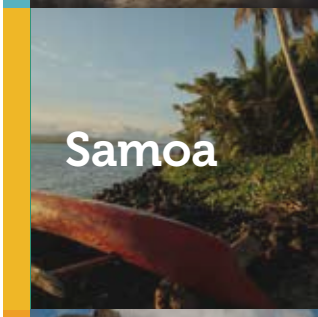
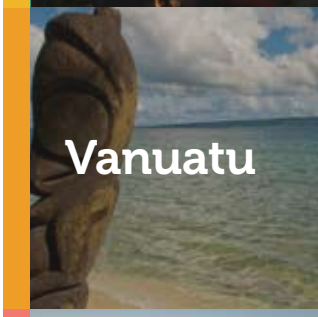
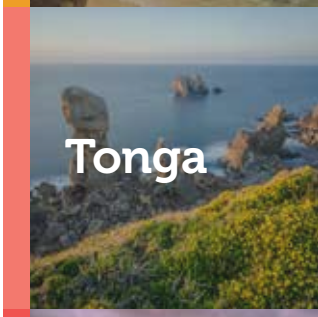
PCRAFI

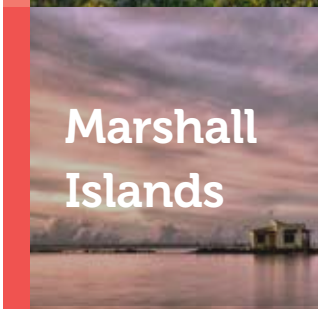
Pacific Catastrophe Risk Assessment & Financing Initiative

Advancing Disaster Risk Financing & Insurance In The Pacific









SPC Secretariat of the Pacific Community

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Advancing Disaster Risk Financing & Insurance In The Pacific

REGIONAL SUMMARY NOTE & OPTIONS FOR CONSIDERATION

February 2015

Disaster Risk Financing and Insurance

PCRAFI 2015

GFDRR

SPC Secretariat of the Pacific Community

WORLD BANK GROUP

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Acknowledgments

This note has been prepared by a team led by Olivier Mahul (Disaster Risk Financing and Insurance Program Manager, World Bank) and comprising Samantha Cook (Financial Sector Specialist) and Barry Bailey (Consultant).

The team gratefully acknowledges the data, information, and other invaluable contributions made by the Pacific Island Countries. Without their skills and expertise, the compilation of this note would not have been possible.

This note benefitted greatly from the technical expertise of the following persons: Franz Drees-Gross (Country Director Timore-Leste, Papua New Guinea. and Pacific Islands, World Bank), Olivier Mahul (Disaster Risk Financing and Insurance Program Manager, World Bank), Denis Jordy (Senior Environmental Specialist, World Bank), Michael Bonte-Grapentin (Senior Disaster Risk Management Specialist, World Bank), Paula Holland (Secretariat of the Pacific Community), and David Abbott (Secretariat of the Pacific Community).

Inputs and reviews from Robert Utz, David Knight, Kim Edwards, Oscar Ishizawa, Rashmin Gunasekera, Keren Charles, Francesca de Nicola and Susann Tischendorf greatly enhanced the final note. Design and layout developed by Bivee.co.

The Pacific Catastrophe Risk Assessment and Financing Initiative (PCRAFI) is a joint initiative between the Secretariat of the Pacific Community (SPC) through its Applied Geoscience and Technology Division (SOPAC), the World Bank, and the Asian Development Bank, with financial support from the government of Japan and the Global Facility for Disaster Reduction and Recovery (GFDRR).

The Disaster Risk Financing and Insurance Program is grateful for the financial support received from the government of Japan and the Global Facility for Disaster Reduction and Recovery.

Acronyms and Abbreviations

ACRRP	Aitutaki Cyclone Recovery and Reconstruction Plan
CBS	Central Bank of Samoa
CBSI	Central Bank of Solomon Islands
CFA	Compact of Free Association
CIIC	Cook Islands Investment Corporation
DAEF	Disaster Assistance Emergency Fund
DISMAC	Disaster Management Council
DMO	Disaster Management Office
DoFT	Department of Finance and Treasury
DRFI	Disaster risk financing and insurance
DRM	Disaster risk management
EMC	Emergency Management Cook Islands
EPC	Electric Power Corporation
ERTF	Emergency Response Trust Fund
FEA	Fiji Electricity Authority
FPCL	Fiji Ports Corporation Limited
FSC	Financial Supervisory Commission
GDP	Gross domestic product
GFDRR	Global Facility for Disaster Reduction and Recovery
GFS	Government Financial Statistics
GIICS	Group of International Insurance Center Supervisors
HFA	Hyogo Framework for Action
IAIS	International Association of Insurance Supervisors
IMF	International Monetary Fund
ISR	Industrial Special Risks
JNAP	Joint National Action Plan
LRF	Loan Repayment Fund
MDBI	Material Damage/Business Interruption
MFEM	Ministry of Finance and Economic Management
MoF	Ministry of Finance
MoFT	Ministry of Finance and Treasury
MOIP	Ministry of Infrastructure and Planning
N-DRM Plan	National Disaster Risk Management Plan
NAB	National Advisory Board
NAP	National Action Plan
NDC	National Disaster Council

Acronyms and Abbreviations

NDMO	National Disaster Management Office
NDRFF	National Disaster Relief and Rehabilitation Fund ("Prime Minister's Fund")
NEMO	National Emergency Management Office
NPI	National Pacific Insurance
PAA	Priorities and Action Agenda
PCRAFI	Pacific Catastrophe Risk Assessment and Financing Initiative
PDNA	post-disaster needs assessment
PFEM	Public Finance and Economic Management
PIC	Pacific Island Country
PICs	Pacific Island Countries
RBF	Reserve Bank of Fiji
RBV	Reserve Bank of Vanuatu
RFA	Regional Framework for Action
SIDS	Small Island Developing States
SIFA	Samoa International Finance Authority
SMEs	Small and medium enterprises
SOE	State-owned enterprise
SOPAC	Applied Geoscience and Technology Division of SPC
SPC	Secretariat of the Pacific Community
SPREP	Secretariat for the Pacific Regional Environment Programme
TAL	Tonga Airports Ltd.
TC	Tropical Cyclone
TPL	Tonga Power Ltd.
UNDP	United Nations Development Programme
UNISDR	United Nations International Strategy for Disaster Risk Reduction
URA	Utilities Regulatory Authority
USAID	U.S. Agency for International Development
VUI	Vanuatu Utilities and Infrastructure

Average Annual Exchange Rates

CURRENCY UNIT	US$1 EQUIVALENT
New Zealand dollar (Cook Islands) (NZ$)	1.22
Fiji dollar (F$)	1.86
Tongan pa'anga (T$)	1.79
Samoan tala (SAT)	2.3
Solomon Islands dollar (SI$)	7.23
Vanuatu vatu (VT)	96

Key Recommendations

for Cost-Effective and Sustainable Disaster Risk Finance Solutions in the Pacific

Pacific Island Countries (PICs) face many common challenges in their efforts to utilize disaster risk financing instruments. The Pacific Disaster Risk Financing and Insurance (DRFI) Program under the Pacific Catastrophe Risk Assessment and Financing Initiative (PCRAFI) has generated discussion at a regional level in order to help countries address their common challenges. Based on that discussion, the following recommendations have been developed for consideration.

1. **Develop an integrated disaster risk financing and insurance strategy.** This should establish potential sources of immediate liquidity post-disaster, such as a dedicated reserve fund for disaster response. A sustainable source of funds should be identified, and legislation should be amended to safeguard expenditures and ensure the development of an operations manual.

2. Develop a post-disaster budget execution manual to improve awareness of post-disaster procedures and processes. A manual will help reduce the time needed to approve post-disaster expenditures by ensuring normal tendering procedures are waived. Agencies and suppliers alike need to be familiar with post-disaster processes to remove any unnecessary delays in the system.

3. Explore the use of contingent credit to access additional liquidity post-disaster, including identification of providers of this type of finance. Contingent credit could help to finance response efforts for intermediate disaster events that exceed the capacity of options from within the budget, but that are too expensive to fund through risk transfer because of their frequency.

4. Develop an insurance program for key public properties. This program would establish a centralized asset register with up-to-date valuations, assess probable losses, and review existing indemnity insurance to ensure that the major perils of tropical cyclone and earthquake are included and that the government and state-owned enterprises (SOEs) are getting the best available terms and conditions for the premiums paid.

5. Develop a regional framework for DRFI. The DRFI framework should be aligned to regional frameworks on disaster risk management and climate change adaptation to ensure that immediate access to liquidity post-disaster is made a priority.

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Economic and Policy Background

There is a 50 percent chance that the Pacific region will face disaster losses exceeding US$1.3 billion in any 50-year period (PCRAFI 2013). There is little doubt that PICs are extremely vulnerable to natural disasters; yet many of these countries find it difficult to access liquidity in the immediate aftermath of a disaster.

The cost of damage and loss suffered in PICs as a result of recent natural disasters ranges from 2.6 percent to 28 percent of national gross domestic product (GDP). Findings from recent post-disaster needs assessments (PDNAs) demonstrate how sensitive small island economies can be to natural disasters: the estimated recovery and reconstruction plans outlined in the PDNAs are about as costly as the total damage and loss incurred if not more so with values ranging from 1.5 percent to 27.0 percent of GDP. These figures give an indication of the contingent liability from natural disasters.

PICS have incurred significant costs to facilitate travel to the outer islands for initial post-disaster relief. Following Tropical Cyclone (TC) Ian in Tonga, 39 percent of initial relief expenditures from the emergency fund went to fuel, distribution, and travel and freight. Similarly, the cost of facilitating travel to Santa Cruz following the 2013 earthquake and tsunami in the Solomon Islands drained the annual budget allocation for the National Disaster Management Office (NDMO) and most of the national contingency budget. These situations demonstrate how costly it can be to access the outer islands when facilitating response efforts.

The PICs are restricted in their options for raising post-disaster liquidity. They are constrained by their size and borrowing capacity and have limited access to international insurance markets. In addition, many PICs have a narrow revenue base, are net importers, and rely on aid as an income stream, all of which place significant additional constraints on the national budget.

The point in the fiscal year at which a disaster occurs affects how much post-disaster finance is available. Post-disaster expenditures are first and foremost driven by the amount of cash readily available to the government. If there are no dedicated reserves for financing disaster relief, there will be different amounts of funding available depending on whether the disaster occurs closer to the beginning or the end of the budget cycle.

The Pacific has seen several recent cases that show the need for immediate liquidity post-disaster from ex-ante instruments. In

the Cook Islands, in the immediate aftermath of TC Pat in 2010, a delay in the receipt of travel funds meant that key government personnel could not immediately commence the initial damage assessment. Following TC Vania in 2010, Vanuatu had to reallocate a significant amount of the national budget. Similarly, Fiji and Samoa had to reallocate budgetary funds in the wake of TC Evan in 2012 and 2013, and as already mentioned, the Santa Cruz earthquake of February 2013 drained the annual budget for the Solomon Islands NDMO and most of the national contingency budget.

A major disaster can create the political will to establish dedicated reserves for relief and early recovery, and many PICS have seized the opportunity post-disaster to establish these reserves. Samoa, for example, can establish a dedicated emergency fund only once a disaster has occurred and then reallocate funds accordingly. In the Marshall Islands, the government makes an annual contribution that is then matched by the U.S. Agency for International Development (USAID). This approach allows funds to accrue over time, although there is a limit on how much can be withdrawn following an event.

Efficient post-disaster budget execution in PICs often relies on a few key individuals dedicated to facilitating quick response. There is a risk that any established good practice could lapse if these individuals were to leave key response ministries or the government itself. To eliminate this risk and do away with the need to rely on a few individuals, PICs should develop post-disaster budget execution manuals to act as a desk reference.

DRFI is a long-term agenda requiring political will, technical expertise, and time. The Pacific DRFI Program enables countries to increase their financial resilience against natural disasters by improving their capacity to meet post-disaster funding needs without compromising their fiscal balance. This program is one application of PCRAFI.

As demonstrated by discussions at the Forum Economic Ministers Meeting for the past two years, there is growing interest in developing disaster risk financing tools within the Pacific region. This regional summary report provides a overview of the procedures used by seven PICs for post-disaster budget mobilization and execution and identifies five key recommendations (see page 04) to support and encourage development of cost-effective and sustainable disaster risk finance solutions and insurance in the Pacific region.

Introduction

Over the last 60 years, extreme natural events in the Pacific region have affected more than 9.2 million people and caused damage in excess of US$3.2 billion, with tropical cyclones the major cause of this loss and damage (World Bank 2012). During 2012–2014 the Pacific experienced a number of disasters, including two severe floods in Fiji, TC Evan in Samoa and Fiji, a magnitude 8.0 earthquake and subsequent tsunami in the Solomon Islands, and TC Ian in Tonga (which led to the first payout under the Pacific Catastrophe Risk Insurance Pilot). Most recently there were floods in the Solomon Islands and storm surge in the Marshall Islands.

The PICs are restricted in their options for raising post-disaster liquidity because of their small size, limited borrowing capacity, and limited access to international insurance markets. The small size of Pacific Island states limits geographic diversification of risk; subsidizing affected regions using revenues from unaffected regions is nearly impossible. High transaction costs, the inability to spread risk over a large territory, and the relatively small size of the local economies keep insurance penetration in the region to a minimum.

PICs' narrow revenue base, status as net importers, and reliance on aid as an income stream serve to limit the options available for post-disaster finance—and in turn place significant additional constraints on the national budget. Alternatives such as contingent credit and risk transfer options could be used to reduce the drain on limited public funds.

Sovereign disaster risk financing and insurance offers a set of ex-ante and ex-post financial tools to increase a government's financial resilience against natural disasters. DRFI has gained increasing recognition in recent years and is a key activity of the HFA Priorities for Action 4 and 5[1]. The HFA is a result-based plan of action adopted by 168 countries to reduce disaster risk and vulnerability to natural hazards and to increase the resilience of nations and communities to disasters over the period 2005–2015. In the Pacific, the HFA formed the basis for the development of the Pacific Disaster Risk Reduction and Disaster Management Framework for Action (Regional Framework for Action, or RFA).

The Regional Framework for Action cites DRFI activities as a key national and regional activity. Theme 4—"Planning for effective preparedness, response and recovery"—has an associated key national activity, "Establish a national disaster fund for response and recovery." Theme 6 of the RFA—"Reduction of underlying risk factors"—cites the development of "financial risk-sharing mechanisms, particularly insurance, re-insurance and other financial modalities against disasters" as both a key national and regional activity (SOPAC 2005). These regional implementation activities align with the three-

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tiered disaster risk financing strategy developed by the World Bank.

The Pacific DRFI Program enables countries to increase their financial resilience against natural disasters by improving their capacity to meet post-disaster funding needs without compromising their fiscal balance. This program, which is one application of PCRAFI, is built upon a three-tiered approach to disaster risk financing. These layers align to the basic principles of sound public financial management, such as the efficient allocation of resources, access to sufficient resources, and macroeconomic stabilization. The three tiers acknowledge the different financial requirements associated with different levels of risk:

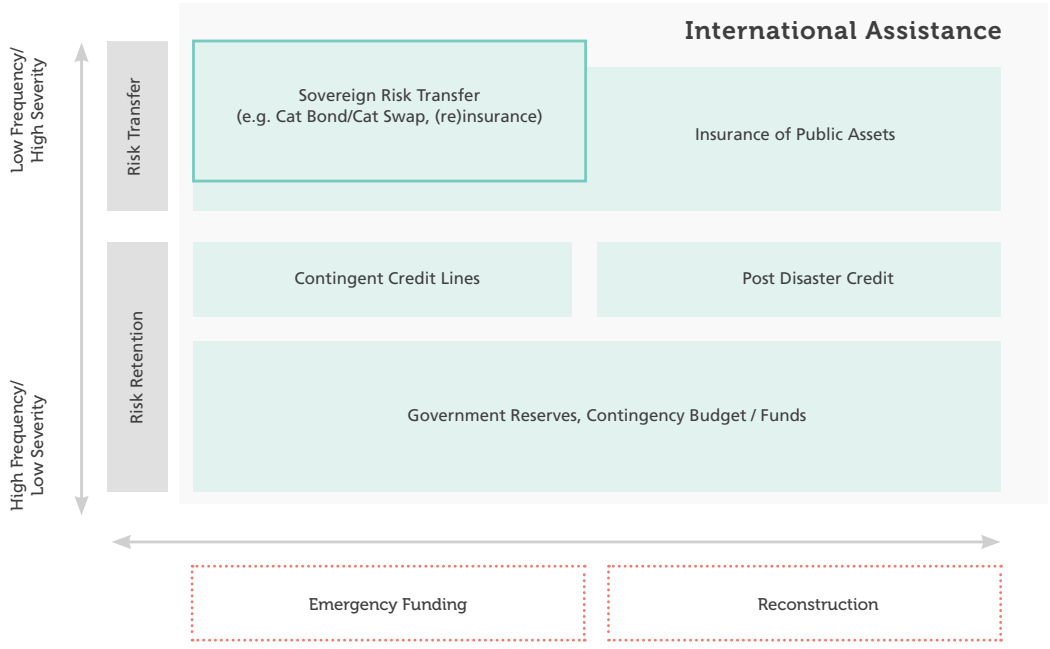
(a) Self-retention, such as a contingency budget and national reserves, to finance small but recurrent disasters;

(b) A contingent credit mechanism for less frequent but more severe events; and

(c) Disaster risk transfer (such as insurance) to cover major natural disasters. See figure 1.

This report looks at the public financial management of natural disasters in seven PICs (the Cook Islands, Fiji, the Marshall Islands, Samoa, the Solomon Islands, Tonga, and Vanuatu) to build understanding of the existing DRFI tools in use in the Pacific and to identify gaps where engagement could further develop financial resilience. In addition, it aims to encourage peer exchange of regional knowledge, specifically by encouraging dialogue on past experiences, lessons learned, optimal use of these financial tools, and the effect of these tools on the execution of post-disaster funds. Given the innovative nature of DRFI, capacity building in this new area is necessary to ensure that it forms part of a comprehensive disaster risk management strategy.

Figure 1 — Three-Tiered Disaster Risk Financing Strategy



Source: World Bank 2010.

Economic Impact of Disasters

Pacific economies are highly exposed to adverse natural hazard events (e.g., tropical cyclones, earthquakes, volcanic eruptions, and tsunamis). The resulting disasters can affect countries' economic, human, and physical environment and harm their long-term development. Ten Pacific economies feature in the list of the top 30 countries most vulnerable to natural disasters (World Bank 2011).

There is a 50 percent chance that the Pacific region will face disaster losses exceeding US$1.3 billion in any 50-year period (PCRAFI 2013).

Figure 2 shows average annual loss from tropical cyclones and earthquakes in 15 PICS, as calculated by the PCRAFI catastrophe risk model. Papua New Guinea experiences the highest level of average annual loss, approximately US$85 million; this is largely driven by damage from earthquakes. Fiji's level of average annual loss is similar—US$79 million—but is almost solely driven by damage from tropical cyclones. Average annual losses may be even higher in the future, as climate change may cause hydrometeorological events (such as tropical cyclones) to occur more frequently.

In many PICs, government revenue depends on the tourism sector and the agriculture, forestry, and fishing sector, both of which are harmed by the occurrence of natural disasters. Harm to these sectors is detrimental not only to the economy, but also to individuals' quality of life, especially that of individuals who rely on subsistence agriculture. When both sectors are affected, economic recovery can take many years unless alternative sources of finance for early recovery can be found.

The cost of damage and loss from recent natural disasters in the Pacific varies between 2.6 percent and 28 percent of national GDP. Findings from recent PDNAs demonstrate how sensitive small island economies can be to natural disasters: the estimated recovery and reconstruction plans outlined in the PDNAs are about as costly as damages and losses, with values ranging from 1.5 percent to 27 percent of GDP (table 1). These figures suggest the contingent liability created post-disaster. The requirements of recovery and reconstruction can pose severe fiscal difficulty for PIC governments, which—at a time when fiscal receipts have declined and the fiscal deficit has increased—need to source additional revenue to complement any funding received from donors.

Figure 2 — Estimated Average Annual Loss from Natural Disasters (US$ millions) *Source*: PCRAFI 2011.

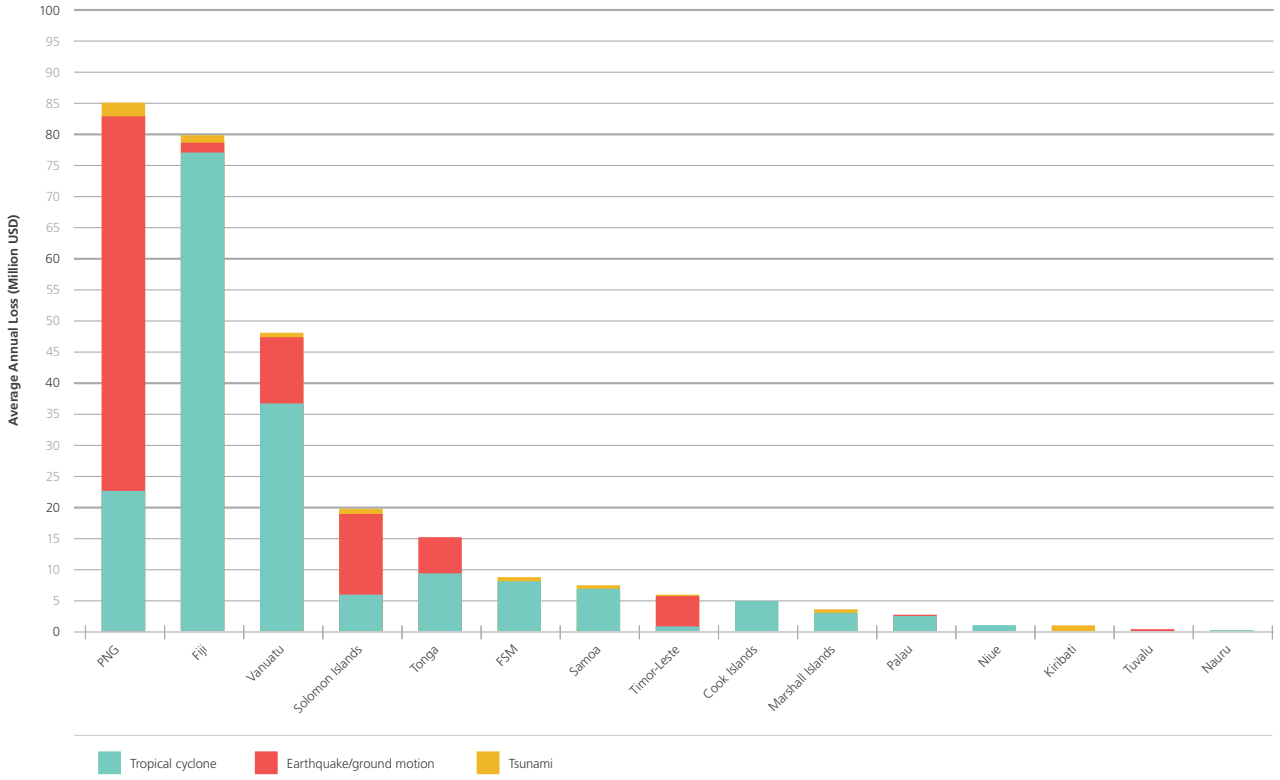


Table 1— Damage and Loss as a Percentage of GDP

COUNTRY	YEAR	DISASTER	DAMAGE AND LOSS				ESTIMATED RECOVERY AND RECONSTRUCTION REQUIREMENTS	
			Damage (US$ millions)	Loss (US$ millions)	Total (US$ millions)	As a % of GDP	Total (US$ millions)	As a % of GDP
Solomon Islands	2014	Floods	52.4	54.6	107.0	9.2	55.0	4.6
Tonga	2014	Cyclone	38.0	11.3	49.3	11.0	49.5	11.0
Fiji	2012	Cyclone	67.2	41.2	108.4	2.6	67.0	1.5
Samoa	2012	Cyclone	103.3	100.6	203.9	28	206.0	29.0
Cook Islands	2010	Cyclone					9.5	4.0
Samoa	2009	Earthquake and tsunami	84.8	39.3	124.1	20.0	117.0–167.0a	19.0–27.0

Sources: Solomon Islands Government 2014; Government of Tonga 2014; Government of Fiji 2012; Government of Samoa 2012, 2009; Government of Cook Islands 2010.

a. The range provided shows the two options presented to the government, one for building back (the lower cost) and the other for an option that includes building back and relocating some villages, schools, etc.

Public Financial Management of Natural Disasters

Public financial management in the Pacific is dictated by the fact that many PICs are classified as Small Island Developing States (SIDS). Typically, countries in this classification have a narrow revenue base, are net importers, and have a consequential reliance on aid as an income stream. These characteristics can limit the options available for post-disaster finance. It is unlikely that a SIDS government could afford to reallocate the capital budget, and a tax increase could make many items unaffordable and hence be detrimental to citizens' quality of life. Given these constraints on the national budget, alternatives such as contingent credit and risk transfer options should be used to reduce the drain on limited public funds.

PIC governments face critical challenges for financial resilience to natural disasters. Most PICs have restricted options for securing immediate liquidity for swift post-disaster emergency response without compromising their long-term fiscal balance. In addition, PICs are constrained by their size, borrowing capacity, and limited access to international insurance markets. In the absence of easy access to debt and well-functioning insurance markets, a large portion of the economic losses stemming from adverse natural events are borne by governments and households, with support from development partners.

This report provides a review of the procedures used by seven PICs for post-disaster budget mobilization and execution. The information presented here is taken from a series of individual country notes [[(see country notes 1–7), which should be consulted for a more in-depth analysis of DRFI in each of the seven countries.

Budget Mobilization for Natural Disasters

The time at which a disaster occurs relative to the fiscal year affects how much post-disaster finance is available. Post-disaster expenditures are first and foremost driven by the amount of cash readily available to the government. Simply put, different amounts of funding will be available depending on whether the disaster occurs at the beginning or the end of the budget cycle.

Table 2— Availability of Financial Instruments Over Time

	SHORT TERM (1-3 MONTHS)	MEDIUM TERM (3-9 MONTHS)	LONG TERM (OVER 9 MONTHS)
Ex-post Financing			
Donor Assistance (relief)	■	■	
Budget Reallocation	■	■	
Domestic Credit		■	■
External Credit		■	■
Capital Budget Realignment			■
Donor Assistance (reconstruction)			■
Tax Increase		■	■
Tax Incentives (Flash Appeal)	■	■	
Ex-ante Financing			
Reserve Fund	■		
Contingency Budget	■	■	
Contingent Credit	■	■	
Sovereign (parametric) Catastrophe Risk Insurance	■	■	
Traditional Disaster Insurance	■	■	■

Source: World Bank 2013.

A country's access to DRFI instruments depends on its current economic conditions. For example, if a country is running a fiscal deficit, is deeply indebted, or is investing heavily in development programs (e.g., to reduce poverty and eradicate epidemics), then its budget flexibility is more likely to be constrained. Such a country may therefore rely on international response to facilitate post-disaster expenditures. International assistance will always play a valuable role, but it is often conditional, and the levels of finance available may be limited or tied to countries' income classification: grants may be available for the least developed countries, while middle-income countries will have to utilize loans from international financial institutions.

An optimal DRFI strategy aims to combine ex-ante and ex-post financial instruments to secure adequate and timely funding. The optimal mix of finance instruments will be unique to each country and based upon its associated hazard and exposure. A list of potential finance instruments is given in table 2. Those that are shaded in blue indicate the generic timelines for mobilizing and executing these funds, although timings may vary in each country depending on its internal processes. The table can be adapted by countries to reflect these differences according to the financial instruments they have utilized and the time it takes to mobilize these funds. Given the innovative nature of the work in this area and the number of products under development, this list is not exhaustive.

Ex-Post DRFI Instruments

A disaster exceeds a country's capacity to cope with an event, and there will therefore always be a need for ex-post practices and arrangements. Ex-post arrangements benefit from being able to establish the extent of the disaster and prioritize the response needs. As a result these arrangements take longer to implement than ex-ante arrangements, but they can often mobilize larger amounts of finance. This section discusses the ex-post practices and arrangements that have been used in the Pacific.

Budget reallocation

Budget reallocation across ministries requires cabinet approval and can take some time to operationalize. For larger amounts of funding, reallocation is sometimes necessary, although it is permissible only for operational funds. Because reallocation can delay key development projects, it may require donors' agreement to divert funds from the planned expenditures to financing of disaster recovery. Table 3 provides an indication of the total budget that can be reallocated.

