometeorological and climate services in selected sectors and builds capacity on effective early warning.

## KEY ACHIEVEMENTS

**1 National Framework for Climate Services** validated and 1 Strategic Plan of Action to implement it ready for adoption.

- Institutional and regulatory framework on hydro-met and climate services will be formally strengthened when the National Framework for Climate Services becomes law in 2021. This and the strategic plan to enact it will define roles and responsibilities of relevant national agencies to ensure production, delivery and application of more effective hydro-met services and climate predictions for women and men.

**Training needs assessment** carried out of 210 technicians, engineers, meteorologists and hydrologists, and 273 administrative staff at national Met Service, MettalSat, with training programme nearly completed. In total, 483 staff, including 58 women, will be trained.

- Training is the backbone of a long-term strategy to enhance sustained institutional capacity on hydrometeorological-related areas, improve sectoral cooperation, and enable data sharing and expertise exchange with other countries.

**12 synoptic and 6 hydrological stations**, 20 rain gauges and other equipment acquired to establish flood early warning system in 2 watersheds — N'Djili and Kalamu.

- Lives and livelihoods of 500,000 people will be better protected by the system, with equipment acquired by leveraging the **World Bank's Strengthening Hydro-Meteorological and Climate Services Project**. The Flood early warning system also guarantees improved regional and global meteorological forecasting through integration with global information networks.



© Matondo Divengele/Mettelsat, 2020



## 2020 KEY DEVELOPMENTS

### Business plan developed for MettelSat.

- The plan will lead to a business model guaranteeing business continuity and the sustainability of measures supported by CREWS DR Congo.



### Equipment acquisition for data rescue and archiving of historic climate data completed, staff recruitment underway to digitalize data.

- Data rescue and digital archiving ensures DR Congo's hydro-meteorologists have access to necessary information to assess climate variability and change, and provide a range of climate services, including more accurate forecasts.



© FAO/Olivier Asselin

## SUSTAINING MOMENTUM DURING COVID-19



2020 marked a milestone for both the country and the CREWS DR Congo project. With a National Framework for Climate Services due to become law, backed by a strategic plan of action, DR Congo has taken the critical step to strengthen regulation and effectiveness of hydrometeorological services. Although COVID-19 impacted project progress, about 60% of planned 2020 activities was achieved. Some activities were completed with the support of global and national experts to strengthen MettelSat capacity.



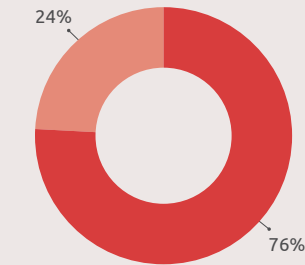
© Matondo Divengele/Mettelsat, 2020

*"Investing in hydrometeorological and climatological services solves several problems globally, as \$1 invested in meteorology produces on average 8 times more than the value invested in a country's sustainable development." In this regard, the DRC, full of enormous potential, especially in the agricultural field with 80 million hectares of arable land, can feed more than one billion people worldwide. Hence, the hydrometeorological and climatological service deserves the attention and combined efforts of all of us.*

**Didier MAZENGA MUKANZU**  
**Minister for Transport and Communication**



## Hydrometeorological Hazards 1990–2014



■ floods ■ droughts

**98.3%** deaths from natural disasters due to floods

**US\$ 44.76 million** average annual loss from floods<sup>1</sup>

World Bank Group/GFDRR  
WMO

2017 -2021

Project Funds

**US\$ 3.33 million**

Expenditure Rate

**41.1%**

Leverage Factor

**11.8x**

Background photo credit:  
Eric Ferrier

<sup>1</sup> <https://www.preventionweb.net/countries/mli/data/>

<sup>2</sup> <https://data.worldbank.org/country/mali?view=chart>

- Nearly 80% of 20 million people<sup>2</sup> dependent on rain-fed agriculture and pasture
- Increasing desertification leading to rapid urbanization
- Poor urban planning and floodplain settlement exacerbating flood vulnerability
- Increasing insecurity in Mali aggravating food insecurity
- **CREWS Mali** complements the **World Bank's Strengthening Climate Resilience in Mali** project and modernizes and strengthens hydro-met and early warning and emergency response systems and services to minimize loss of lives and livelihoods.

## KEY ACHIEVEMENTS

**Training needs assessment** carried out on National Meteorological and Hydrological Services.

- 40% women and 53% men at national hydrometeorological institutions satisfied with information and training provided on flood management and early warning services. The results will inform the development of a blueprint to modernize Mali's hydrometeorological services.



**Mapping completed** of national Met Service's weather and climate observation network.

- Diagnostic on Mali's entire observation network and systems used to develop hydrometeorological modernization programme plan and timeline.



**90 women leaders trained** on climate risks and early warning on floods, thunderstorms and drought, integrating acquired knowledge into awareness raising campaigns for greater public reach.

- Women from 6 regions, including Bamako, enabled to carry out sensitization campaigns on disaster risk management and to create a women's network after end to security and COVID-19 crises.



© IOM/Juliana Quintero



## 2020 KEY DEVELOPMENTS

**46 hydro-met staff**, including 17 women, trained virtually on using National Disaster Risk Reduction Platform on risk knowledge.

- Sustained capacity of the national hydro-met agencies increased to better gather, analyze and disseminate timely climate and weather information and enable public and sectors to make informed decisions.



**Production and dissemination** of 2 awareness campaigns on COVID-19 supported, while campaign on disaster risk prevention was finalized.

- COVID-19 awareness campaigns targeted market trader collectives to reduce transmission risks among those particularly vulnerable from continued public interaction.



