

PCRAFI
PROGRAM

PCRAFI Program

Phase II

Furthering Disaster Risk Finance in the Pacific

Regional Collaboration on Climate and Disaster Risk Financing

May 2017





“In the Pacific we are extremely vulnerable to natural disasters. The PCRAFI Facility will enable us to receive fast cash injections for emergency response and to sustain essential services in times of crisis. Following the devastation Cyclone Pam wreaked on Vanuatu in 2015, we are acutely aware of the value insurance programs like this bring in supporting our ability to respond quickly to disasters.”

Honorable Gaetan Pikioune – Minister of Finance and Economic Management – Vanuatu

“The establishment of the PCRAFI Facility marks a real development within the region, with Pacific Island Countries taking full ownership of the disaster and climate risk finance agenda. The PCRAFI Facility is owned by the countries and has brought in significant donor funds from Germany, Japan, UK and US, which will remain as partners in the region to support this agenda going forward”

Honorable Mark Brown – Minister of Finance and Economic Management – the Cook Islands

“This evolution of PCRAFI is a major advancement in the region to mitigate against the financial impacts caused by extreme climate, weather related and geological hazards. Countries have full ownership of the PCRAFI Facility, putting finance ministers in the driving seat for product development and for designing financial instruments that fit national disaster risk financing strategies.”

Dame Meg Taylor – Secretary-General – Pacific Islands Forum Secretariat

“The PCRAFI Facility is just one example of multiple governments and development partners working together to deliver a program that will deliver real benefits for the people of the Pacific. The World Bank looks forward to working with partners to continue supporting the development of new insurance products that will meet the specific needs of more Pacific Island Countries.”

Michel Kerf – Country Director for Timor-Leste, Papua New Guinea and the Pacific Islands – World Bank Group

“We are happy to be supporting the PCRAFI Program to assist countries in using PacRIS – a regional database of hazard and exposure data. Quality data is essential in multiple sectors, including disaster risk management, infrastructure design and in stimulating domestic insurance markets.”

Colin Tukuitonga – Director-General – Pacific Community





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Acronyms

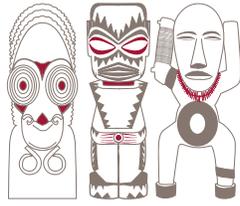
ARC	African Risk Capacity
CCRIF	Caribbean Catastrophe Risk Insurance Facility
CoM	Councils of Members
DRFI	Disaster Risk Financing and Insurance
DRFIP	Disaster Risk Financing and Insurance Program
DRM	Disaster Risk Management
DRR	Disaster Risk Reduction
EQ	Earthquake
FEMM	Forum Economic Ministers' Meeting
FSC	Financial Supervisory Commission
GDP	Gross Domestic Product
IAIS	International Association of Insurance Supervisors
MDTF	Multi-Donor Trust Fund
NDMO	National Disaster Management Office
PacRIS	Pacific Risk Information System
PCRAFI	Pacific Catastrophe Risk Assessment and Financing Initiative
PCRIC	Pacific Catastrophe Risk Insurance Company
PCRIF	Pacific Catastrophe Risk Insurance Foundation
PICs	Pacific Island Countries
PIFS	Pacific Islands Forum Secretariat
PML	Probable Maximum Loss
PPP	Public-Private Partnership
SC	Steering Committee
SEEC CRIF	South East Europe and Caucasus Regional Catastrophe Risk Insurance Facility
SPC	Pacific Community
TA	Technical Assistance
TC	Tropical Cyclone
TWG	Technical Working Group
WBG	World Bank Group



This map is for illustrative purposes. The boundaries, colors, denominations and any other information shown on this map do not imply, on the part of The World Bank Group, any judgment on the legal status of any territory, or any endorsement or acceptance of such boundaries.

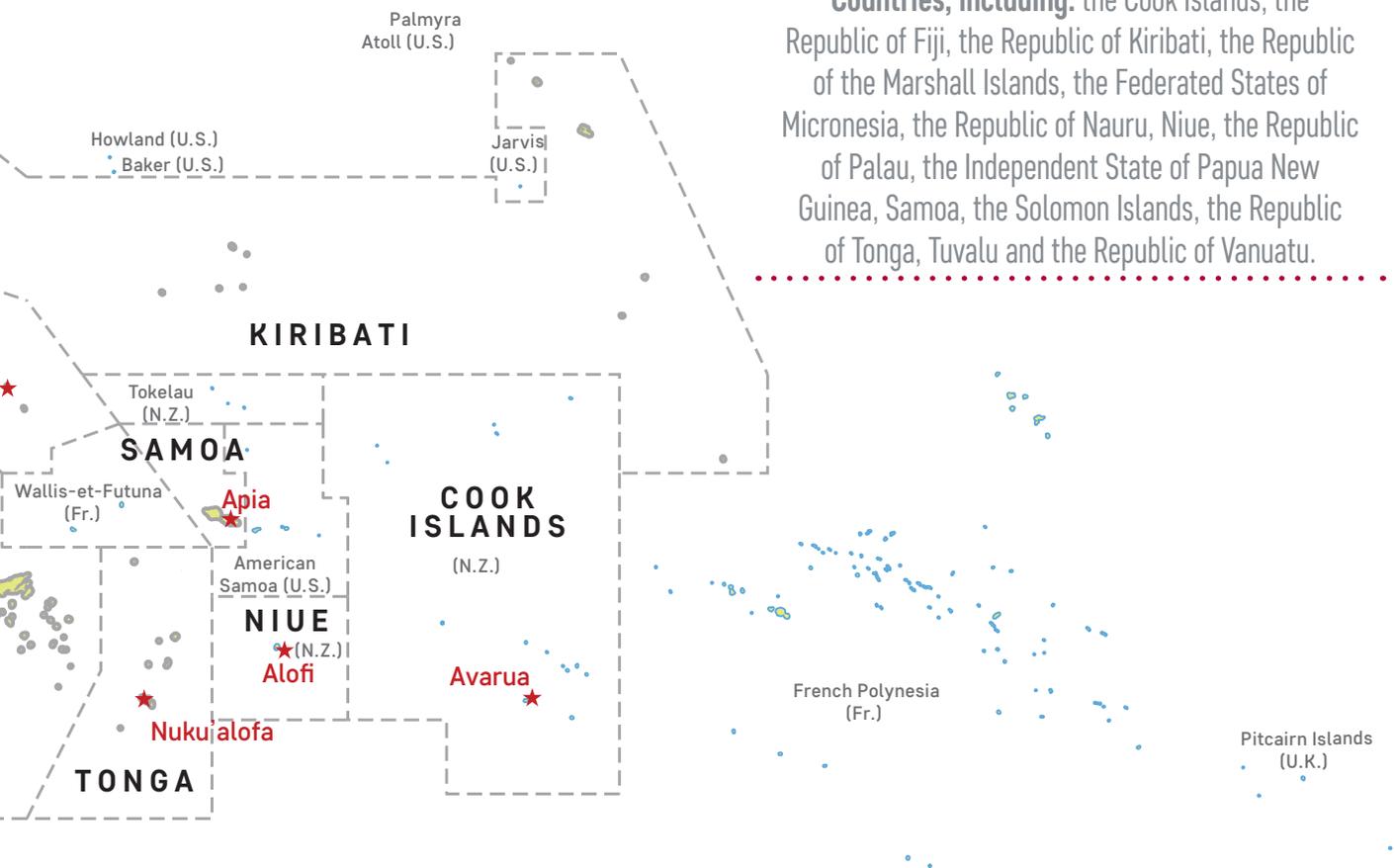


PACIFIC OCEAN



PCRAFI PROGRAM

The PCRAFI Program includes 14 Pacific Island Countries, including: the Cook Islands, the Republic of Fiji, the Republic of Kiribati, the Republic of the Marshall Islands, the Federated States of Micronesia, the Republic of Nauru, Niue, the Republic of Palau, the Independent State of Papua New Guinea, Samoa, the Solomon Islands, the Republic of Tonga, Tuvalu and the Republic of Vanuatu.



SOUTH PACIFIC OCEAN

Executive Summary

Phase II of the PCRAFI Program sees a significant scale-up of regional efforts to increase the financial resilience and ownership of the disaster risk financing agenda in the Pacific. Over the next five years, the Program will contribute to the financial protection of Pacific Island Countries (PICs) through the implementation of two programmatic areas, or tracks: (I) PCRAFI Facility, and (II) PCRAFI Technical Assistance.

Due to their geographic location, PICs are confronted by extreme fiscal shocks caused by climate and seismic hazards. In 2016, Tropical Cyclone Winston – one of the most powerful cyclones on record – gave the Pacific a harsh reminder of its vulnerability towards natural disasters. The Category 5 cyclone swept across Fiji affecting 62% of the population and causing over US\$900 million in estimated damage and loss.¹ This came less than a year after Vanuatu was struck by TC Pam, a Category 4 event, causing damage and loss equivalent to 64% of GDP.

To manage disasters and provide emergency response, PICs have few options to raise quick liquidity for emergency response and maintenance of essential government services. Due to their small economy, limited borrowing capacity constrains their access to short-term, immediate liquidity in international insurance markets. High transaction costs, small domestic economies, and the inability to spread risk over a large territory are barriers for insurance markets to penetrate in the region. Without easy access to debt and robust insurance markets, a large proportion of economic losses stemming from adverse natural events is borne by governments and households.

The Pacific Catastrophe Risk Assessment and Financing Initiative (PCRAFI) laid the foundation for a sovereign catastrophe risk pool to issue affordable parametric insurance. As part of PCRAFI, the Pilot Insurance Program (2013-15) issued parametric insurance policies to five participating countries, covering both tropical cyclones and earthquakes/tsunamis. This allowed PICs to use catastrophe risk insurance as a means of providing an immediate injection of cash for emergency response in the wake of a major tropical cyclone and/or earthquake/tsunami.

In 2015 at the Forum Economic Ministers' Meeting (FEMM), the Ministers of Finance made a collective decision to create the PCRAFI Facility, demonstrating their commitment to manage climate and disaster risk finance at the regional level. Ministries of Finance called upon partners for financial support and technical assistance to establish a regional facility and capacity building on climate and disaster risk finance. With this decision taken, it marked the end of the PCRAFI Pilot and commenced Phase II – the PCRAFI Program.