Intraministry transfers from the operational budget can be made with the approval of the minister. This can be a good solution for some ministries, such as agriculture, where additional purchases, such as seeds and seedlings, may be needed to help recovery. Transferring funds from wages and salaries or commitments is not permitted.

The amount of cash available for reallocation will vary significantly depending on when in the fiscal year the event occurs. Should an event occur at the beginning of the fiscal year, the government may be better placed to reallocate funds; the same is true if a disaster occurs at the end of the fiscal year (see box 1).

Donor assistance for relief and recovery

While donor funds will always be required, there will always be an element of uncertainty surrounding how much will be provided, what will be provided, and when the donations will arrive in country. Consequently, overdependence on international relief as a

Table 3— Indicative Percentage for Budget Reallocation

COUNTRY	% OF TOTAL BUDGET THAT CAN BE REALLOCATED FOLLOWING A NATURAL DISASTER
Cook Islands	24
Fiji	17
Marshall Islands	10
Samoa	Discretionary
Solomon Islands	Discretionary
Tonga	Discretionary
Vanuatu	34

Box 1— Tropical Cyclone Evan, 2012: Fiji.

In December 2012, TC Evan struck Fiji, causing damage on the northern island of Vanua Levu and the western part of the main island, Viti Levu. The fiscal year in Fiji coincides with the calendar year, so the government had a good idea of what the full year's expenditures had been, and as a result was able to swiftly reallocate US$3.7 million from the 2012 national budget, equivalent to approximately 0.3 percent of the total budget (Government of Fiji 2012). This money was used to finance the initial disaster response for TC Evan. A further US$9.1 million was reallocated from the 2013 budget to finance housing rehabilitation, equivalent to 0.7 percent of total expenditures.

Box 2— Tropical Cyclone Evan, 2012: Samoa

In the month following TC Evan, Samoa received cash donations from the international community worth over US$2 million; in addition, the local and international community also donated significant supplies to help with initial relief. Experience shows that donations continue even after relief work ends and recovery and reconstruction programs begin. For example, the completion report for the tsunami fund states that a total of US$26.7 million was received from development partners and private individuals and organizations (Government of Samoa 2011.). This serves to demonstrate that while donor assistance for reconstruction may take some time to mobilize, significant amounts of finance can be raised.

Box 3— 2014 Floods in Solomon Islands: Flash Appeal

During the 2014 flash floods in the Solomon Islands, an account was established at the Central Bank of Solomon Islands to receive funds from a flash appeal conducted by the National Disaster Council (NDC). The appeal collected SI$2.3 million (US$318,000), which has been used for emergency relief and recovery needs. Donations came from private companies, individuals, embassies of the Solomon Islands, and other governments such as Papua New Guinea and China. This account was opened to receive funds from external parties following an event and has acted as a replacement to the National Disaster Council Fund, giving the NDC greater control over and accountability for expenditures.

source of post-disaster financing can delay the provision of initial relief and inhibit ex-ante contingency planning. Development partners, international organizations, local nongovernmental organizations, businesses, and individuals contribute in the form of cash grants and aid in kind. The provision of aid in kind, while vital, can pose additional costs for distribution that governments must assume. Box 2 gives an example of the amount of donor funds that Samoa received following Tropical Cyclone Evan.

External credit

Many PICs are classified as low-income countries and qualify for grant funding, so they do not always need to utilize external credit. Depending on a country's economic status, external credit can be a good way to meet the larger finance requirements of reconstruction.

Before a country takes a loan to finance recovery, it should duly consider its level of existing debt and be aware that a loan often requires a lengthy negotiation period with the provider. In the Cook Islands, for example, the Asian Development Bank provided a US$4 million loan to help with the recovery efforts following a series of cyclones in 2005. This loan

took four months to approve and significantly delayed the necessary relief and recovery work—which suggests that contingent credit may be more beneficial.

The majority of PICs have manageable levels of debt, and their associated risk of debt distress is low to moderate. Thus they appear well placed to explore the use of contingent credit as a DRFI tool. The only exception is the Marshall Islands, which has been cited as having a high risk of debt distress under the International Monetary Fund (IMF)/World Bank debt sustainability analysis (see table 4).

Tax increase

A tax increase could generate additional revenue to finance recovery but could also make many items unaffordable and hence be detrimental to citizens' quality of life. It is not known whether any PICs have levied taxes to finance post-disaster recovery. It is difficult to attribute any tax increases with disaster expenditures, since the government would need to explicitly indicate that the funds were spent on disaster relief.

Tax incentives and flash appeal

Tax concessions to encourage donations have been successful in many PICS. For example, the government of Fiji implemented tax concessions to encourage donations in the wake of TC Evan. A 200 percent tax deduction of the donation amount was available to those who contributed US$537 and above to the National Disaster Relief and Rehabilitation Fund. In addition, duty-free status was applied to goods donated in kind.

Flash appeals have proved a good way for PICs to centrally control financial contributions from members of the public, donors, and development partners. The Marshall Islands, Tonga, Samoa, Solomon Islands and Fiji have all conducted flash appeals following recent events. Specific accounts have been established to enable ease of deposit and to allow the countries to execute all contributions to finance post-disaster relief and recovery. Box 3 gives an example from the flash appeal conducted in the Solomon Islands in 2014.

Table 4— Current Debt-to-GDP Ratio and Risk of Debt Distress

COUNTRY	DEBT-TO-GDP RATIO (%)	RISK OF DEBT DISTRESS (IMF/WORLD BANK DEBT SUSTAINABILITY ANALYSIS)
Cook Islands	18	Not available
Fiji	50	Sustainable[a]
Marshall Islands	55	High
Samoa	46	Moderate
Solomon Islands	25	Moderate
Tonga	45	Moderate
Vanuatu	40	Low

Sources: IMF 2011a, 2011b, 2011c, 2012a, 2012b, 2013a, 2013b.

Note: a. Referred to as sustainable in IMF Article IV consultation report 2013,

Ex-Ante DRFI Instruments

The uncertainty surrounding international assistance has put pressure on countries to establish domestic sources of finance for post-disaster relief, such as national reserves or the transfer of risk to the international insurance market. The ex-ante practices and arrangements in some PICs are discussed below.

The Pacific has seen several recent cases that show the need for immediate liquidity post-disaster from ex-ante instruments. In the Cook Islands, in the immediate aftermath of TC Pat in 2010, a delay in the receipt of travel funds meant that key government personnel could not immediately commence the initial damage assessment. Following TC Vania in 2010, Vanuatu had to reallocate a significant amount of the national budget. Similarly, Fiji and Samoa had to reallocate budgetary funds in the wake of TC Evan in 2012 and 2013, and the Santa Cruz earthquake in the Solomon Islands in February 2013 drained the annual budget for the NDMO and used the majority of the national contingency budget.

The seven PICs in this report have at least one ex-ante DRFI instrument to help facilitate early recovery. Table 5, which details the ex-ante DRFI instruments utilized by PICs involved in the Pacific DRFI Program, shows that each country holds some level of contingency budget and that many have established dedicated reserves to help meet early recovery costs. These funds are complemented with catastrophe risk insurance via the Pacific Catastrophe Risk Insurance Pilot and traditional insurance for key government properties.

Table 5— Ex-Ante DRFI Instruments Used in PICs

	RESERVE FUND (US$ thousands)	CONTINGENCY BUDGET AS % OF TOTAL APPROPRIATIONS	SELECTED LAYER OF COVERAGE FOR SOVEREIGN (PARAMETRIC) CATASTROPHE RISK INSURANCE[A]	MAXIMUM PAYOUT COVERAGE FROM PACIFIC CATASTROPHE RISK INSURANCE PILOT AS % OF CONTINGENCY BUDGET	TRADITIONAL DISASTER INSURANCE
Cook Islands	409	1.50%	Low	200%	Government and SOEs
Fiji	1,600[b]	Discretionary	-	-	SOEs
Marshall Islands	1,500	US$200,000	Medium	>300%	Government and SOEs
Samoa	Needs basis	3%	High	188%	Government and SOEs
Solomon Islands	-	2.50%	-	-	SOEs
Tonga	2,400	5%	Low	>300%	SOEs
Vanuatu	256	1.50%	High	>300%	SOEs

Source: World Bank, 2014 a,b,c,d,e,f,g

Note:

FFa. Low layer = 1-in-10-year attachment point; medium layer = 1-in-15-year attachment point; high layer = 1-in-20-year attachment point.

b. Composed of F$1 million annual allocation to the Prime Minister's Fund and F$2 million for the NDMO budget for rehabilitation.

c. - = Not available

Box 4— Cook Islands Disaster Emergency Trust Fund

In 2010, TC Pat struck the Cook Islands and caused widespread devastation on the island of Aitutaki. National agencies wanted to respond, but had to wait while funds were mobilized and executed.

Following TC Pat, the prime minister of the Cook Islands announced that his country would look at ways to become self-reliant and seek to generate new income streams to invest in a fund specifically for disaster management response and recovery.

Emergency Management Cook Islands (EMCI) collaborated with the Ministry of Finance and Economic Management and the Ministry of Infrastructure and Planning to establish the Emergency Response Trust Fund (ERTF). Led by EMCI, these agencies were able within one year to draft a policy for the ERTF that was approved by the cabinet. This policy details the budget execution process, the reporting requirements to ensure that expenditures are transparent and accountable, and the role of the trustees' management committee. The ERTF was fully operational and had received an appropriation from the annual budget by December 2011.

Following its establishment and receipt of an initial appropriation, the ERTF received additional funds from the Small Islands State Development Fund administered by the Small Island States Program Unit of the Pacific Islands Forum Secretariat. The government has established a minimum level of reserves, and the fund has accrued almost US$10,000 in interest to date. The government will continue to explore ways to grow the ERTF. The country's experience with the ERTF demonstrates the importance of ex- ante cooperation between government agencies and suggests how quickly procedures can be developed when several agencies work together to remove barriers to effective post-disaster budget execution.

Dedicated reserve funds

Many PICs have established dedicated reserves to facilitate relief and early recovery. These funds are governed by legislation in their respective financial management acts and vary in complexity. In Samoa, for example, a dedicated emergency fund is established only once a disaster has occurred, and funds are then reallocated accordingly. In the Marshall Islands, the government makes an annual contribution that is then matched by USAID; this approach has the benefit of allowing funds to accrue over time, although there is a restriction on how much can be withdrawn following an event.

Reserve funds have been shown to significantly reduce the time it takes to expedite funds and operationalize staff. A declaration of disaster normally acts as the trigger to gain access to dedicated disaster reserve funds, although Tonga used its emergency fund to purchase essential relief supplies the day before TC Ian, a category 5 cyclone, made landfall.

The demand for establishing dedicated reserves for disaster response is created when a major hazard event occurs, and this opportunity should be capitalized on. The experience of TC Pat in the Cook Islands, for example, led to discussions about establishing the Emergency Response Trust Fund, and the fund was fully operational by December 2011, less than 12 months after it was initially proposed (see box 4).

Contingency budget

Contingency budgets, while not exclusively designed for post-disaster expenditures, can provide a timely source of limited cash. Many PICs have contingency budgets worth 1.5–5.0 percent of total appropriations (the Marshall Islands allocates a nominal amount of US$200,000). These funds are normally accessed following a declaration of disaster, but some

Box 5— Pacific Catastrophe Risk Insurance Pilot

The Pacific Catastrophe Risk Insurance Pilot provides an off-budget injection of liquidity following an eligible disaster event. The insurance is designed to cover emergency losses, which are estimated using a modeled representation of the event based on hazard parameters and a calculation of total modeled physical damage. Unlike a conventional insurance scheme, where a payout would be assessed against actual incurred costs, this scheme pays out on the results of a model. The advantage of this approach is that it results in a much faster payout. The payout would act as a form of budget support and would go some way to cover the costs incurred by the government in the aftermath of a severe natural disaster that disrupts the provision of government services.

Countries can choose between three layers of coverage—low, medium, and high—depending on the frequency of events. The lower layer will cover events with a return period of 1 in 10 years—that is, more frequent but less severe events. The medium layer covers events with a 1-in-15-year return period, while the higher layer covers less frequent but more severe events, or those with a return period of 1 in 20 years. However, countries may also request that a more customized option be developed for them.

countries, such as Samoa and Tonga, require cabinet approval for expenditures from this budget line.

The amount of cash available from the contingency budget will vary significantly depending on when in the fiscal year the event occurs, and it should be complemented with other sources of cash. For example, the Solomon Islands allocated US$5.4 million for disaster purposes in 2013, a 28 percent reduction from 2011. This variability raises questions about reliance on the contingency budget as a source of post-disaster finance.

Sovereign catastrophe risk insurance

A regional initiative, the Pacific Catastrophe Risk Insurance Pilot was established in January 2013 to test the viability of market-based sovereign risk insurance. The program was jointly implemented by the Secretariat of the Pacific Community (SPC) and the World Bank with the generous financial support of the government of Japan. The objectives of the pilot were twofold: it sought to test whether there was interest from the international reinsurance market in supplying such a product, and whether there was demand from the PICs for such coverage. Five countries are involved in the third season of the pilot (which runs from November 1, 2014, to October 31, 2015): the Cook Islands, the Marshall Islands, Samoa, Tonga, and Vanuatu. Further information on the coverage provided can be found in box 5.

The catastrophe risk insurance purchased by PICS can provide them with an injection of liquidity equivalent to almost double their respective contingency budgets. Five PICs (Vanuatu, Tonga, Marshall Islands, Solomon Islands[3] and Samoa) purchased tropical cyclone and/or earthquake catastrophe risk insurance with support from the government of Japan and contributions from the national budget. The Cook Islands paid its premium in full. For each of these six countries the annual coverage limit represents between 185 percent and over 300 percent of the national contingency budget (see table 6).

A catastrophe risk insurance payout was disbursed to Tonga within two weeks of TC Ian, a category 5 cyclone that caused extensive damage in Tonga on January 11–12, 2014. The government of Tonga received US$1.27 million under its policy. Tonga is the first country to receive a payout under the Pacific Catastrophe Risk Insurance Pilot, launched on January 17, 2013. The payout is equivalent to more than the 2013 contingency budget or half of the current reserves of the Tonga National Reserve Fund.

Table 6— Pacific Catastrophe Risk Insurance Pilot, 2014–2015 Season

COUNTRY	PERILS COVERED	SELECTED COVERAGE[A]	AGGREGATE COVERAGE LIMIT AS % OF NATIONAL CONTINGENCY BUDGET
Vanuatu	TC + EQ/TSU	Medium layer	>300
Tonga	TC + EQ/TSU	Low layer	>300
Marshall Islands	TC	Medium layer	>300
Cook Islands	TC	Low layer	200
Samoa	TC + EQ/TSU	High layer	188

Source: World Bank, 2014 a,b,c,d,e,f,g

Note:

TC = tropical cyclone;

EQ = earthquake;

TSU = tsunami.

a. Low layer = 1-in-10-year attachment point; medium layer = 1-in-15-year attachment point; high layer = 1-in-20-year attachment point

Not every disaster event that occurs will generate an insurance payout, as the experience of the Solomon Islands shows. The Solomon Islands discontinued its insurance in the third season in part because neither the Santa Cruz earthquake nor the 2014 flash floods had generated a payout or had in fact been eligible under the terms of the insurance. The Santa Cruz earthquake generated emergency losses that were below the attachment point of the policy, and flood risk is not covered under the terms of the insurance. Both of these events financially constrained the government (see box 6).

The experience of the Solomon Islands highlights the importance of building a DRFI strategy that uses different tools to address different layers of risk. Countries need to decide exactly what type of risk they wish to cover and what tools are best suited for this purpose. Insurance cannot be used as a singular solution to hazard risk. The experience of the Solomon Islands has also given impetus to development of additional DRFI products tailored to countries' specific needs.

> ***"The cash received from the catastrophe risk insurance pilot makes an important financial contribution [to] carrying out the government strategy for mitigating natural disasters, [and helps] to ensure that response efforts to help the people of Ha'apai recover and return to their normal everyday lives can continue without interruption or delay."***
>
> —Hon. Dr. 'Aisake Valu Eke, Minister for Finance and National Planning in Tonga

Contingent credit

Contingent credit can be a useful tool for accessing additional funds post-disaster, but it has not been used in the Pacific to date. An advantage of contingent credit is that it is accessed only following an event of a pre-agreed upon magnitude and is therefore off-budget. This type of tool may be subject to conditionality to ensure effective management upon receipt.

Box 6— NDMO Budget Allocation, Solomon Islands

The disaster relief budget allocated to the Solomon Islands National Disaster Council is small—SBD1.9 million (US$262,000)—and was quickly exhausted following the floods in 2014. That was the second year in a row that a single disaster exhausted not only the relief budget of the NDC but also the operational budget. Both the floods in 2014 and the Santa Cruz earthquake in 2013 occurred in the first four months of the fiscal year (which is the same as the calendar year), and each left the NDMO with only enough funds to cover its fixed costs for the remainder of the year. There were serious concerns about what would have happened if another event had struck the Solomon Islands after the relief budget was exhausted.

Box 7— Tropical Cyclone Ian, 2014: Staff Relocation in Tonga

Following a statement of emergency, staff from the Ministry of Finance are relocated to the National Emergency Management Office. This move helps to ensure that procurement of emergency supplies occurs as quickly as possible; normally it is senior staff with signing authority who are relocated.

Post-Disaster Budget Execution

Anecdotal evidence from PICs suggests that even countries with emergency procurement procedures do not always adhere to them during a disaster. Ministry of Finance staff were reportedly often unaware of relevant procedures, since they were not part of business as usual. To address this issue, some PICs—among them Fiji and Tonga—have established the practice of relocating a Ministry of Finance staff member to the NDMO to expedite purchases (see box 7).

Efficient post-disaster budget execution in PICs often relies on a few key individuals dedicated to facilitating quick response. There is a risk that any established good practice could lapse if these individuals were to leave key response ministries or the government itself. To avoid this risk in the future, PICs should develop a post-disaster budget execution manual to act as a desk reference.

Facilitating travel to the outer islands in PICs can account for a significant amount of initial relief and recovery funding and can drain limited public funds. Following TC Ian in Tonga, for example, fuel, distribution, and travel and freight accounted for 39 percent of initial relief expenditures from the emergency fund. This situation demonstrates how costly it can be to access the outer islands when facilitating response efforts.

Many PICs have expressed their support for allocating a higher level of response funding to the NDMO to facilitate initial response. Failure to do so can result in delayed initial damage assessments and the development of relief packages on "best guess" information. Following TC Ian in Tonga, the Ministry of Finance itself cited the need to allocate additional funds to the National Emergency Management Office. The lack of budgetary allocation has also posed problems for the Solomon Islands, where two years in a row a single event has drained the annual budgetary allocation.

Property Insurance of Public Assets

The insurance market in the Pacific is small, served by only 34 companies (PFIP 2013). These companies themselves tend to be small; they have no independent financial security rating and pass on their high administrative costs to the consumer in the form of higher premiums. Except for those that are a subsidiary of a large multinational insurer, the companies tend to have low capital and solvency.

PICs are price takers when accessing insurance, as the market is small and has high exposure to catastrophic events relative to premium incomes. Table 7, which shows non-life insurance premium per capita for 2012, gives an indication of insurance penetration in the region.[4] Fiji and the Cook Islands, for example, have non-life premium per capita of approximately of US$111 and US$342, respectively, which suggests high insurance penetration in these countries compared to other PICs. However, these high rates may be driven by the well-developed commercial and tourism sectors in these countries, given that households remain largely uninsured.

Capacity within the reinsurance market is limited and associated premium costs are high, which limits the size of risk accepted and keeps premiums high.

Most SOEs in PICs have some form of property insurance, but the purchase of insurance is not centrally coordinated or recorded (see table 8). All of the PICs studied expressed their concern at not being able to purchase infrastructure insurance from the

Table 7— Pacific Non-life Insurance Premium per Capita 2012 (US$)

COUNTRY	GDP MILLIONS	POPULATION	GDP PER CAPITA	MARKET PREMIUM	PREMIUM PER CAPITA
Cook Islands	$305	19,300	$15,823	$6,600,000	$342
Fiji	$3,908	874,700	$4,467	$97,500,000	$111
Samoa	$683	188,900	$3,619	$17,000,000	$90
Solomon Islands	$1,008	549,600	$1,130	$13,000,000	$24
Tonga	$471	104,900	$4,495	$4,400,000	$42
Vanuatu	$781	247,300	$3,182	$16,500,000	$67

Source: World Bank, 2014 a,b,c,d,e,f,g

marketplace. It was either too expensive or simply not available.

Accessing cyclone insurance for property requires an engineer's report certifying that the insured property meets the building code. In order to better underwrite the cyclone peril, insurers require that buildings be inspected and certified by local structural engineers. Given the low number of qualified civil engineers in the region, this can be both expensive and time-consuming. Weak enforcement of building codes is not uncommon in the region, given limited capacity; and some countries, such as the Marshall Islands, have no building code in place to begin with.

PICs lack up-to-date centrally held asset registers or insurance registers, and this lack is potentially problematic. Assets could be undervalued if replacement values are out of date. Identifying a pool of key public properties to insure and approaching the market could help PIC governments to attain better prices. This approach should be complemented with a centralized insurance register containing key information on the assets insured and the exact coverage that has been purchased.

There is a need to strengthen the regulatory bodies for insurers across the region, or to introduce a regulator for those countries that are unregulated at present. All PIC insurers report to the regulator (where there is one) on a quarterly basis. However, the reported information could be used more effectively to encourage further growth and expansion in the industry. Given that the insurance industry is in its infancy in many PICs, it is expected that the regulation of insurance will improve over time.

Table 8— Pacific Government Property Insurance

COUNTRY	GOVERNMENT PROPERTY ENSURED	SOE PROPERTY INSURED	INFRASTRUCTURE INSURED	INSURANCE LEGISLATION
Cook Islands	Yes	Yes	No	Insurance Act (2008)
Fiji	No	Yes	No	Insurance Act (1998)
Marshall Islands	Limited	No	No	None
Tonga	No	Yes	No	None
Samoa	Yes	Yes	No	Insurance Act (2007)
Solomon Islands	No	Limited	No	Insurance Act (1985)
Vanuatu	No	Yes	No	Insurance Act (2005)

Source: World Bank, 2014 a,b,c,d,e,f,g

End Notes

1 Priority for Action 4—"Reduce the underlying risk factors"—has an associated key activity of financial risk-sharing mechanisms, such as insurance, while Priority for Action 5—"Strengthen disaster preparedness for effective response at all levels"—includes the establishment of emergency funds such as contingency budget, national reserves, and annual budgetary allocations. See UNISDR (2005).

2 Normally 14 countries are classified as PICs, but for the purposes of the PCRAFI initiative Timor-Leste was included.

3 The Solomon Islands participated in the first two seasons of the insurance pilot and only. They are not featured in the table below which covers the third season. The coverage limit for the two expired policies was equivalent to 185% of their contingency budget.

4 Please note data was not available for the Marshall Islands

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Country Note

FIJI

February 2015

Disaster Risk Financing and Insurance

CHAPTER 01

GFDRR

SPC Secretariat of the Pacific Community

WORLD BANK GROUP

Executive Summary

This note aims to build understanding of the existing disaster risk financing and insurance (DRFI) tools in use in Fiji and to identify gaps where potential engagement could further develop financial resilience. In addition the note aims to encourage peer exchange of regional knowledge, specifically by encouraging dialogue on past experiences, lessons learned, optimal use of these financial tools, and the effect they may have on the execution of post-disaster funds.

In 2012 alone Fiji experienced three major events with estimated total damage of F$146 million (US$78 million) (Government of Fiji 2013c). These include the severe flooding in January in the areas of Ra, Tavua, Ba, Lautoka, Nadi, Nadroga, Sigatoka, and Rewa; even more intense flooding in these same areas in March; and Tropical Cyclone (TC) Evan in December. The government of Fiji estimated that damage from the 2012 floods was approximately F$71 million (US$38 million).

Fiji is expected to incur, on average over the long term, annual losses of F$158 million (US$85 million) due to earthquakes and tropical cyclones. In the next 50 years Fiji has a 50 percent chance of experiencing a loss exceeding F$1,500 million (US$806 million) and a 10 percent chance of a loss exceeding F$3,000 million (US$1.6 billion)(PCRAFI 2011).

Fiji has a taken a proactive approach to DRFI and developed a finance manual for post-disaster budget execution. During the response to TC Evan, an internal memo was produced detailing the finance procedures and processes to be followed. This document has since been transformed into a finance manual that sets out a step-by-step process, details the structure of the operation, and establishes key focal points, processes, and procedures before and during the operation and the acquittal process.

Fiji has F$3 million (US$1.6 million) available in DRFI instruments to facilitate disaster response. It has established two sources of dedicated funds, the National Disaster Relief and Rehabilitation Fund (NDRRF), which can release up to F$1 million (US$0.5 million), and the recently established Rehabilitation Fund, which receives an annual appropriation of F$2 million (US$1 million). In any given year, there is a 57 percent chance that Fiji will experience government emergency losses that exceed the F$3 million (US$1.6 million) contingency provision.

The government of Fiji reallocated F$7 million (US$3.7 million) from the national budget in 2012, equivalent to approximately 0.3 percent of the total budget (Government of Fiji 2013c). This money was used to finance the initial disaster response for TC Evan. Fiji's fiscal year is the same as the calendar year, and given that TC Evan happened in December, a further F$17 million (US$9.1 million) was reallocated from the

2013 budget to finance housing rehabilitation, equivalent to 0.7 percent of total expenditures.

The government of Fiji implemented tax concessions to encourage donations in the wake of TC Evan. A 200 percent tax deduction was available to those who contributed F$1,000 (US$537) and above into the NDRRF. In addition, duty-free status was applied to goods that were donated in kind.

The Fiji non-life (general) insurance market is the second-largest in the Pacific Island Countries, with a total premium of F$174.5 million (US$95 million). Seven local insurers are currently operating with a total premium income of F$145.5 million (US$78 million). The balance of F$29 million (US$16 million)—17 percent of the market—is placed with offshore insurers by the four local brokers.

The government of Fiji does not have a property insurance program in place for key public or infrastructure assets, including major transportation assets such as roads and bridges. This situation could result in delays in reconstruction following a catastrophic event. Some ministries and departments may insure physical property assets on an individual basis.

A number of options to support ongoing DRFI improvements in Fiji are presented for consideration:

(a) the finance manual developed by the Ministry of Finance for post-disaster procedures should be finalized, and cabinet approval should be sought;

(b) an overarching disaster risk financing and insurance strategy should be developed that includes options for risk transfer; and

(c) assets should be identified in order to develop an insurance program for critical public assets.

Introduction

Fiji is located in the tropical cyclone belt and experiences on average one cyclone per year. This exposure poses problems for the Government of Fiji, as the maintenance and repair of national infrastructure following cyclones drains limited financial resources. In addition, Fiji is located in the Pacific Ring of Fire and is exposed to geophysical hazards, such as volcanoes, earthquakes, tsunamis, and landslides. Fiji has a land area of 18,273 km2 and comprises 332 islands, of which 110 are populated by approximately 860,000 inhabitants.[1] The majority of the population live on the two main islands of Viti Levu and Vanua Levu.

In 2001 Fiji established the National Disaster Management Office (NDMO), which is responsible for the coordination of response to natural disasters. The NDMO operates under the jurisdiction of the Natural Disaster Management Act (1998), which sets out the provisions for the government and relevant agencies in relation to management of natural disasters and related activities. The act provides the legislative basis for the Fiji National Disaster Management Plan (1995), which outlines in some detail the roles, responsibilities, and procedures relevant to the conduct of disaster preparedness and emergency operations (NDMO 1995).

In 2007 the Government of Fiji approved the Sustainable Economic and Empowerment Development Strategy 2008–2010, one of whose goals is "reducing vulnerability to disasters and risks and promoting sustainable development" Government of Fiji 2007). The strategy recognizes the need for a comprehensive approach to disaster reduction, including community preparedness, disaster mitigation, and the integration of the impact of disasters into national development planning.

The government of Fiji is seeking to develop a Joint National Action Plan for Disaster Risk Management and Climate Change Adaptation. These efforts are led by the NDMO, which is in discussions with the Ministry of Strategic Planning, National Development and Statistics, and the Department of the Environment, as well the Secretariat of the Pacific Community Applied Geosciences Division (SPC-SOPAC), the Secretariat of the Pacific Regional Environment Programme (SPREP), United Nations Development Programme (UNDP) Pacific Centre, the United Nations International Strategy for Disaster Reduction (UNISDR), and other partners. The institutional frameworks that are already in place are these:

- Hyogo Framework for Action (HFA) 2005–2015
- Pacific Disaster Risk Reduction and Disaster Management Framework for Action (Regional Framework for Action or RFA) 2005–2015
- Sustainable Economic and Empowerment Development Strategy 2008–2010
- Fiji National Disaster Management Plan 1995
- Cyclone Support Plan 1997
- Fiji National Disaster Management Act 1998

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Disaster risk financing and insurance (DRFI) is a key activity of the HFA Priorities for Action 4 and 5.[2] The HFA is a result-based plan of action adopted by 168 countries to reduce disaster risk and vulnerability to natural hazards and to increase the resilience of nations and communities to disasters over the period 2005–2015. In the Pacific, the HFA formed the basis for the development of the Regional Framework for Action.