© UNDP/Imen Meliane

## SUSTAINING MOMENTUM DURING COVID-19



Increasing insecurity combined with COVID-19 hindered the ability of national hydro-met agencies to deliver normal services and put an almost virtual stop to CREWS Mali activities. The project worked with the national civil protection agency to minimize the spread of COVID-19 through information campaigns and to distribute protective equipment to vulnerable groups. To make progress where possible, remote monitoring through mobile phone surveys was introduced to support basic project implementation. Some work was carried out online, including an assessment on hydro-met training needs. In addition, plans to increase the remote working capacities of national partners were developed.



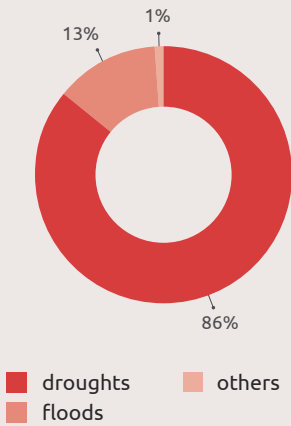
*Today, I know and educate other women who didn't have this training on how to prevent flood disasters — avoid building homes on water passages and avoid dumping rubbish on water passages or in pits. Failing to comply with these measures makes us indirectly responsible for floods which cause enormous damage.*

**Mariam Koné**  
trained woman leader





## Hydrometeorological Hazards 1973–2019



**14.1 million** women and men directly and indirectly affected by drought<sup>1</sup>

**133,300** houses damaged or destroyed and US\$ 285 million losses from 2020 floods alone<sup>2</sup>

World Bank Group/GFDRR  
WMO

2017 -2021

Project Funds

**US\$ 2.74 million**

Expenditure Rate

**54.72%**

Leverage Factor

**12x**

Background photo credit: Shutterstock

<sup>1</sup> <https://www.desinventar.net/Desinventar/profiletab.jsp?countrycode=ner&continue=y>

<sup>2</sup> Ministry of Humanitarian Action and Disaster Relief (MAH/GC)

<sup>3</sup> <https://data.worldbank.org/country/niger?view=chart>

- Regular droughts have led to rural exodus with impact on food security
- Rapid urbanization and watershed degradation have increased flood risk and occurrence
- 23 million<sup>3</sup> people need strong weather and climate observation/forecasting system
- **CREWS Niger** works to strengthen food security early warning and establish effective flood and extreme weather warning services.

## KEY ACHIEVEMENTS

**National early warning and security risk response mechanism** established by decree, and National Alert Code operational with hydro-met and civil protection agencies' early warning system roles and services defined.

- Foundations for effective food security, flood and extreme weather early warning systems to reduce mortality and economic impact by 2030 are in place, and disaster response capacity improved.

**950 community leaders**, women, local teams and agents trained on early warning services, disaster management and National Alert Code.

- 600 women from 8 regions covering more than 23 million people trained on disaster preparedness, and now sharing national alerts via WhatsApp groups. 66 local teams trained on disaster and impact assessments. 265 municipal leaders trained on community preparedness and emergency response planning.

## 2020 KEY DEVELOPMENTS

**20 meteorological observers** trained.

- First such training in 20 years enables more accurate monitoring and forecasting for population where 80% of people are engaged in agriculture.

**62 municipalities identified** as flood risk communities, 15 selected to provide flood early warning system training to municipal leaders, women and men.

- Limited loss of life from severe and extensive floods in 2020, particularly in urban areas, mainly due to flood early warning system.



© Norwegian Red Cross/Mari A. Mortvedt



**Risk-management tool** transferred to National Agency for Information Society data server and accessible on [www.risques-niger.ne](http://www.risques-niger.ne)

- Securing of national ownership of risk mapping tool enables hydro-met and civil protection institutions to access data for impact-based forecasting and disaster planning and response.



**2 TV spots** on flood awareness and COVID-19 produced and disseminated through media for 4 months in 4 languages.

- Women and men nationally better informed on preparing and protecting lives and assets against floods, extreme weather events and COVID-19.



© OXFAM/Valérie Batselaere

## SUSTAINING MOMENTUM DURING COVID-19



With about 20% of CREWS Niger activities for 2020 carried out, investment in building capacity within national hydro-met institutions is paying dividends. Daily weather bulletins continued to be issued by Niger's Met Service despite COVID-19. The new Operational Centre for Crisis Monitoring and Management and adoption of the Alert Code by all early warning actors marked a turning point. The Centre played a key role in disaster management of 2020's extensive floods through public alert messages on danger to life, assets and infrastructure. The project life will need extension to complete unfinished activities.



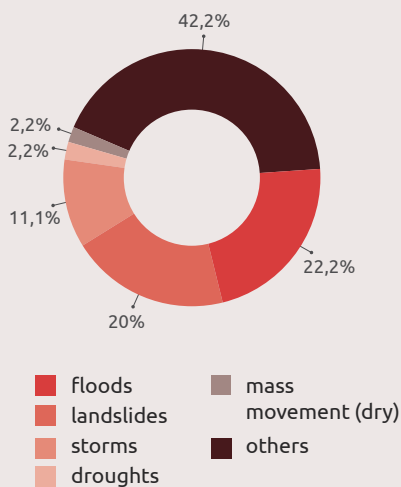
*Through CREWS, Niger has a three-year plan that will result in standard operating procedures and strengthened capacity for flood early warning and response that can be extended to other hazards as well.*

**Magagi Laouan**  
**Minister of Humanitarian Action and Disaster Management (MAH/GC)**



# PAPUA NEW GUINEA

## Natural Hazards 1990–2014



**US\$ 96.25 million** average annual losses from weather-related disasters<sup>1</sup>

**51.3%** average annual losses due to floods

**40%** of population affected by 2015-2016 severe drought<sup>2</sup>

## WMO

2017 -2020

Project Funds

**US\$ 1.65 million**

Expenditure Rate

**15.8%**

Leverage Factor

**0.36 x**

Background photo credit: Shutterstock

<sup>1</sup> <https://www.preventionweb.net/countries/png/data/>

<sup>2</sup> <https://reliefweb.int/sites/reliefweb.int/files/resources/PNG%20Brief%20Sep2015.pdf>

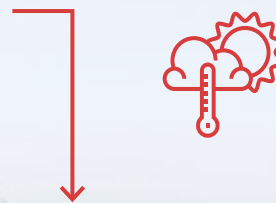
<sup>3</sup> <https://www.worldometers.info/world-population/papua-new-guinea-population/>

- 85% of 9 million people<sup>3</sup> reliant on subsistence farming
- Food insecurity mainly due to crop failures from floods, drought and frosts
- **CREWS Papua New Guinea (PNG)** builds national Met Service capacity on weather forecasting and early warning to improve food security and strengthens its cooperation with key ministries and sectors.