Two separate legal entities, the Pacific Catastrophe Risk Insurance Foundation (PCRIF) and the Pacific Catastrophe Risk Insurance Company (PCRIC) were established to create the PCRAFI Facility by legal statute in the Cook Islands on June 10, 2016. These two entities, PCRIF and PCRIC comprise the overarching structure of the PCRAFI Facility to maintain high regional ownership by Pacific island members. The PCRIF was formed for the purposes of creating a collective, which owns and governs the captive insurance company – PCRIC. While PCRIC is a legally independent entity, as a captive insurer, its mandate is

¹ Government of Fiji, 2016.



to meet the needs of its members in providing sustainable cost-efficient, climate and disaster risk insurance.

The PCRAFI Program will be supported by the PCRAFI Multi-Donor Trust Fund (MDTF) managed by the Disaster Risk Financing and Insurance Program (DRFIP) of the World Bank Group. Following the request from PICs during FEMM 2015, the World Bank assisted countries to raise funds to establish a regional entity and support the technical assistance program of PCRAFI. Over US\$40 million in grant funding was mobilized on behalf of PICs to establish the PCRAFI MDTF, which includes generous contributions from Germany, Japan, the United Kingdom and the United States as part of *InsuResilience* - the G7 Initiative on Climate Risk Insurance that aims to increase access to insurance coverage against the impacts of climate change for up to 400 million of the most vulnerable people in developing countries by 2020.²

The PCRAFI Program leverages the expertise of the regional organizations - the Pacific Community (SPC) and the Pacific Islands Forum Secretariat (PIFS) in order to maximize capacity building potential in the region.

The SPC serves an important role as a technical agency to update the hazard and exposure databases housed in the Pacific Risk Information System (PacRIS), which underpins the PCRAFI insurance model. Similarly, in recognition of its mandate, PIFS is instrumental in convening political dialogue across the region and fosters knowledge exchange with other regional risk pooling facilities (e.g. African Risk Capacity – ARC, Caribbean Catastrophe Risk Insurance Facility – CCRIF).

The PCRAFI Facility issued their first catastrophe risk insurance policies to five Pacific Island Countries on November 1st, 2016 in its fifth season.

Six Guiding Principles of the PCRAFI Program

1	Country Ownership
2	Financial Sustainability
3	Contingency Planning
4	Accountability and Transparency
5	Comprehensive Disaster Risk Financing Strategy
6	Link with Disaster Risk Management Agenda

² <http://newsroom.unfccc.int/lpaa/resilience/g7-climate-risk-insurance-initiative-stepping-up-protection-for-the-most-vulnerable>

Introduction

Ten countries in the Pacific region are among the top 30 countries in the world most vulnerable to natural disasters³. Pacific Island Countries (PICs) are highly exposed to climate and seismic hazards that cause extreme damage and economic losses. From 1950 to 2009, tropical cyclones and earthquakes events caused damage and loss estimated at US\$7.2 billion. In 2016, Tropical Cyclone Winston (Category 5) struck Fiji affecting 62% of the population and causing over US\$900 million in estimated damage and loss.⁴ Less than a year before, Vanuatu was hit by TC Pam (Category 4) causing damage and loss equivalent to 64% of gross domestic product (GDP). In Samoa, a tsunami hit in September 2009 generating damage and losses in excess of US\$120 million (22% GDP), and in 2011 a tropical cyclone caused damage and losses equal to 35% of GDP.⁵

Pacific Island Countries (PICs) are in immediate need of affordable and effective disaster risk financing instruments. At the onset of a hazard event, access to short-term immediate liquidity is constrained due to their relatively small economies that limit borrowing capacity and access to sovereign catastrophe risk insurance. Compounding this effect, PICs on average have limited (to zero) budget reserves, which force countries to reallocate resources from other priorities that have long-term economic impacts. Without easy access to debt and robust insurance markets, a large proportion of the economic losses stemming from adverse natural events is borne by governments and households.

Pacific Catastrophe Risk Assessment and Financing Initiative (PCRAFI) Insurance Program was designed to build the financial resilience of PICs against natural disasters. Beginning in 2007, PCRAFI aimed to provide PICs with disaster risk financing tools to enhance national disaster

risk management and climate change adaptation strategies. PCRAFI was a joint initiative of the World Bank, the Secretariat of the Pacific Community, and Asian Development Bank, with financial support from the government of Japan, the Global Facility for Disaster Reduction and Recovery (GFDRR), and the European Union, which later enabled the three-year PCRAFI Pilot Insurance Program. One of the key outputs of PCRAFI was the development of the Pacific Risk Information System (PacRIS), which contains information on the hazard, exposure and vulnerability of 15 PICs to develop country risk profiles and select appropriate disaster risk financing solutions.

The PCRAFI Insurance Pilot was proved effective as a means of providing rapid response, post-disaster financing after two insurance payouts to participating countries. During the three-year pilot supported by Japan, six countries selected policies for parametric insurance coverage against major tropical cyclones and earthquakes/tsunamis. To date, two payouts were made for an aggregate amount of US\$3.2 million: (i) Tonga received US\$1.3 million following Tropical Cyclone Ian in January 2014, and (ii) Vanuatu received US\$1.9 million following Tropical Cyclone Pam in March 2015. The payouts were among the first injections of cash each received, both within ten days of the event. (See Payout History, Annex V)

With the decision by Ministers of Finance to develop a regional catastrophe risk insurance, a Multi-Donor Trust Fund (MDTF) was established to catalyze disaster risk financing solutions for PICs. In response to a call for financing and capacity building at FEMM '15, the World Bank Group collaborated with donor partners to secure over US\$40 million in grant funds to establish the PCRAFI MDTF with generous contributions from Germany, Japan, the United Kingdom and

³ Ranked according to expected annual disaster losses scaled by GDP.

⁴ Government of Fiji, 2016.

⁵ Government of Samoa (2010 and 2014).



the United States. The MDTF provides critical financing to accelerate access to the reinsurance market, namely through the PCRAFI Facility, the region's first sovereign catastrophe risk pool. The PCRAFI MDTF is managed by the Disaster Risk Financing and Insurance Program (DRFIP) of the World Bank Group.

A Technical Working Group (TWG) comprising the Secretaries of Finance of current PCRAFI member countries (the Cook Islands, the Marshall Islands, Samoa, Tonga and Vanuatu) was formed to provide strategic guidance and lead the design of the PCRAFI Facility. This demonstrates the high level of ownership in developing future insurance products and services that complement national and regional disaster risk financing strategies.

The PCRAFI Facility uses parametric insurance policies as a rapid response financing mechanism to provide an

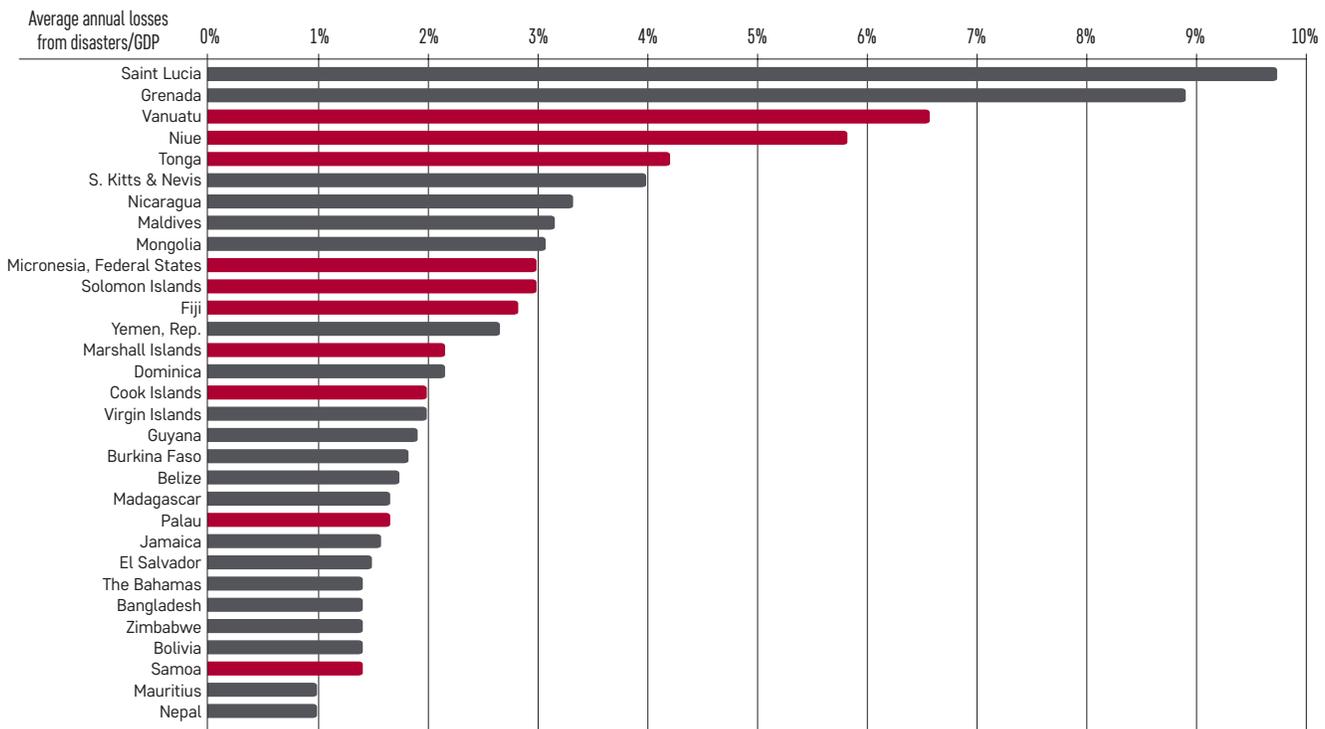
immediate injection of cash in the aftermath of a disaster.

Parametric insurance is one example of an instrument that builds the financial response capacity of a country to meet post disaster funding needs, without compromising their fiscal balances and development agenda. With increased access to disaster risk financing instruments, countries gain greater control to manage climatic and geophysical hazards.

Phase II: PCRAFI Program is a comprehensive, regional effort to increase the financial resilience to climate and disaster risks in the Pacific.