The RFA cites DRFI activities as a key national and regional activity. Theme 4—"Planning for effective preparedness, response and recovery"—has an associated key national activity, "Establish a national disaster fund for response and recovery." Theme 6 of the RFA—"Reduction of underlying risk factors"—cites the development of "financial risk-sharing mechanisms, particularly insurance, re-insurance and other financial modalities against disasters as both a key national and regional activity" (SOPAC 2005). These regional implementation activities align with the three-tiered disaster risk financing strategy developed by the World Bank.

The Pacific DRFI Program enables countries to increase their financial resilience against natural disasters by improving their capacity to meet post-disaster funding needs without compromising their fiscal balance. This program is one application of the Pacific Catastrophe Risk Assessment and Financing Initiative (PCRAFI). The Pacific DRFI Program is built upon a three-tiered approach to disaster risk financing. These layers align to the basic principles of sound public financial management, such as the efficient allocation of resources, access to sufficient resources, and macroeconomic stabilization. The three tiers acknowledge the different financial requirements associated with different levels of risk:

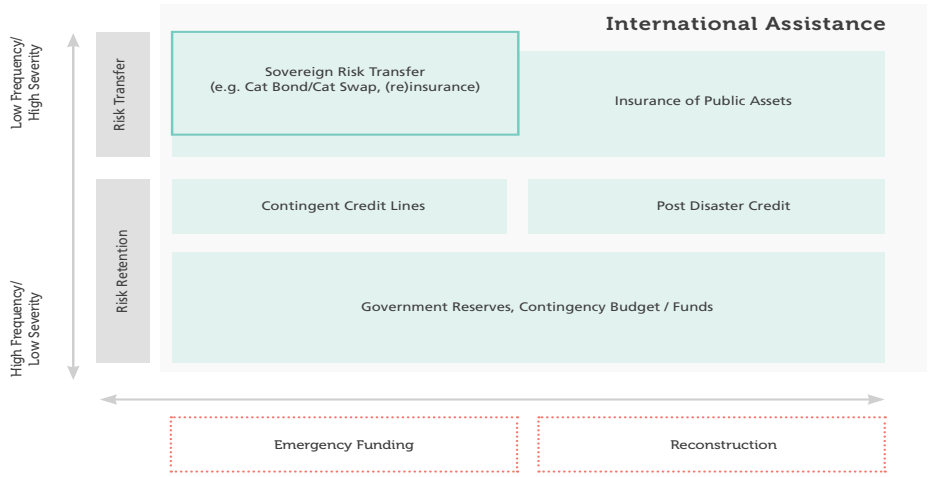
(a) Self-retention, such as a contingency budget and national reserves, to finance small but recurrent disasters;

(b) A contingent credit mechanism for less frequent but more severe events; and

(c) Disaster risk transfer (such as insurance) to cover major natural disasters. See figure 1.

This note aims to build understanding of the existing DRFI tools in use in Fiji and to identify gaps where potential engagement could further develop financial resilience. In addition, the note aims to encourage peer exchange of regional knowledge, specifically by encouraging dialogue on past experiences, lessons learned, optimal use of these financial tools, and the effect of these tools on the execution of post-disaster funds.

Figure 1 — Three-Tiered Disaster Risk Financing Strategy



Source: World Bank 2010.

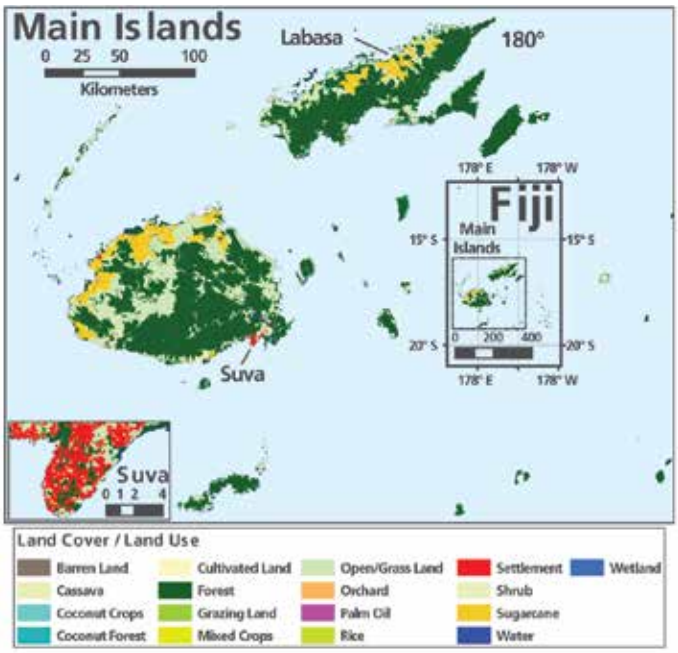
Economic Impact of Natural Disasters

Since 2003, climate-related hazards have caused damage and loss in Fiji estimated in excess of F$590 million (US$317 million) (Government of Fiji 2013c). This figure includes damage and loss from major events such as TC Ami in 2003, which resulted in estimated damages in excess of F$100 million (US$54 million). The costs associated with disasters pose problems for the government of Fiji, as the repair of national infrastructure following floods and other hazard events drains limited national financial resources.

In 2012 alone, Fiji experienced three major events with estimated total damage of F$146 million (US$78 million) (Government of Fiji 2013c). These include severe flooding in the areas of Ra, Tavua, Ba, Lautoka, Nadi, Nadroga, Sigatoka, and Rewa in January; even more intense flooding of the same areas in March; and TC Evan in December. The government of Fiji estimated that damage from the two 2012 floods was approximately F$71 million (US$38 million).

Total damage and loss from TC Evan in December 2012 was reported in the Post-Disaster Needs Assessment to be F$200 million (US$108 million); the recovery and reconstruction needs were estimated to be F$135 million (US$73 million). In comparison, the Initial Damage Assessment by the government

Figure 2 — Land Cover and Land Use in Fiji



Source: PCRAFI 2011.

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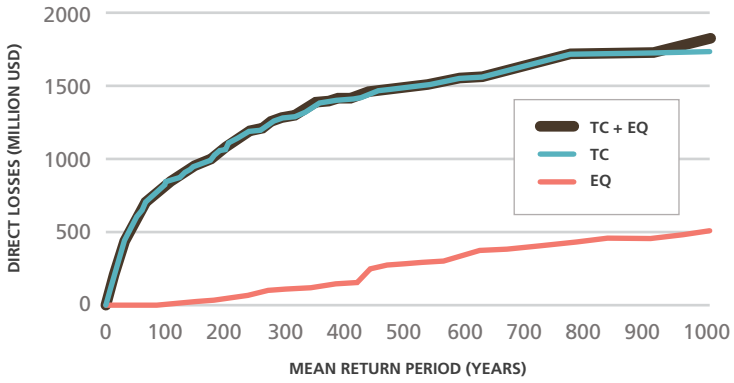
Figure 3 — Direct Losses by Return Period



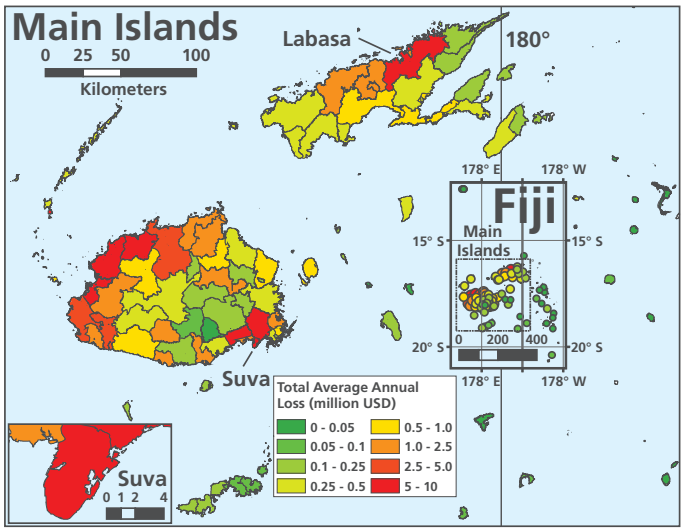
Source: PCRAFI 2011

Note: TC = tropical cyclone; EQ = earthquake.

estimated damage at approximately F$75 million (US$40 million) (NDMO 2012). TC Evan caused widespread damage to property, infrastructure, and crops in northern Vanua Levu and western Viti Levu.

Agriculture and tourism are major drivers of the Fiji economy, and both sectors are susceptible to damage from natural hazards. Agriculture was the most heavily impacted sector following TC Evan: it experienced damage and loss amounting to F$44 million (US$24 million), with 86 percent of damage occurring to the private sector and 14 percent to the public sector. Fiji has the largest tourism industry of any Pacific Island Country (PIC), and an estimated 24 percent of its population work in tourism (Scheyvens and Russell 2010). Because it relies heavily on coastal attractions, this sector is highly vulnerable to cyclones and their consequent storm surge, as well as disruptions to key transport links. Figure 2 shows Fiji's land use/land cover. The coastal location of fields for growing Fiji's main productive crop, sugarcane (depicted in yellow), suggests the extent of this crop's exposure and vulnerability.

Figure 4 — Average Annual Loss by Area



Source: PCRAFI 2011

Section 01

Fiji is expected to incur average annual losses over the long term of F$158 million (US$84 million) due to earthquakes and tropical cyclones. In the next 50 years Fiji has a 50 percent chance of experiencing a loss over F$1,500 million (US$806 million) and a 10 percent chance of a loss exceeding F$3 billion (US$1.6 billion) (see figure 3).

Figure 4 shows the average annual loss by area, with red indicating high levels of average annual losses—those with a range of US$5 million to US$10 million. The full risk profile for Fiji can be found in annex 4.

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Public Financial Management of Natural Disasters

By relocating members of staff to the NDMO to facilitate rapid execution of funds, the Ministry of Finance plays an integral role in disaster response. This practice has thus far been carried out on a goodwill basis, however, and is not formally documented or required. There is a risk that this could lapse should key individuals leave the department.

Fiji has a taken a proactive approach to DRFI and developed a finance manual for Disaster Management Council (DISMAC) operations. During TC Evan, an internal memo was produced that detailed disaster-related finance procedures and processes. This document has since been transformed into a finance manual that sets out a step-by-step process, details the structure of the operation, and establishes key focal points, processes, and procedures before and during the operation and the acquittal process.

Effective post-disaster financial response relies on two fundamental capabilities:

(a) The ability to rapidly mobilize funds post-disaster; and

(b) The ability to execute funds in a timely, transparent, and accountable fashion.

This section discusses the existing procedures for post-disaster budget mobilization and execution and where possible provides examples of their use.

Post-Disaster Budget Mobilization

The government of Fiji utilizes ex-ante financial instruments and combines these with innovative ex-post financial tools such as tax incentives to finance the costs of disasters. Fiji has established the National Disaster Relief and Rehabilitation Fund (NDRRF), also known as the Prime Minister's Fund, as well as the Rehabilitation Fund, which is an annual appropriation to the NDMO. To complement these ex-ante tools, the government implements ex-post financial tools, such as flash fund appeals and tax incentives to encourage donations from the private sector as well as members of the public. Budget reallocation reportedly takes between one and three months, but additional budget support, if required, can be provided to ensure the response effort continues (see Table 1).

Clauses 32 and 33 of the Finance Instructions 2010 detail the process for emergency purchases and immediate relief assistance, respectively.[3] They stipulate that when procuring goods and services, existing contracts with suppliers must be utilized; should a new supplier be needed, the normal legal purchase order process is waived and immediate payment is made to suppliers. Approval of the minister of finance is needed before emergency procurement operations can commence. Any such emergency expenditure should then be acquitted in a report back to the Ministry of Finance. The procedures for ongoing relief assistance and rehabilitation are set out in Clause 34 and include a transition phase back toward business-as-usual procedures.

While a member of staff from the Ministry of Finance is generally relocated to NDMO as part of the DISMAC to assist with emergency

Table 1— Sources of Funds Available

	SHORT TERM (1-3 MONTHS)	MEDIUM TERM (3-9 MONTHS)	LONG TERM (OVER 9 MONTHS)
Ex-post Financing			
Donor Assistance (relief)	■	■	
Budget Reallocation	■	■	
Domestic Credit	■	■	■
External Credit			■
Capital Budget Realignment			
Donor Assistance (reconstruction)			■
Tax Increase			
Flash Appeal			
Ex-ante Financing			
Emergency Fund	■		
Contingency Budget	■	■	
Contingent Credit			
Sovereign (parametric) Catastrophe Risk Insurance	■	■	
Traditional Disaster Insurance	■	■	■

Source: Government of Fiji; World Bank.

▲
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operations after a disaster, this transfer is not documented as a requirement. It is required, however, that a team leader from the Ministry of Finance be appointed and assume responsibility for verification of purchases before handover to DISMAC. The finance procedures and processes for DISMAC contain the authorization process and signatories for expenditures, a template for acquittals, and a process to begin seeking additional assistance once expenditures exceed 67 percent of the emergency budget.

The various ex-ante and ex-post financial tools used in Fiji take significantly different lengths of time to mobilize and execute. Building on the World Bank disaster risk financing and insurance framework (see annex 1), table 1 shows the ex-ante and ex-post financial tools available, indicates those utilized by Fiji, and gives indicative timings. The tools utilized by Fiji are highlighted in blue. Those sections highlighted in gray are for generic instruments that to date have not been used in Fiji.

Ex-Ante Practices and Arrangements

The uncertainty surrounding international assistance has put pressure on countries to establish domestic sources of finance for post-disaster relief, such as the establishment of national reserves or the transfer of risk to the international insurance market. Fiji's ex-ante practices and arrangements include budgetary appropriation, the NDRFF, a contingency budget, and external debt.

Budgetary appropriation

Since 2012 the National Disaster Management Office has received an annual budget of F$2 million (US$1 million) for rehabilitation work. When these funds were rapidly exhausted

following TC Evan, the NDMO requested a F$3 million (US$1.6 million) contingency fund to help with response. The NDMO would also like dedicated funds to be established at the provincial level to reduce the time lag for procuring urgent relief supplies.

National Disaster Relief and Rehabilitation Fund

In 2004 the National Disaster Relief and Rehabilitation Fund, also known as the Prime Minister's Fund, was approved by the cabinet. The NDRRF is held and managed by the Prime Minister's office, and monies from this account can be released when necessary in the wake of an event. It is utilized following a Statement of Natural Disaster and for response purposes only. It receives an annual contribution of F$1 million (US$540,000F$) from the government of Fiji. It is also possible for individuals and private sector entities to deposit funds into the account, which happens frequently throughout the year. This fund is able to accrue and the balance was F$2.2 million (US$1.17 million) as of October 1, 2013.

Following TC Evan, additional donations from the private sector, members of the public, and international partners totaled F$0.5 million (US$0.27 million). To assist with reconstruction in the housing sector, F$1 million (US$0.5 million) was allocated from the NDRRF.

Contingency budget

In 2014 a general reserve allocation of F$$5.3 million (US$2.9 million) was made for unforeseen and unavoidable expenditures. While some of this might be used to facilitate disaster response, it is unlikely that the whole amount would be available, given that the general reserves are drawn down from the beginning of the financial year.

External debt

In 2012 the ratio of debt to gross domestic product (GDP) in Fiji was 51.1 percent (IMF 2013), down from a ratio of 53.0 percent in 2011 (Government of Fiji 2013b). One-quarter of the stock of debt was attributable to external sources.

Fiji's level of external debt is set to decline significantly in 2016 if full settlement of its F$465 million (US$250 million) global bond is achieved; in 2013 the government's external debt sinking fund had a balance of F$238 million (US$128 million). The government still faces the challenge of a heavy maturity program of

Table 2— Fiscal Year 2013 Composition of Operating Payments

	FISCAL YEAR 2013 (F$ MILLION)	FISCAL YEAR 2013 (US$ MILLION)	% OF TOTAL BUDGET
Personnel	674	362	39.8
Commitments[a]	724	389	42.8
Operations[b]	294	158	17.3
Total budget	**1,692**	**910**	**100%**

Source: Government of Fiji; World Bank.

Note:

a. "Commitments" refers to the sum of transfer payments and interest.

b. "Operations" refers to the sum of supplies and consumables, purchase of outputs, and other operational costs.

domestic debt in the next five years (Government of Fiji 2013b).

Most of the budget deficit has been financed by domestic bonds, with the remainder being the drawdown of external loans. Economic and political uncertainties have constrained investment, including private sector and foreign direct investment, which averaged around 15 percent of GDP between 1996 and 2012 (IMF 2013). The successful conclusion of the 2014 election, however, is expected to boost investment as policy uncertainty is reduced.

Ex-Post Practices and Arrangements

Because disasters generally exceed a country's capacity to cope with them, there will always be a need for ex-post practices and arrangements. An optimal strategy for DRFI relies on a combination of ex-ante and ex-post financial instruments. Ex-post arrangements benefit from being able to establish the extent of the disaster and prioritize the response needs. As a result these arrangements take longer to implement than ex-ante arrangements, but they can often mobilize larger amounts of finance. This section discusses the ex-post practices and arrangements that have been made by Fiji.

Budget reallocation

The Financial Management Act 2004 under section 22 sets out the process for the redeployment[4] of funds. The minister of finance, subject to the approval of the cabinet, can reallocate funds in the Annual Appropriation Act. The reallocation should be laid out in a bill to be submitted for cabinet approval and is often based on the quarterly expenditure review. Given the reporting requirements, it is estimated that the redeployment of funds takes two to three weeks, although it reportedly took two to three months following TC Evan.

In 2012, the floods resulted in reallocation of almost 2 percent of the total budget. This equated to F$36.1 million (US$19.4 million). The majority of this money was to meet the flood rehabilitation and reconstruction requirements, which amounted to F$29.4 million (US$16 million), and a further F$6.7 million (US$3.6 million) went for other unbudgeted commitments.

A maximum of F$294 million (US$158 million), or 17.3 percent of operating payments, could potentially be reallocated following a disaster. The remainder of operating payments cannot be reallocated because it comprises personnel costs and commitments (see table 2).

Donor funds for relief and reconstruction

While donor funds will always be required, there will often be an element of uncertainty surrounding how much will be provided, what will be provided, and when funds will arrive in country. Consequently, overdependence on international relief as a source of post-disaster financing can create delays in the provision of initial relief and can inhibit ex-ante contingency planning. Development partners, international organizations, local nongovernmental organizations, businesses, and individuals contribute in the form of cash grants and aid in kind. The provision of aid in kind, while vital, can affect the costs borne by governments for the distribution these goods.

Following TC Evan, the government of Fiji received approximately F$9 million from international organizations, nongovernmental organizations, development agencies, local businesses, and individuals. Of this amount, 60 percent was provided as aid in kind, while the remainder was provided in the form of conditional cash grants (Government of Fiji 2013c).

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Tax incentives

The government of Fiji implemented tax concessions to encourage donations in the wake of TC Evan. A 200 percent tax deduction of the donation amount was available to those who contributed F$1,000 (US$540) and above into the NDRRF. In addition, duty-free status was applied to goods donated in kind.

Total Response Funds Available

Fiji has F$3 million (US$1.6 million) available in ex-ante instruments to facilitate disaster response. Fiji has established two sources of dedicated, yet limited, funds: the NDRRF, which can release up to F$1 million (US$0.54), and the recently established Rehabilitation Fund, which receives an annual appropriation of F$2 million (US$1 million). There is a 57 percent chance that Fiji will experience government emergency losses of F$3 million (US$1.6 million) or greater in any given year.

While Fiji has established some dedicated reserves, the funds are limited and will be exhausted quickly. To avoid any funding gap that could impede disaster response, it is recommended that Fiji consider the use of other ex-ante financial tools such as contingent credit. Fiji has expressed interest in participating in the Pacific Catastrophe Risk Insurance Pilot, but it could also benefit from insuring its critical public assets.

Post-Disaster Budget Execution

The Ministry of Finance developed a finance manual for the NDMO to help ensure that staff are aware of the correct post-disaster finance procedures. However, this document does not stipulate the need to reallocate staff from the Ministry of Finance to the NDMO and has not been approved by the cabinet. The document should be reviewed and approved by the cabinet in order to embed the good practices already established.

The government of Fiji reallocated F$7 million (US$3.7 million) from the national budget in 2012, equivalent to approximately 0.3 percent of the total budget (Government of Fiji 2013c). This money was used to finance the initial disaster response for TC Evan. Fiji's fiscal year is the same as the calendar year, and since the event happened in December, a further F$17 million (US$9.1 million) was reallocated from the 2013 budget, equivalent to 0.7 percent of total expenditures.

In September 2013, the government of Fiji, with support from the World Bank, conducted post-disaster needs assessment training in Suva, Lautoka, and Labasa. A total of 119 government staff have now been trained in this internationally recognized methodology—an achievement that demonstrates the dynamic environment that exists within Fiji for ongoing improvement in disaster response. Adopting a standardized approach to the post-disaster needs assessment will make it possible to produce these assessments more quickly and expedite access to additional donor support through the associated recovery and rehabilitation framework.

Figure 5 — Amount of Ex-Ante Funds Available for Immediate Response

Disaster risks	Disaster risk financing instruments	Amount of funds available
High-risk layer (E.G. Major earthquake, major tropical cyclone)	**Disaster risk insurance**	**N/A**
Medium-risk layer (E.G. Floods, small earthquakes)	**Contingent credit**	
Low-risk layer (E.G. Localized flood, landslides)	**Contingency budget, national reserves, annual budget allocation**	**Rehabilitation budget: F$2M** (US$1M) **NRRRF: F$1M** (US$0.5M)

Source: World Bank.

Insurance of Public Assets

The Fiji non-life (general) insurance market is the second-largest in the PICs, with a total premium of F$174.5 million (USD$93 million). Seven local insurers are currently operating with a total premium income of F$145.5 million. The balance of F$29 million (US$16 million) is equal to 17 percent of the market and is placed with offshore insurers by the four local brokers.

Fiji has legislation in place—the Insurance Act (1998) and regulations—to regulate the insurance industry. The Reserve Bank of Fiji (RBF) is the regulator. The RBF undertakes reviews to ensure that solvency margins are met, that there is adequate reinsurance protection in place for insured catastrophe risks, and that property and other accumulations are monitored. Offshore insurance placements must be approved by RBF before premium is remitted overseas.

Fiji is exposed to the catastrophic perils of cyclones and earthquakes. Fiji is in the Southern Hemisphere tropical cyclone zone. Earthquakes are known to have occurred in Fiji. The last major earthquake in a built-up area (Suva) was in 1953 and was large enough to trigger a tsunami.

The total general insurance market, in the context of the size of the Fijian economy and population, suggests relatively high insurance penetration. The country's non-life premium is approximately F$206 (USD$111) per capita, which is high for PICs. The commercial sector is the major contributor to this apparently high penetration, based on premium volume. Households remain largely uninsured.

Insurance for catastrophe insurance perils of earthquake and cyclone are available in the market and can be included in property insurance products. Cyclone insurance is available only as an extension to property policies once an engineer's certification of compliance with the building code has been received. Storm surge caused by cyclones is normally excluded. Earthquake is underwritten by insurers on differing bases. Tsunami is included as an earthquake peril by some insurers but excluded by others. Property insurance rates for the cyclone peril are around the Pacific average (0.30 percent); rates for the earthquake peril (0.08 percent) are lower than in most other Pacific countries.

The government of Fiji does not have a property insurance program in place for key public or infrastructure assets. This means that major transportation assets, such as roads and bridges, are uninsured, which could result in delays in reconstruction following a catastrophic event. Some ministries and departments may insure physical property assets on an individual basis.

Government-owned commercial companies and statutory authorities arrange their own insurance programs, including property insurance for key assets. Each public authority must make its own arrangements for property insurance. Most of these programs insure earthquake, but the cyclone insurance extension is not always taken.

Please refer to annex 3 for the full market insurance review that was conducted in Fiji.

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Options for Consideration

The government has well-documented processes and procedures for DRFI and has taken steps to improve the post-disaster budget execution procedures for the next event. To assist with the continuous improvement underway in Fiji, the following recommendations are suggested for consideration.

Recommendation 1: Finalize the existing finance manual for the NDMO and seek cabinet approval. Good progress has been made to develop and document current procedures. Some procedures, however, such as the relocation of staff from the Ministry of Finance to the NDMO during the initial response phase, are not currently included and should be added. It is important that staff know and understand the correct procedures to follow in the event of a disaster. A manual that brings together all relevant procedures in a single document and that has been approved by the cabinet would institutionalize current processes, and it would guard against the risk of lapse even if key staff members were to leave their positions.

Recommendation 2: Develop an overarching disaster risk financing strategy aligned to existing processes. Fiji has taken a proactive ex-ante approach to DRFI. The funds available are limited, however, and options for risk transfer should be considered. It is proposed that an overarching DRFI strategy be developed and endorsed by the cabinet. This would create a single document to articulate the available financing options and the associated policies behind these tools. An action plan for implementation activities is also recommended.

Recommendation 3: Identify assets to be included in an insurance program for critical public assets. This process would investigate existing insurance coverage provided in country and develop a table detailing coverage options by provider to assist with decisions about which assets to include and what appropriate coverage would be. Barriers to accessing catastrophe insurance would be identified, and solutions developed for facilitating appropriate coverage of critical public assets. This work would build on the annual insurance report produced by the RBF.

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End Notes

1 Figure is based on the 2012 projections by the Fiji Bureau of Statistics

2 Priority for Action 4—"Reduce the Underlying Risk Factors"—has an associated key activity of financial risk-sharing mechanisms, such as insurance, while Priority for Action 5—"Strengthen disaster preparedness for effective response at all levels"—includes the establishment of emergency funds such as contingency budget, national reserves, and annual budgetary allocations. See UNISDR (2005).

3 The Finance Instructions 2010 are available on the Ministry of Finance website at http://www.finance.gov.fj/legislation.html.

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Annex

Insurance Market Review, February 2014

Executive Summary

The Fiji non-life (general) insurance market is the second-largest in the Pacific Island Countries (PICs), with a total premium of F$174.5 million (US$94 million). Seven local insurers are currently operating with a premium income of F$145.5 million (US$78 million). The balance of F$29 million (US$15.6 million) is equal to 17 percent of the market and is placed with offshore insurers by the four local brokers.

Fiji has legislation in place—the Insurance Act (1998) and regulations—to regulate the insurance industry. The Reserve Bank of Fiji (RBF) is the regulator. The RBF undertakes reviews to ensure that solvency margins are met, that there is adequate reinsurance protection in place for insured catastrophe risks, and that property and other accumulations are monitored. Offshore insurance placements must be approved by RBF before premium is remitted overseas.

Fiji is exposed to the catastrophe perils of cyclones and earthquakes. Fiji is in the Southern Hemisphere tropical cyclone zone. Earthquakes are known to have occurred in Fiji. The last major earthquake in a built-up area (Suva) was in 1953 and was large enough to trigger a tsunami.

The total general insurance market, in the context of the size of the Fijian economy and population, suggests relatively high insurance penetration. The country's non-life premium is approximately F$206 (US$111) per capita, which is high for PICs. The commercial sector is the major contributor to this apparently high penetration, based on premium volume. Households remain largely uninsured.

Insurance for catastrophe insurance perils of earthquake and cyclone is available in the market and can be included in property insurance products. Cyclone insurance is available only as an extension to property policies once an engineer's certification of compliance with the building code has been received. Sea surge caused by cyclones is normally excluded. Earthquake is underwritten by insurers on differing bases. Tsunami is included as an earthquake peril by some insurers but excluded by others. Property insurance rates for the cyclone peril are around the Pacific average (0.30 percent); rates for the earthquake peril (0.08 percent) are lower than most other Pacific countries.

The government of Fiji does not have property insurance programs in place for key public or infrastructure assets. This means that major transportation assets such as roads and bridges are not insured, which could result in delays in reconstruction following a catastrophic event. Some ministries and departments may insure physical property assets on an individual basis.

Government-owned commercial companies and statutory authorities arrange their own insurance programs, including property insurance for key assets. Public authorities' property insurance is arranged by each individual public authority. Most of these programs insure earthquake, but the cyclone insurance extension is not always taken.