## KEY ACHIEVEMENTS

**1st seasonal forecast** issued to government decision-makers using dynamic instead of statistical climate models for Pacific Island countries.

- Supported use of Australian Met Service's climate simulation system through CREWS was an important milestone in operational transition to more accurate seasonal and multi-week climate predictions to help reduce food insecurity.



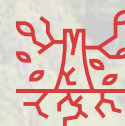
**Weekly provision** of experimental high resolution climate prediction products, monthly early action rainfall bulletins and 1-3 months rainfall outlooks to enhance food production through climate smart agriculture.

- User-need input and collaboration with Australian Centre for International Agricultural Research led to new forecast products that informed humanitarian and food security agencies' work in 2020. Rainfall bulletins help food producers better plan planting and harvesting.



**Weekly, monthly and seasonal drought detection** and monitoring products for local user needs created to help prepare operational drought information.

- Products were adapted from those of WMO's Spaced-Based Weather and Climate Extreme Monitoring Demonstration Project.



© Nick Turner/UNDP



## 2020 KEY DEVELOPMENTS

**5 products improved** – seasonal and sub-seasonal rain prediction, near-surface air and sea surface temperature, and mean sea-level pressure products tailored for PNG by Australian Met Service.

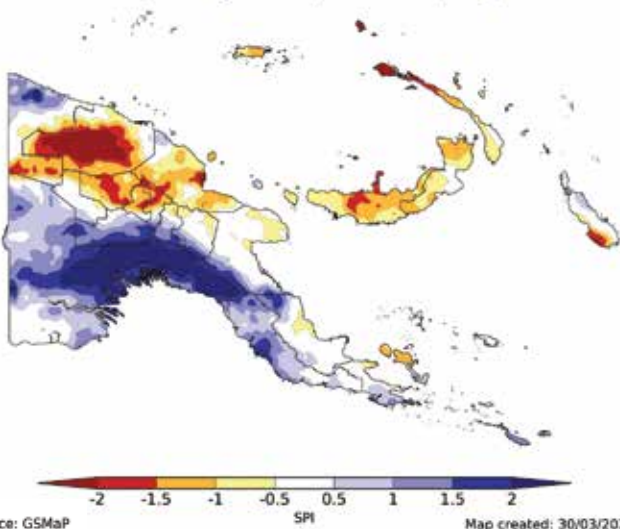
- National hydro-met services able to deliver timely and more accurate climate and weather information to people and better protect them from drought, floods and coastal inundations.



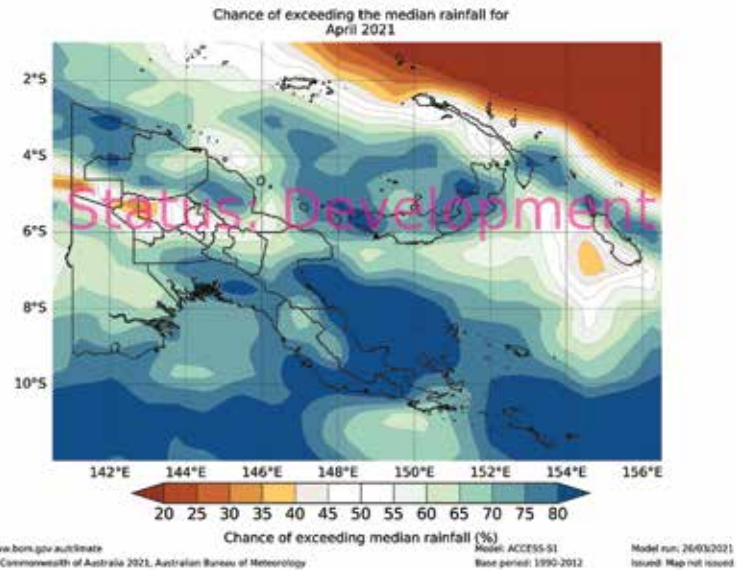
**115 people**, including 40 women, from agriculture, energy, health, water, disaster management and other sectors, shared updated user needs on climate services at 3 workshops.

- Annual assessment of early warning user needs for each hazard type and system by different sectors ensures climate services stay relevant. One workshop was held virtually along with a bi-annual Climate Outlook Forum.

3-month SPI for January 2021 (2001-2020, 20 years record)



Credit: Australian Bureau of Meteorology/CREWS



## SUSTAINING MOMENTUM DURING COVID-19



CREWS Papua New Guinea estimates about 20% of the annual workplan was achieved. To maintain momentum, WMO and the Met Services of Papua New Guinea and Australia began bi-monthly virtual meetings. These have proven highly beneficial and will now continue as bi-annual meetings until the project ends, with participants also from partner organizations.