Building upon eight years of collaborative experience in disaster risk finance, a partnership among regional agencies, countries, donors and the World Bank Group kicked off the PCRAFI Program in 2016. Over the next five years, the Program will be implemented through two programmatic areas, or tracks: i) the PCRAFI Facility, and ii) PCRAFI Technical Assistance on climate and disaster risk finance.

Ten Pacific Island Countries are amongst the 30 most vulnerable in the world



Legend:
 ■ Based on reported disaster damages - Natural Hazards, UnNatural Disasters
 ■ Based on modeled annual losses from cyclones, earthquakes and tsunamis - Pacific Catastrophe Risk Assessment and Financing Initiative

Source: PCRAFI (2014)

Phase II: PCRAFI Program - Overview

The development objective of the PCRAFI Program is to increase the financial resilience of Pacific Island Countries (PICs) against natural disasters and their capacity to meet post-disaster funding needs. To meet this goal, the Program is designed in two complementary tracks:

» **Track I: PCRAFI Facility**

The creation of a new regional catastrophe risk pool dedicated to the provision of climate and disaster risk insurance for PICs

» **Track II: PCRAFI Technical Assistance**

A multi-faceted program that provides PICs, regional organizations and the PCRAFI Facility with technical assistance in three thematic areas: i) market-based instruments, ii) public financial management, and iii) knowledge management and learning

The five-year PCRAFI Program will facilitate a phased handover of the PCRAFI Program from the World Bank to the Facility, allowing it to build its capacity over time to provide PICs the option to purchase catastrophe insurance products that address varying types of risk. The PCRAFI Facility was legally formed and became operational in June 2016

and has since issued its first contracts to five participating countries for Season 5, which began on November 1, 2016.

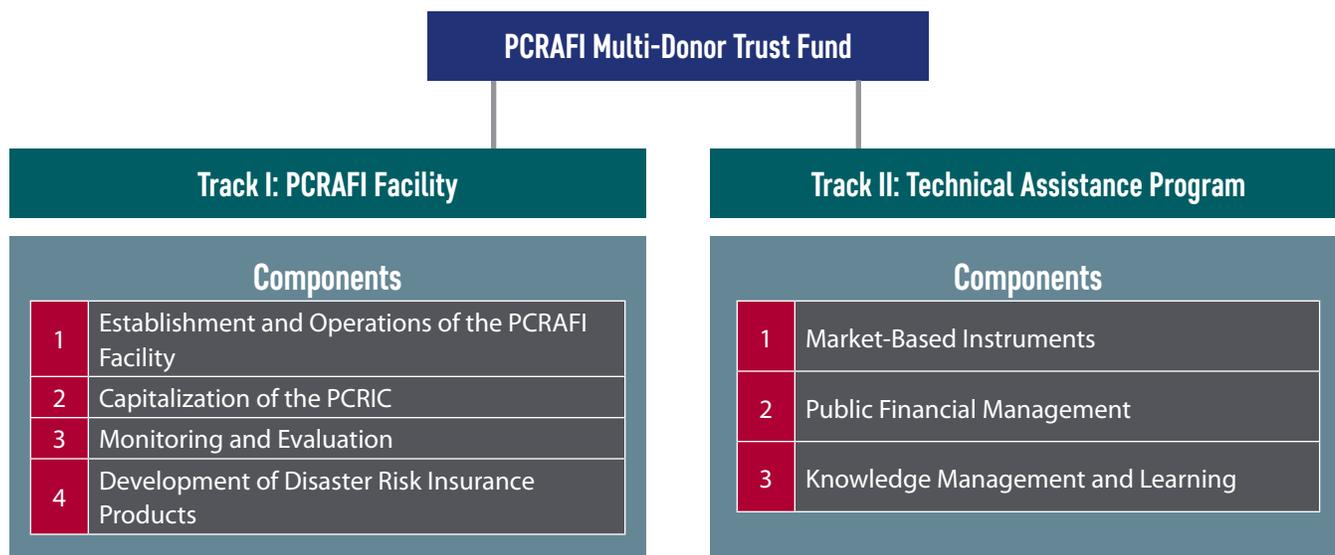
The design of the PCRAFI Program benefits from lessons learned from similar initiatives and shared experiences from African Risk Capacity (ARC), Caribbean Catastrophe Risk Insurance Facility (CCRIF) and the South East Europe and Caucasus Catastrophe Risk Insurance Facility (SEEC CRIF). For example, sustainability is a key design feature of such insurance programs, and the PCRAFI Facility requires actuarially sound pricing of reinsured risk and the requisite risk capital to support its portfolio. Further opportunities for knowledge exchange across the regional institutions are integrated into Phase II.

Long-term sustainability of the Facility is envisioned by the end of the five-year program in 2021. Through Program activities of capitalization, technical assistance and parametric insurance operations, the Facility's reserves will be established, along with its role in leading the financial resilience agenda in the Pacific region.

As a whole, the PCRAFI Program aims to increase the capacity to develop disaster risk financing strategies and to stimulate new insurance markets at both the regional and national levels.



Implementation Framework of the PCRAFI Program



Implementing Agencies

The region-wide PCRAFI Program is delivered in collaboration with regional partners and the World Bank Group.

» Track I

Led by the two entities that constitute the PCRAFI Facility: the Pacific Catastrophe Risk Insurance Foundation (PCRIF) and the Pacific Catastrophe Risk Insurance Company (PCRIC)

» Track II

Builds upon the experience within the Pacific region and benefits from the niche expertise of two regional organizations, namely: the Pacific Community (SPC) for risk assessment activities, and the Pacific Islands Forum Secretariat (PIFS) for political dialogue

Pacific Catastrophe Risk Insurance Foundation	Pacific Catastrophe Risk Insurance Company	Pacific Island Forum Secretariat	Pacific Community	World Bank Group - Disaster Risk Financing and Insurance Program
PCRIF	PCRIC	PIFS	SPC	WBG - DRFIP
Lead entity of the Facility responsible for the management and design of the PCRAFI Insurance Program	Captive insurance company responsible for issuing policies and product development for member countries	Regional leader in convening political dialogue and knowledge exchange	Technical agent with key experience in hazard and risk information and assessments	Global technical expertise in disaster risk financing and insurance

Track I: PCRAFI Facility

Components – Track I: PCRAFI Facility

1	Establishment and Operations of the PCRAFI Facility
2	Capitalization of the PCRIC
3	Monitoring and Evaluation of the Payout Process and Expenditure Review
4	Development of Disaster Risk Insurance Products

Component 1: Establishment and Operations of the PCRAFI Facility

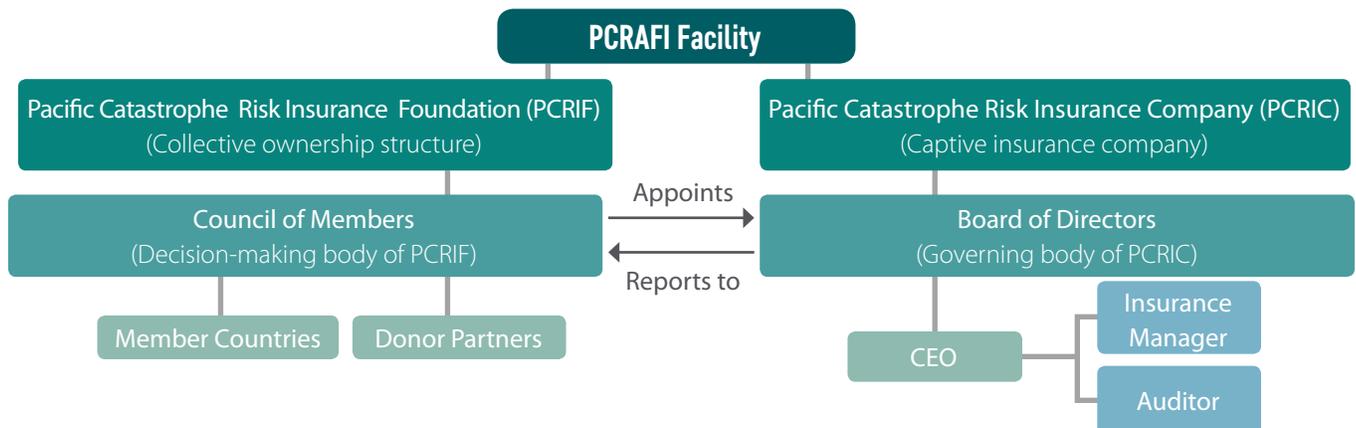
This component provides technical and financial support for the establishment and operations of the PCRAFI Facility, which is comprised of two legal entities that regionally govern and manage the Facility:

- Pacific Catastrophe Risk Insurance Foundation (PCRIF)** The collective ownership structure for participating member countries to govern the PCRAFI Facility
 - Pacific Catastrophe Risk Insurance Company (PCRIC)** A captive insurance company owned by the Foundation, created solely to serve the climate and disaster insurance needs of its members
- Activities under this component include: inter alia professional service fees, registration fees audit costs, recruitment of PCRIC management, and related fees to enable PCRIC to manage the insurance operations.

Establishing the PCRAFI Facility

The PCRIF and PCRIC were established by legal statute under the Pacific Catastrophe Risk Insurance Facility Act (2016) of the Cook Islands. The PCRIF holds the sole share of the PCRIC that was issued on June 10th, 2016. The PCRIF is bound by the Foundation Rules that stipulate the decision making processes made by the Council of Members (CoM), which represents the highest level of decision-making across the two entities. The Board of Directors of PCRIC is appointed by the CoM, and is required to seek the endorsement of the CoM for strategic guidance.