Insurance Market Overview

There are eight registered non-life (general) insurers in Fiji, with seven currently operating and one in run-off. These seven insurers and their company status are detailed in table 1. Of the seven insurers, QBE, New India, and Tower were reported to be the most active in the Fire (property) insurance class, which includes the catastrophe perils of earthquake and cyclone when underwritten. General insurers suffered significant losses in the Fire class in 2009 and 2012 due to cyclone and flood events.

The general insurance market has a total premium of F$174.5 million (US$94 million), which in the context of the size of the Fijian economy and population suggests relatively high insurance penetration(RBF 2012). However, examination of industry data indicates that the commercial sector is the major contributor to this apparently high penetration. Viewed on a premium volume basis, households remain largely uninsured. The seven local insurers currently have a combined premium income of F$145.5 million (US$78 million). The balance of F$29 million (US$15.6 million) is placed with offshore insurers by the four local insurance brokers.

The New India Assurance Company Limited is registered in India and has a branch in Fiji. Its financial strength rating, issued by A. M. Best on January 16, 2013, is A- (excellent). Concern was expressed by a source outside the insurance industry that New India (Fiji) was slow in paying major claims, possibly due to its branch status and

Table A.1— Non-life (General) Insurers Operating in Fiji 2012

COMPANY	COUNTRY OF INCORPORATION	COUNTRY OF OWNERSHIP	STATUS	FINANCIAL SECURITY
BSP Health Care (Fiji) Ltd.	Fiji	Papua New Guinea	Subsidiary	Local solvency
Dominion Insurance Co. Ltd.	Fiji	Fiji	Local co.	Local solvency
Fiji Care Insurance Co. Ltd.	Fiji	Australia	Subsidiary	Local solvency
New India Assurance Co. Ltd.	India	India	Branch	A. M. Best "A-" (excellent) & local solvency
Sun Insurance Co. Ltd.	Fiji	Fiji	Local co.	Local solvency
QBE Insurance (Fiji) Ltd.	Fiji	Australia	Subsidiary	Local solvency
Tower Insurance (Fiji) Ltd.	Fiji	New Zealand	Subsidiary	Local solvency

Source: RBF 2012; World Bank.

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the need to refer any major loss events to the head office in India.

QBE Insurance (Fiji) Limited is a wholly owned subsidiary of QBE Insurance Group Limited, an Australian company listed on the Australian stock exchange. As QBE (Fiji) is a subsidiary, it has no additional financial security in place beyond that provided under the solvency requirements of the Insurance Act. QBE (Fiji) does not have its own financial security rating. The ultimate parent, QBE Insurance Group Limited, has a security rating of A- from Standard & Poor's dated May 22, 2013, and an A+ rating for core operating entities.

Tower Insurance (Fiji) Limited is a wholly owned subsidiary of Tower Insurance Limited, a New Zealand registered company listed on the New Zealand and Australian stock exchanges. As Tower (Fiji) is a subsidiary, it has no additional financial security in place, other than that provided under the solvency requirements of the Insurance Act. Tower Insurance (Fiji) Limited does not have its own financial security rating. The parent, Tower Insurance Limited, has a security rating of A- (excellent) from A. M. Best dated July 26, 2013, in accordance with the New Zealand Insurance Prudential Supervision Act (2010).

All other local insurers are locally registered or subsidiaries with no financial security ratings, though all are in compliance with local insurance solvency regulation.

Offshore market

The main offshore insurers used for placement of Fiji risks are Lloyds and the associated London market. Placement is arranged by local brokers Aon, Marsh, and Insurance Holdings (a member of the Willis global network), all of which have international connections. The RBF must approve

Table A.2— Pacific Non-life Insurance Premium per Capita 2012 (US$)

MARKET	GDP MILLIONS	POPULATION	GDP PER CAPITA	MARKET PREMIUM	PREMIUM PER CAPITA
Cook Islands	$305	19,300	$15,823	$6,600,000	$342
Fiji	$3,908	874,700	$4,467	$97,500,000	$111
Marshall Islands	$182	52,560	$3,470	$3,000,000	$57
Samoa	$683	188,900	$3,619	$17,000,000	$90
Solomon Islands	$1,008	549,600	$1,130	$13,000,000	$24
Tonga	$471	104,900	$4,495	$4,400,000	$42
Vanuatu	$781	247,300	$3,182	$16,500,000	$67

Source: World 2014

all offshore placements and keeps comprehensive records of them. For the Fire (property) insurance class, the number and value of offshore placements of Fiji between 2010 and 2012 were as follows: in 2010, 64 offshore placements valued at F$14.8 million (US$8 million); in 2011, 72 valued at F$11 million (US$6 million); and in 2012, 71 valued at FJ $14.6 million (US$8 million) (RBF 2012).

Market penetration per capita

The non-life insurance industry contributes around 2.34 percent to the local GDP, and general insurance premium penetration was approximately US$111 per capita in 2012 (RBF 2012; World Bank 2012). A comparison to other Pacific Island countries is shown in table 2. These figures suggest relatively high insurance penetration in the Pacific context, although further information on number of household policies indicates that the commercial sector (notably tourism) is driving these figures, and that household insurance penetration remains very low.

Distribution channels

There is a wide variety of distribution channels available to market general insurance products in Fiji. These are discussed below.

Agents

There are 129 licensed general insurance agents, including banks (RBF 2012). Most of these agents are individual salespeople and act for specific insurers.

Bancassurance

Three trading banks have agency licenses under the Insurance Act: ANZ Banking Group Limited, Bank South Pacific, and Westpac Banking Corporation. All three have specific agency arrangements with Tower (Fiji).

Brokers

There are four licensed insurance brokers: Aon (Fiji) Limited, Marsh (Fiji) Limited, Unity Insurance Brokers (Fiji) Limited, and Insurance Holdings Fiji Limited. Aon, Marsh, and Insurance Holdings are all majority-owned by or have links with major international insurance brokering firms. The RBF (2012) records that F$137 million (US$74 million) of insurance premium is managed by brokers, which equates to 78 percent of the market. Insurance brokers therefore dominate the industry distribution channels on a premium basis.

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Direct

A number of the general insurers in Fiji offer insurance products on a direct basis for domestic household and motor vehicle insurance products. There are no online insurance services available in Fiji.

Catastrophe Risk Exposure and Capacity

Catastrophe risk insurance represents a particular challenge to insurers' exposure management, since unlike other types of insurance, it presents the possibility of large correlated losses. Insurers need to use a combination of reinsurance, reserves, and diversification within their portfolios to ensure that they can withstand large disaster shock losses without threatening their solvency.

The main catastrophe hazard in Fiji is tropical cyclone. Insurers are aware of the exposure and insure only those properties that meet the cyclone standard set out in the building code. In order to better underwrite the cyclone peril, local insurers require that buildings be inspected and certified by local structural engineers as complying with the cyclone code. This certification is then valid for seven years. Cyclone insurance is available only as an extension to property policies once the engineer's certification has been received. The average premium rate for cyclone extension is 0.30 percent of the total insured value, with deductibles ranging between 10 percent to 20 percent of the loss and a maximum based on the asset value. Sea surge caused by cyclones is normally an excluded peril, even when the cyclone extension is given, but limited sub-limit coverage for sea surge is available for some major commercial accounts.

Earthquake as a peril is underwritten by the insurers on differing bases. Some offer it as an automatic peril with full sum insured, and others offer it with a peril-specific limit (sub-limit) applied to restrict the insurer's exposure. The average premium rate for the earthquake peril was 0.08 percent of total insured value, although this rate varies if a sub-limit is used. Deductible for earthquake was generally 10 percent of sum insured, with a minimum of F$2,000. Tsunami is included as an earthquake peril by some insurers but excluded by others.

Properties are insured on either a replacement or indemnity value basis. Policies are subject to underinsurance where the value declared as sum insured is less than 80 percent of the correct value. To avoid underinsurance, insured entities should obtain replacement valuations and have these updated every three to five years.

Access to catastrophe insurance

By comparing the consolidated data in the RBF Insurance Annual Report (RBV 2012) to the data in the Fiji risk profile (PCRAFI 2011), it is possible to determine insurance market penetration. The insurance report indicates that 14,792 household policies were issued along with 4,192 Fire (commercial property) policies. The country risk profile asset counts give counts of 240,958 for residential and 25,178 for public and commercial. Comparing the policy numbers and profile asset count is not comparing like for like, but still provides some general guidance into insurance market penetration.

On the basis of this comparison, the approximate residential property insurance penetration is around 6 percent and the public/commercial penetration 17 percent. This finding suggests that the majority of houses in Fiji are not insured for catastrophe events. Anecdotal evidence would suggest that the cost of premiums is the main factor in residents' decision not to insure their homes. Insurance penetration is better in the commercial sector, but is still low, with the majority of businesses uninsured based on this analysis.

Market capacity

The local market has no major limitations on property and catastrophe capacity. Three major property insurers, QBE, Tower, and New India, offer high acceptance limits, and other insurers offer lower property capacity for smaller accounts. There is additional capacity available by way of offshore placements if needed. Industry sources advised that most of these are property offshore placements for large commercial and outer island

Photo Credit Kyle Post/ Flickr

Box 1— Reinsurance Programs

New India Assurance Company Limited in Fiji operates as a branch. According to the company 2012 annual report, each of the company's overseas branches makes its own reinsurance arrangements. The report also indicates that there is additional excess of loss (reinsurance) protection for the company as a whole (New India Assurance Limited 2012).

QBE (Fiji) is reinsured for catastrophe events under the QBE Group reinsurance program. QBE Group has a detailed risk management process (QBE Insurance Group Limited 2012) that includes monitoring of catastrophe claims concentration and reinsurance protection to mitigate the exposures.

Tower (Fiji) is reinsured for catastrophe events under the Tower Insurance Limited Group reinsurance program. Tower (Fiji) has determined that its predominant catastrophe exposures are cyclones and earthquakes, with the main accumulation on the main island of Viti Levu. The Tower Group advised that reinsurance costs have increased in the 2011/12 financial period (Tower Insurance Ltd 2012). Tower Group also confirmed that it has risk management procedures in place to identify natural hazard exposures and where necessary purchases reinsurance to protect against the potential catastrophe financial exposures.

Public information is not available on the reinsurance arrangements of the other general insurers in the Fiji market—that is, BSP Health Care (Fiji) Limited, Dominion Insurance Company Limited, Fiji Care Insurance Limited, and Sun Insurance (Fiji) Limited. The 2012 Key Disclosure Statements for these companies all included reinsurance premiums, and RBF reviews their reinsurance programs.

tourism risks that are underwritten by the London and Lloyd's market or by large international insurers in the New Zealand market. These placements are arranged by locally registered international insurance brokers and approved by RBF.

Local insurance brokers surveyed advised that property catastrophe insurance capacity is readily available in the country, although insurers are at times selective in accepting risk. They reported that for major individual property risks they had limited choice, as the major property insurers were the only companies with large capacity for those accounts. Many of the outer island tourism risks are placed offshore because local insurers are reluctant to accept these risks, given the potential losses from cyclone, sea surge, and tsunami.

Reinsurance

RBF requires general insurers to submit a reinsurance management strategy as part of their license renewal. RBF reviews the submitted strategies as required by Section 39 of the Insurance Act. Local insurers must submit gross aggregate amounts (a summary of how much risk they have taken on) for each class of business by division, within Fiji and outside Fiji. The main property risk accumulations are located within the Western and Central Divisions on the main island of Viti Levu. According to the RBV Insurance Annual Report (RBV 2012), reinsurance reinstatement premiums of F$17.8 million (US$9.6 million) were reported by the industry following the 2012 catastrophe events, meaning that reinsurance programs were claimed upon for these events.

In 2011, natural catastrophe insured losses in the global reinsurance market were the second-largest ever, at over US$110 billion (Swiss Re 2012). What made this year significant for insurers (and reinsurers) in the Pacific was the number of events that occurred in the Asia Pacific region: earthquakes in New Zealand and Japan, floods in Australia and Thailand, and a cyclone in Australia. According to the Global Insurance Market Report (IAIS 2012), these Asia Pacific events accounted for 61 percent of the insured losses from natural catastrophes in 2011, compared to a 30-year average of 18 percent. As a consequence, there

Box 2— Past Catastrophe Events

Cyclone

In December 2012, Cyclone Evan caused significant damage in Fiji's Western Division. A total of 977 insurance claims valued at F$56.7 million (US$30 million) were lodged after the event. In 2009, Cyclone Mick caused damage totaling F$15.2 million (US$8 million); a total of 240 insurance claims were lodged after this event (RBF 2012).

Earthquake and tsunami

There have been no major earthquake insurance events reported in Fiji in recent years. The last major damaging earthquake in Fiji was a magnitude 6.7 earthquake on September 14, 1953, off the south coast of Viti Levu near Suva (Houtz 1962). Local loss adjusters also advised that over the last 20 years there have been only minor earthquake claims reported.

Other catastrophe events

Fiji has suffered from three major flood events, one in 2009 and two in 2012. In the 2009 flood, 418 property insurance claims were lodged in the Western Division for a total value of F$28.5 million (US$15.3 million). In 2012, the two flood events were also in the Western Division; 838 claims were lodged following these floods for a total value of F$33 million (US$18 million) (RBF 2012).

Catastrophe event insurance impact

The three major property insurers—QBE (Fiji), New India, and Tower (Fiji)—all reported net accounting losses in their Key Disclosure Statements for the 2012 period (RBF 2012). These losses resulted from claims following Cyclone Evan and the two Western Division (Nadi) flood events in 2012 and brought the final Fire net claims ratio to 195.7 percent. According to industry sources, offshore insurers also suffered significant property losses as a result of claims from Cyclone Evan, particularly in outer island tourist resorts. A significant number of claims were lodged in 2009 as a result of Cyclone Mick and the Nadi flood event.

Local insurers have expressed concern at the increasing frequency of cyclones and floods in recent years. They are also aware of the potential for a local earthquake or tsunami event.

On the basis of these major property claims in recent years, it is likely that Fire class insurance premiums will rise over the next one to two years. Property insurers may also take underwriting action or withdraw coverage completely from exposed areas such as the Western Division floodplains and Nadi Township.

were adjustments in reinsurance capacity and higher risk premiums. In 2012 the natural disaster losses dropped to US$77 million (Swiss Re 2013), but this was still the third-highest year for natural catastrophe insured losses since 1970. In the Pacific, Tropical Cyclone Evan caused insured losses of F$57 million in Fiji (RBF 2012) and estimated insured losses of SAT 3 million in Samoa in December 2012.

Products

There are no specific catastrophe insurance products available in the Fiji market. The following property and engineering insurance products include the catastrophe perils of earthquake and tsunami. Cyclone insurance is not automatically available and is included only as an extension to property policies once an engineer's cyclone certification has been received.

Industrial Special Risks (ISR) policies are used for property insurance on all major commercial, government, public authority, and government commercial companies. Each major property insurer has its own ISR version, and most brokers use agreed-upon ISR wordings for their clients. The wordings are generally based on the Australian Mark IV, London market, or Papua New Guinea market ISR wordings.

A major limitation of the ISR wording for governments is that infrastructure assets such as roads, bridges, and wharves are specifically

excluded. Local insurers and insurance brokers advised that it was common practice, on major commercial accounts, to include smaller infrastructure items in an ISR schedule and waive the exclusion. Major infrastructure items, however, would need to be insured under a Completed Civil Works policy.

Commercial Package or Business Protection policies are used for small and medium enterprises and are offered as either a Multi Risks (accidental damage including earthquake and cyclone by extension) or as a Specified Risks (fire and basic perils). These generally follow the perils insured under the ISR, although coverage tends to be more restrictive.

Contract Works insurance is available for property under construction and may be extended to insure construction of infrastructure assets.

Completed Civil Works insurance for infrastructure assets is not a commonly available product in the Fiji market. Given that smaller infrastructure assets can be insured under ISR, the specialist Completed Civil Works product is less needed than it otherwise would be.

Insurance Law and Regulation

The current insurance legislation in Fiji is the Insurance Act (1998) and regulations. According to RBF, a review of the act is currently in progress. In addition to the act and regulations, RBF provides a number of insurance supervision policy statements on various aspects of insurance regulation.

Local non-life insurers are required to maintain a minimum solvency ratio of no less than F$1 million, or 20 percent of net premium, or 15 percent of net claims outstanding (RBF 2012). In addition, RBF reviews reinsurance management strategies annually, undertakes on-site examinations of licensed insurers and brokers, and obtains accumulation details from insurers on classes of insurance written in each division (region) of the country. There is no requirement for a catastrophe reserve to be held, and current solvency requirements do not take into account catastrophe risk exposures or any quantification of probable large losses from disaster events.

RBF (2012) reports that the general insurance industry has a combined solvency surplus of FJ$71.9 million (US$39 million), compared to the minimum required solvency margin of F$20.6

Photo Credit
Kyle Post/Flickr

Box 3— Fiji Electricity Authority

FEA has a comprehensive enterprise risk management process in place to identify risks and take action to mitigate those risks. According to FEA, this process allowed it to secure a favorable property insurance renewal in September 2012, in spite of a volatile property insurance market (FEA 2012). FEA advised that the Electricity Act has a clause requiring it to insure its assets. It maintains two asset registers, one for accounting purposes and one for insurance replacement purposes. It undertakes a review of asset replacement values on a regular basis (the last was undertaken in 2008, and a new valuation is due in 2014). FEA management is aware of sub-limits under its ISR insurance for cyclone and sea surge. Overall cyclone limit is F$20 million (US$11 million) per event and F$40 million (US$22 million) on an annual aggregate basis, with specific limits for wind farm and exclusion for transmission and distribution lines. The earthquake peril is insured on a full sum insured basis. FEA self-funds against potential losses below its agreed-upon deductible levels and for any excluded property items.

million (US$11 million). RBF did note that due to the catastrophic claims events of 2012, the general insurance solvency surplus fell that year by F$8.1 million (US$4 million).

The comprehensive annual analysis of the insurance industry that RBF undertakes demonstrates a high level of supervision and a comprehensive understanding of the insurance market.

From 2012 insurers were required to provide public Key Disclosure Statements. These statements are available on insurer websites and within the RBF Insurance Annual Report. Their aim is to allow transparent financial comparisons to be made between insurers.

Fiji is not listed as a member of the International Association of Insurance Supervisors (IAIS).[1] Membership in IAIS would allow Fiji to access international best practice information on insurance regulation and supervision.

Building Control and Standards

The legal basis for all construction in Fiji is the National Building Code (2004). A local engineer in Suva, who undertook cyclone inspections for insurers, advised that the code became law in August 2004. The code is understood to use Australian and New Zealand standards as a basis, including the New Zealand earthquake code (NZS4203) and Australian wind loads (AS1170.2) for cyclone code. In the engineer's view, most commercial and government buildings constructed after 2004 are probably in accordance with the code. There is some uncertainty about who acts as the final certifier of constructed buildings; the Ministry of Health, Ministry of Works, and local authorities all have some involvement in the construction approval process.

Insurers expressed concern that the code was not always enforced, and they questioned why the Ministry of Health—which does not appear to have the necessary engineering technical expertise in this area—is authorized to sign off on building construction. The insurance industry also had concerns that local authorities were allowing construction to take place on known floodplains and in areas that were exposed to sea surge and tsunami.

Insurers have taken proactive steps to ensure cyclone building standard compliance by requiring engineering certificates for insured properties, rather than relying on the government's enforcement of the building code.

Box 4— Fiji Ports Corporation Limited

FPCL advised that it has no formal risk management plan or risk register in place. It did review some of its key risks with its insurance broker, Marsh Fiji, and attended a disaster management workshop presented by Marsh Fiji in the past. FPCL has an asset register in place; the last revaluation was completed in 2012. These valuations give the reinstatement values of all wharves and buildings under its ownership. FPCL's property insurance program was placed by Marsh Fiji with AIG NZ. FPCL was aware that the property program insured the catastrophe peril of earthquake only and that cyclone was excluded. The policy had a first loss limit of F$150 million (US$81 million) and one event, and the deductible was 2.5 percent of site value, with a minimum of F$500,000 (US$269,000).

FPCL made a decision not to insure for cyclone because the additional premium costs would have been F$500,000 (US$269,000) per year, whereas its actual losses in December 2012 from Cyclone Evan were only F$100,000 (US$54,000). It is aware of the 1953 earthquake and has obtained engineering reports on the earthquake resistance of major wharves. In 2005 strengthening was carried out to the Suva wharf and (when the extension was completed) to the Lautoka wharf, in both cases with consideration for the seismic risk.

FPCL management did consider that it would be useful if the Ministry of Finance issued guidelines on insurance requirements for government-owned companies.

Insurance of Public Assets

Fiji has no formal government risk management or risk financing strategy in place to provide guidance on which risks are to be retained and which transferred or financed (including by traditional insurance).

There is no program in place to insure government key property assets against the catastrophe perils of cyclone, earthquake, and tsunami. Only one government department, the Fiji Revenue Customs Authority, is reported to have property insurance for a government building.

The Ministry of Finance currently has a project underway to prepare an asset register of all government physical assets; the goal is to complete the project by 2014. The main reason to compile the asset register is to provide an accounting value for the included assets, although the register could also record the replacement value of property assets for insurance purposes. Once the asset register is completed, it would be possible to identify key property assets that the Government wish to insure. Fiji also has no central register recording existing insurance of public assets.

Government-owned commercial companies and statutory authorities arrange their own insurance programs, including property insurance for key assets. The insurance broker used for the majority of these programs is Marsh (Fiji), with various local insurers and offshore placements also used. Those entities with property insurance programs are advised by their brokers to have assets revalued at least every three years.

A government statutory authority, Fiji Electricity Authority (FEA), and a commercial company, Fiji Ports Corporation Limited (FPCL), were selected by the Ministry of Finance to operate key government infrastructure assets. Managers of the two entities were interviewed to gain an understanding of their risk management processes and of the risk financing arrangements they have in place, including property insurance.

It is not possible from a sample of only two entities to reach conclusions about the property insurance programs of all other statutory authorities and state-owned enterprises. It is possible that the catastrophe peril of cyclone is generally not insured, both because of the engineering certificate required and because of

the high premium cost of the cyclone insurance extension. Thus there is a potential contingent liability for the government should a major cyclone occur, particularly if the main island of Viti Levu (Central and Western Divisions) were to be directly impacted. A full survey of the property insurance programs for statutory authorities and state-owned companies would need to be undertaken to determine if this assumption of a contingent liability is correct.

Options for Consideration

Recommendation 1: An integrated DRFI strategy should be developed by the government. The strategy should identify key public assets and provide agreed-upon retention limits for individual departments, public authorities, and state-owned enterprises. It should also consider a number of risk financing and transfer options, such as captive insurance, regional risk pooling, and both parametric and indemnity insurance.

Recommendation 2: Any DRFI strategy that is developed should integrate current indemnity property insurance held by various government-owned commercial companies, statutory authorities, and some ministries and departments. Existing indemnity insurance should be reviewed to ensure that the government, statutory authorities, and commercial companies are getting the best available coverage, terms, and conditions for the premiums paid. Particular consideration should be given to the insurance of public assets from the perils of earthquake/tsunami and cyclone/sea surge.

Recommendation 3: The government should ensure both that the current project to set up a central key asset register is integrated with any DFRI strategy, and that the asset register is updated regularly. There is currently no central asset register of public property owned by statutory authorities or commercial companies. Asset registers are held by the individual statutory authorities and commercial companies. A consolidated register would allow the government to accurately determine the aggregate asset exposure to catastrophe events and formulate appropriate risk financing responses.

Recommendation 4: The government should set up a central insurance register as part of the DFRI strategy and update the register as insurance contracts fall due. There is currently no central register of insurance held by the government in respect of property insurance in place for individual government departments, statutory authorities, and commercial companies.

Recommendation 5: The Reserve Bank of Fiji should consider applying for membership in the International Association of Insurance Supervisors. Membership would allow the RBF to access international best practice information on insurance company regulation and supervision.

End Notes

1 IAIS members are listed at http://www.iaisweb.org/About-the-IAIS/IAIS-members-31 (accessed January 20, 2014).

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Glossary

Agent	Someone who acts for the insurance company in arranging insurance contracts. There are two main types of agents: tied agents, who act for one insurer only, and general agents, who act for multiple insurance companies.
Broker	Someone who acts as an agent for the insured in arranging an insurance or reinsurance program with a provider of capacity.
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.
Captive insurer	An insurance company wholly owned by a company or entity that insures the risks of the parent entity and subsidiaries.
Indemnity insurance	Insurance that reimburses individuals or entities for loss or damage to a financial position as close as possible to the position they were in prior to the event, in the context of the financial terms of the coverage (such as deductible/excess and limit).
Intermediaries	The general term given to insurance agents and brokers.
Net retention	The amount that an insurance company retains on a reinsurance contract and in particular an excess of loss of contract.
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. May also be called 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.
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.
Solvency margin	The extent by which an insurer's assets exceed its liabilities. Minimum statutory solvency requirements are normally included in insurance acts or regulations.

Country Note

COOK ISLANDS

February 2015

Disaster Risk Financing and Insurance

CHAPTER 02

GFDRR

SPC Secretariat of the Pacific Community

WORLD BANK GROUP

Executive Summary

The Cook Islands is composed of 15 islands, spread across nearly 2 million km2 of territorial waters. The geographic spread of the Cook Islands poses logistical problems for any necessary post-disaster relief and response efforts. The 2011 census estimated the resident population of the Cook Islands at approximately 14,974 people, with a further 2,820 temporary residents. Approximately three-quarters of the population lived in Rarotonga. The geographic spread of the population makes initial disaster response to the outer islands expensive and further burdens already-constrained public finances.

The events of 2005 demonstrated that the Cook Islands is extremely vulnerable to the threat of tropical cyclones (TCs): in the two months of February and March 2005, TCs Meena, Nancy, Olaf, Percy, and Rae swept the country. Four of these cyclones reached the maximum category 5 rating and caused severe damage to infrastructure and agriculture (Cyclone Recovery Committee 2006).

The Cook Islands is expected to incur, on average, about NZ$6 million (US$4.9 million) per year in losses due to tropical cyclones. In the next 50 years, the Cook Islands has a 50 percent chance of experiencing a per-event loss exceeding NZ$97 million (US$79.5 million), and a 10 percent chance of experiencing a per-event loss exceeding NZ$327 million (US$268 million) from tropical cyclones. Tropical cyclones are the predominant peril impacting the Cook Islands; Pacific Catastrophe Risk Assessment and Financing Initiative (PCRAFI) catastrophe models indicate negligible losses from earthquake and tsunami.

The Cook Islands has a proactive approach to disaster risk financing and insurance (DRFI), which is supported by the upper echelons of government. In January 2011, the prime minister in his role as chair of the National Disaster Risk Management Council requested that the Ministry of Finance and Economic Management look at ways to become self-reliant in initial disaster response and generate new income streams for investment in a fund specifically for disaster management response and recovery.

The Cook Islands has available a maximum amount of NZ$5.6 million (US$4.6 million)—in the form of contingency funds and catastrophe risk insurance—to facilitate disaster response. This amount is equivalent to 4 percent of gross total appropriations and 1.7 percent of gross domestic product in 2011. The probability in any year that disaster losses could exceed these contingency funds is estimated at 4.9 percent. The government has dedicated, yet limited, funds that can be accessed following an event.

A number of options for further improving the Cook Islands' financial protection against disasters are presented for consideration:

(a) the development of an integrated DRFI strategy;

(b) investigation of using contingent credit to access additional liquidity post-disaster;

(c) development of an operations manual for post-disaster budget mobilization and execution; and

(d) the identification of assets to be included in an insurance program for critical public assets.

Introduction

The Cook Islands is composed of 15 islands, spread across nearly 2 million km2 of territorial waters. The geographic spread of the Cook Islands poses logistical problems for any necessary post-disaster relief and response efforts. The 2011 census estimated the resident population of the Cook Islands at approximately 14,974 people, with a further 2,820 temporary residents. Approximately three-quarters of the population lived in Rarotonga. The resident population has been in a slow but generally steady decline since 1965 as a result of outward migration. The government views outward migration as a major threat to sustainable development. A steady increase in the number of migrant workers, primarily in the tourism industry, has acted as a counter to out-migration.

Events of early 2005 demonstrated that the Cook Islands is extremely vulnerable to the threat of tropical cyclones (TCs): in the two months of February and March 2005, TCs Meena, Nancy, Olaf, Percy, and Rae swept the country. Four of these cyclones reached the maximum category 5 rating and caused severe damage to infrastructure and agriculture (Cyclone Recovery Committee 2006).