*Based on the November 2020 report, I will be able to tell my coffee farmers on Lelet plateau in New Ireland Province to be prepared for the potential drought.*

**Participant**  
**3<sup>rd</sup> user need workshop**

© Laura Keenan/World Bank

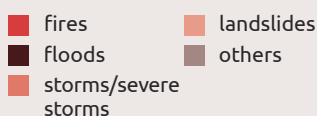
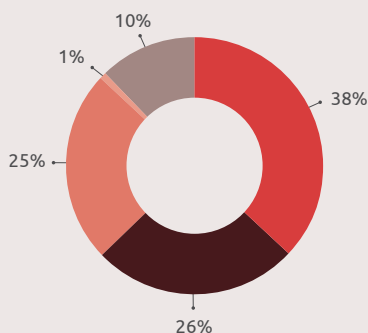


*Initiatives like CREWS address needs of climate sensitive sectors in Papua New Guinea such as agriculture, food security, clean power and disaster risk reduction. The sustainability of such initiatives is critical for successful operations of sectors which rely on availability of climate data and products from PNG National Weather Service.*

**Samuel Maiha, Director**  
**PNG National Weather Service**

© PNG NWS

## Natural Hazards 1960–2014



2,760 deaths, with 1,582 caused by floods<sup>1</sup>

83,000 people affected by 2010 floods

US\$ 38 million in damages and economic loss<sup>2</sup>

World Bank Group/GFDRR  
WMO

2019 -2024

Project Funds

**US\$ 2.36 million**

Expenditure Rate

**19.2%**

Background photo credit: Shutterstock

<sup>1</sup> <https://www.desinventar.net/Desinventar/profiletab.jsp?countrycode=tgo&continue=y>

<sup>2</sup> <https://www.gfdr.org/sites/default/files/publication/country-profile-2016-togo.pdf>

<sup>3</sup> <https://data.worldbank.org/country/togo?view=chart>

- 43% of GDP from agriculture, mainstay of most livelihoods among 8 million population<sup>3</sup>
- High reliance on increasingly erratic weather for food production
- No official severe weather warnings currently issued, though pilot flood forecasting exists in two river basins
- **CREWS Togo** builds national capacity on climatological, hydrometeorological and early warning services, with focus on floods, drought and food security.

## KEY ACHIEVEMENTS

**Activation of the National Framework for Climate Services** first adopted in 2018.

- With CREWS support, an inter-ministerial steering committee is guiding implementation and monitoring of the National Framework and an action plan focusing on reinforcing and developing Togo's climate services.

**US\$ 1.2 million humanitarian aid budget** for those affected by floods in Central, Kara and Savanes regions in 2020.

- National civil protection agency was supported in preparing an assessment mission on flood damage and loss in northern Togo. Recommendations will contribute to improving disaster response management.

## 2020 KEY DEVELOPMENTS

**National assessment** on Multi-Hazard Early Warning System capacities underway, involving national hydrometeorological services, civil protection and other institutions.

- Hydro-Met services and civil protection agencies have improved cooperation between them by jointly assessing the processes involved in weather and climate forecasting, flood warning, and identifying areas for improvement. This includes data sharing. They will also jointly contribute to action plans to improve warning services for women and men in Togo.

**Methodological process proposed** to monitor and evaluate implementation of the National Framework for Climate Services action plan.

- Process developed with multi-sector representatives and overseen by inter-ministerial committee to engage relevant national authorities in boosting climate services development and delivery in Togo.



© Agence Nationale de Protection Civile (ANPC)



**Diagnostic on flood early warning needs** of farmers in 2 river basins — Oti and Mono — underway.

- Post-flood assessment in Central, Kara and Savanes regions revealed: nearly 57,000 people affected, nearly US\$2.5 million in agricultural losses, and US\$ 10 million in damages to road infrastructure. Recommendations from the assessment will be used to improve flood warnings and forecasts, the most prevalent weather-related hazard.



**Training strategy being developed** to enable women leaders' network in 2 regions to increase awareness raising activities on disaster risk reduction and reduce impacts of weather-related hazards on communities.

- 50 women leaders from Maritime and Savanes, regions most prone to floods, supported to empower communities with the knowledge on how to keep safe and protect assets in disasters.



© World Bank/GFDRR

## SUSTAINING MOMENTUM DURING COVID-19



Between 10-15% of CREWS Togo overall activities were completed in 2020, and 10% were impacted by COVID-19. These included supporting the establishment of a multi-sectoral disaster risk reduction monitoring and evaluation tool, developing rapid evacuation plans for communities, and building capacity of community leaders and hydrometeorological observers in rural areas. The project workplan is being revised as a result. The silver lining on a challenging year is that COVID-19 motivated national institutions to collaborate and coordinate more in preparing and carrying out activities.



© Agence Nationale de Protection Civile (ANPC)

*This training meets a triple imperative: building capacity, reducing disaster risk and training on better use of cooking stoves.*

**Woman leader trained in disaster risk reduction**







Anguilla, Antigua and Barbuda, Bahamas, Barbados, Belize, Dominica, Dominican Republic, Grenada, Guyana, Haiti, Jamaica, Montserrat, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Trinidad and Tobago

World Bank/GFDRR  
WMO  
UNDRR

2018 -2021

Project Funds

**US\$ 5.5 million**

Expenditure Rate

**30.2%**

Leverage Factor

**0.36 x**

Background photo credit: Shutterstock

<sup>1</sup> GFDRR, Disaster Risk Management in the Caribbean, The World Bank's Approaches and Instruments for Recovery and Resilience, 2018

<sup>2</sup> <https://worldpopulationreview.com/country-rankings/caricom-countries-and-the-populations-of-anguilla-and-dominican-republic>

- 1.2 million people on average directly affected by natural disasters in last 20 years<sup>1</sup>
- **CREWS Caribbean**, co-funded by Canada, covers 15 Caribbean Community (CARICOM) countries, with Anguilla and the Dominican Republic also supported
- The project strengthens and streamlines regional and national systems for multi-hazard forecasting, warnings and service delivery to mitigate loss of life and economic assets.

## KEY ACHIEVEMENTS

**Situation Analysis** of Early Warning Systems in the Caribbean.

- Opportunities for an inclusive and reliable regional multi-hazard early warning system were identified.



**Roadmap for regional multi-hazard early warning** drafted, 9 potentially game-changing strategic initiatives defined, and 4 priority pilot activities to be developed.