Structure of the PCRAFI Facility





Council of Members - PCRIF

The Council of Members (CoM) is the governing body established as part of PCRIF, which convenes biannually. There are presently nine seats on the CoM, each seat with one equal vote. The CoM is comprised of participating PCRAFI member countries (currently five: the Cook Islands, the Marshall Islands, Tonga, Samoa and Vanuatu) and the four contributing donors (Germany, Japan, the UK and the US). This structure provides donor partners a voice in key decisions pertaining to the operations of PCRIF, as well as direct dialogue to discuss priorities and challenges of the Facility with member countries. (See CoM Governance Structure, Annex III)

Component 2: Capitalization of the Pacific Catastrophe Risk Insurance Company (PCRIC)

This component provides the initial capitalization funds for the *captive insurance company*, PCRIC, to begin operations, including its key functions:

- **Invest and generate income** for the Company to finance current and future insurance operations
- **Retain and manage a portion of the risk portfolio**, and transfer the rest to the reinsurance market
- **Make rapid insurance payouts** to countries in the event the policy is triggered; payouts come from PCRIC reserves and reinsurance payouts

Captive Insurance Company - PCRIC

The Pacific Catastrophe Risk Insurance Company (PCRIC) is a captive insurance company that was created as an independent private-sector entity. However, as a captive insurance company it exists solely to serve its clients, namely the participating members of Facility. PCRIC was established by the Pacific Catastrophe Risk Insurance Foundation (PCRIF) with the mandate to: i) provide cost-effective climate and disaster-related risk insurance for the Pacific Island Countries, and ii) maintain the affordability of high quality sovereign catastrophe risk transfer for climate and seismic hazards.

Component 3: Monitoring and Evaluation of the Payout Process and Expenditure Review

The PCRIC leverages best practice to ensure the transparency of reporting insurance payouts. In order to provide necessary inputs for the Facility to evaluate insurance payouts, PCRIC is responsible to develop a uniform process for recipient countries to report on the execution of funds, which includes:

- **Monitoring the insurance payout process**
 - **Monitoring the budget execution process**
 - **Ex-post reporting on the use of payout funds**
- The monitoring and evaluation of payouts also yields an opportunity to capture best practices in post-disaster budget execution, including the use of insurance payouts. (See Payout History, Annex V) This provides a feedback loop amongst member countries to share lessons learned from the execution of emergency payout funds, particularly on how to improve contingency plans.





Component 4: Development of Disaster Risk Insurance Products

The development and refinement of parametric insurance products is a complex and highly technical task that requires expertise in international financial markets. Component 4 activities support PCRIC in refining current products, developing new products to attract other countries to join, and developing new products for additional perils (e.g. excess rainfall, drought, etc.).

This component is implemented through a suite of market-based activities to design commercially viable products to meet sovereign risk insurance priorities for PICs, primarily:

- **Parametric geophysical insurance** to cover major geophysical events and associated sub-hazards

- **Parametric climatic insurance** to cover major hydro-meteorological events and associated sub-hazards
- **Mutual disaster risk insurance** such as hybrid disaster risk insurance product to cover medium-sized disasters

During the first years of operations and expansion of the insurance portfolio, technical support is provided from the WBG-DRFIP to assist PCRIC, with emphasis on transferring this responsibility once sufficient capacity is built. In the long run, these costs are to be covered as operational expenses. The Pacific Community (SPC) Geoscience Division is also involved in the product development component and responsible for updating PacRIS, the exposure database that underpins the parametric insurance model.

What is PacRIS, and How Is It Relevant to the PCRAFI Insurance Model?

One of the key outputs of the PCRAFI Initiative was the development of a geospatial data management platform – Pacific Risk Information System⁶ (PacRIS). PacRIS provides necessary data inputs to run the insurance model that underpins the PCRAFI insurance program. It hosts a database of more than five million public and private buildings with their attributes (construction features and current condition/quality), and is the largest collection of geo-referenced data for hazard modeling in the region. This was carried out in collaboration with the Asian Development Bank, the Pacific Community Geoscience Division and the World Bank, along with technical inputs from AIR Worldwide, Geoscience Australia, GNS Science, and financial support from the European Union (ACP-EU) and the Global Facility for Disaster Reduction and Recovery (GFDRR).

Since 2010, PacRIS serves as a regional data repository for 15 Pacific Island Countries to store, share and facilitate the use of risk information, including hazard, exposure and vulnerability. While the risk information can be employed to inform urban planning and other applications (see p. 19), its primary objective was to develop the PCRAFI Insurance Program. Specifically, PacRIS provides:

- Critical data inputs for the PCRAFI insurance model to produce country risk profiles and an amalgamated regional portfolio for the reinsurance market, and used to calculate insurance policy premiums
- Decision-making tools and information for disaster managers and first responders to assess impacted areas, such as the affected population and the likely severity of the event (in terms of potential fatalities and injuries), and the estimated damage to buildings, infrastructure and crops

However, for this information to remain accurate, updating the database is critical to ensure the damage assessment, and resulting calculation of PCRAFI insurance payouts closely corresponds to reality. As data gets older, it becomes less accurate in terms of existing baseline data for infrastructure assets, population density, and hazard models. Experts estimate that this type of database should be updated every 3-5 years. PacRIS will be updated by SPC through Component 4, and in the medium to long-term, PCRIC is expected to cover associated costs from its revenues.¹

⁶ <http://pcrafi.sopac.org/>

Track II: PCRAFI Technical Assistance

The PCRAFI Technical Assistance (TA) is a multi-faceted program that focuses on strengthening institutional capacity for financing climate and disaster risks. To address the priority needs across the region, TA is implemented at **three levels of engagement**:

» **PCRAFI Facility**

Supports product development and its capacity to provide affordable climate and disaster risk insurance to the region

» **Regional**

Assists efforts to expand insurance markets, increase collaboration and further the regional DRF agenda

» **National**

Enhances the capacity of national governments to develop and implement disaster risk financing strategies

In this light, PCRAFI TA is designed with a holistic approach to elevate the understanding of disaster risk financing and insurance; provide technical training; develop tools to support decision making on financial solutions for climate and disaster risk; and promote regional knowledge sharing. TA activities are tailored to each level of engagement in **three thematic areas**, or components:

Components - Track II: Technical Assistance

1	Market-Based Instruments
2	Public Financial Management
3	Knowledge Management and Learning

Implementing Agencies of the PCRAFI Technical Assistance Program

• **Pacific Community**

The Pacific Community (SPC) leverages their role as the regional agency with risk assessment expertise to update the PCRAFI exposure database (PacRIS). SPC supports program-related risk assessment activities, which are implemented in collaboration with national agencies responsible for disaster risk management (DRM) to build their capacity in disaster risk assessment.

• **Pacific Islands Forum Secretariat**

The Pacific Islands Forum Secretariat (PIFS) holds the regional mandate for convening political dialogue. Their role will focus on three components; (i) providing opportunities for discussion on disaster risk finance at the ministerial level; (ii) convening annual dedicated regional peer exchange workshops; and (iii) ensuring regional

representation at global events on disaster risk finance, and iv) knowledge exchange across the three regional risk insurance pools, including the African Risk Capacity (ARC) and Caribbean Catastrophe Risk Insurance Facility (CCRIF) and PCRIC.

• **World Bank**

The Program leverages the World Bank's expertise in both public and private sectors, particularly of the Disaster Risk Financing and Insurance Program (DRFIP), to implement technical assistance on climate and disaster risk financing. As regional capacity is built across the three levels of engagement, World Bank TA responsibilities transition to national and regional entities that will take the lead, reinforcing the emphasis on long-term sustainability.



Component 1: Market-Based Instruments

» Facility

To support its operations, technical assistance to the Facility will be provided by the WBG-DRFIP, including:

- Review technical documents of initial activities to ensure accelerated implementation of catastrophe risk insurance
- Provide operational support to the PCRAFI Insurance Program activities, namely:
 - Annual portfolio analysis to assess reinsurance markets based on indicative member countries
 - Validation of the reinsurance package
- Assist PCRIC in the development of new insurance products (as noted in Track I, Component 4)
- Encourage public-private partnerships (PPP) with the private sector to identify insurance gaps and design interventions to crowd in the market

» Regional

- Coordinate with the International Association of Insurance Supervisors (IAIS) to ensure regulatory capacity on disaster and climate risk insurance products is built
- Identify interventions to stimulate regional insurance market development

» National

- Stimulate domestic markets to develop climate and disaster insurance at the household level
- Assist countries to develop domestic insurance programs for key public assets
- Identify interventions to stimulate domestic insurance market development

Public-Private Partnerships and the PCRAFI Facility

The private sector plays an essential role in developing additional financial tools for disaster risk finance. Public-private partnerships such as the PCRAFI Facility are key to developing products that may not be always be commercially viable. To ensure that the catastrophe risk products offered by PCRAFI both adequately price the risk and provide a payout in the aftermath of a disaster, technical assistance is provided through Track II, Component 1.

The private sector has already expressed interest in the country specific risk models for their own future use. The models and standards that are now established can be used by local insurance companies to inform the insurance cover they provide against the catastrophic perils of tropical cyclone and earthquake/tsunami. This would benefit both the public and private sectors as local insurers would be in a better position to price these perils more accurately within the domestic market place, and it may help to reduce some of the post-disaster financial burden on the public purse with increased uptake of insurance by businesses and individuals.

Crowding in the private sector in such a way was also noted as key to the success of CCRIF and the South East Europe and Caucasus Regional Catastrophe Risk Insurance Facility (SEEC CRIF).

Component 2: Public Financial Management

Technical assistance activities of Component 2 primarily target public financial management at the national and regional levels. However, progress around these activities is relevant to the Facility to inform decision-making on future product development.

» Regional

- Design and implement regional annual disaster risk financing and insurance (DRFI) workshops
- Promote knowledge exchange and learning across the region

» National

National-level technical assistance is primarily tailored to the Ministries of Finance of PICs in coordination with national agencies responsible for disaster risk management. TA activities focus on assisting countries in developing comprehensive and cost effective financial protection measures against natural hazards through the

selection of different rapid response financing instruments. **National-level activities focus on five priorities** (see descriptions below):

- i) Develop disaster risk financing tools (e.g. dedicated reserves, contingency credit, risk transfer, etc.)
- ii) Develop fiscal and actuarial models to help assess the fiscal exposure to natural hazards, and develop decision-making tools to assist countries in selecting appropriate risk financing instruments
- iii) Develop national disaster risk financing strategies
- iv) Strengthen post-disaster public financial management, including: post-disaster budget execution, mobilization and reporting
- v) Develop national post-disaster contingency plans in alignment with existing DRM policies

National-Level Activities for Public Financial Management

- i) **Develop disaster risk financing tools** to innovate thinking and develop analytical tools to increase the use of DRFI approaches in disaster risk management, national economic planning and public financial management. Underlying these activities is to ensure that funds can be accessed and disbursed as quickly and efficiently as possible in the immediate aftermath of a disaster. For example decision-making tools to help make choices on insurance policy selection and understand the impact on potential payouts.
- ii) **Develop fiscal and actuarial models** to assess the fiscal exposure to natural hazards. This aims to articulate contingent liabilities from climatic and geophysical hazards by establishing: the cost governments observed in the past, and anticipated costs to the government in the future. In this manner, identifying the fiscal impact of disasters helps establish funding requirements and which financial tools are best to ensure rapid budget mobilization and execution.
- iii) **Develop national disaster risk financing strategies** in which insurance is part of an integrated disaster risk financing strategy. The PCRAFI Program supports countries to develop their national disaster risk financing strategy, assess financial instruments and improve post-disaster budget execution processes.
- iv) **Strengthen post disaster public financial management** including post disaster budget execution, mobilization and reporting. Many PICs developed post-disaster budget execution manuals, detailing sources of finances for post disaster response and how to execute these funds. Future developments in this arena may include: reinforcing the legal environment to support the development of risk financing and insurance solutions; strengthening quality of risk information and risk analytics for evidence-based decision making; building national capacity to have dedicated mechanisms or protocols, human resources, and expertise to effectively allocate, disburse, and monitor recovery and reconstruction funds following a major hazard event.
- v) **Develop national post-disaster contingency plans** in alignment with existing DRM policies to ensure timely and effective use of funds, including insurance proceeds, in the event of a natural hazard impact.