The government of Cook Islands, in conjunction with the Secretariat of the Pacific Community Applied Geoscience Division (SPC-SOPAC), the Secretariat of the Pacific Regional Environment Programme (SPREP), the United Nations Development Programme (UNDP) Pacific Centre, the United Nations International Strategy for Disaster Risk Reduction (UNISDR), and other partners, has developed several institutional frameworks on disaster risk management and climate change adaptation at the national, subregional, and international level, including the following:

- Hyogo Framework for Action (HFA) 2005–2015
- Pacific Disaster Risk Reduction and Disaster Management Framework for Action (Regional Framework for Action, or RFA) 2005–2015
- National Action Plan (NAP) for Disaster Risk Management, 2009–2015
- Joint National Action Plan (JNAP) for Disaster Risk Management and Climate Change Adaptation, 2011–2015

The JNAP cites the creation of sustainable national financing mechanisms for disaster risk management and climate change adaptation as a priority for action (Government of Cook Islands 2011). This goal has been carried forward from the NAP, and a great deal of progress has been made in the Cook Islands toward establishing sustainable sources of finance for these areas, including establishment of the Emergency Response Trust Fund (ERTF) in 2011.

Disaster risk financing and insurance (DRFI) is a key activity of the HFA Priorities for Action 4 and 5. [1] The HFA is a result-based plan of action adopted by 168 countries to reduce disaster risk and vulnerability to natural hazards and to increase the resilience of nations and communities to disasters over the period 2005–2015. In the Pacific, the HFA formed the basis for the development of the Pacific Disaster Risk Reduction and Disaster Management Framework for Action (Regional Framework for Action, or RFA).

The Regional Framework for Action cites DRFI activities as a key national and regional activity. Theme 4—"Planning for effective preparedness, response and recovery"—has an associated key national activity, "Establish a national disaster fund for response and recovery." Theme 6 of the RFA—"Reduction of underlying risk factors"—cites the development of "financial risk-sharing mechanisms, particularly insurance, re-insurance and other financial modalities against disasters" as both a key national and regional activity (SOPAC 2005). These regional implementation activities align with the three-tiered disaster risk financing strategy promoted by the World Bank.

The Pacific Disaster Risk Financing and Insurance (DRFI) Program enables countries to increase their financial resilience against natural disasters by improving their capacity to meet post-disaster funding needs without compromising their fiscal balance. This program is one application of the Pacific Catastrophe Risk Assessment and Financing Initiative (PCRAFI). The Pacific DRFI program is built upon a three-tiered approach to disaster risk financing. These layers align to the basic principles of sound public financial management, such as the efficient allocation of resources, access to sufficient resources, and macroeconomic stabilization. The three tiers acknowledge the different financial requirements associated with different levels of risk:

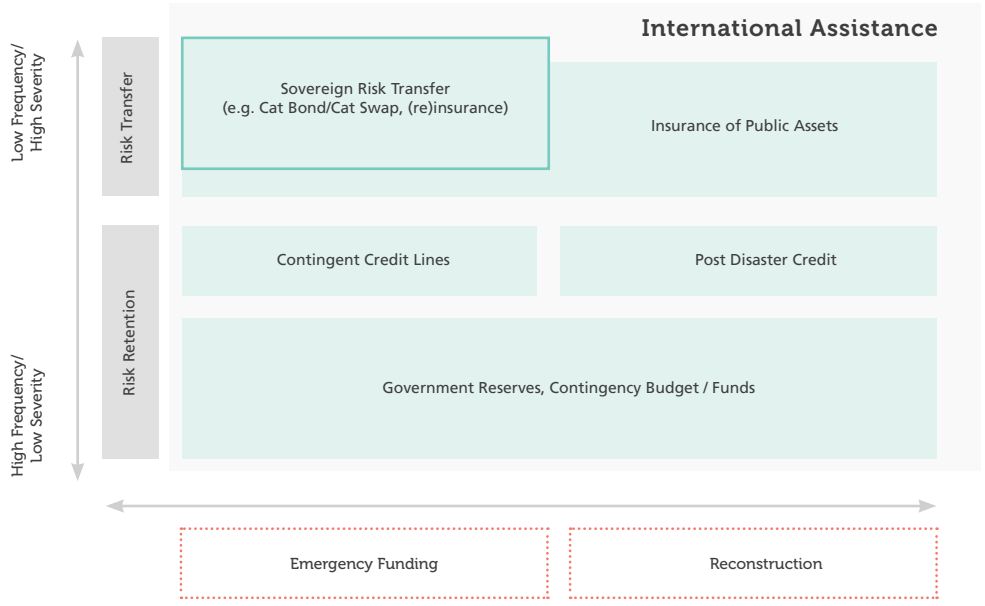
(a) Self-retention, such as a contingency budget and national reserves, to finance small but recurrent disasters;

(b) A contingent credit mechanism for less frequent but more severe events; and

(c) Disaster risk transfer (such as insurance) to cover major natural disasters. See figure 1.

This report aims to build an understanding of the existing DRFI needs and tools in use in the Cook Islands. Specifically, it aims to encourage peer exchange of regional knowledge through dialogue on past experiences, lessons learned, optimal use of these financial tools, and their effect on the execution of post-disaster funds.

Figure 1 — Three-Tiered Disaster Risk Financing Strategy *Source:* World Bank 2010.



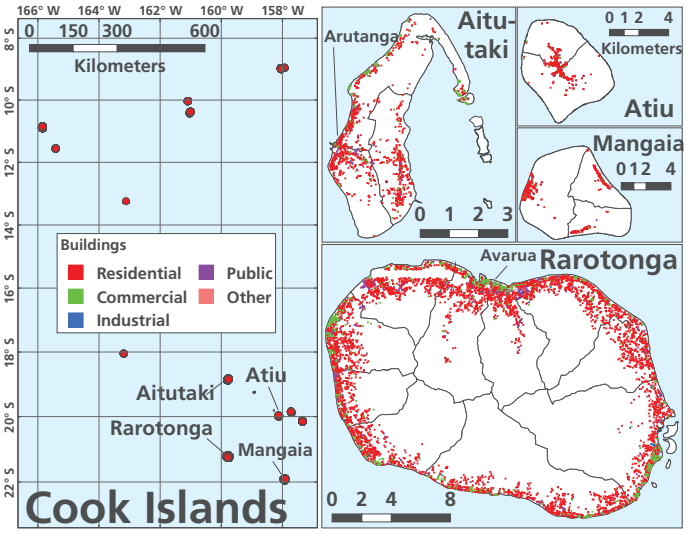
Economic Impact of Natural Disasters

Since 1955 the Cook Islands has experienced a total of 28 natural disasters that have cost in total approximately NZ$65.4 million (US$53.6 million) (SPC-SOPAC 2011). Cyclones account for 86 percent of past disasters (24 of 28), with epidemics and earthquakes accounting for 11 percent and 4 percent, respectively (SPC-SOPAC 2011). Of the NZ$65.4 million (US$53.6 million) in disaster loss recorded in the Cook Islands, 100 percent is attributable to tropical cyclones. It should be noted that the cost of disasters presented above reflects only 10 cyclone events.

Because of its high exposure to severe tropical cyclones, the Cook Islands is among the 30 countries that experience the highest average annual disaster-related losses in terms of gross domestic product (GDP). Average annual disaster-related losses in the Cook Islands are estimated at 2 percent of GDP (World Bank 2011).

The recovery and reconstruction program following TC Pat (2010) was equivalent to 10 percent of national revenue in 2012 terms, or 3.5 percent of GDP. In 2012, tax revenue was

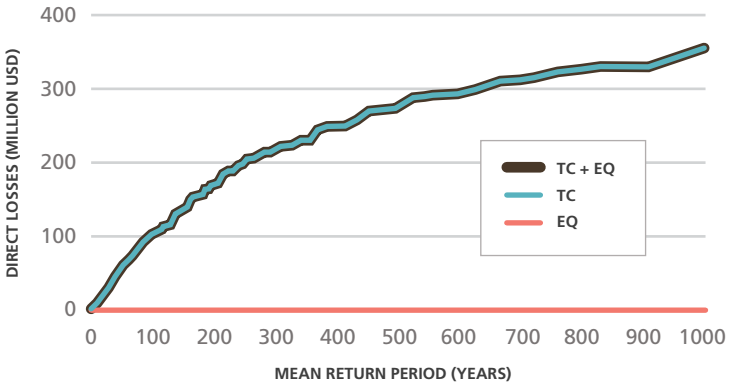
Figure 2 — Building Locations



Source: PCRAFI 2011.

Section 02

Figure 3 — Direct Losses by Return Period



Source: PCRAFI 2011

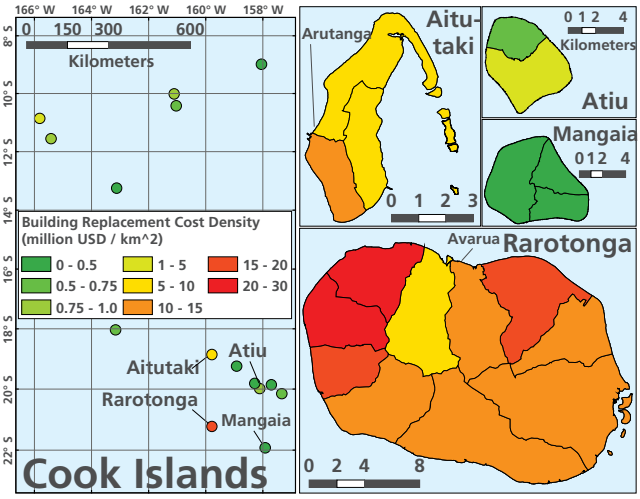
Note: TC = tropical cyclone; EQ = earthquake.

approximately NZ$100 million (US$81.9 million). This narrow revenue base poses problems for stable public financial management in the Cook Islands, just as it does for many other Pacific Island Countries (PICs).

The economy is driven by tourism, pearl farming, fishing, and agriculture, all of which are susceptible to adverse weather conditions. Emigration poses problems for skilled labor-force availability to support the tourism industry, in particular, and it has led to an increase in the number of migrant workers in the tourism sector. Notwithstanding these issues, the Cook Islands is among the best-performing Pacific economies, with GDP per capita around NZ$15,477 (US$12,686) in 2012 (ADB 2013).

The build-up of assets along the coastline of the capital, Rarotonga, has increased the country's vulnerability and exposure to damage from tropical cyclones and storm surge (see figure 2). Coastal construction has been driven by the tourism industry, which seeks to offer tourists direct access to the waterfront. The risk of damage from tropical cyclones and storm surge has increased with this development, since many natural barriers that protect the coastline have been removed to create uninterrupted views of the ocean.

Figure 4 — Average Annual Loss by Area



Source: PCRAFI 2011

Section 02

The Cook Islands is expected to incur, on average, about NZ$6 million (US$4.9 million) of losses per year due to tropical cyclones.

In the next 50 years, the Cook Islands has a 50 percent chance of experiencing a loss exceeding NZ$97 million (US$79.5 million) and a 10 percent chance of experiencing a loss exceeding NZ$327 million (US$268 million) (see figure 3).

Figure 4 shows the modeled average annual loss by area, with red indicating high levels of average annual losses—in the range of NZ$0.6 million to NZ$0.8 million (US$0.49 million–US$0.65 million). The full risk profile can be found in annex 4.

Public Financial Management of Natural Disasters

In 2007, Emergency Management Cook Islands (EMCI) was moved from the supervision of the police to the Office of the Prime Minister (OPM). This move gave EMCI greater political visibility and resources: its annual budget allocation more than doubled, from NZ$46,000 (US$37,700) in 2006 to NZ$102,000 (US$83,600) in 2007. The budget allocation for the 2013 financial year was NZ$105,542 (US$87,500) for operational and capital costs.

The Cook Islands has a proactive approach to DRFI, which is supported by the upper echelons of government. In January 2011, the prime minister in his role as chair of the National Disaster Risk Management Council requested that the Ministry of Finance and Economic Management (MFEM) look at ways to become self-reliant in initial disaster response and generate new income streams for investment in a fund specifically for disaster response and recovery.

The demand for self-reliance followed a delayed response to TC Pat in 2010, which caused widespread devastation on the island of Aitutaki. National agencies wanted to respond but could not access the funds needed to facilitate action.

Effective post-disaster financial response relies on two fundamental capabilities:

(a) The ability to rapidly mobilize funds post-disaster; and

(b) The ability to execute funds in a timely, transparent, and accountable fashion.

This section discusses the Cook Islands' existing procedures for post-disaster budget mobilization and execution and where possible provides examples of their use.

Post-Disaster Budget Mobilization

The MFEM is heavily involved in disaster response, and the financial secretary sits on the Response Executive, a committee that is required to report directly to the cabinet. The role of the Response Executive is to provide advice and support to ensure effective emergency response and initial relief coordination. It is primarily concerned with systematic acquisition and distribution of resources in accordance with requirements imposed by the national emergency or declared disaster.

Following response to TC Percy in 2005 and TCs Pat and Oli in 2010, the MFEM has taken an ex-ante approach to DRFI. To help finance immediate relief, it has established NZ$500,000 (US$409,000) in dedicated domestic reserves (the ERTF) and has purchased catastrophe risk insurance with a maximum payout of NZ$3.4 million (US$2.79 million) under the Pacific Catastrophe Risk Insurance Pilot. While these steps do not negate the need for international assistance, they provide dedicated funds for initial response and ensure that the government maintains control during this crucial period.

Mobilizing ex-post financial measures (such as budget reallocation) and the contingency fund can take between one and two weeks. A Statement of Disaster will generate access to the ERTF, but use of the contingency fund and reallocation of funds (even within the same ministry) may take one to two weeks to mobilize, given that both require cabinet approval. The cabinet sits every week, so it is unlikely but not impossible that the reallocation of funds could take as long as two weeks to mobilize. Table

Table 1— Sources of Funds Available

	SHORT TERM (1-3 MONTHS)	MEDIUM TERM (3-9 MONTHS)	LONG TERM (OVER 9 MONTHS)
Ex-post Financing			
Donor Assistance (relief)	■	■	
Budget Reallocation	■	■	■
Domestic Credit			
External Credit		■	■
Capital Budget Realignment			
Donor Assistance (reconstruction)			■
Tax Increase			
Flash Appeal			
Ex-ante Financing			
Emergency Fund	■		
Contingency Budget	■	■	
Contingent Credit			
Sovereign (parametric) Catastrophe Risk Insurance	■	■	
Traditional Disaster Insurance	■	■	■

Source: Government of the Cook Islands; World Bank.

Box 1— The Pacific Catastrophe Risk Insurance Pilot

The Pacific Catastrophe Risk Insurance Pilot aims to provide immediate budget support following a major tropical cyclone or earthquake/tsunami. The insurance is designed to cover emergency losses, which are estimated using both a modeled representation of the event based on hazard parameters and a calculation of total modeled physical damage. Unlike a conventional insurance scheme, where a payout would be assessed against actual incurred costs, this scheme pays out on the results of a model. The advantage of this approach is that it results in a much faster payout. The payout would act as a form of budget support and would go some way to cover the costs that would be incurred by the government in the aftermath of a severe natural disaster that disrupts the provision of government services. Countries can choose between three layers of coverage—low, medium, and high—depending on the frequency of events. The lower layer will cover events with a return period of 1 in 10 years, that is, more frequent but less severe events. The medium layer will cover events with a 1-in-15-year return period, while the higher layer will cover less frequent but more severe events, or those with a return period of 1 in 20 years. However, countries may request that a more customized option be developed for them.

1 provides an indication of when funds can be mobilized and where possible the amount of funding available.

The Cook Islands has a variety of ex-ante and ex-post financial tools, and the timing for mobilizing and executing these funds varies significantly. Building on the World Bank framework for disaster risk financing and insurance (see annex 1), table 1 shows the ex-ante and ex-post financial tools available, specifies those utilized by the Cook Islands, and gives indicative timings. The tools utilized by the Cook Islands are highlighted in blue. Those sections highlighted in gray are for generic instruments that to date have not been used in the Cook Islands.

The sections below discuss in detail the ex-ante and ex-post finance tools available to the Cook Islands, including information on the time it takes to mobilize these funds and the amount of funds available.

Ex-Ante Practices and Arrangements

The uncertainty surrounding international assistance following a disaster has placed pressure on countries to establish domestic sources of finance for post-disaster relief, such as the establishment of national reserves or the transfer of risk to the international insurance market. The ex-ante practices and arrangements that have been made by the Cook Islands include a contingency budget, the ERTF, and sovereign catastrophe risk insurance.

Contingency budget

Section 70b(i) of the Cook Islands Constitution sets a cap on the contingency budget equivalent to 1.5 percent of the total sums

appropriated (Government of Cook Islands 2004). These sums were the equivalent of NZ$1.7 million (US$1.4 million) for the 2012/13 fiscal year. It should be acknowledged, however, that the contingency budget is not exclusively for disaster response, and it is unlikely that the full amount would be available in the event of a disaster.

Emergency Response Trust Fund

Following the prime minister's request that the country become self-reliant in the provision of initial disaster response, EMCI collaborated with the MFEM and the Ministry of Infrastructure and Planning (MOIP) to establish the Emergency Response Trust Fund. Led by EMCI, these agencies within one year were able to draft a policy for the ERTF that was approved by the cabinet. This policy details the budget execution process, the reporting requirements to ensure that expenditures are transparent and accountable, and the role of the trustees' management committee.

The purpose of the ERTF is to enable a swift and coordinated response by the Disaster Response Executive once a State of Emergency or State of Disaster is activated. The fund is limited to emergency response, including the following: deployment of initial damage assessment team(s); reestablishment of essential services; deployment of appropriate ministry staff from Rarotonga to assist or relieve staff on the outer islands; deployment of skilled volunteers, tools, parts, and machinery to assist with clearance and immediate repairs; transport, accommodation, food, and water for volunteers and relief workers; and all costs associated with either air or sea freight (ERTF Policy 2011).

The ERTF was fully operational and had received an appropriation from the annual budget by December 2011, less than 12 months after it was initially discussed. Following its establishment and receipt of the initial appropriation, the ERTF received additional funds from the government and the Pacific Islands Forum Secretariat to establish a minimum reserve of NZ$500,000 (approximately US$409,000). It is expected that the fund will be increased to reach NZ$1 million (US$819,000). The country's experience with the ERTF demonstrates the importance of ex-ante cooperation between government agencies, and suggests how quickly procedures can be developed when several agencies work together to remove barriers to effective post-disaster budget execution.

Sovereign catastrophe risk insurance

Table 2— Selected Insurance Coverage, 2014–2015 Pilot Season

	TROPICAL CYCLONE
Policy period	November 1, 2013–October 31, 2014
Peril selected	Tropical cyclone
Layer of coverage selected	1 in 10 years
Coverage limit as a percentage of contingency budget	200 percent
Reporting agencies	Joint Typhoon Warning Center

Source: World Bank and PCRAFI 2013.

Table 3— Total Operating Expenditure, Fiscal Year 2013/14

	2013 NZ$ MILLION	US$ MILLION	PERCENTAGE OF TOTAL EXPENDITURE
Payments on behalf of the Crown	78.4	64.2	66%
Operating	28.5	23.4	24%
Other[a]	11.9	9.8	10%
Total budget	118.8	97.4	100%

Source: MFEM 2013; World Bank

Note: a. This comprises airport authority, debt-servicing interest, and depreciation.

The Cook Islands has financed its premium in an innovative way: by collaborating with state-owned enterprises (SOEs). The SOEs find it difficult to access insurance for infrastructure in the insurance marketplace. To overcome this problem, the Cook Islands has arranged to fund half of its premium through SOE contributions and half through a contribution from the national budget; the SOEs will receive 50 percent of any payout. The MFEM and SOEs agreed to finance the premium in this way as a form of self-insurance; it is recommended that they consider increasing their insurance coverage in the future. This is a model that could be considered by other countries participating in the pilot program.

The Cook Islands' participation in the Pacific Catastrophe Risk Insurance Pilot provides access to an injection of liquidity within the first month of a qualifying disaster. This coverage came into effect on November 1, 2014, and was renewed on November 1, 2015. The Cook Islands opted for coverage against tropical cyclones (see table 2) and chose the lower layer of coverage—that is, they chose coverage for more frequent but less severe events.

In the event that the Cook Islands experiences a tropical cyclone with an estimated emergency loss[2] that exceeds the attachment point, it will be eligible for a payout equivalent to over double the annual contingency budget. Events that generate an emergency loss beneath the attachment point must be managed by optimizing the use of other financial tools.

Ex-Post Practices and Arrangements

A disaster often exceeds a country's capacity to cope with such an event, and there will generally be a need for ex-post practices and arrangements. An optimal strategy for DRFI relies on a combination of ex-ante and ex-post financial instruments. Ex-post arrangements benefit from being able to establish the extent of the disaster and prioritize the response needs. As a result these arrangements take longer to implement than ex-ante arrangements, but they can often mobilize

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larger amounts of finance. This section discusses the ex-post practices and arrangements that have been made by the Cook Islands.

Budget reallocation

Under the Ministry of Finance and Economic Management Act 1995/1996, ministries may transfer operational funds between departments with the agreement of the minister responsible and the financial secretary. Any ministry spending over its appropriation as a result of these transfers will be investigated by the Public Expenditure Review Committee, which may direct that funds to be repaid from any subsequent appropriation.

In 2012/13, the Cook Islands adopted the Government Finance Statistics (GFS) format of the International Monetary Fund (IMF) to present Crown expenditures. Table 3 shows a summary of the total operating expenditure for the financial year 2013/14. It is estimated that approximately NZ$28.5 million (US$23.4 million), or 24 percent, can be reallocated from the operating expenditures in between departments within the same ministry with the approval of the minister and the financial secretary.

External credit

In 2012/13 gross debt servicing was approximately NZ$4.8 million (US$3.9 million) and included loans from New Zealand and the Asian Development Bank, both major development partners to the Cook Islands. Debt outstanding as of June 30, 2012, was NZ$93.6 million (US$76.2 million), an 18 percent reduction from 2010. Annual debt service is equivalent to 4.4 percent of recurrent expenditure (MFEM 2013).

The Cook Islands is in the process of establishing a fund for debt repayment, the Loan Repayment Fund (LRF). The LRF would manage the repayment of government debt and of guaranteed debt of SOEs. The government is to deposit funds in the LRF annually to provide for the repayment of all government borrowing and government guaranteed borrowing. Annual contributions to the LRF are to be based on the debt service requirements for the year.

The Cyclone Emergency Assistance Project with the Asian Development Bank provided a NZ$4.8 million (US$3.9 million) loan to help with the recovery efforts following the series of cyclones that affected the Cook Islands in 2005. This loan took four months to approve, significantly delaying the necessary relief and recovery work and demonstrating the need to have access to a pre-agreed upon line of contingent credit to minimize disruption to the provision of relief and recovery.

Given the structured management of existing debt, the use of contingent credit could be explored as an alternative to securing cash reserves for disaster response. MFEM expressed an interest in optimizing the use of contingent credit as an alternative to increasing the level of cash held in the ERTF.

Donor funds for relief and reconstruction

While donor funds will always be required following disaster, there is often an element of uncertainty surrounding how much will be provided, what will be provided, and when funds will arrive in country. Consequently, overdependence on international relief as a source of post-disaster financing can delay the provision of initial relief and inhibit ex-ante contingency planning. Development partners, international organizations, local nongovernmental organizations, businesses, and individuals contribute in the form of cash grants and aid in kind. The provision of aid in kind, while vital, can affect the costs borne by governments for the distribution these goods.

Donor assistance for reconstruction often takes significant amounts of time and requires negotiation between the country and its donors to establish key priorities. Significant amounts of finance can be assigned, however. For example, New Zealand Aid provided NZ$6.4 million (US$5.3 million) to support the Aitutaki Cyclone Recovery and Reconstruction Plan (ACRRP). Reconstruction financing may be conditional and may be aligned to donor rather than national priorities.

Total Response Funds Available

The Cook Islands has a maximum amount of NZ$5.6 million (US$4.6 million) available to facilitate disaster response. This amount is equivalent to 4 percent of gross total appropriation and 1.7 percent of GDP in 2011. Figure 8 shows the three-tiered DRFI strategy alongside the sources of funds and the maximum amounts of funding available to the Cook Islands following an event. However, it should be acknowledged that the contingency budget is not exclusively for disaster response, and it is unlikely that NZ$1.7 million (US$1.4 million) would be exclusively available for response. Consequently, there is likely to be a gap between the amount available from the contingency and ERTF before a payout may be triggered by breaching the selected attachment point of the catastrophe risk insurance pilot. It is estimated that there is a 4.9 percent chance in any year that disaster losses will exceed these contingency funds.

Post-Disaster Budget Execution

Following TC Pat in 2010, the Cook Islands government reallocated NZ$2.7million (US$2.2 million) from its outer islands budget to reestablish essential services and for infrastructure support; the aim was to enable businesses to resume immediate operations so that the locals could assist with recovery efforts. An additional NZ$6.4 million (US$5.2 million) was provided by New Zealand Aid to support the ACRRP.

The completion report for the ACRRP suggests that overall financial management could be improved through personnel secondments from MFEM. The report indicated that overall, financial management processes could have been better coordinated between the implementing and aid-coordinating agencies to ensure timely and accurate processing and reporting of expenditure. The total cost of the ACRRP was NZ$597,074 (US$489,000) under the planned budget (ACRRP 2013).

Following a Statement of Disaster or a Statement of Emergency by the prime minister under part 3 or 4, respectively, of the Disaster Risk Management Act (Act No. 33) of 2007, the funds contained within the ERTF can be disbursed for any purchases deemed necessary by the fund's trustee management committee. There are four trustees on the committee: the national controller, director of EMCI, secretary of MOIP, and the financial secretary. Upon agreement within the committee, all funds can be spent if required in order to facilitate response. The fund is to be administered in accordance with Cook Islands Government Financial Policies and

Figure 5 — Amount of Ex-Ante Funds Available for Immediate Response

Disaster risks	Disaster risk financing instruments	Amount of funds available
High-risk layer (E.G. Major earthquake, major tropical cyclone)	**Disaster risk insurance**	**Catastrophe risk insurance coverage NZ$3.4m** (US$2.8m)
Medium-risk layer (E.G. Floods, small earthquakes)	**Contingent credit**	
Low-risk layer (E.G. Localized flood, landslides)	**Contingency budget, national reserves, annual budget allocation**	**Contingency budget: NZ$1.7m** (US$1.4m) **ERTF: NZ$0.5m** (US$0.4m)

Source: World Bank.

▲ Photo Credit
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Procedures, specifically the MFEM Act (Act No. 21 of 1995/96), and the draft Trust Fund Procedures.

Although ERTF procedures and processes are well documented, there appears to be limited awareness of them within MFEM. Given the small number of staff in the department this is not surprising; it is likely that those initially involved have moved to positions elsewhere in government. In small island states it is easy for institutional knowledge be lost upon the departure of a few key individuals.

The Cook Islands has developed policies and procedures well founded on past experiences. The government has dedicated, yet limited, funds that can be accessed following an event, but not all staff are aware of the procedures involved in accessing them. It would be helpful to carry out staff training and to develop a dedicated post-disaster budget execution manual to ensure swift post-disaster mobilization and execution when next required.

Domestic Catastrophe Risk Insurance Market

The insurance market in the Cook Islands is small, with the portfolio for general insurance premium estimated to be NZ$8.2 million (US$6.7 million), including aviation. There is one local insurance provider who holds NZ$4.4 million (US$3.6 million) of the market, while the remainder is placed offshore. Insurance agents and brokers placing risk offshore are required to report back to the Financial Supervisory Commission (FSC) with details of those offshore placements.

Insurance law and regulation within the Cook Islands is governed by the Insurance Act (2008), the Insurance Code (2010), and Insurance Regulations (2009). Insurance supervision is the responsibility of the FSC.

There is a high uptake of insurance by the private sector, particularly in the tourism industry, where it is estimated that 80 percent of operators purchase property insurance. Almost all these policies include tropical cyclone coverage, and some of the policies include coverage against sea surge. In addition, many tourism industry operators, irrespective of size, hold business interruption insurance.

The Cook Islands is exposed to the catastrophic peril of cyclones. It is located in the Southern Hemisphere tropical cyclone zone, and though the cyclone season officially runs from November to May, tropical storms may occur outside this period. There have been few earthquakes or tsunami events in the Cook Islands.

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Insurance for catastrophe insurance perils of earthquake and cyclone are available in the market and can be included in property insurance products. Cyclone insurance is not covered under standard property coverage wordings, and is available by extension only. Property insurance rates for the cyclone peril are 0.45 percent in the Cook Islands, which is higher than the rate in most other Pacific countries. Rates for the earthquake peril are 0.12 percent, around the Pacific average.