- Nearly 30 million people<sup>2</sup> to ultimately benefit from 3 pilot activities, including developing an operational blueprint for hydro-met hazards and transitioning to impact-based forecasting. 950,000 people in Barbados, St. Lucia, St. Vincent and Martinique will benefit from the development of a multi-sensor precipitation grid.

## 2020 KEY DEVELOPMENTS

**Hydrological forecasting** and impact-based components of Integrated River Flood Forecasting System at 2 pilot river basins in the Dominican Republic under development.

- At least 160,000 women and men will be provided with timely and accurate flood warnings that will help save lives and assets.

**35 women and 31 men** from region with enhanced knowledge on impact-based forecasting, and roles and responsibilities of national hydro-met, disaster management and gender agencies.

- An online workshop also saw the Network of Caribbean Chambers of Commerce committing to work with hydro-met and disaster management communities to strengthen early warning systems.



© FAO



**120 people, including 72 women**, trained on early warning systems at 4 national workshops for gender and vulnerable groups.

- Women and other most-at-risk groups of people from Antigua and Barbuda, Dominica, St. Vincent and the Grenadines and St. Lucia were empowered to better protect themselves from disasters.



**2 reports drafted** to inform final National Strategic Plans for Grenada and Jamaica and 1 draft policy to inform design of model Caribbean MET Bill.

- National Strategic Plans and future adoption of Met Bill will strengthen hydro-met governance, oversight and services across the region.



© UNICEF/Afonso/Libre

## SUSTAINING MOMENTUM DURING COVID-19



With regional and national partners largely occupied with tackling COVID-19, CREWS Caribbean focused on developing the draft regional strategy on multi-hazard early warning systems and carrying out activities virtually where feasible. However, COVID-19-related delays and future uncertainty means adjusting the scope, timeline and delivery mode of most activities. An estimated 18-month no-cost extension will be needed to complete the project.

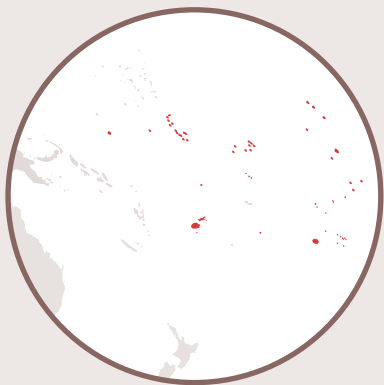


Credit: Dr. Arlene Laing

*The CMO is grateful to the CREWS Initiative for strengthening our National Meteorological and Hydrological Services (NMHS) by funding legislation and policy development and strategic planning to meet vulnerable Caribbean societies' needs for weather, climate, water, and environmental information. Stakeholders have enthusiastically expressed their support for these projects, which will enable our NMHSs to be leaders in delivering information for better decision-making.*

**Dr Arlene Laing**  
**Coordinating Director of the Caribbean Meteorological Organization (CMO) Headquarters Unit**





Cook Islands, Federal States of Micronesia, Fiji, Kiribati, Marshall Islands, Nauru, Niue, Palau, Samoa, Solomon Islands, Tonga, Tokelau, Tuvalu, Vanuatu

WMO

2017 -2021

Project Funds

**US\$ 2.5 million**  
**US\$ 4.79 million**  
extra financing in 2020 extends project to 2024

Expenditure Rate

**88.6% (Phase I)**

Leverage Factor

**27 x**

Background photo credit: F. Skroski

- Pacific among most disaster-prone regions, and particularly vulnerable to climate change and sea-level rise
- Effective early warning systems a priority for Pacific SIDS and LDCs<sup>1</sup>
- **CREWS Pacific**, co-funded by Canada, strengthens hydro-met governance, mechanisms, forecasts and warnings in 14 States to alert and instigate behavioural change that minimizes risks to lives and livelihoods.

## KEY ACHIEVEMENTS

**Flash flood early warning system** implemented in Fiji.

- 906,000 people better protected from flash floods with system providing real-time information to forecasters producing and disseminating site-specific warnings in 3 languages.



**6 National Strategic Plans** launched, developed or underway in Fiji, Kiribati, Marshall Islands, Micronesia, Palau and Tuvalu.

- 1.25 million people and economies of 6 countries will benefit from national hydro-met institutions working to improve climate services, strengthen hydrometeorological governance and disaster risk management as national priorities are defined, aligned and funded.

## 2020 KEY DEVELOPMENTS

**1 Water Resources Act passed**, 1 Meteorological Bill under parliamentary scrutiny, 2 Met Bills in the pipeline.

- Tonga's Water Resources Act, drafted since 1983, regulates and applies environmental standards to limited water resources for nearly 105,000 people. Met Bills for Tuvalu, Solomon Islands and Kiribati will strengthen hydro-met governance, oversight and services when enacted.

**Hazard assessments** completed and data analyzed for all sites in Tuvalu for impact-based coastal inundation forecasting, and inundation forecast system for Kiribati's capital, Tarawa, ready for testing.

- 130,000 population of Kiribati and Tuvalu living on low-lying coral atolls and reef islands are among the most vulnerable to sea-level rise and climate change globally. Timely flood forecasting for coastal communities will save lives.



© UNDP Climate/Joe Hitchcock

<sup>1</sup> Climate Services Report 2020



**2 Regional Climate Outlook Fora** held virtually with 250 people, including 87 women — total participation 4 times higher than previous fora.

- The regional fora led to 3 virtual National Climate Outlook Fora. Tuvalu and Solomon Islands held their 1st forum and Tonga its 2nd, focusing on agriculture. It will trial activities supporting 10 farmers to use climate information to improve agricultural output.



**Community-based early warning and response mechanism** for extreme weather, climate and disaster risk reduction established in Palau and 47 men and 38 women trained.

- 749 people from 3 communities were consulted on the mechanism. Community-based systems provide access to science-based information and integrate traditional knowledge into community practices.