Component 3: Knowledge Management and Learning

» Facility

Facility-level TA focuses primarily on facilitating technical collaboration with similar regional risk pooling facilities, in particular, the Caribbean Catastrophe Risk Insurance Facility (CCRIF) and African Risk Capacity (ARC), both of which offer similar parametric catastrophe risk insurance solutions since 2007 and 2014, respectively. For example:

- Develop a secondment program between PCRAFI, CCRIF, and ARC to facilitate knowledge exchange and shared technical capacity
- Capture lessons from both ARC and CCRIF to leverage expertise in addressing the unique insurance needs in their respective regions, such as the development of drought insurance by ARC, and excess rainfall insurance by CCRIF

» Regional

- PIFS to support the Facility to foster knowledge exchange with other regional risk pooling mechanisms, particularly with ARC and CCRIF
- PIFS to facilitate knowledge sharing and collaboration amongst PICs, as well as with other regional/international organizations

- Develop and implement a capacity development program for climate and disaster risk finance to include professional training and higher education opportunities with regional universities
- Design and implement regional annual workshops on disaster risk financing and insurance (DRFI)
- Convene regional dialogue among PICs to identify insurance gaps, particularly other types of tropical cyclone (TC) and earthquake (EQ) insurance
- Convene high-level dialogue among ministers and secretaries of finance on disaster risk financing solutions
- Ensure visibility and representation of PCRAFI at global events on disaster risk finance to foster partnerships and technical knowledge exchange

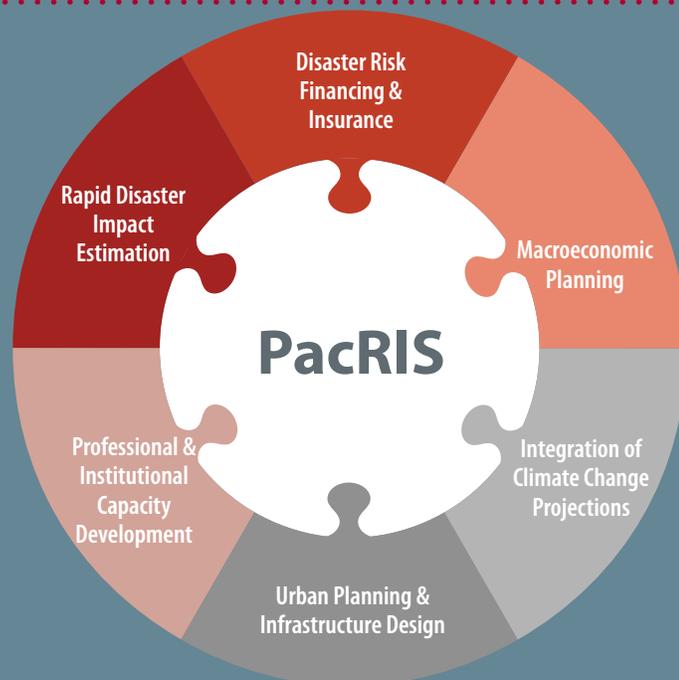
» National

- Design and implement trainings on PacRIS (the database that underpins the PCRAFI insurance model) to identify other applications of hazard and exposure data, such as to inform disaster risk reduction (DRR) and develop new insurance markets for public infrastructure and housing.

Other Applications of PacRIS

PacRIS is a regional data repository that contains quantitative, probabilistic risk information, including climate and disaster information. It serves as a tool to conduct risk assessments and used to assist PICs in determining appropriate disaster risk financing and insurance solutions.

In both the public and private sectors, this robust database of regional and national data facilitates the uptake of risk information, in numerous applications including but not limited to: rapid disaster impact estimation; macroeconomic planning; disaster risk financing and insurance; professional and institutional capacity development; and urban planning and infrastructure design. Other applications are explored under Track I, Component 3.







Multi-Donor Trust Fund PCRAFI

The PCRAFI Multi-Donor Trust Fund (MDTF) was established with financial support from four donor partners – Germany, Japan, the United Kingdom, and the United States – to support the five-year PCRAFI Program. Donor funds for the MDTF was facilitated through the *G7 InsuResilience*, which aims to increase access to climate risk insurance coverage for up to 400 million of the world’s most vulnerable populations by 2020⁷.

The PCRAFI MDTF totals over US\$40 million in grant funds, primarily to provide critical financing to capitalize the PCRAFI Facility and to establish operations of the PCRIC. Though the five-year implementation of the Program, the **PCRAFI MDTF:**

- Provides capitalization funds to establish the PCRAFI Facility and PCRIC operations
- Enables the incremental buildup of capital to PCRIC over its first years of operation
- Commits financial support to the PCRAFI Technical Assistance Program
- Supports the development of new climate and disaster insurance products

The role of Donor Partners is to provide strategic guidance to the PCRAFI Program to evolving challenges and global financing considerations, such as the climate financing agenda that may be important to program implementation and

the Facility. Additionally, as part of the formal governance structure of the Facility, donors have an integral role in its establishment, operations, and growth. The two governing bodies in which donors convene are the CoM (See Track I, Component 1) and the MDTF Steering Committee:

» MDTF Steering Committee (SC)

The Steering Committee was established for the purposes of the MDTF to provide strategic oversight of the Program, including to: i) review the monitoring and evaluation of the Program; ii) ensure lessons learned are integrated into future program activities; and iii) make key decisions related to the Program implementation. The SC is composed of one representative of each contributing Donor, up to two representatives from the Pacific Island Countries, as observers, and one representative of the Bank as the Chair. Meetings convene bi-annually the first year and annually thereafter, unless more are desired by donors. (See MDTF Governance Structure, Annex IV)

The PCRAFI MDTF is managed by the WBG-DRFIP. Its role is to administer the MDTF, including fiduciary management and implementation of PCRAFI Program activities. As the trustee, the WBG-DRFIP is responsible administrative activities such as planning, budget management, meetings, communications, and outreach, in addition to the appraisal, implementation review, and overall monitoring and evaluation of the PCRAFI Program. The WBG-DRFIP also serves as the Chair for the Steering Committee, and as an Advisor to the CoM upon request.

⁷ <http://newsroom.unfccc.int/lpaa/resilience/g7-climate-risk-insurance-initiative-stepping-up-protection-for-the-most-vulnerable>





Next Steps – PCRAFI Program

Moving forward a large focus will be on the **provision of technical assistance**. The program will continue to develop PacRIS, the GIS platform used as the database infrastructure to develop selected applications for smarter DRM investments. These applications will be supported by building upon PacRIS:

- Macroeconomic planning and disaster risk financing
- Mainstreaming of risk information into urban and infrastructure planning
- Rapid post-disaster impact estimation
- Integration of climate change projections
- Professional and institutional capacity building
- Other applications are to be developed over time

Increase the number of participating PICs within the PCRAFI Insurance Program. Expansion of the insurance pool is expected to continue in the medium term, as countries like Fiji and Palau have expressed their interest in joining.

Develop additional disaster risk insurance products. To better meet the post disaster financing needs of PICs, hybrid disaster risk insurance (based on parametric and soft triggers, such as declaration of emergency) will be designed to finance disaster events that result in mid-level damage—that is, events that are not currently covered by the PCRAFI insurance because they are “below the insurance deductible,” but that are yet too large to be financed solely by domestic reserves. This type of product is being developed in response to PICs’ request at 2015 FEMM, which will require additional seed capital and close collaboration with the private sector.

Develop contingency plans and ex post reporting procedures in conjunction with PICs. In order to create and shape national disaster risk financing strategies, the facility will work with PICs to develop contingency plans that ensure quick and efficient disbursement of funds after a disaster. These will be complemented by ex post financial reporting procedures designed to provide transparency on the use of funds and to ensure that reporting for statutory and regulatory purposes is met.

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Frequently Asked Questions

What is Parametric Insurance?

Parametric insurance is a rapid-response financial instrument that makes an immediate payment based on a specified trigger or intensity of an event (e.g. wind speed or earthquake intensity), or the amount of loss calculated in a pre-agreed model. Unlike traditional insurance settlements that require an on the ground assessment of individual losses, parametric insurance relies on an assessment of losses using a pre-defined methodology that is based on variables that are exogenous to both the individual policyholder and the insurer, but have a strong correlation to individual losses.

Parametric trigger means that the product is triggered based on a modelled representation of the event losses and not based on an assessment of actual losses incurred, as under a traditional indemnity-type insurance contract. In the case of the PCRAFI Insurance Program, the trigger is based on hazard parameters derived from the PaCRIS database to create a modelled event footprint from which modelled losses can be derived.

Why was parametric insurance selected for the PCRAFI Facility?

A parametric trigger was selected because the risk to be covered was atypical and because no suitable risk market infrastructure—one allowing for effective post-event loss estimation—existed; under these circumstances, an indemnity-type product would have been difficult to implement.

Another consideration was the wish for the product to cover some portion of the modelled damage as a result of the disaster. It was deemed more practical to use the correlation between the government's emergency response cost (estimated as a percentage of total ground-up loss) and physical event severity than to establish an independent third-party system to estimate the government's actual emergency post-disaster costs, which would need to be applied systematically across all participating countries).