The Cook Islands government does have an indemnity property insurance program in place for the majority of its assets. The program is arranged by Cook Islands Investment Corporation (CIIC). It does not insure buildings under NZ$50,000 in value, and many infrastructure assets are not insured. Cyclone insurance is not included in this program.

SOEs have independent indemnity property insurance programs in place for the majority of their assets. Cyclone insurance is not included in the majority of these programs. SOEs contributed 50 percent of the premium for the parametric pilot insurance program in 2013.

Please refer to annex 3 for the full market insurance review that was conducted in the Cook Islands.

Options for Consideration

The Cook Islands has implemented several DRFI instruments to increase its financial protection against disasters. Some actions that would strengthen this work further are outlined below for consideration.

Recommendation 1: Develop an overarching disaster risk financing strategy aligned to existing processes. The Cook Islands has taken a proactive ex-ante approach to DRFI. However, the activities in place have been developed in isolation, and while some processes are documented, this information can be difficult to find. An overarching DRFI strategy could be developed, and possibly endorsed by the cabinet, in order to create a single document that would articulate the financing options available and associated policies behind these tools. It would be complemented by an action plan for implementation.

Recommendation 2: Investigate the use of contingent credit to complement existing finance options. The Cook Islands has a strong history of using credit to its best advantage and has developed the LRF to ensure prudent management of debt in the future. Having access to a line of contingent credit that has been agreed upon in advance could prove a useful way to access cash following a disaster and could help minimize disruption to the provision of relief and recovery. The government has expressed interest in establishing access to credit in advance of an event so that the funds can be received as soon as required without any negotiation.

Recommendation 3: Develop an operations manual detailing the processes required to facilitate swift post-disaster budget mobilization and execution. This document would build on the procedures established for the ERTF and refer to emergency procurement procedures in place. A manual that detailed existing practices in a single document would help staff understand correct procedures by formalizing existing processes—such as the allocation of a member of staff from MFEM to the EMCI—that are now conducted on a goodwill basis . Such processes are at risk of lapse when they rely on a few key individuals in government, as is the case in the Cook Islands.

Recommendation 4: Develop an insurance program for key public assets. This program would identify possible assets to be included, investigate existing insurance coverage provided in country, and develop a table detailing coverage options by provider to help determine which assets to include in the program and to select appropriate coverage. This program could investigate the use of an insurer vehicle if appropriate.

End Notes

1 Priority for Action 4—"Reduce the Underlying Risk Factors"—has an associated key activity of financial risk-sharing mechanisms, such as insurance, while Priority for Action 5—"Strengthen disaster preparedness for effective response at all levels"—includes the establishment of emergency funds such as contingency budget, national reserves, and annual budgetary allocations. See UNISDR (2005).

2 Emergency loss is estimated as a percentage of direct losses, which include the cost of repairing or replacing damaged assets.

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Annex

Insurance Market Review, February 2014

Executive Summary

The insurance market in the Cook Islands is small, with the portfolio for general insurance premium estimated to be NZ$8.2 million (US$6.7 million), including aviation. There is one local insurance provider who holds NZ$4.4 million (US$3.6 million) of the market, while the remainder is placed offshore. Insurance agents and insurance brokers placing risk offshore are required to report back to the Financial Supervisory Commission (FSC) with details of those offshore placements.

Insurance law and regulation within the Cook Islands is governed by the Insurance Act (2008), the Insurance Code (2010), and Insurance Regulations (2009). Insurance supervision is the responsibility of the FSC.

There is a high uptake of insurance by the private sector, particularly in the tourism industry, where it is estimated that 80 percent of operators purchase property insurance. Almost all these policies include tropical cyclone coverage and some of the policies include sea surge coverage. In addition, many tourism industry operators, irrespective of size, hold business interruption insurance.

The Cook Islands is exposed to the catastrophic peril of cyclones. It is located in the Southern Hemisphere tropical cyclone zone, and though the season officially runs from November to May, tropical storms may occur outside this period. There have been few earthquakes or tsunami events in the Cook Islands.

Insurance for catastrophe insurance perils of earthquake and cyclone are available in the market and can be included in property insurance products. Cyclone insurance is not covered under standard property coverage wordings, and is available by extension only. In the Cook Islands, property insurance rates for the cyclone peril are higher (0.45 percent) than in most other Pacific countries, and are around the Pacific average for the earthquake peril (0.12 percent).

The Cook Islands government does have an indemnity property insurance program in place for the majority of its assets. The program is arranged by Cook Islands Investment Corporation (CIIC). It does not insure buildings under NZ$50,000 in value, and many infrastructure assets are not insured. Cyclone insurance is not included in this program.

State-owned enterprises (SOEs) have independent indemnity property insurance programs in place for the majority of their assets. Cyclone insurance is not included in the majority of these programs. SOEs contributed 50 percent of the premium for the parametric pilot insurance program in 2013.

Introduction

Insurance Market

In the Cook Islands, total non-life (general) insurance premium, all classes including aviation, is estimated at NZD$8.2 million (US$$6.7 million). Estimates based on anecdotal evidence from insurance industry sources suggest that of this amount, NZD$4.4 million (US$3.6 million), or 54 percent of the market, is placed with local insurer Tower Insurance Cook Islands Limited (Tower), and the remaining NZD$3.8 million (US$3.1 million) is placed with offshore insurers.

The non-life insurance industry within the Cook Islands is limited to Tower as the only locally licensed company. Tower has a small local office with three employees who handle direct domestic insurance, agency business, and insurance for small and medium enterprises (SMEs). The Auckland office of Tower manages insurance for corporate businesses.

There are four licensed insurance agents in the market: Australian and New Zealand Banking Group Limited (Cook Islands), Bank of Cook Islands Limited, Shaun Gallagher Insurance, and Richard ET Fisher Insurance Services.

There is one licensed insurance broker, Willis New Zealand Limited (Willis).

Insurance may be placed offshore by an approved insurance agent or insurance broker licensed under the Insurance Act. Those agents and brokers must report back to the Financial Supervisory Commission (FSC) with details of those offshore placements. The main offshore insurer used in the market is the London market (including Lloyd's), which is the major international insurance market. Another offshore insurer used to provide some additional capacity is the New India Insurance Company Ltd via branches in New Zealand or London.

The non-life premium spending in the Cook Islands, at NZ$417.2 (US$$342), is higher than comparable spending in other Pacific Island Countries (PICs); see table 1. The higher premium per capita could be driven by a number of factors, including higher market penetration by non-life insurers, higher asset concentration as a consequence of higher gross domestic product (GDP) per capita, issues with the pricing of policies arising from a lack of competition in the market, higher exposure to natural perils, or a mix of these factors. A single local insurer has the potential to restrict local competiveness for insurance products, particularly for SMEs and personal insurance

Table A.1— Pacific Non-life Insurance Premium per Capita 2012 (US$)

MARKET	GDP MILLIONS	POPULATION	GDP PER CAPITA	MARKET PREMIUM	PREMIUM PER CAPITA
Cook Islands	$305	19,300	$15,823	$6,600,000	$342
Fiji	$3,908	874,700	$4,467	$97,500,000	$111
Samoa	$683	188,900	$3,619	$17,000,000	$90
Tonga	$471	104,900	$4,495	$4,400,000	$42
Vanuatu	$781	247,300	$3,182	$16,500,000	$67

Source: World Bank; Cook Islands MFEM.

Table A.2— Pacific Commercial Property Insurance Rate and Deductible Comparison

MARKET	AVERAGE EARTHQUAKE RATE	GENERAL EARTHQUAKE DEDUCTIBLES	AVERAGE CYCLONE RATE	GENERAL CYCLONE DEDUCTIBLE
Cook Islands	0.12%	2% of sum insured	0.45%	20% of sum insured
Fiji	0.08%	10% of sum insured	0.30%	20% of loss
Samoa	0.12%	2% of sum insured or 5% of loss	0.20%	2% of sum insured or 5% of loss
Tonga	0.15%	5% of sum insured	0.25%	5% of sum insured
Vanuatu	0.30%	5% of loss	0.17%	20% of loss

Source: World Bank 2013.

Note: Tables shows average market rate percentage of value based on insurance industry sources.

buyers who do not have the ability to access the offshore insurance market. However, this report does not seek to undertake a full quantitative analysis of the appropriateness and competitiveness of insurance pricing within the Cook Islands, and so cannot comment on the degree to which anticompetitive behavior is influencing pricing.

There are a number of variables in property insurance rating, such as location of premises, construction, occupation, fire protection, frequency of expected losses, and the amount and type of deductible on policies. It is not possible to use average rating data as an exact basis for rating a specific company, individual risk, or country. It is possible, however, to offer a general comparison of the property insurance rates in respective markets (see table 2). The analysis below should be interpreted with due consideration of the fact that corrections for differences in exposure to natural perils, building stock, occupation, and financial terms have not been made.

Local property insurance rates in the Cook Islands are higher than in other PICs. The local earthquake insurance basis rate used in the Cook Islands is 0.12 percent, which is consistent with the earthquake basis rate used in other Pacific countries; the Cook Islands risk profile (PCRAFI 2011) suggests, however, that the country's earthquake risk is extremely low. The local basis rate for cyclone extension was quoted at 0.45 percent, considerably higher than the regional range of 0.17 percent to 0.30 percent. Insurance intermediaries in the Cook Islands market advised that while 0.12 percent and 0.45 percent were the local standard rates for earthquake and cyclone perils, it was possible to negotiate for larger corporate accounts or to place the business with offshore markets. This type of negotiation would be more difficult for SMEs or domestic homeowners, making insurance products less accessible to them due to price. However, the limitations of comparing rates (explained above) should be considered when interpreting this information.

Catastrophe Risk Insurance

The main catastrophe hazard in the Cook Islands is tropical cyclone. Tower advised it was aware of the potential exposure and insured only those properties that had an engineer's certification of compliance with the cyclone (wind load) standard. The Cook Islands' primary accumulation exposure is on the main island of Rarotonga.

Photo Credit
US Navy /Flickr

According to the World Bank (1999), "Catastrophic events are unique among insurance risks: while traditional insurable risks occur with predictable frequency and relatively low losses, catastrophes occur infrequently but with high losses." For this reason, it is difficult for insurers to prepare for catastrophe losses and obtain an appropriate premium for these infrequent events. To reduce the volatility that results from catastrophe events, they undertake a mix of methods, including portfolio management, underwriting selection (e.g., declining risks in high exposure areas), and purchase of reinsurance.

While the market is constrained by its small size, some additional capacity is available offshore—though in the past, the Cook Islands' cyclone exposure has limited the willingness of New Zealand–based insurers to provide such capacity, as evidenced by the withdrawal of New Zealand Insurance Ltd. in 1985 (Crocombe 1992).

All insurers with catastrophe exposures need to obtain reinsurance to increase their capacity. Reinsurance is even more important when the insurer or the insurance market pool is small, such as in the Pacific. As regulators become increasingly vigilant about requiring insurers to have sufficient capital and a good solvency margin to protect their interests from catastrophic events, they are requiring adequate reinsurance programs, placed with robust reinsurers.

The non-life premium per capita comparison (table 1) demonstrates that the insuring public in the Cook Islands pays more in premiums per head than in other PICs. From the catastrophe peril rates comparison (table 2), it is clear that cyclone rates are higher in the Cook Islands than in other PICs; as a consequence, property premiums, particularly

for cyclone, will also be higher. The need to obtain an engineer's cyclone certification for buildings before obtaining cyclone insurance presents a challenge to the insuring public. These two factors are likely to restrict the access to cyclone insurance in the Cook Islands, particularly for residential property owners and small businesses.

Catastrophe Reinsurance

Tower advised that its operation in the Cook Islands is included in the group reinsurance program arranged by Tower Insurance Limited.

In 2011, natural catastrophe insured losses in the global reinsurance market were the second-largest ever, at over US$110 billion (Swiss Re 2012). What made this year significant for insurers (and reinsurers) in the Pacific was the number of events that occurred in the Asia Pacific region, including earthquakes in New Zealand and Japan, floods in Australia and Thailand, and a cyclone in Australia. According to the Global Insurance Market Report (IAIS 2012), these Asia Pacific events accounted for 61 percent of the insured losses from natural catastrophes in 2011, compared to a 30-year average of 18 percent. As a consequence, there were adjustments in reinsurance capacity and higher risk premiums. In 2012 the natural disaster losses dropped to US$77 million (Swiss Re 2013), but this was still the third-highest year for natural catastrophe insured losses since 1970. In the Pacific, Tropical Cyclone Evan caused insured losses of F$57 million in Fiji (Reserve Bank of Fiji 2012) and estimated insured losses of SAT 3 million in Samoa in December 2012.

In its 2011 annual report, Tower Insurance Limited specifically advised that its event excess (net retention) had increased to NZ$6.7 million (US$5.5 million) and that it had protection for

two catastrophe events within the program for the 2011–2012 period (Tower Limited/Tower Capital Limited 2011). The reinsurance program is not detailed in the 2012 report, but it would be expected to follow the previous arrangements. Tower did express concern in its annual reports at the increase in catastrophe reinsurance premiums in recent years.

Indeed, insurers throughout the Pacific have expressed concern at the recent increase in reinsurance premiums, and more particularly premiums for catastrophe reinsurance. They have limited ability to pass on the full costs of these increases to insured clients due to the small size and economic constraints in those markets.

Market Property and Catastrophe Insurance Products

Tower uses Material Damage/Business Interruption (MDBI) wordings for major commercial, government, and state-owned enterprise (SOE) insurance. The MDBI wording is based on insurance industry standard Industrial Special Risks (ISR) wordings used in many Commonwealth countries. These wordings include cover of specified natural perils, such as earthquake, but do not cover cyclone risk.

Cyclone insurance is available in the Cooks Islands by extension only and is limited to those buildings with an engineering cyclone certificate that confirms the building meets the building code for cyclone. The cyclone engineer's certificates are valid for seven years.

A Business Protection Policy is used for SMEs and is taken as either Multi Risks (accidental damage including earthquake and cyclone by extension) or as Specified Risks (fire and extraneous perils). These policies generally follow the perils insured under the MDBI, although coverage may be more restricted.

Regulatory Framework

Insurance Law and Regulation

Insurance law and regulation within the Cook Islands is governed by the Insurance Act (2008), the Insurance Code (2010), and Insurance Regulations (2009). Insurance supervision is the responsibility of the FSC (Cook Islands Financial Supervisory Commission, 2014).

The Insurance Code (2010) details the requirements for registered insurance companies, including capital, solvency, and reinsurance programs. Minimum capital for a local general insurer (category A) is NZD$200,000 (US$163,000) and minimum solvency is 5 percent of unearned premium reserve or 10 percent of outstanding claim reserve. There is no requirement for the general insurer to hold a catastrophe reserve. A written reinsurance strategy must be submitted to the FSC each year in November. The FSC advised that it did not undertake a detailed analysis of the submitted reinsurance strategy from Tower because it lacked the necessary expertise and understanding of the reinsurance contracts.

The Cook Islands is not listed as a member of the International Association of Insurance Supervisors (IAIS). Membership in IAIS would allow the Cook Islands to access international best practice information on insurance regulation and supervision.

The Cook Islands has recently enacted the Captive Insurance Act (2013) and Captive Insurance Regulations. As of September 2013, there were no captive insurers registered under the new legislation.

Under existing insurance regulations, Tower is required to submit to the FSC its annual reinsurance management strategy, which would include risk accumulations and catastrophe

Table A.3— Property Insurance for Major Cook Island State-Owned Enterprises

ENTITY	PROPERTY INSURANCE (MDBI/ISR)	EARTHQUAKE PERIL INCLUDED	CYCLONE PERIL INCLUDED	REPLACEMENT VALUE (LAST VALUATION DATE, WHERE KNOWN)	INFRASTRUCTURE ASSETS
Investment corporation	Yes	Yes	No	Yes (1998)	Bridges or roads–not insured
Airports Authority	Yes	Yes	One building only	Yes (2012)	Runway–not insured
Te Aponga Uria O Tumu (Electricity provider)	Yes	Yes	No	Yes (2013)	Transmission lines–not insured
Bank of Cook Islands	Yes	Yes	Yes	Yes (2013)	Not applicable
Ports Authority	Yes	Yes	No	Yes (2013)	Wharf–not insured

Source: SOE senior employees and insurance industry members.

exposures. The FSC advised that it did not undertake the detailed analysis of the local insurer's reinsurance program and property accumulation that would determine if these are adequate for the probable maximum loss (PML) within the Cook Islands. The FSC also advised they did not check the number of reinstatements available under the catastrophe reinsurance program.

Building Controls and Standards

The legal basis for all construction in the Cook Islands is the Building Controls and Standards Act (1991) and the building code. According to a local project manager and engineer in Rarotonga who undertook cyclone inspections for insurers, most commercial and government buildings constructed after 1991 are in accordance with the code and the wind loads for cyclones. This suggests that the building code is being followed for commercial structures. The project manager also advised that, based on inspections, many houses were not constructed to meet the wind loads in the code. This suggests that the building code is not always adhered to for residential properties, and that these properties could not obtain cyclone insurance without upgrades.

Insurers have taken proactive steps to ensure compliance with the cyclone building standard by requiring engineering certificates for insured properties, rather than relying on government enforcement of the building code.

Financial Security of Onshore Insurers

Tower Insurance Cook Islands Limited is a wholly owned subsidiary of Tower Insurance Limited, a New Zealand–registered company listed on the New Zealand and Australian stock exchanges. As a subsidiary whose parent company has a security rating of A- (excellent),[1] Tower Cook Islands is not required to provide additional security in accordance with the New Zealand Insurance Prudential Supervision Act (2010).

Financial Security of Known Offshore Insurers

The main offshore insurer used in the market is Lloyd's, which is regulated by the UK Financial Conduct Authority and the Prudential Regulation Authority under the Financial Services and Markets Act (2000). As of August 2013, Lloyd's had confirmed security ratings of A (excellent) from A. M. Best and A+ (strong) from Fitch Ratings and Standard & Poor's.

The New India Insurance Company Limited is used as a coinsurer on some local property insurance programs. It is registered in India and operates branches in New Zealand, Fiji, and London. Its financial strength rating, issued by A. M. Best in January 2013, is A- (excellent).

Insurance of Public Assets

Insurance of government properties is arranged either by Cook Islands Investment Corporation (CIIC) or by the individual public authorities, with many policies excluding the tropical cyclone peril. CIIC manages the government insurance program, although some public authorities—i.e., SOEs—make their own independent arrangements. As a result SOEs have their assets revalued on average every three years, whereas the CIIC relies on an asset register that uses property valuations from 1998. This practice generates a risk of underinsurance. Insurance professionals recommend that individual buildings should be revalued at best every three years and certainly no longer than five years apart. CIIC should consider engaging an independent valuer to provide updated valuations as soon as possible. CIIC has made a decision not to insure any property under NZ$50,000 in value.

The provision of cyclone insurance requires an engineer's certificate to verify that properties comply with the building code, and it is often expensive. As a result the majority of government and SOE assets are not insured for the main catastrophic peril in the Cook Islands.

The insurance broker used for SOE programs is Willis New Zealand; the program uses various insurers, including Tower. Findings on existing property insurance arrangements for SOEs are summarized in table 3.

Government infrastructure assets are not insured in the Cook Islands, due either to property exclusions under existing market insurance policy wordings or to high premium cost. Uninsured property includes wharves,

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bridges, roads, power transmission and distribution lines, and airport runways (see table 3).

With the passage of the Captive Insurance Act (2013), the Cook Islands government can consider setting up of a captive insurer, as a subsidiary of CIIC, to act as an alternative risk financing facility for property assets. A feasibility study would be necessary to explore this option, taking into account the volume of risk to transfer and the consequent economics, capital, captive management, claims management, and reinsurance. This option has some advantages for the government and SOEs, such as the possibility of wider coverage, the inclusion of infrastructure assets in a program, and premium savings from risk pooling. The captive would need to reinsure the total accumulated catastrophe exposures once a pre-agreed upon level was reached that exceeded its capacity.

The Cook Islands government has been included in the Pacific Catastrophe Risk Insurance Pilot since 2013. The government should include this program in any disaster risk financing and insurance strategy that is developed, and should also provide input on ways to expand the program.

There is no up-to-date government central asset register for public assets. While the CIIC has an asset register, it uses 1998 data. Some government departments, public authorities, and state-owned enterprises hold asset registers, but these are not looked at collectively. The result is a piecemeal approach to insuring assets. Should a centralized asset register be developed, there may be potential for premium reduction.

The government keeps no centralized register of insurance arrangements for public assets that have been made by individual government departments, public authorities, or SOEs. This may in part be linked to the uncoordinated approach toward an asset register.

Past Catastrophe Events

The major reported damaging cyclones within the Cook Islands have been Cyclone Sally (1987) and Cyclone Pat (2011).

Damage from Cyclone Sally was estimated at NZ$30 million (US$24.6 million) in 1987 prices (Fiji Meteorological Service 1987) across all islands in the group, but the cyclone was reported to be at its strongest when passing by Rarotonga (the most populated island in the group and the government and commercial center). The main non-life insurer at the time, Cook Islands Insurance Limited, is reported as incurring claims that exceeded NZ$4 million (US$3.3 million) in value on a premium base of NZ$400,000 (US$328,000) (Crocombe 1992). This would suggest an insurance penetration of around 13 percent at that time.

Damage from Cyclone Pat, which impacted Aitutaki, was estimated at NZ$9.5 million (US$7.8 million); there was damage to 436 homes, and 68 homes were totally destroyed. Tower advised that there were minimal insured losses from Cyclone Pat because most damaged properties on Aitutaki were not insured for cyclone. This suggests a current low property insurance penetration on Aitutaki.

There have been no reported earthquakes or tsunami events in the Cook Islands.

Options for Consideration

Recommendation 1: Develop an insurance program for key public assets to be included in a broader disaster risk financing and insurance strategy. This approach would include establishment of a centralized asset register with up-to-date valuations in conjunction with the Cook Islands Investment Corporation, assessment of probable losses, and a review of existing indemnity insurance to ensure that the major perils of cyclone and sea surge are included, and that the government and SOEs are getting the best available terms and conditions for the premiums paid.

Recommendation 2: Develop a program of technical development for the Financial Supervisory Commission and consider applying for membership in the International Association of Insurance Supervisors. This program should focus on building the capacity of those responsible for risk-based supervision. Membership in IAIS would allow the Cook Islands to access international best practice information on regulation and supervision of insurance companies.

Endnotes

1 A. M. Best rating, July 26, 2013.

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Glossary

Agent	Someone who acts for the insurance company in arranging insurance contracts. There are two main types of agents: tied agents, who act for one insurer only, and general agents, who act for multiple insurance companies.
Broker	Someone who acts as an agent for the insured in arranging an insurance or reinsurance program with a provider of capacity.
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.
Captive insurer	An insurance company wholly owned by a company or entity that insures the risks of the parent entity and subsidiaries.
Indemnity insurance	Insurance that reimburses individuals or entities for loss or damage to a financial position as close as possible to the position they were in prior to the event, in the context of the financial terms of the coverage (such as deductible/excess and limit).
Intermediaries	The general term given to insurance agents and brokers.
Net retention	The amount that an insurance company retains on a reinsurance contract and in particular an excess of loss of contract.
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. May also be called 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.
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.
Solvency margin	The extent by which an insurer's assets exceed its liabilities. Minimum statutory solvency requirements are normally included in insurance acts or regulations.

Country Note

SOLOMON ISLANDS

February 2015

Disaster Risk Financing and Insurance

CHAPTER 03

GFDRR

SPC Secretariat of the Pacific Community

WORLD BANK GROUP

Executive Summary

This report aims to build understanding of the existing disaster risk financing and insurance (DRFI) tools in use in the Solomon Islands and to identify gaps where engagement could further develop financial resilience. It also aims to encourage peer exchange of regional knowledge, specifically by encouraging dialogue on past experiences, lessons learned, optimal use of these financial tools, and the effect these tools may have on the execution of post-disaster funds.

The Solomon Islands is located in an area known for frequent tropical cyclones and is also in the Pacific Ring of Fire, an active seismic area. Consequently, it is exposed to both hydrometeorological and geophysical hazards. This exposure was clearly demonstrated at the end of December 2012, when the country experienced Tropical Cyclone Freda, followed in early February 2013 by a magnitude 8.0 earthquake and a subsequent tsunami affecting the Santa Cruz Islands.

The Solomon Islands is expected to incur, over the long term, average annual losses of SI$145 million (US$20 million) due to earthquakes or tropical cyclones. In the next 50 years, the Solomon Islands has a 50 percent chance of experiencing a single event loss exceeding SI$1.7 billion (US$240 million), and a 10 percent chance of experiencing a single event loss exceeding SI$3.7 billion (US$520 million) (PCRAFI 2011).

The Solomon Islands government has a variety of tools for financing the cost of disasters, but the funds are limited and can be quickly exhausted. The disaster relief budget allocated to the National Disaster Council (NDC) is small—SI$2.2million (US$305,250) in 2013—and is quickly exhausted, as happened during the response to the Santa Cruz earthquake and tsunami. There is a 77 percent chance that disaster losses will exceed this budget amount in any given year. If these funds were exceeded, the government would need to source remaining funds from the contingency warrant and pursue budgetary reallocation. Consequently the Solomon Islands tends to rely heavily on donor support to fund post-disaster expenditures.

The NDC met on the day of the Santa Cruz earthquake and was able to immediately mobilize SI$1 million (US$138,000) to purchase relief supplies. This is equivalent to approximately half of the annual budget for response. The remaining SI$1.2 million was exhausted shortly for the additional supplies needed, for the first shipment following updates from situation reports identifying the need for greater quantities of relief goods. The first shipment of goods to the affected area had fully exhausted the annual response budget. In light of the small amount of dedicated funds allocated to the NDC and the speed with which they can be used up, the Solomon Islands government should

consider the reactivation of the National Disaster Council Fund, or the use of other DRFI instruments such as contingent credit to ensure additional sources of liquidity following an event.

Anecdotal evidence suggests that the Ministry of Finance and Treasury (MoFT) would benefit from the development of a post-disaster budget execution manual to improve staff awareness of post-disaster procedures and processes. During the Santa Cruz response, the bid waiver process was not adhered to; MoFT staff were unaware of this process because it is rarely used. As a result, there were significant delays in the purchase of necessary relief items.

A number of options to improve DRFI are presented here for consideration:

(a) Develop a post-disaster budget execution manual to improve awareness of post-disaster procedures and processes;

(b) Develop an integrated disaster risk financing and insurance strategy; and

(c) Explore the use of other DRFI tools such as contingent credit to access additional liquidity post-disaster.

▼ **Photo Credit**
Australian Department of Foreign Affairs and Trade/Flickr

Introduction

Located in the Pacific Ring of Fire, the Solomon Islands is susceptible to both hydrometeorological and geophysical disasters. Hydrometeorological hazards include tropical cyclones, floods, and droughts, whereas geophysical hazards include earthquakes and resulting tsunamis and landslides. The population of the Solomon Islands is estimated to be 515,870, with an estimated growth rate of 2.3 percent.[1] The population is spread across 845 of the country's 992 islands, which cover an area of 24,000km^2 . With 80 percent of the total population living in rural areas, disaster response is often time-consuming and expensive; post-disaster transportation costs create a significant fiscal burden and have led to delays in the distribution of relief goods in the past.

The Solomon Island government has demonstrated commitment to disaster risk management through its National Disaster Risk Management (N-DRM) Plan 2010, which was adopted by the cabinet under the 1989 National Disaster Council Act. The N-DRM Plan provides the government with a comprehensive institutional framework to address hazards, reduce risks (including those associated with climate change), and implement activities for disaster management, recovery, and rehabilitation across sectors at the national, provincial, and village levels.

The N-DRM Plan lays out procedures for the Recovery and Rehabilitation Committee, which is responsible for developing funding arrangements for cabinet approval. These plans can include reallocation of sector budgets, as well as international partner and stakeholder support (Solomon Islands Government 2010).