© Fiji Government/Fiji Red Cross

## SUSTAINING MOMENTUM DURING COVID-19



An estimated 70% of the 2020 project workplan was achieved despite strict and pre-emptive COVID action in the Pacific. Where possible, activities were carried out virtually, including consultations. COVID-19 has, however, significantly delayed coastal inundation forecasting work in Tuvalu and Kiribati, and community-based early warning systems in Niue, Palau, Samoa and the Marshall Islands.



*I've learned so much on the importance of weather and climate patterns and how this information can help me with pruning and managing pests and diseases affecting my cocoa plants. I have also learned about the language used in Met Service bulletins. I now understand, follow and use the information.*

**Temukisa Tofilau**  
cocoa farmer (in blue)  
Samoa

© UNDP Samoa

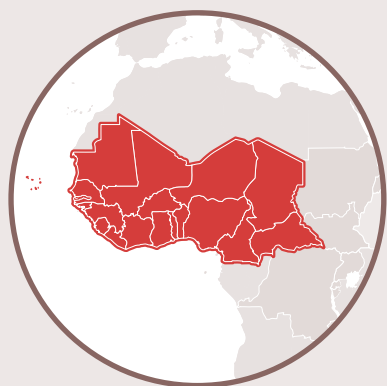


*The strategies and actions embedded within [the] strategic plan contribute to Pillar 2 of the Kiribati Vision in 20 Years... on Peace and Security targets that all weather and climate monitoring systems will be advanced and completed by 2036, with emphasis on improving early warning.*

**H.E Taneti Maamau**  
President of Kiribati

© UN

# WEST AFRICA



Benin, Burkina Faso, Cabo Verde, Cameroon, Central African Republic, Chad, Côte d'Ivoire, Gambia, Ghana, Guinea, Guinea Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra Leone, Togo

World Bank Group/GFDRR  
WMO

2017 -2022

Project Funds

**US\$ 5.3 million**

Expenditure Rate

**30.5%**

Leverage Factor

**4 x**

Background photo credit: OPEC Fund

- West Africa is particularly vulnerable to climate variability and change due to low capacity to adapt
- Hydrometeorological events — droughts, floods, storms and storm surges — cause most deaths and economic losses from disasters
- 19 countries covered by **CREWS West Africa**
- The project aims to enhance regional centres' capacity in supporting countries to provide risk information and warning services, and pilots local warning services in Sierra Leone.

## KEY ACHIEVEMENTS

**19 national Hydro-Met services** and regional institutions providing services to 415 million people can access 3 new sub-regional climate databases to more accurately track and predict hydrometeorological and extreme climate events.

- The climate extremes, climate assessment and climate watch databases enable the regional agrometeorology and hydrology training centre in Niamey to provide the mandatory services of a regional climate centre. The Centre also helps appraise a **food system resilience program** to provide resources to Hydro-Met services in Chad, Sierra Leone and Togo.

**76 million people** will benefit from expansion of Burkina Faso's Sand and Dust Storm Warning Advisory System to 6 other countries — Cabo Verde, Chad, Mali, Mauritania, Niger and Senegal.

- Daily bulletins in Burkina Faso since 2018 have proven particularly useful for transportation, health and agriculture.



**120 participants trained** on data collection, management, exchange and quality monitoring at a 2020 regional workshop.

- The workshop confirmed the need to receive country-specific guidance on processing climate datasets and enhancing international data exchange.



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## 2020 KEY DEVELOPMENTS

### West Africa Flash Flood Guidance System

implementation begun with data inputs from Burkina Faso, Mali and Niger, mapping of flash flood prone basins in the countries, and online courses delivered in English and French.

- Full implementation of the warning system will enable flood forecasting capabilities in all 19 countries.



### 80 climatologists and agrometeorologists

trained on using satellite-based rainfall datasets to anticipate water need and shortfall for rain-fed crops and providing accurate advisories to farmers.

- When calibrated with rain gauge data, satellite-based datasets provide guidance on best time to plant, treat, fertilize, harvest or dry crops — vital information for about 60% of women and men in the 19 project countries.

**2 agreements** with WMO-accredited regional centres to build capacity in 19 countries on severe weather forecasting and data exchange and processing.

- The agreements secure weekly guidance to National Hydro-Met Services to strengthen severe weather forecasting and will enhance weather observation for more accurate and timely forecasts and warnings.



**3 assessments** completed on capacities of Sierra Leone's hydro-met agencies and on weather and climate forecasts and services user needs.

- 2 assessments are informing government decisions on future investment. Outcomes will define the number of people better protected through improved early warning services from 2 financing projects that focus on urban areas and food systems resilience.



UNICEF Sierra Leone

## SUSTAINING MOMENTUM DURING COVID-19



To minimize COVID-19's impact on its work, CREWS West Africa prioritized activities that could be implemented remotely without compromising quality. The project made some key advances and relied upon national partners to ensure appropriation and sustainability. Progress on climate assessment and extreme weather databases will improve warning capabilities, six more countries will benefit from sand and dust storm warning services, and the foundations for a flash flood warning system were laid in a region badly affected by them.





UNDRR  
WMO

2020 - 2022

Project Funds

**US\$ 0.76 million**

Expenditure Rate

**5%**

- Metrics are required to track global targets on early warning and early action
- Capacity building is needed in LDCs and SIDS on measuring 2030 targets set by the **Sendai Framework on Disaster Risk Reduction** to reduce numbers of people killed and affected by disasters, and increase access to early warning services
- Opportunity exists to ensure national adaptation efforts guided by Article (4) of the **Paris Agreement**, specifically on Early Warning Systems, enhance resilience.

## KEY DEVELOPMENTS

- The initiative will provide a benchmark to determine the impact of CREWS investments in countries and support LDCs and SIDS in **measuring and monitoring the effectiveness of their multi-hazard early warning services**. This CREWS project aligns Sendai Framework indicators with National Adaptation Plan monitoring and measuring progress against the Global Framework for Climate Services (GFCS).