Additionally, the selection of a parametric insurance instrument was largely based on predominant characteristics for this type of "rapid response" insurance including:

- More cost-effective than traditional indemnity insurance product as it does not require a loss assessment procedure in the case of a hazard event
- Reduced administration costs and time to process a claim to quickly provide a payout
- Facilitates the design and development to offer low-cost sovereign insurance options
- Carries a lower *uncertainty loading* by reinsurers

Why is risk pooling effective for Pacific Island Countries?

There are significant benefits to be gained from working together to form a risk pool. Risk pooling creates a critical mass of business that makes the offer more attractive to the market versus dealing with multiple individual policies, which allows for significant reductions in operating costs. This enables participating countries to pool their individual risks into a single, better diversified portfolio.

The pooling concept makes the overall risk more stable and therefore more attractive to the reinsurance market, thereby reducing the cost of reinsurance. As it is highly unlikely that several countries will be hit by a major disaster within the same year, the diversification among participating countries creates a more stable, and less capital-intensive portfolio, which is less costly to reinsure. Those benefits translate into lower insurance premiums and/or higher insurance coverage. As a risk aggregator, risk pooling provides insurance coverage to member countries at a significantly lower cost than individual governments could obtain on their own.

Risk pooling can be highly beneficial but requires strong discipline and coordination among participating countries. However, in order to reap the full benefits of regional risk pooling it is important that countries work together to ensure that all administrative steps are processed according to the agreed-on schedule.



Finding the Right Mix of Instruments

Country specific solutions should be developed to address the post disaster financial needs that each country faces. This will be dependent on their size, location, hazard and exposure profile, access to international markets and their ability to finance risk from their own budget. Once a country has an idea of their risk profile it is possible to make a selection of financial tools and combine them based on specific country needs and risk financing strategies.

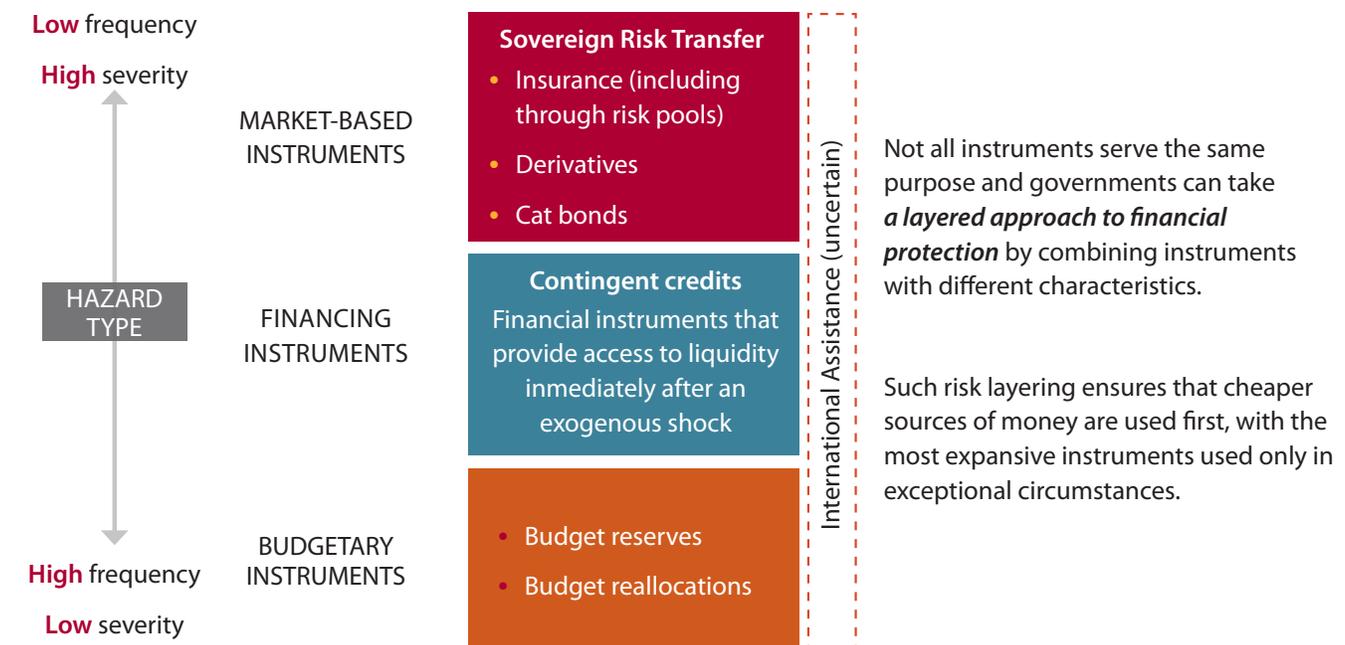
Depending on the frequency and severity of risks to be managed, governments can combine (or layer) financing instruments that address different needs and have different cost implications. Such an approach prioritizes cheaper sources of funding, ensuring that the most expensive instruments are only used in exceptional circumstances. For example, sovereign insurance may provide cost-effective cover against extreme events, but it may be inefficient and costly to protect against low intensity and recurrent events. For such events, a dedicated contingency fund that 'retains' this lowest layer of risk may be a more appropriate solution. The

figure below provides a graphic representation of this risk layering approach.

Combining instruments enables governments to take into account the evolving needs for funds from emergency response to long-term reconstruction. For example, a government may decide to purchase (ex-ante) quick-disbursing risk transfer instruments, such as parametric insurance, to ensure immediate liquidity in the aftermath of extreme events. However, much larger sums are required to finance reconstruction efforts and can be raised through (ex-post) budget reallocations, issuing bonds, and through recoveries from traditional indemnity insurance.

Pre-planned financing mechanisms. This approach to financial protection needs to complement other elements of a comprehensive disaster risk management strategy, including programs to identify and reduce risk. It does so by helping a government to proactively manage the residual risk that cannot be fully mitigated (either because this is not feasible or not cost effective).

Sovereign Disaster Risk Layering



Source: World Bank (Forthcoming)





Origins of PCRAFI

The Pacific Catastrophe Assessment and Financing Initiative (PCRAFI) began at the request from finance ministers at the 2007 Forum Economic Ministers' Meeting (FEMM) held in Washington D.C. at the World Bank Annual Meetings. PICs requested support to develop disaster risk financing and insurance solutions to improve disaster risk management and climate change adaptation strategies. (See PCRAFI Timeline, next page)

The development of the Initiative was the result of technical discussions with regional and national stakeholders, primarily with secretaries of finance. PCRAFI was founded upon the principle of regional coordination and implemented as a joint initiative of the World Bank, the Pacific Community (SPC), and the Asian Development Bank (ADB), with financial support from the government of Japan, the Global Facility for Disaster Reduction and Recovery (GFDRR), and the Africa Caribbean Pacific (ACP)–European Union (EU) Natural Disaster Risk Reduction Program, and with technical inputs from GNS Science, Geoscience Australia, and AIR Worldwide.

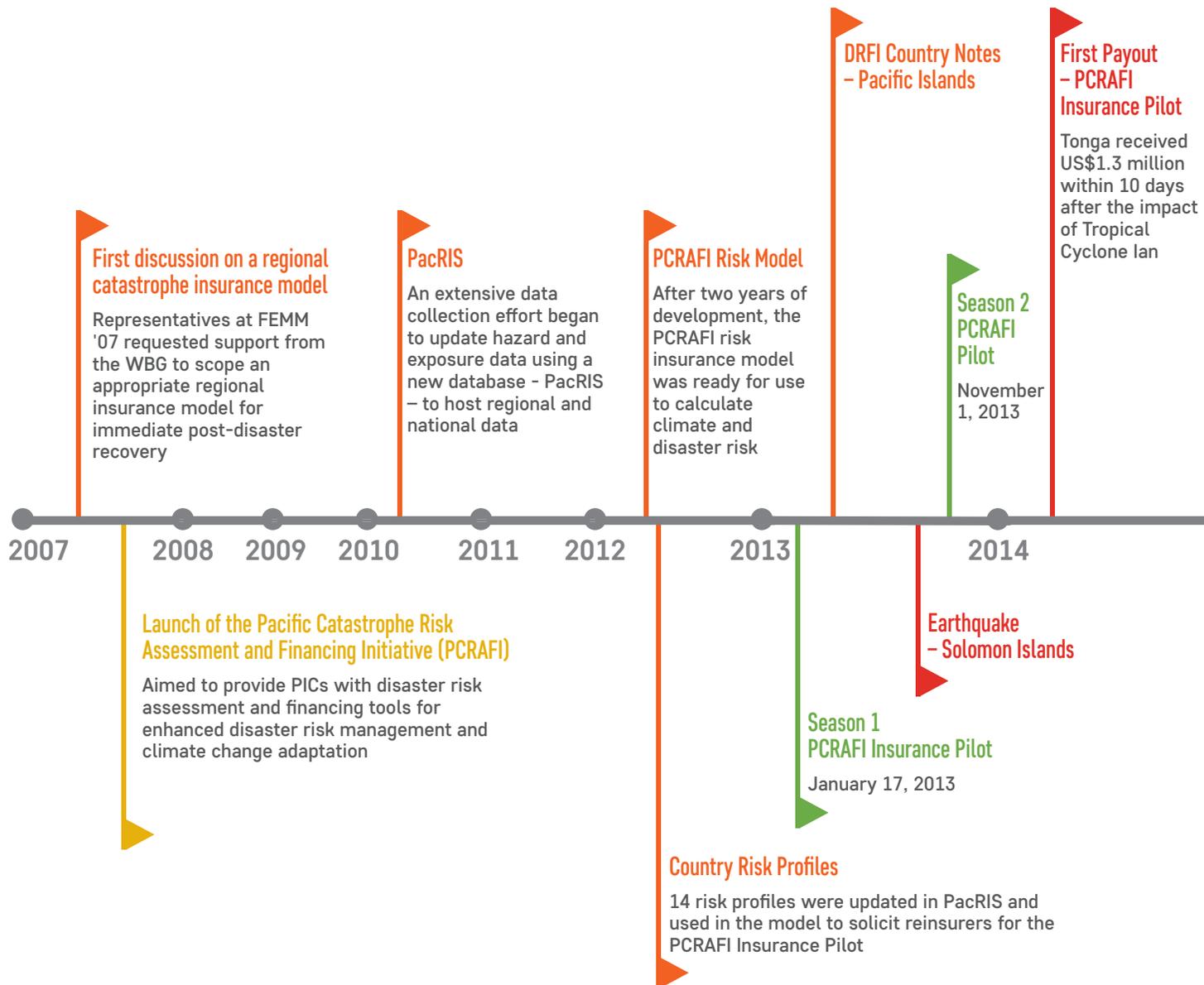
Through its implementation (2007-2015), PCRAFI provided the region with disaster risk modelling and assessment tools to enable market-based financial

solutions, namely sovereign parametric risk insurance, to meet the need for rapid response liquidity for emergency response. The Initiative fostered dialogue on disaster risk financing and increased understanding of various financial instruments for post-disaster budget management, execution and planning.