Both independently and in conjunction with many partners—such as Secretariat of the Pacific Community Applied Geoscience Division (SPC-SOPAC), the Secretariat for the Pacific Regional Environment Programme (SPREP), United Nations Development Program (UNDP) Pacific Centre, and the United Nations International Strategy for Disaster Reduction (UNISDR)—the Solomon Islands has developed several institutional frameworks on disaster risk management and climate change adaptation at the national, subregional, and international level, including the following:

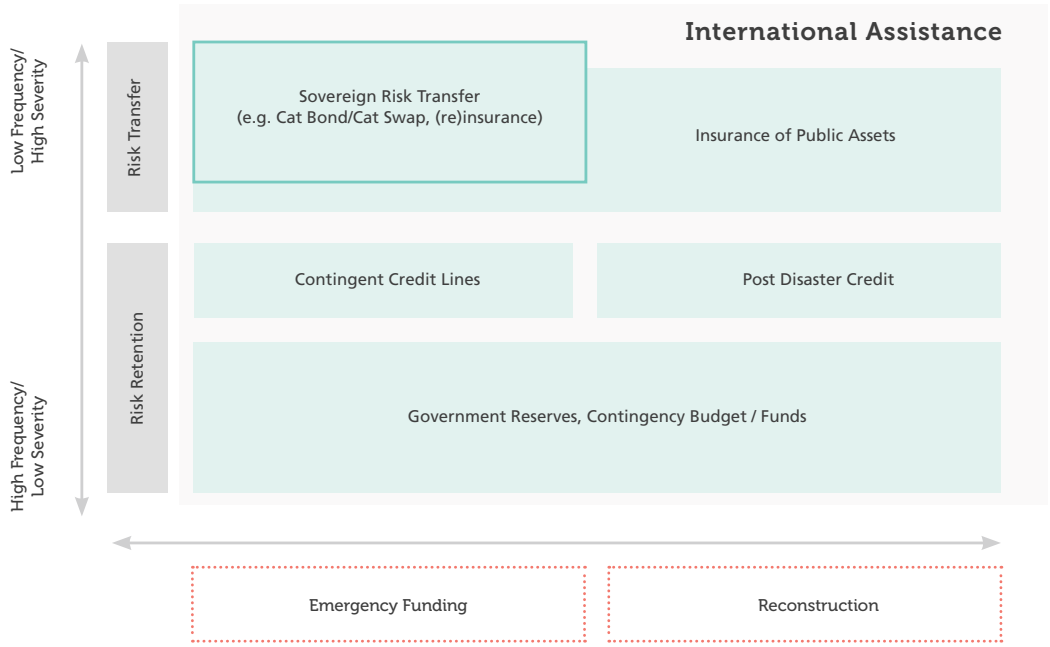
- Hyogo Framework for Action (HFA) 2005–2015
- Pacific Disaster Risk Reduction and Disaster Management Framework for Action (Regional Framework for Action or RFA) 2005–2015
- National Adaptation Programme of Action (NAPA), 2008
- National Disaster Risk Management Plan, 2010
- Solomon Islands National Climate Change Policy, 2012–2017
- National Development Strategy, 2011–2020

Disaster risk financing and insurance (DRFI) is a key activity of the HFA Priorities for Action 4 and 5.[2] The HFA is a result-based plan of action adopted by 168 countries to reduce disaster risk and vulnerability to natural hazards and to increase the resilience of nations and communities to disasters over the period 2005–2015. In the Pacific, the HFA formed the basis for the development of the Regional Framework for Action.

The RFA cites DRFI activities as a key national and regional activity. Theme 4—"Planning for effective preparedness, response and recovery"—has an associated key national activity, "Establish a national disaster fund for response and recovery." Theme 6 of the RFA—"Reduction of underlying risk factors"—cites the development of "financial risk-sharing mechanisms, particularly insurance, re-insurance and other financial modalities against disasters as both a key national and regional activity" (SOPAC 2005). These regional implementation activities align with the three-tiered disaster risk financing strategy developed by the World Bank.

The Pacific DRFI Program enables countries to increase their financial resilience against natural disasters by improving their capacity to meet post-disaster funding needs without compromising their fiscal balance. This program is one application of the Pacific Catastrophe Risk Assessment and Financing Initiative (PCRAFI). The Pacific DRFI Program is built upon a three-tiered approach to disaster risk financing. These layers align to the basic principles of sound public financial management, such as the efficient allocation of resources, access to sufficient resources, and macroeconomic stabilization. The three tiers acknowledge the different financial requirements associated with different levels of risk: (i) self-retention, such as a contingency budget and national reserves, to finance small but recurrent disasters; (ii) a contingent credit mechanism for less frequent but more severe events; and (iii) disaster risk transfer (such as

Figure 1 — Three-Tiered Disaster Risk Financing Strategy



Source: World Bank 2010.

insurance) to cover major natural disasters. See figure 1.

This note aims to build understanding of the DRFI tools in use in the Solomon Islands and to identify gaps where engagement could further develop financial resilience. It also aims to encourage peer exchange of regional knowledge, specifically by encouraging dialogue on past experiences, lessons learned, optimal use of these financial tools, and the effect of these tools on the execution of post-disaster funds.

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Economic Impact of Natural Disasters

Since 1980, the Solomon Islands has experienced approximately 111 disasters that affected over half a million people. Just over half of these events were earthquakes, about a quarter were tropical cyclones and storms, 11 percent were attributable to tsunamis, and 12 percent were man-made disasters, landslides, and droughts (PDN 2013).

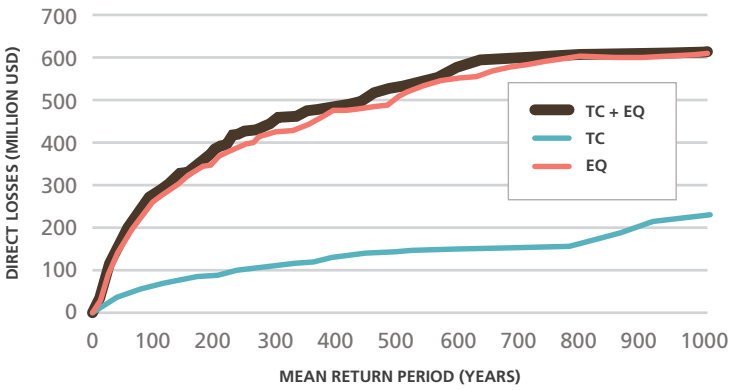
The Solomon Islands is located in an area known for frequent tropical cyclones, and is also situated in the Pacific Ring of Fire, an active seismic area. Consequently, it is exposed to both hydrometeorological and geophysical hazards. This exposure was clearly demonstrated at the end of December 2012, when the country experienced Tropical Cyclone Freda, followed in early February 2013 by a magnitude 8.0 earthquake and a subsequent tsunami affecting the Santa Cruz Islands.

The majority of the population works in the agriculture, fishing, and forestry sectors, which are highly susceptible to natural hazards, as the Santa Cruz earthquake demonstrated. The tsunami following that earthquake increased saline levels in the country's water sources. This had a severe impact on the living standards of and livelihoods of residents, most of whom practice subsistence agriculture (Solomon Islands Government 2013d). The Santa Cruz earthquake affected 37 percent of the resident population, totally destroying 588 houses and partially damaging an additional 478.

Logging, fishing, and more recently gold mining drive the economy of the Solomon Islands, and all of these industries can be impacted by a natural disaster, which in turn reduces the limited sources of government revenue. Like many small island states, the Solomon Islands has limited sources of domestic revenue and thus limited budget flexibility. In 2013, domestic revenue grew by 8 percent (SI$202 million or US$28 million), which reflects growth in the national economy, ongoing improvement in revenue administration, and compliance efforts (Solomon Islands Government 2013).

The Solomon Islands is expected to incur, over the long term, average annual losses of SI$145 million (US$20 million) due to earthquakes or tropical cyclones. In the next 50 years, the Solomon Islands has a 50 percent chance of experiencing a single event loss exceeding SI$1.7 billion (US$240 million), and a 10 percent chance of experiencing a single event loss exceeding SI$3.7 billion (US$520 million) (see figure 2).

Figure 2 — Direct Losses by Return Period



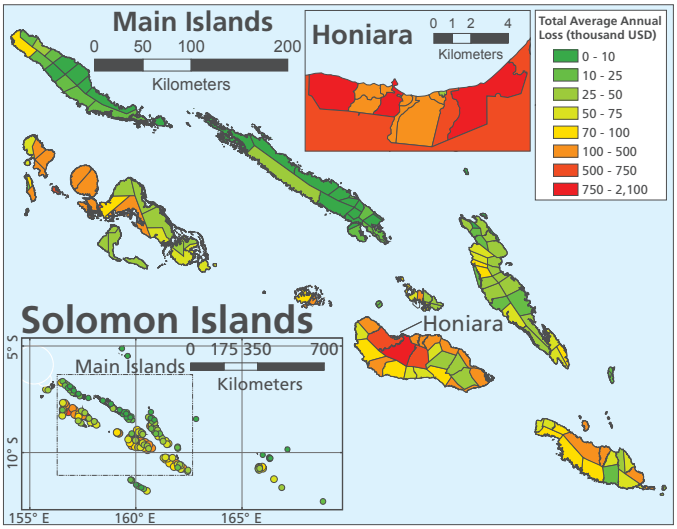
Source: PCRAFI 2012

Note: TC = tropical cyclone; EQ = earthquake

Figure 3 shows average annual loss by geographic area. Areas highlighted in red are likely to incur the highest level of loss, between US$0.75 million and $2.1 million per year. The full country risk profile for the Solomon Islands can be found in annex 4.

In April 2014, flash flooding in Honiara, Guadalcanal, Isabel, Malaita, and Makira-Ulawa caused damage and loss estimated at SI$787.3 million (US$108.9 million), equivalent to 9.2 percent of gross domestic product (GDP). A slow-moving tropical depression caused persistent heavy rains, with over 732mm of rainfall recorded over four days at the Honiara rain gauge. These floods caused 22 fatalities across the country, internally displaced some 10,000 people initially, and affected approximately 52,000 people in total. The flooding caused damage to major infrastructure, fully destroying some 675 houses along with the food gardens that many people depend upon for their livelihood. This event took place at the time of writing, and information from the event has been incorporated into this report where possible.

Figure 3 — Average Annual Loss by Area



Source: PCRAFI 2011.

Section 03

Public Financial Management of Natural Disasters

Although the Solomon Islands has developed many policies to facilitate timely mobilization and execution of post-disaster funds for disaster response, these policies are little known outside the NDC. This situation has led to delays in the purchase and distribution of relief goods and has had a significant impact on both the budget for the NDC and the national contingency warrant (contingency budget).

All Solomon Islands government programs receive 100 percent of their budget allocation (also known as a warrant) at the start of the calendar year. This provides government agencies with the flexibility to manage their allocated funds as they see fit throughout the year. Purchases can be made as long as they are within budget. But the arrangement can also create difficulty with post-disaster finance, particularly if a disaster should occur toward the end of the year. Conversely, there is a risk that an event at the start of the year could exhaust the entire year's worth of funds.

The National Disaster Risk Management Plan lists the permanent secretary of the Ministry of Finance and Treasury (MoFT) as a member of the National Disaster Council (NDC). This structure recognizes the need for MoFT to be part of the decision-making process for disaster response purchases. MoFT staff, however, remain uncertain of their role in post-disaster finance; in the past they have not adhered to the correct bid waiver process, which created unnecessary delays in purchasing needed goods.

Effective post-disaster financial response relies on two fundamental capabilities: (i) the ability to rapidly mobilize funds post-disaster; and (ii) the ability to execute funds in a timely, transparent, and accountable fashion. This section discusses the existing procedures for post-disaster budget mobilization and execution and where possible provides examples of their use.

Post-Disaster Budget Mobilization

The Solomon Islands government takes an ex-post approach to financing the cost of disasters. The disaster relief budget allocated to the NDC is small—SI$2.2 million (US$ 304,000) in 2013 and SI$1.9 million (US$262,000) in 2014. Both amounts were quickly exhausted following one event during the first four months of the fiscal year. In other words, for two years in a row a single disaster has exhausted not only the relief budget of the NDC but also the operational budget. In addition, anecdotal evidence suggests that the majority of the national contingency budget was depleted following the event in Santa Cruz. It appears that the Solomon Islands continues to rely heavily on donor support to fund post-disaster expenditures.

The Solomon Islands has a variety of DRFI tools available to it, and the time needed to mobilize and execute these funds varies significantly. Building on the World Bank disaster risk financing and insurance framework (see annex 1), table 1 shows the ex-ante and ex-post financial tools available, indicates those utilized by the Solomon Islands, and gives indicative timings. The tools utilized by the Solomon Islands are highlighted in blue. Those sections highlighted in gray are for generic instruments that to date have not been used in the Solomon Islands.

The sections below discuss the financing tools available in the Solomon Islands in detail, providing information on the time needed to mobilize these funds and the amount of funds available.

Ex-Ante Practices and Arrangements

The uncertainty surrounding international assistance has placed pressure on countries to establish domestic sources of finance for post-disaster relief, such as national reserves or transfer of risk to the international insurance market. The Solomon Islands has a variety of ex-ante practices and arrangements, which are discussed below.

Table 1— Sources of Funds Available

	SHORT TERM (1-3 MONTHS)	MEDIUM TERM (3-9 MONTHS)	LONG TERM (OVER 9 MONTHS)
Ex-post Financing			
Donor Assistance (relief)			
Budget Reallocation			
Domestic Credit			
External Credit			
Capital Budget Realignment			
Donor Assistance (reconstruction)			
Tax Increase			
Tax Incentives (Flash Appeal)			
Ex-ante Financing			
National Disaster Council Fund			
Contingency Budget			
Contingent Credit			
Sovereign (parametric) Catastrophe Risk Insurance			
Traditional Disaster Insurance			

Source: Solomon Islands government; World Bank.

National Disaster Council Fund

The National Disaster Council Fund was established under Section 17 of the NDC Act (1989). However, this fund has not received an appropriation since 2008, when a special audit conducted by the Office of the Auditor General found that the National Disaster Council Fund was misused and that funds were often diverted away from disaster response activities (Solomon Islands Government 2008). In response to this finding, an account was established at the Central Bank of Solomon Islands (CBSI) to give the NDC greater control of any monies received from external sources. (See "Flash appeal" below.)

Contingency warrant

In 2011 the Solomon Islands government established a national contingency warrant to set aside funds to meet unforeseen spending needs throughout the year (Solomon Islands Government 2013c). The warrant enables the government to meet an urgent need for expenditure on matters that were not foreseen at the time of the last appropriation bill; for example, it can be used in response to a national emergency or natural disasters, but can also be appropriated for less imperative financing demands.

Contingency warrants for disaster relief and response can be released only following a national declaration of emergency. The aggregate allocation for the 2013 contingency warrant was SI$38 million (US$5.2million), a 28 percent reduction from 2011. This decline raises questions about the long-term sustainability of the fund.

The Solomon Islands participated in the first two seasons of the Pacific Catastrophe Risk Insurance Pilot but chose to discontinue this insurance in the third season. This decision was influenced by the fact that neither the Santa Cruz earthquake nor the flash floods of early 2014 generated a payout under the terms of the insurance. Nor was either event eligible under the terms of the insurance: the Santa Cruz earthquake generated emergency losses that were below the attachment point of the policy, and the insurance does not cover flood risk in itself.

The experience of the Solomon Islands highlights the importance of capacity building in DRFI. Countries need to decide exactly what type of risk they wish to cover and what tools are best suited to covering it. Insurance cannot be used as a singular solution to hazard risk. The experience of the Solomon Islands has also given impetus to development of additional DRFI products tailored to the specific needs of countries.

Ex-Post Practices and Arrangements

Because disasters generally exceed a country's capacity to cope with them, there will always be a need for ex-post practices and arrangements. An optimal strategy for DRFI relies on a combination of ex-ante and ex-post financial instruments. Ex-post arrangements benefit from being able to establish the extent of the disaster and prioritize the response needs. As a result these arrangements take longer to implement than ex-ante arrangements, but they can often mobilize larger amounts of finance. This section discusses the ex-post practices and arrangements that have been made by the Solomon Islands.

Flash appeal

During the 2014 flash floods, an account was established at the CBSI to receive funds from a flash appeal conducted by the NDC. The appeal received SI$2.3 million (US$318,000), which has been used to help emergency relief and recovery needs. Donations came from private companies, individuals, embassies of the Solomon Islands, and other governments, including Papua

Box 1— The Pacific Catastrophe Risk Insurance Pilot

The Pacific Catastrophe Risk Insurance Pilot aims to provide immediate budget support following a major tropical cyclone or earthquake/tsunami. The insurance is designed to cover emergency losses, which are estimated using both a modeled representation of the event based on hazard parameters and a calculation of total modeled physical damage. Unlike a conventional insurance scheme, where a payout would be assessed against actual incurred costs, this scheme pays out on the results of a model. The advantage of this approach is that it results in a much faster payout. The payout would act as a form of budget support and would go some way to cover the costs that would be incurred by the government in the aftermath of a severe natural disaster that disrupts the provision of government services. Countries can choose between three layers of coverage—low, medium, and high—depending on the frequency of events. The lower layer will cover events with a return period of 1 in 10 years, that is, more frequent but less severe events. The medium layer will cover events with a 1-in-15-year return period, while the higher layer will cover less frequent but more severe events, or those with a return period of 1 in 20 years. However, countries may request that a more customized option be developed for them.

New Guinea and China. This account was opened to receive funds from external parties following an event and has acted as a replacement to the National Disaster Council Fund—and given the NDC greater control over and accountability for any expenditures.

Donor funds for relief and reconstruction

While donor funds will always be required, there is often an element of uncertainty surrounding how much will be provided, what will be provided, and when the funds will arrive in country. Consequently, overdependence on international relief as a source of post-disaster financing can delay the provision of initial relief and inhibit ex-ante contingency planning. Development partners, international organizations, local nongovernmental organizations, businesses, and individuals contribute in the form of cash grants and aid in kind. The provision of aid in kind, while vital, can affect the costs borne by governments for the distribution of these goods.

Donor assistance for reconstruction often takes significant amounts of time and involves negotiation between the country and its donors to establish key priorities. However, significant amounts of finance can be assigned. For example, the Solomon Islands government had received SI$7.9 million (US$1million) by February 19, 2013, less than two weeks after the Santa Cruz earthquake and tsunami took place. Within one month of the disaster, the amount of international assistance received had increased to SI$13 million (US$1.8 million). Approximately 5 percent of this was received as aid in kind while the remainder was provided as cash grants.

Following the flash floods in 2014, the Solomon Islands was able to access SI$13 million (US$1.8 million) in grant funds from the United Nations Central Emergency Response Fund. These funds are to be used to support health, nutrition, and water and sanitation activities. However, access to these funds came almost two months after the event, creating a lag in recovery activities.

Budget reallocation

The NDC has three options for acquiring additional funds to facilitate response activities:

(a) Transfer funds between accounts within an agency, which requires approval of the head of agency and the minister of finance;

(b) Seek a contingency warrant, subject to cabinet approval and in the event that the contingency warrant allocated for that financial year is depleted; or

(c) Request a supplementary budget allocation from the contingency warrant.

According to the Public Financial Management Bill, the finance minister may seek supplementary appropriations when an urgent and unforeseen need has arisen and the cabinet has granted its approval (Solomon Islands Government 1978).

External debt

During the global economic crisis, the Solomon Islands economy was hit hard. An 18-month Standby Credit Facility Arrangement approved in June 2010 succeeded in stabilizing the economy and catalyzing donor support. The country's fiscal position has improved substantially since then as a result of improved tax compliance and tax arrears collection. The government cash balance increased from almost zero in the first quarter of 2010 to about two months of recurrent spending by the second quarter of 2011 (IMF 2011).

In 2012, the government introduced a debt management framework incorporating a debt management strategy. This new framework

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will guide any future debt decisions. The debt management strategy aims to provide a robust and pragmatic approach to ensure that the volume of new borrowing is limited to sustainable and affordable levels (Solomon Islands Government 2013). MoFT has set the debt-to-GDP ratio at 25 percent, and has set the future maximum debt-servicing cost at 8 percent of forecast domestically sourced revenue. At present, 10 percent of revenue is set aside for debt servicing (Solomon Islands Government 2013).

The Solomon Islands government has been improving its debt service ratio, which suggests that the option of contingent credit could be considered to facilitate an immediate injection of liquidity following a disaster. However, any new credit facility must be affordable and satisfy all the criteria outlined in the debt management strategy. Furthermore, costs of use (including opportunity costs) must be balanced against the benefits of the potential post-disaster liquidity injection.

Total Response Funds Available

The Solomon Islands has a maximum amount of SI$41 million (US$5.7 million) available to facilitate disaster response. Figure 4 shows the three-tiered DRFI strategy alongside the sources of funds and the maximum amounts of funding available to the Solomon Islands following an event. However, it should be acknowledged that the contingency warrant is issued at the start of the financial year and is not exclusively for disaster response. The full amount of the contingency warrant will probably not be available for response, and there is likely to be a gap between the amount available and the disaster relief budget line.

The Solomon Islands government has SI$2.2 million (US$0.3 million) available in dedicated response funds, and there is a 77 percent chance that disaster losses will exceed this amount in any given year. If these funds were exceeded, the government would need to source remaining funds from the contingency warrant and pursue budgetary reallocation. This situation demonstrates the financial constraints the government faces in financing disaster response. The government should investigate the possibility of expanding the amount of dedicated funds available and the use of contingent credit to fund the level of retained risk.

Post-Disaster Budget Execution

Following the Santa Cruz earthquake and tsunami, a Humanitarian Action Plan was developed that identified 41 activities with an estimated total cost of SI$68.8 million (US$9.5 million), of which SI$47.5 million (US$6.6 million) remained unmet two months after the event (Solomon Islands Government 2013d).

The NDC met on the day of the Santa Cruz earthquake and was able to immediately mobilize SI$1 million (US$138,000) to purchase relief supplies. This is equivalent to approximately half of the annual budget for response. The remaining SI$1.2 million was exhausted shortly afterward following updates from situation reports identifying the need for greater quantities of relief goods. The first shipment of goods to the affected area had fully exhausted the annual response budget.

The location of the earthquake in Santa Cruz was remote, and the Solomon Islands government faced high transportation costs to facilitate relief. This experience provides a strong case for establishing some form of national reserves for disaster response and recovery. At the moment the government depends on the recurrent budget of the NDC, which is insufficient for high post-disaster transportation costs. In fact the response to the Santa Cruz earthquake drained the annual budget for the National Disaster Management Office and the majority of the national contingency budget.

Anecdotal evidence suggests that the bid waiver process was not adhered to after the Santa Cruz earthquake or the flash floods in 2014; MoFT staff were unaware of this process, which is rarely used. In a statement of emergency, normal tendering procedures should be waived upon submission of a bid waiver. But following the earthquake and floods, the NDC was required to submit a copy of the statement of

Figure 4 — Amount of Ex-Ante Funds Available for Immediate Response

Disaster risks	Disaster risk financing instruments	Amount of funds available
High-risk layer (E.G. Major earthquake, major tropical cyclone)	**Disaster risk insurance**	**N/A**
Medium-risk layer (E.G. Floods, small earthquakes)	**Contingent credit**	**N/A**
Low-risk layer (E.G. Localized flood, landslides)	**Contingency budget, national reserves, annual budget allocation**	**Contingency Warrant:** SB$38m (US$5.4m) **Disaster Relief** SB$2.2m (US$0.3m)

Source: World Bank.

emergency and a bid waiver form to accompany each quote for purchase. At times three quotes were sought despite the submission of a bid waiver. This created significant delays in the purchase of necessary relief items. Some agencies, including the Ministry of Health, asked nongovernmental organizations to pay for goods, as this was easier than procuring essential equipment through government. These anecdotes suggest that a post-disaster budget execution manual would help MoFT raise staff's awareness of post-disaster procedures and processes.

Some government departments indicated that they had sufficient funding to respond to the flash floods, but lacked the institutional capacity to expend the funds. Key line ministries such as Health and Education cited the lack of institutional capacity as a major constraint—not only on the required response to the 2014 floods but also on their day-to-day operations. These ministries have significant sector budget support from donors but do not have sufficient capacity to implement the work required. One staff member was reported to oversee over 30 maintenance contracts across the islands.

Practical policies and procedures for post-disaster finance are contained within the National Disaster Risk Management Plan. But there is limited awareness of these policies and procedures across the Solomon Islands government and in particular in the MoFT. The small volume of dedicated funds allocated to the NDC is easily exhausted, and the government should consider reactivating the National Disaster Council Fund or using other DRFI instruments such as contingent credit to ensure additional sources of liquidity following an event.

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Insurance of Public Assets

Total Solomon Islands non-life (general) insurance premium, all classes, was SI$95.6 million (US$13 million) in 2012. Local insurers underwrite SI$48.7 million (US$6.6 million) of this amount, and the balance of SI$46.9 million (US$6.3 million), or 48 percent of the market, is placed with offshore insurers.

The Solomon Islands non-life local insurance market is small and currently has two locally registered insurers, QBE Insurance (International) Limited, Tower Insurance Limited, and a new entrant, Pacific Assurance Group (Solomon Islands) Limited, which joined the market in 2014.

The Solomon Islands has legislation in place—the Insurance Act Cap. 82 (1985) and regulations—to regulate the insurance industry. The CBSI is the regulator. The CBSI requires insurers to report quarterly, ensures that solvency margins are met, and receives copies of all reinsurance contracts. Offshore insurance placements must be approved by CBSI before coverage is placed overseas.

The Solomon Islands is exposed to the catastrophic perils of cyclone, volcanic eruption, and earthquake. The Solomon Islands is located at the northern edge of the Southern Hemisphere tropical cyclone zone. The most recent damaging earthquakes were a magnitude 8.1 earthquake in April 2007 in Western Province and magnitude 8.0 earthquake in February 2013 near the Santa Cruz Islands.

Non-life premium per capita is estimated at SI$174 (US$24), which is lower than the rate in other Pacific Island Countries (PICs) and indicates a low insurance penetration. The current low insurance market premium suggests that the insurance market is, like the economy, still recovering from the ethnic tension and unrest of the past decade. The non-life insurance market premium prior to 1999 was estimated by insurance industry sources at over SI$181 million (US$25 million) (1999 value).

Insurance for catastrophe insurance perils of earthquake and cyclone is available in the market and is automatically included in property insurance products. Property insurance rates for cyclone in the Solomon Islands are below average rates for PICs, at 0.13 percent, due to comparatively lower frequency of cyclones. The earthquake insurance rates in the Solomon Islands—0.17 percent—are higher than average rates for other PICs because of recent major earthquake events.

The Solomon Islands government does not have indemnity property insurance programs in place for its public assets, including major transportation assets such as wharves, roads, and bridges. This could result in delays in reconstruction following a catastrophic event.

Since 2012, the government has had a property asset register in place, managed by the MoFT. The MoFT advised that individual ministries have their own existing asset registers and that these are not integrated or updated with the MoFT asset register.

According to insurance industry sources, some Solomon Islands statutory bodies and state-owned enterprises that manage public assets have insurance programs in place that include indemnity property insurance for catastrophe perils. Some statutory bodies do not have property insurance.

Options for Consideration

The Solomon Islands has developed a variety of DRFI processes and procedures, as detailed in this note. However, these could be strengthened to reduce the time it takes to expedite post-disaster funds. Toward that end, a number of options for consideration are presented:

Recommendation 1: Develop a post-disaster budget execution manual to improve awareness of post-disaster procedures and processes. A manual will help to reduce the time it takes to approve post-disaster expenditures by ensuring normal tendering procedures are waived. Any new process developed should align to the National Disaster Council Act (1989). Agencies and suppliers alike need to be familiar with post-disaster processes to remove any unnecessary delays in the system.

Recommendation 2: Develop an integrated disaster risk financing and insurance strategy. This should establish potential sources of immediate liquidity post-disaster, such as a dedicated reserve fund for disaster response. It is recommended that a feasibility study be conducted to look at reactivating the National Disaster Council Fund, considering in particular identification of a sustainable source of funds, any necessary amendments to legislation to safeguard expenditures, and development of an operations manual.

Recommendation 3: Explore the use of contingent credit to access additional liquidity post-disaster, including identification of the providers of this type of finance. The advantage of contingent credit is that it is used only following an event and does not affect the current debt-servicing ratio unless a disaster of an agreed-upon magnitude occurs. This option could plausibly finance response efforts following intermediate disaster events—that is, those that exceed the capacity of options from within the budget, but that are too expensive to fund through risk transfer due to their frequency.

End Notes

1 Data are from Solomon Islands National Statistics Office, available at http://www.spc.int/prism/solomons/.

2 Priority for Action 4—"Reduce the Underlying Risk Factors"—has an associated key activity of financial risk-sharing mechanisms, such as insurance, while Priority for Action 5—"Strengthen disaster preparedness for effective response at all levels"—includes the establishment of emergency funds such as contingency budget, national reserves, and annual budgetary allocations. See UNISDR (2005).