### A set of custom indicators are being developed.

- The 2020 State of Climate Services Report by WMO and 17 partners provides a first benchmark in early warning system implementation globally and identifies where and how governments can invest in effective early warning systems.
- Countries will choose indicators refined over time through lessons learned and identified gaps. An expert group guiding custom indicator development will review and validate the indicators, which will include metrics on gender and social inclusion.

### Early warning system e-trainings to be developed by the end of 2021.

- These will be rolled out in targeted Caribbean, Pacific and West African countries and will be multi-sectoral in participation to ensure diverse perspectives in measuring early warning system effectiveness.



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Background photo credit: NASA



# PARTNERSHIPS ONGOING AND NEW

2020 saw a new partnership begin and existing ones develop. Joining the Anticipation Hub, an online knowledge exchange platform to mobilize anticipatory action on multi-hazard events and reduce disaster risk, allows us to use our early warning services expertise to help scale up global action. We will also work more directly with the International Federation of Red Cross and Red Crescent Societies (IFRC) to strengthen its national societies' role in our projects, starting by documenting activities of three Red Cross Red Crescent Societies that provide early warning services.

At IFRC, we witness first-hand how early warnings save lives and livelihoods. As a global humanitarian organization with a deep local reach, our staff and volunteers prepare for and respond to extreme weather events daily. We are excited that IFRC and CREWS are building a strong partnership to ensure that Early Warning Systems prioritize the most vulnerable and hardest to reach communities.

*Jagan Chapagain,  
IFRC Secretary General*



## InsuResilience

In 2020, we contributed to the InsuResilience Trust Fund's 2020 Annual Report by sharing our project experience in Burkina Faso and provided input on the initiative's monitoring and evaluation tools that measure InsuResilience targets. In addition, CREWS cooperates with InsuResilience as it analyzes the links between early warning, disaster management and insurance solutions.

## Risk-Informed Early Action Partnership (REAP)

To strengthen institutional and project alignment, we developed a joint programme of work with the Risk-Informed Early Action Partnership Secretariat. It focuses on early action and early warning analytics, country programming, evidence-based practices as well as advocacy and events.

## Alliance for Hydromet Development

Two countries with CREWS funding, Afghanistan and Chad, were used to road test a prototype diagnostic tool designed to investigate the whole value chain of national meteorological and hydrological services. Turkish and Moroccan Met Services reviewed and analyzed data, processes, contexts and mandates of the Afghan and Chadian Met Services respectively to grant maturity levels to each of the 10 parameters defined in the Country Hydromet Diagnostics. The diagnostics enabled holistic evaluations of national hydro-met services in both countries before CREWS activities began on recently launched projects.

## Green Climate Fund (GCF)

We strengthened our partnership with the Green Climate Fund which helps developing countries reduce their greenhouse gas emissions and enhance their ability to respond to climate change. The CREWS South West Indian Ocean Countries project is the latest to inform and contribute to enhancing the effectiveness of GCF investments. Other countries and regions where this is already happening are Burkina Faso, Mali and the Pacific. We contributed to the sector guidance developed by the GCF Secretariat on Early Warning and Climate Information to guide their investments.

## Global Commission on Adaptation (GCA)

In 2020, we worked with the Global Commission on Adaptation and the Netherlands government to advance Climate Adaptation Action Tracks on Disaster Risk Management with a strong focus on early warning and action. This builds on contributions to GCA's flagship report — Adapt Now — which lays out a bold agenda for scaling up climate adaptation.

# SCALING UP ACTION AND EFFECTIVENESS 2021-2025

Since our creation in 2015 to accelerate global efforts on reducing mortality and economic losses from natural disasters in LDCs and SIDS from access to early warning services, our programming has grown year-on-year. Our projects build on ongoing efforts and achievements already made so the impact of what we do is greater.

*An Operational Plan: Delivering at Scale 2021-2025* developed in consultation with CREWS Members, recipient countries and operational partners, will enhance our business model and ramp up our response to the early warning needs of the world's most vulnerable populations. In parallel, CREWS will remain operationally agile by continually refining and integrating lessons learned into our projects to help achieve our mission, and target action to address existing gaps and needs.

Future CREWS operations, implemented by our partners, the World Bank/GFDRR, WMO and UNDRR, will:

- **Be people centred.** We will engage with and encourage collaboration between local actors to better ensure effective impact-based multi-hazard early warning systems.
- **Build sustainability into project outcomes.** Strong national ownership and financing of services developed will ensure CREWS' impacts endure.
- **Strengthen cooperation** with other relevant initiatives, financiers and implementers. This will enable CREWS to more strategically frame and deploy resources. It will also simultaneously develop and harmonize national partner efforts to leverage additional financing.
- **Increase and intensify public-private collaboration** to foster innovative, sustainable, and cost-effective approaches and engagement on early warning systems.

CREWS will also establish a Strategic Support Window for all LDCs and SIDS to allow for swift, targeted actions. These will largely focus on strengthening elements of early warning systems and the conditions required to keep them sustainable and effective.

Although funding decisions on the new operational plan will be driven by country needs and demands, to meet our objectives in LDCs and SIDS and achieve our vision, a projected US\$ 107 million will be required by 2025.

“Early warning and early action is key to minimising the impact of today’s extreme weather events and tomorrow’s climate change impacts. The UK is proud to contribute to the CREWS Initiative, which has enabled the installation of early warning systems across vulnerable small island States and least developed countries. It is in these climate-vulnerable contexts that reliable, impact-based forecasting and forewarning is most needed, and by investing in climate services we are supporting countries and communities to build a more resilient future. We see CREWS, in partnership with REAP and others, as vital in enabling anticipatory action on disasters, thereby maintaining the forward momentum of development.