The PCRAFI Insurance Pilot ran from 2013 to 2015 offering PICs parametric insurance options to provide rapid response financing through an immediate injection of cash following a major tropical cyclone and/or earthquake/tsunami. During the three-year pilot, six countries participated: the Cook Islands, the Marshall Islands, Samoa, the Solomon Islands, Vanuatu, and Tonga, made possible through the Pacific Disaster Risk Financing and Insurance MDTF and the Japan Disaster Risk Management single-donor trust fund that provided premium financing support to participating countries.

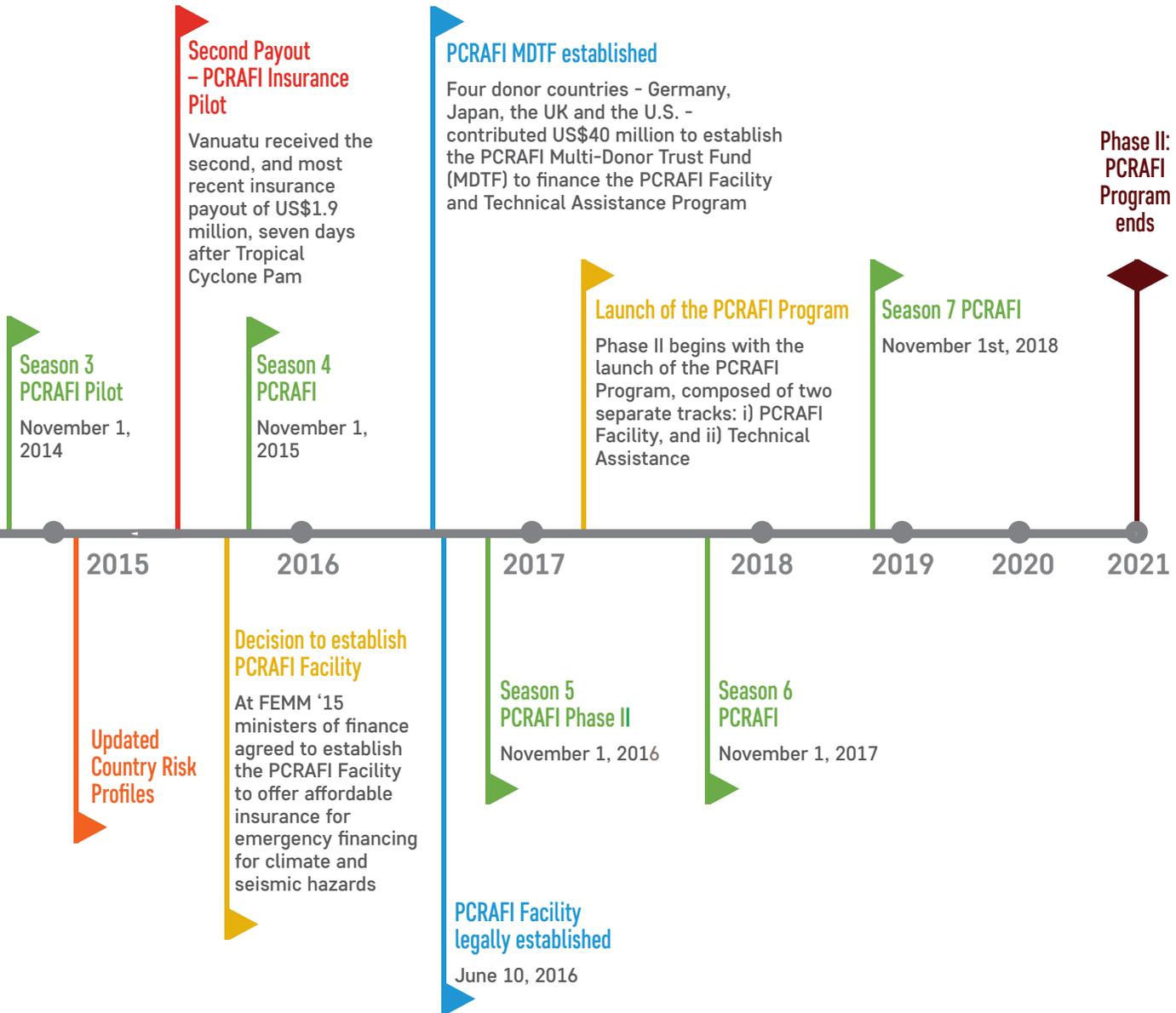
Since its inception, the PCRAFI insurance portfolio has made two payouts for an aggregate amount of US\$3.2 million within 10 days of the disasters. (See Payout History, Annex V). For the fifth consecutive season, the five participating PCRAFI members – the Cook Islands, the Marshall Islands, Samoa, Tonga, Vanuatu – all paid their premiums in full.

Timeline of PCRAFI and Disaster



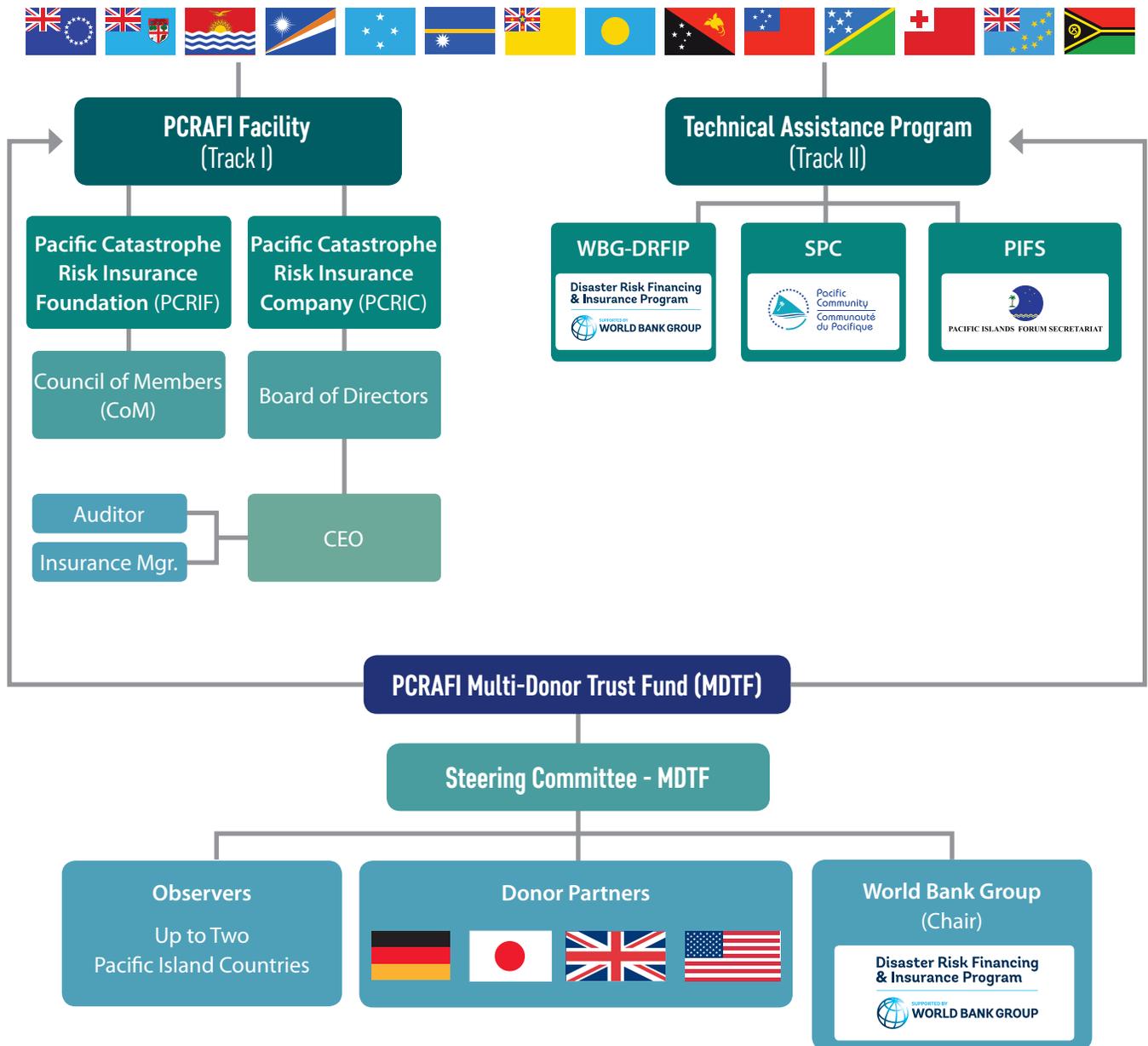


Risk Finance in the Pacific



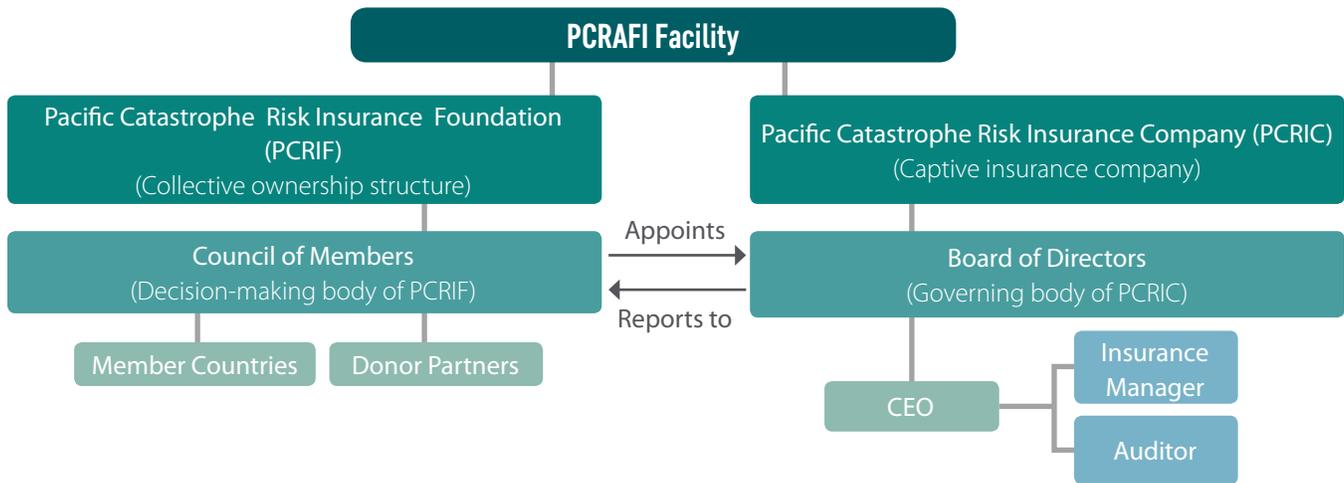
Annexes

Annex I: Organizational Structure of the PCRAFI Program

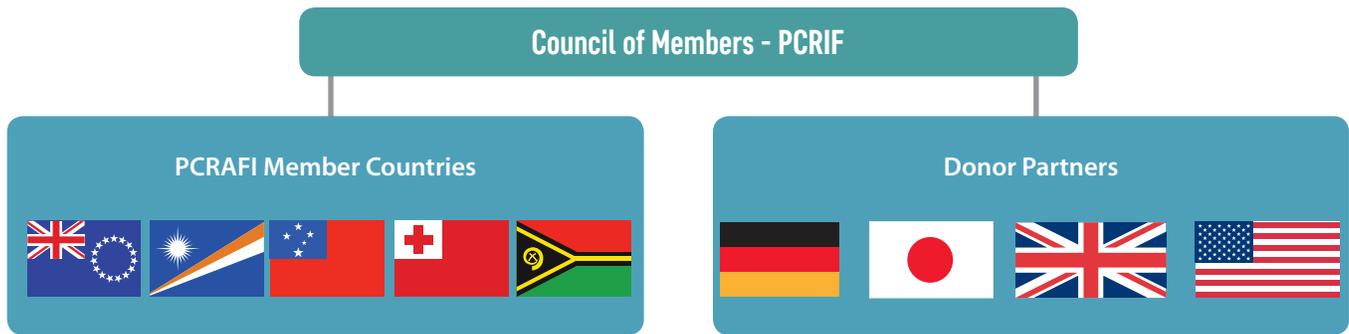




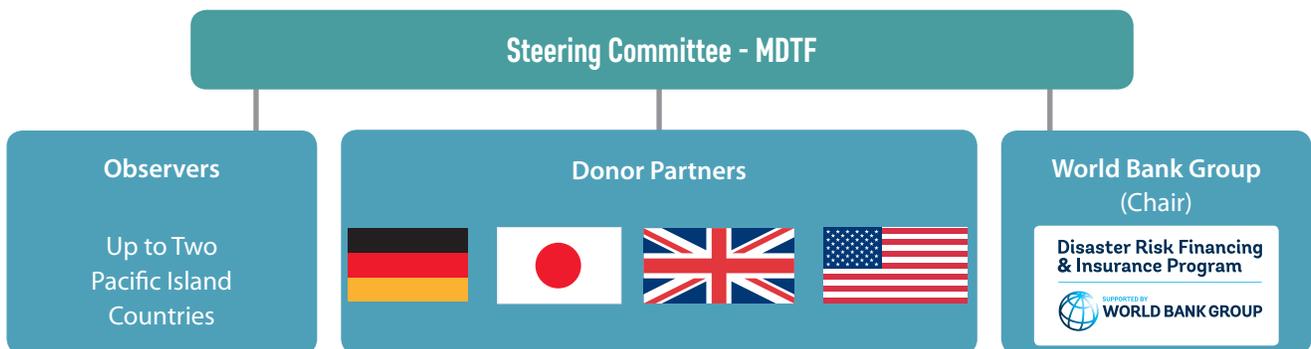
Annex II: Structure of the PCRAFI Facility



Annex III: Governance Structure of the Council of Members



Annex IV: Governance Structure of the PCRAFI MDTF







Annex V: Payout History – PCRAFI Insurance Program

Payout 1 – Tonga

On January 11, 2014, Tropical Cyclone Ian hit Tonga with devastating force, passing close to the country's Vava'u island group and making landfall on the main islands of Ha'apai. The cyclone had intensified to Category 5 before landfall, and its arrival led the prime minister of Tonga to declare a state of emergency for Vava'u and Ha'apai. The cyclone damaged or destroyed more than 1,000 buildings in Ha'apai, and caused significant damage to infrastructure and agriculture across the worst-affected islands. More than 2,000 people sought refuge in evacuation centers (OCHA 2014).

On January 13, an event Calculation Notice was sent to AIR Worldwide, the calculation agent for the Pacific Catastrophe Risk Insurance Pilot. AIR Worldwide performed a calculation

of the modelled losses from the event under the terms of the pilot, and on January 20 the Calculation Report was sent to the pilot counterparties to notify them that the modelled loss was large enough to trigger a payout for Tonga under the policy. A payout of US\$1.27 million was made to Tonga on January 27; the amount was equivalent to more than the country's 2013 contingency budget, and more than half of the reserves of the Tonga National Reserve Fund.

The payout from Tropical Cyclone Ian was the first under the pilot, and it successfully demonstrated the core principle of rapid disbursement anticipated under the program. The entire process, from Calculation Notice to receipt of funds, was executed in less than 15 days.

Payout 2 – Vanuatu

Tropical Cyclone Pam hit Vanuatu on March 13, 2015, and triggered an insurance payout of US\$1.9 million for the government of Vanuatu. This insurance payout provided a rapid cash injection into the government's budget. As a comparison, the payout amount was equivalent to eight times Vanuatu's emergency provision.

The Calculation Notice was sent to AIR Worldwide by the World Bank/International Development Association (IDA) on March 14; the Calculation Report, which includes the calculation of the insurance payout amount, was released on March 20; and the payout was received by the government of Vanuatu on March 24. The insurance payout is consistent with the severity of the loss and the contract selected by the government of Vanuatu.

While the tropical cyclone reached Category 5 (and was estimated to have return a period of 150 years), the eye of the cyclone passed 45 km away from the capital city, so the storm did not generate as much damage as it might have. The damage loss is estimated to have a return period of 40 years. Interestingly, the modelled physical losses estimated from the catastrophe risk model within six days after the event were commensurate with the estimated damage from the post-disaster loss assessment conducted a month later (US\$182 million versus US\$220 million).

The relatively low payout is mainly due to the fact that Vanuatu had relatively low coverage (given that their premium was not very high).

Annex VI: Key Terms

Attachment Point	This quantity represents the losses retained by a country; a deductible is the quantity of expenses that a country must pay “out of pocket” before PCRIC issues an insurance payout
Capacity	The ability of an insurance company to provide insurance protection to clients, which is limited by its own financial strength and the reinsurance protection it has in place
Capitalization Funds	Endowment income earned, or accumulated fund balances, to the principal of the fund
Captive Insurer	An insurance company wholly owned by a parent company or collective; PCRIC is a legally independent entity, yet it exists solely to insure the risks of its owner – PCRIF
Ceding Percentage	The percentage of coverage that a country decides to acquire
Coverage Limit	This indicates the maximum payout as defined under the policy
Emergency Losses	Emergency losses in the context of the Pacific Catastrophe Risk Insurance Pilot are calculated by using a percentage of the estimated ground-up losses
Ex ante	Latin for ‘from before’. In the context of disaster events, ex ante instruments are arranged before the event, and ex ante decisions are made at that time as well
Ex post	Latin for ‘from after’. In the context of disaster events, ex post instruments are arranged after the event, and ex post decisions are made at that time as well
Indemnity insurance	An insurance policy that pays claims based on the actual economic losses incurred by the policyholder
Index Insurance	An insurance policy that pays claims based on an index; indexes are typically chosen to be a good proxy of the economic losses incurred by the policyholder
Natural Disaster	A disastrous event leading to loss of lives and livelihoods caused by natural hazards such as tropical cyclones, earthquakes, floods, and landslides
Parametric insurance	A type of insurance that is triggered by the occurrence of a specific measured hazard event, such as a certain magnitude of earthquake or category of cyclone
Probable Maximum Loss (PML)	The maximum value of a claim from a large or catastrophe event; also referenced as MPL
Property insurance	The insurance of physical assets such as buildings, plant and equipment, stock, and machinery; the products used for this insurance are variously named as fire and perils, commercial or business package, industrial special risks, or material damage insurance
Public-Private Partnership (PPP)	A cooperative arrangement between one or more public and private sectors, typically of a long term nature
Rapid Response Financing	A mechanism to provide a quick injection of liquidity in the event a policy is triggered by pre-determined natural hazard impact
Reinsurance	A risk transfer method used by insurance companies to transfer part of a single large risk or an accumulation of similar risks and so increase their capacity; reinsurance helps to smooth the extreme results and effects of specific perils (such as catastrophe events) and therefore to reduce the volatility of an insurance portfolio
Risk-retention Instrument	An instrument whereby a party retains the financial responsibility for loss in the event of a shock; risk-retention instruments do not take risk off the balance sheet—the cost of a disaster must still be repaid. The instrument just offers more flexibility in how and when one would have to pay. Contingency funds, budget allocations, and lines of contingent credit are all risk-retention instruments, as are budget reallocations, tax increases, and post-disaster credit
Sovereign Catastrophe Risk Pool	A group of countries that collaborate to manage risk financially as a single group
Trigger	An event that must occur before a particular insurance policy applies to a given loss; for example, a trigger could be a weather measurement that causes the insurance policy to pay out, such as a certain magnitude of a tropical cyclone





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