*Anne-Marie Trevelyan, Member of Parliament, UK International Champion on Adaptation and Resilience for the COP26 Presidency*



© UK Parliament





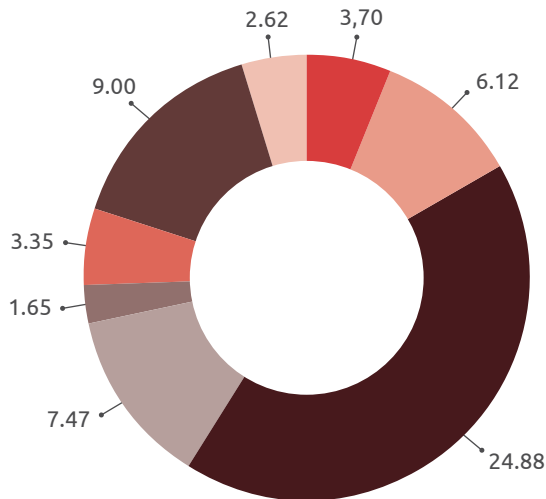
# FINANCIALS

## Fund Contributions

By year end, contributions to the CREWS Trust Fund totalled US\$ 66.16 million, of which US\$ 58.80 million had been received. Finland became the eighth and latest CREWS Member, contributing more than US\$ 6 million to the CREWS Initiative.

### CREWS Trust Fund Signed Contributions

In US\$ millions, as of 31 December 2020



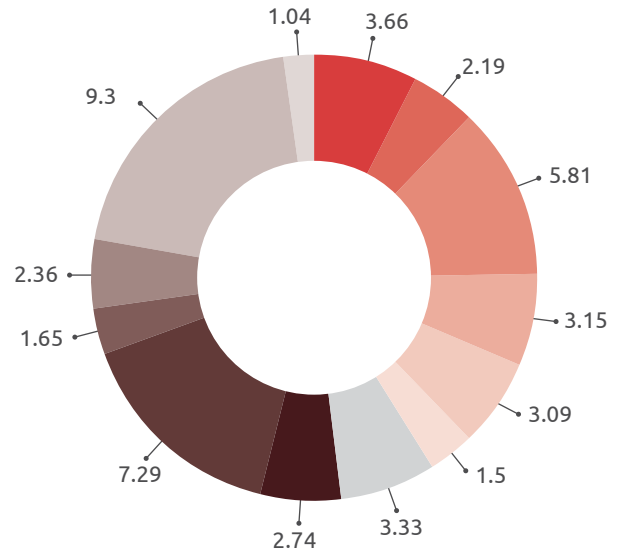
- Australia
- Luxembourg
- Finland
- Netherlands
- France
- Switzerland
- Germany
- United Kingdom

## Project Funding

As of 31st December 2020, more than US\$ 51.5 million had been directly allocated to country, regional and global projects since CREWS operations began. Of that, nearly US\$ 15 million of funding decisions were made in 2020, underlining the growing need and relevance of the CREWS's mandate and mechanism.

### Funding Decisions by Projects

In US\$ millions, as of 31 December 2020\*



- Afghanistan
- Niger
- Burkina Faso
- Pacific Islands Region
- Caribbean
- Papua New Guinea
- Chad
- Togo
- Democratic Republic of Congo
- Africa
- Haiti
- Global
- Mali

\*Figures may differ from the Trustee due to the different method of aggregation and timing of the report.

CREWS Trust Fund Summary as of 31 December 2020  
in USD millions

	<b>Total</b>	<b>% of Total</b>
<b>Donor Pledges and Contributions</b>		
Contributions	66.16	100.0%
Pledges	–	0.0%
<b>Total Pledges and Contributions</b>	<b>66.16</b>	<b>100.0%</b>
<b>Cumulative Resources</b>		
<b>Resources received</b>		
Cash Receipts	58.80	87.1%
Investment Income earned	1.35	2.0%
<b>Total Resources Received</b>	<b>60.15</b>	<b>89.1%</b>
<b>Resources not yet Received</b>		
Contributions not yet received	7.37	10.9%
Pledges	–	0.0%
<b>Total resources not yet received</b>	<b>7.37</b>	<b>10.9%</b>
<b>Total Potential Resources (A) (in USD millions)</b>	<b>67.51</b>	<b>100.0%</b>
<b>Cumulative Funding Decisions</b>		
Projects	42.04	81.5%
Fees	5.17	10.0%
Administrative Budget	4.35	8.4%
<b>Total Funding Decisions Net of Cancellations (B)</b>	<b>51.56</b>	<b>100.0%</b>
<b>Total Potential Resources Net of Funding Decisions (A) - (B)</b>	<b>15.95</b>	
<b>Funds Available</b>		
Funds Held in Trust with no restrictions	10.41	
Approved Amounts Pending Cash Transfers	1.82	
<b>Total Funds Available to Support Steering Committee Decisions</b>	<b>8.58</b>	

The CREWS Trust Fund Summary is prepared by the CREWS Trustee (World Bank).

*Note: Sub-totals may not add up due to rounding.*

The CREWS Initiative gratefully acknowledges the contributions and support of:

### CREWS Members



Australia



Finland



France  
(Chair)



Germany



Luxembourg



Netherlands



Switzerland



United  
Kingdom

### CREWS Observers



Canada



Japan



Mexico



New Zealand



Norway



ACP



European  
Commission



IFRC



Empowered lives.  
Resilient nations.  
UNDP



USAID  
FROM THE AMERICAN PEOPLE

USAID

### CREWS Implementing Partners



WORLD  
METEOROLOGICAL  
ORGANIZATION



WORLD BANK GROUP



GFDRR  
Global Facility for Disaster Reduction and Recovery



UNDRR  
UN Office for Disaster Risk Reduction





For more information visit [www.crews-initiative.org](http://www.crews-initiative.org)

Contact us at [crewsinfo@wmo.int](mailto:crewsinfo@wmo.int)

Engage with us: @CREWSinitiative