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Annex 3

Insurance Market Review, April 2014

Executive Summary

Total Solomon Islands non-life (general) insurance premium, all classes, was SI$95.6 million (US$13 million) in 2012. Local insurers underwrite SI$48.7million (US$6.6 million) of this amount, and the balance of SI$46.9 million (US$6.3 million), or 48 percent of the market, is placed with offshore insurers.

The Solomon Islands non-life local insurance market is small and currently has three locally registered insurers, QBE Insurance (International) Limited, Tower Insurance Limited, and a new entrant, Pacific Assurance Group (Solomon Islands) Limited, which joined the market in 2014.

The Solomon Islands has legislation in place—the Insurance Act Cap. 82 (1985) and regulations—to regulate the insurance industry. The Central Bank of Solomon Islands (CBSI) is the regulator and requires insurers to report quarterly to ensure that solvency margins are met. All reinsurance contracts must be sent to CBSI, which also approves offshore insurance placements before coverage is placed overseas.

The Solomon Islands is exposed to the catastrophic perils of cyclone, volcanic eruption, and earthquake. The Solomon Islands is located at the northern edge of the Southern Hemisphere tropical cyclone zone. The most recent damaging earthquakes were a magnitude 8.1 earthquake in April 2007 in Western Province and magnitude 8.0 earthquake in February 2013 near the Santa Cruz Islands.

Non-life premium per capita is estimated at US$24, which is lower than the rate in other Pacific Island Countries (PICs) and indicates a low insurance penetration. The current low insurance market premium suggests that the insurance market is still recovering from the political unrest of the past decade. The non-life insurance market premium prior to 1999 was estimated by insurance industry sources at over US$25 million (1999 value).

Insurance for catastrophe insurance perils of earthquake and cyclone is available in the market and is automatically included in property insurance products. Property insurance rates for cyclone in the Solomon Islands are 0.13 percent, below average rates for PICs, due to the lower frequency of cyclones. The earthquake insurance rates in the Solomon Islands, at 0.17 percent, are higher than average rates for other PICs because of recent major earthquake events.

The Solomon Islands government does not have indemnity property insurance programs in place for its public assets, including major transportation assets such as wharves, roads, and bridges. This could result in delays in reconstruction following a catastrophic event.

Table 1— Pacific Non-life Insurance Premium per Capita 2012 (US$)

MARKET	GDP MILLIONS	POPULATION	GDP PER CAPITA	MARKET PREMIUM	PREMIUM PER CAPITA
Cook Islands	$305	19,300	$15,823	$6,600,000	$342
Fiji	$3,908	874,700	$4,467	$97,500,000	$111
Marshall Islands	$182	52,560	$3,470	$3,000,000	$57
Samoa	$683	188,900	$3,619	$17,000,000	$90
Solomon Islands	$1,008	549,600	$1,130	$13,000,000	$24
Tonga	$471	104,900	$4,495	$4,400,000	$42
Vanuatu	$781	247,300	$3,182	$16,500,000	$67

Source: World Bank

Since 2012, the government has had a property asset register, managed by the Ministry of Finance and Treasury (MoFT). The MoFT advised that individual ministries have their own existing asset registers and that these are not integrated or updated with the MoFT asset register.

According to insurance industry sources, some Solomon Islands statutory bodies and state-owned enterprises that manage public assets have insurance programs in place that include indemnity property insurance for catastrophe perils. Some statutory bodies do not have property insurance.

Insurance Market Overview

Total non-life (general) insurance premium, all classes, was SI$95.6 million (US$13 million) in 2012. Local insurers underwrite SI$48.7 million (US$6.6 million) of the business and the balance of SI$46.9 million (US$6.3 million) is placed with offshore insurers.

The Solomon Islands non-life insurance market is small and currently has three locally registered insurers, QBE Insurance (International) Limited (QBE), Tower Insurance Limited (Tower), and a new entrant, Pacific Assurance Group (Solomon Islands) Limited, which joined the market in 2014.

The Insurance Act Cap. 82 (1985) restricts the placement of insurance offshore, and any offshore placements must be approved by the Central Bank of Solomon Islands (CBSI). Insurance industry sources advised that most offshore placements are for specialist and global corporate insurance risks, such as Gold Ridge mine and Solomon Breweries. Aviation risks are also placed offshore, as there is no capacity for this class of business in the Solomon Islands.

The non-life premium per capita in the Solomon Islands is US$24, lower than rates in other Pacific Island Countries (PICs) (table 1). Insurance industry sources advised that the non-life insurance market premium in 1999 was an estimated US$25 million. The current low insurance market premium suggests that the insurance industry is still recovering from the ethnic tension and unrest of the past decade.

Distribution channels

Table A.2— Pacific Commercial Property Insurance Rate and Deductible Comparison

MARKET	AVERAGE EARTHQUAKE RATE	GENERAL EARTHQUAKE DEDUCTIBLES	AVERAGE CYCLONE RATE	GENERAL CYCLONE DEDUCTIBLE
Cook Islands	0.12%	2% of sum insured	0.45%	20% of sum insured
Fiji	0.08%	10% of sum Insured	0.30%	20% of loss
Samoa	0.12%	2% of sum insured, or 5% of loss	0.20%	2% of sum insured, or 5% of loss
Tonga	0.15%	5% of sum insured	0.25%	5% of sum insured
Vanuatu	0.30%	5% of loss	0.17%	20% of loss

Source: World Bank 2013

Note: Average market rate percentage of value based on insurance industry sources.

According to CBSI, the Solomon Islands has two licensed insurance agents, Australia & New Zealand Banking Group Limited and Credit Corporation (Solomon Islands) Limited.

There are four licensed insurance brokers: United Risk Services Limited, MAT Insurance Brokers Limited, Pacific Insurance Broker Limited, and Marsh PTY Limited. Only Marsh does not have a servicing office in the Solomon Islands; its business is transacted from Australia or Papua New Guinea.

Both of the current non-life insurers in Solomon Islands offer insurance products on a direct basis for domestic household and motor vehicle insurance products. No insurance services are available by Internet in the Solomon Islands.

There is a range of distribution channels available in the marketing of general insurance products in Solomon Islands, all of which are focused in the capital, Honiara.

Property insurance rates for cyclone in the Solomon Islands are below average for PICs, although the earthquake rates are higher than average (see table 2). These high earthquake rates are due to the occurrence of major earthquake events in recent years. The low cyclone rates are due to the low number of claims for these events in the Solomon Islands; while the events themselves are relatively frequent, the areas affected have limited assets and consequently very little insurance coverage.

There are a number of limitations with a comparison of this type because of the variables in property insurance rating, such as location of premises, construction, occupation, fire protection, frequency of expected losses, and the amount and type of deductible on the policies. It is not possible to use average rating data as an exact basis for a specific company or individual risk, but it is possible to offer a general comparison of the property insurance rates in respective markets.

The local market does not appear to have any major capacity limitations for property insurance. Insurance intermediaries' advised that both insurance providers have capacity for most property risks within the Solomon Islands. There is additional capacity available, by way of offshore placements, if necessary. The fact that 48 percent of the market premium is placed offshore suggests that the capacity is used by insurance brokers to place client business.

Catastrophe Risk Insurance

There are three major catastrophe hazards in the Solomon Islands: earthquakes, volcanic eruptions, and tropical cyclones. The major property accumulation exposure is in the capital (Honiara) and the island of Guadalcanal.

Catastrophe risk insurance presents a particular challenge to insurers' exposure management, since unlike other types of insurance, it presents the possibility of large correlated losses. Insurers need to use a combination of reinsurance, reserves, and diversification within their underwriting to ensure that their portfolios can withstand large disaster shocks without threatening their solvency. The Solomon Islands local domestic market has capacity available, with one international insurer and two regional insurers, and additional capacity is available offshore if needed.

All insurers with catastrophe exposures need to obtain reinsurance to increase their capacity. This is even more important when the insurer or the insurance market pool is small, such as in the Pacific. As regulators become increasingly vigilant about requiring insurers to have sufficient capital and a good solvency margin to protect their interests from catastrophic events, they are requiring adequate reinsurance programs, placed with robust reinsurers.

Catastrophe Reinsurance

In 2011, natural catastrophe insured losses in the global reinsurance market were the second-largest ever, at over US$110 billion (Swiss Re 2012). What made this year significant for insurers (and reinsurers) in the Pacific was the number of events that occurred in the Asia Pacific region: earthquakes in New Zealand and Japan, floods in Australia and Thailand, and a cyclone in Australia. According to the Global Insurance Market Report (IAIS 2012), these Asia Pacific events accounted for 61 percent of the insured losses from natural catastrophes in 2011, compared to a 30-year average of 18 percent. As a consequence, there were adjustments in reinsurance capacity and higher risk premiums. In 2012 the natural disaster losses dropped to US$77 million (Swiss Re 2013), but this was still the third-highest year for natural catastrophe insured losses since 1970. In the Pacific, Tropical Cyclone Evan caused insured losses of F$57 million in Fiji (RBF 2012) and estimated insured losses of SAT 3 million in Samoa in December 2012.

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QBE (Solomon Islands) is reinsured for catastrophe events under the QBE Group reinsurance program. QBE Group has a detailed risk management process (QBE Insurance Group Limited 2012) that includes monitoring of catastrophe claims concentration and reinsurance protection to mitigate the exposures.

Tower (Solomon Islands) is reinsured for catastrophe events under the Tower Insurance Limited Group reinsurance program. Tower has determined that its main exposure in the Solomon Islands is earthquake and that the main accumulation is in the capital, Honiara. Tower Insurance Limited (2011, 2012) acknowledges that property accumulations and exposure to natural perils represent a significant risk to its business. In order to mitigate this risk the company undertakes accumulation risk modeling and ensures that adequate reinsurance protection is in place. In its 2011 annual report, Tower Insurance Limited (2011) advised that its event excess had increased to NZ$6.7 million and that it had protection for two catastrophe events within the program for the 2011/12 period. The reinsurance program is not detailed in the company's 2012 report, but it could be expected to follow the previous arrangements.

Insurers throughout the Pacific have expressed concern at the recent increase in reinsurance premiums, particularly premiums for catastrophe reinsurance. They have limited ability to pass on the full costs of these increases to insured clients due to the small size and economic constraints in those markets.

Market Property and Catastrophe Insurance Products

Cyclone insurance in the Solomon Islands differs from that in most other PICs in that it is available automatically, with no preconditions for acceptance such as an engineer's report. It can be assumed, however, that buildings do not meet any form of building code, since a national building code has not been agreed upon or passed in the country. Should clients wish, they can provide an engineer's report to indicate that the building meets the building standards applied elsewhere, and this can be factored into the policy.

Industrial Special Risks (ISR) policies are used for property insurance on most major commercial, government, and government public bodies accounts. There is no agreed upon ISR within the market—that is, each property insurer has its own ISR. The wordings are generally based on the Australian Mark IV or Papua New Guinea market ISR wordings.

The QBE ISR wording is based on the Australian Mark IV insurance industry standard wording. Tower uses an ISR wording based on the Papua New Guinea insurance market wording. These wordings insure material damage (subject to specific exclusions) and include insurance for natural perils, such as volcanic eruption, earthquake, tsunami, and cyclone.

Commercial Package or Business Protection wordings are used for small and medium enterprises, and policies are taken as either Multi Risks (accidental damage including earthquake and cyclone by extension) or as Specified Risks (fire and extraneous perils). These policies generally follow the perils insured under the ISR, although coverage may be more restricted.

Regulatory Framework

Insurance Law and Regulation

Under the Insurance Act Cap. 82 (1985), all insurance companies, agents, and brokers must be licensed. The CBSI is the regulator and requires quarterly and annual returns from insurers. According to the CBSI (2012), the draft of a new

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Insurance Bill was completed in 2008 with the assistance of the International Monetary Fund, although the bill is still pending at this time.

CBSI requires insurers to annually submit a reinsurance management strategy and program details with their insurance license renewal application. CBSI holds quarterly prudential consultative meetings with insurance companies and brokers to discuss market issues. It also undertakes biannual on-site reviews of local insurers, including cross-checks of accumulations against adequacy of insurance coverage.

Building Controls and Standards

The Solomon Islands does not have a building act in place. Insurance industry sources advised that a draft National Building Code was circulated in 1990, using the New Zealand earthquake code (NZS4203) and Australian wind loads (AS1170.2) as its basis. Under the Town and Country Planning Act Cap. 154 (1980), any development plans must be lodged with local authorities prior to construction, but this legislation does not require compliance with any building code.

In the absence of a legally enforceable building code, insurers underwrite on the basis that premises do not meet code, unless proof by way of an engineer's report is provided to the contrary.

Financial Security of Onshore Insurers

The Solomon Islands has three onshore insurers, QBE (Solomon Islands), Tower (Solomon Islands), and Pacific Assurance Group (Solomon Islands) Limited,

QBE (Solomon Islands) is a branch of QBE Insurance (International) Limited, which is a wholly owned subsidiary of QBE Insurance Group Limited, an Australian company listed on the Australian stock exchange. QBE Insurance (International) Limited has a security rating of A+ (strong) from

Standard & Poor's, dated May 22, 2013, as a core operating entity of QBE.

Tower (Solomon Islands) is a branch of Tower Insurance Limited, a New Zealand–registered company listed on the New Zealand and Australian stock exchanges. As a branch, Tower (Solomon Islands) holds the financial security rating of the parent company, Tower Insurance Limited, which has a security rating of A- (excellent) from A. M. Best dated July 26, 2013.

The new entrant, Pacific Assurance Group (Solomon Islands) Limited, is a subsidiary of a company registered in Papua New Guinea, Pacific Assurance Group Limited. No details of the company's financial security are available at this time.

Insurance of Public Assets

According to the Ministry of Finance and Treasury (MoFT), the Solomon Islands has no property insurance program in place for government buildings or infrastructure assets. Nor is there a current plan to insure public assets.

The government does have an asset register in place for property and infrastructure assets, managed since 2012 by MoFT. The existing asset register could be used to identify key government assets for any risk financing or insurance program.

Some state-owned enterprises that hold major public assets have property insurance programs that include earthquake and cyclone perils. These enterprises include Solomon Airlines Limited, Solomon Islands Electricity Authority, and Solomon Islands Ports Authority.

The government keeps no centralized register detailing the insurance arrangements made by individual state-owned enterprises. A register of this type would allow a coordinated approach to property insurance management and purchasing, which could result in lower premiums.

Past Catastrophe Events

The most destructive cyclone within the Solomon Islands was Cyclone Namu in 1986 (Revell 1986). This event caused significant property damage in the capital city, Honiara, and in the surrounding islands of Guadalcanal and Malaita. Insurance industry sources reported that claims were estimated at SI$14 million (1986 values), the largest of which was from Solomon Islands Plantations Limited at over SI$7 million. The remaining SI$7 million in claims was from flood and wind damage within Honiara township. The loss adjuster who attended to these claims advised that there were a number of roof failures due to incorrect or inadequate fixing of roofing iron.

On April 2, 2007, a magnitude 8.1 earthquake occurred in Western Province to the southwest of the regional town Gizo. As a result of damage from the earthquake and resulting tsunami, 35 insurance claims were lodged, and insured damage was estimated at SI$9 million (US$1.1 million). The claims and insured costs were lower than might have been expected due to the low penetration of insurance in remote islands.

Following Cyclone Namu, one insurer, Sun Alliance, withdrew from the underwriting of insurance business in the Solomon Islands market.

Options for Consideration

Recommendation 1: The government should develop an insurance program for key public assets and include this in a broader disaster risk financing and insurance strategy. This step would include use of the existing asset register to identify key assets and assessment of premium costs for property indemnity insurance on key public assets, in particular for the major catastrophe perils of earthquake/tsunami and cyclone/sea surge.

Recommendation 2: The government should update the asset register held by the MoFT to include the property assets currently listed in existing asset registers with other ministries. Where possible the asset register entries should include the current replacement value of public assets, in addition to the existing purchase value.

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Glossary

Agent	Someone who acts for the insurance company in arranging insurance contracts. There are two main types of agents: tied agents, who act for one insurer only, and general agents, who act for multiple insurance companies.
Broker	Someone who acts as an agent for the insured in arranging an insurance or reinsurance program with a provider of capacity.
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.
Captive insurer	An insurance company wholly owned by a company or entity that insures the risks of the parent entity and subsidiaries.
Indemnity insurance	Insurance that reimburses individuals or entities for loss or damage to a financial position as close as possible to the position they were in prior to the event, in the context of the financial terms of the coverage (such as deductible/excess and limit).
Intermediaries	The general term given to insurance agents and brokers.
Net retention	The amount that an insurance company retains on a reinsurance contract and in particular an excess of loss of contract.
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. May also be called 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.
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.
Solvency margin	The extent by which an insurer's assets exceed its liabilities. Minimum statutory solvency requirements are normally included in insurance acts or regulations.

Country Note

SAMOA

February 2015

Disaster Risk Financing and Insurance

CHAPTER 04

GFDRR

SPC Secretariat of the Pacific Community

WORLD BANK GROUP

Executive Summary

In 2012 Tropical Cyclone (TC) Evan offered a distressing reminder of Samoa's exposure to natural hazards. TC Evan came only three years after the earthquake and tsunami of 2009, which affected 2.5 percent of the country's population, causing 143 fatalities and associated economic losses equivalent to 20 percent of gross domestic product (GDP).

The economic growth of Samoa has been impacted in the past few years by two major disasters: the tsunami in 2009 and TC Evan in 2012. Growth was also impacted by the global financial crisis. Overall GDP contracted by 5.1 percent following the tsunami in 2009, but it has gradually increased in subsequent years. Following TC Evan, real GDP declined by 0.4 percent. Growth in GDP rebounded to 2.2 percent in 2013/14 as the reconstruction program commenced (World Bank 2014).

Samoa is expected to incur, on average over the long term, about SAT 23 million (US$10 million) per year in losses due to earthquakes and tropical cyclones. In the next 50 years, Samoa has a 50 percent chance of experiencing a loss exceeding SAT 255 million (US$110 million) and a 10 percent chance of experiencing a loss exceeding SAT 812 million (US$350 million) (PCRAFI, Country Risk Profile).

Samoa has several disaster risk financing and insurance (DRFI) tools in place and is able to reallocate resources swiftly following an event. However, there is some confusion surrounding the correct post-disaster finance policies among Ministry of Finance (MoF) staff. At present these policies are spread across a variety of documents. This has resulted in delays in procurement and inefficient allocation of human resources. It is recommended that post-disaster policies be compiled into a single document for post-disaster budget mobilization and execution to avoid problems in the future.

A number of options to improve the existing DRFI measures have been presented for consideration:

(a) develop an overarching disaster risk financing strategy aligned to existing processes;

(b) develop an operations manual detailing the processes required to facilitate swift post-disaster budget mobilization and execution; and

(c) develop an insurance program for key public assets.

Introduction

Samoa is composed of two large volcanic islands (Upolu and Savai'i) and several smaller islands, and has a total land area of approximately 2,935 km^2. The resident population of Samoa for 2013 was estimated at 190,652, with 80 percent of this number living in rural areas. [1]

Samoa is exposed to tropical cyclones, floods, earthquakes, tsunamis, volcanic eruption, and drought. Samoa was ranked 51st out of 179 countries in the Global Climate Risk Index 2012 report on who suffers most from extreme weather events (Harmeling 2012).

In 2012 TC Evan offered a distressing reminder of Samoa's exposure to natural hazards. TC Evan came only three years after the earthquake and tsunami of 2009, which affected 2.5 percent of the country's population, causing 143 fatalities and associated economic losses equivalent to 20 percent of gross domestic product (GDP).

The government of Samoa, in conjunction with the Secretariat of the Pacific Community Applied Geoscience and Technology Division (SPC-SOPAC), the Secretariat of the Pacific Regional Environment Programme (SPREP), the United Nations Development Programme (UNDP) Pacific Centre, and the United Nations International Strategy for Disaster Risk Reduction (UNISDR) as well as other partners, has developed several institutional frameworks on disaster risk management and climate change adaptation at the national, subregional, and international level, including the following:

- Hyogo Framework for Action (HFA) 2005–2015
- Pacific Disaster Risk Reduction and Disaster Management Framework for Action (Regional Framework for Action, or RFA) 2005–2015
- Samoa's National Disaster Management Plan 2011–2014
- Samoa National Action Plan (NAP) for Disaster Risk Management, 2011–2016

Samoa's National Disaster Management Plan cites disaster-related financing as the role of the Ministry of Finance (MoF). Under reference 17 in the plan, the MoF must coordinate the collection, allocation, and provision of monetary aid to people affected by a disaster (GoS 2011a).

Disaster risk financing and insurance (DRFI) is a key activity of the HFA Priorities for Action 4 and 5.[2] The HFA is a result-based plan of action adopted by 168 countries to reduce disaster risk and vulnerability to natural hazards and to increase the resilience of nations and communities to disasters over the period 2005–2015. In the Pacific, the HFA formed the basis for the development of the Regional Framework for Action.

The RFA cites DRFI activities as a key national and regional activity. Theme 4 of the RFA—"Planning for effective preparedness, response

and recovery"—has an associated key national activity, "Establish a national disaster fund for response and recovery." Moreover, Theme 6 of the RFA—"Reduction of underlying risk factors"—cites the development of "financial risk-sharing mechanisms, particularly insurance, re-insurance and other financial modalities against disasters as both a key national and regional activity" (SOPAC 2005). These regional implementation activities align with the three-tiered disaster risk financing strategy promoted by the World Bank (and described below).

The Pacific DRFI Program enables countries to increase their financial resilience against natural disasters by improving their capacity to meet post-disaster funding needs without compromising their fiscal balance. This program is one application of the Pacific Catastrophe Risk Assessment and Financing Initiative (PCRAFI). The Pacific DRFI Program is built upon a three-tiered approach to disaster risk financing (figure 1). The different tiers align to the basic principles of sound public financial management, such as the efficient allocation of resources, access to sufficient resources, and macroeconomic stabilization. The three tiers acknowledge the different financial requirements associated with different levels of risk:

(a) Self-retention, such as a contingency budget and national reserves, to finance small but recurrent disasters;

(b) A contingent credit mechanism for less frequent but more severe events; and

(c) Disaster risk transfer (such as insurance) to cover major natural disasters.

This note aims to build understanding of the existing DRFI tools in use in Samoa and to identify gaps where potential engagement could further develop financial resilience. In addition, this note aims to encourage peer exchange of regional knowledge through dialogue on past experiences, lessons learned, and ways to optimize the use of these financial tools, as well as how these tools may affect the execution of post-disaster funds.

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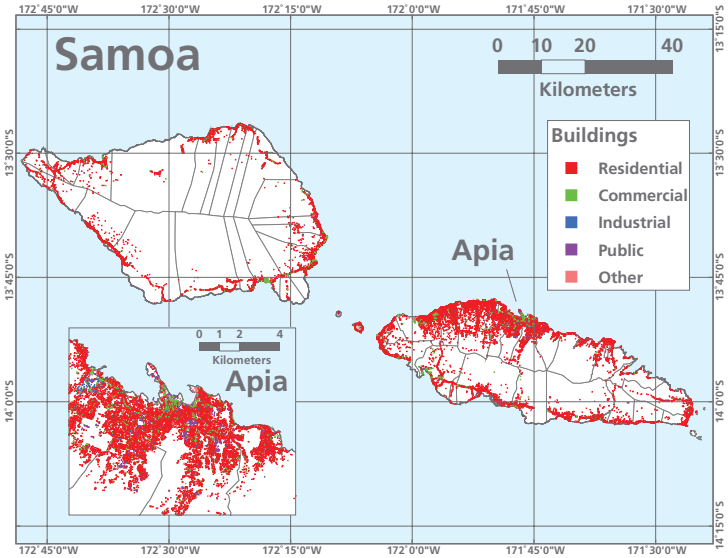
Economic Impact of Natural Disasters

In 2012, the Global Climate Risk Index ranked Samoa 51st out of 179 countries for extreme weather event impacts (Harmeling 2012). In the past 50 years Samoa has experienced 56 events with associated losses of SAT 1,270 million (US$543 million).[3]

The main hazards that affect Samoa are from tropical cyclones, earthquakes, tsunamis, and occasional flooding. In 1990, Tropical Cyclones (TCs) Ofa and Val caused estimated total loss of between SAT 690 and SAT 1,150 million (US$300 million–US$500 million) (PCRAFI, 2012), which is equivalent to approximately four times GDP (GoS 2013). In comparison, the last major flood in 2001 caused direct losses worth SAT 11 million (GoS 2013).

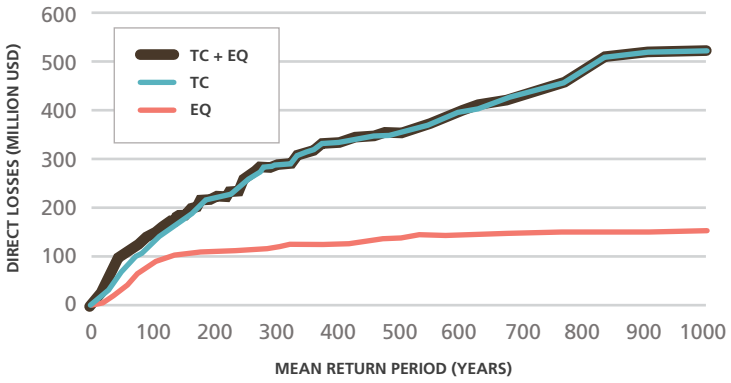
The economic growth of Samoa has been impacted in the past few years by two major disasters: the tsunami in 2009 and TC Evan in 2012. Growth was also impacted by the global financial crisis. Overall GDP contracted by 5.1 percent following the tsunami in 2009 but has gradually increased in subsequent years. Following TC Evan, real GDP declined by 0.4 percent. Growth

Figure 1 — Land Use/Land Cover



Section 04

Figure 2 — Direct Losses by Return Period



Source: PCRAFI 2012

Note: TC = tropical cyclone; EQ = earthquake

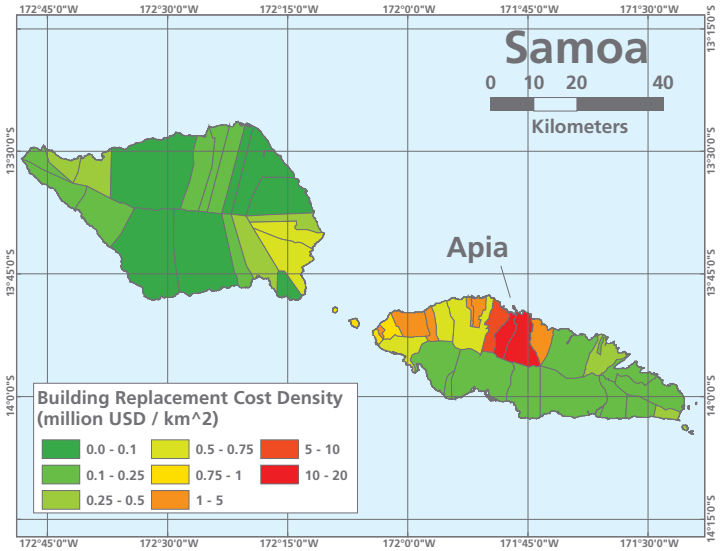
in GDP rebounded to 2.2 percent in 2013/14 as the reconstruction program commenced (World Bank 2014).

Tourism is a major economic driver and has increased the concentration of assets along Samoa's coastline, where the majority of the population resides. Figure 2 shows that the majority of buildings, residential and commercial, are located along the coastline.

Samoa is expected to incur, on average over the long term, about SAT 23 million (US$10 million) per year in losses due to earthquakes and tropical cyclones. In the next 50 years, Samoa has a 50 percent chance of experiencing a loss exceeding SAT 255 million (US$110 million), and a 10 percent chance of experiencing a loss exceeding SAT 812 million (US$350 million) (see figure 3).

Figure 4 shows the average annual loss by area, with red indicating a high level of average annual losses—those worth SAT 5.5 million (US$2.4 million) and over.

Figure 3 — Average Annual Loss by Area



Source: PCRAFI 2012

Public Financial Management of Natural Disasters

Following the declaration of a state of emergency, staff from the Ministry of Finance are relocated to the Disaster Management Office (i) or the National Emergency Operation Centre. This change is to help ensure that procurement of emergency supplies occurs as quickly as possible. For expenditures agreed upon by the National Disaster Council, emergency procurement policies allow for payments to be made to contractors within one week, as opposed to the standard term of 30 days.

Samoa has experienced two major disasters within a three-year period, the tsunami in 2009 and TC Evan in 2012. These events placed considerable pressure on core government staff, in particular in the DMO and the MoF. As a result of these events, however, the policies and processes for DRFI have been tested—and found to be effective.

Effective post-disaster financial response relies on two fundamental capabilities:

(a) the ability to rapidly mobilize funds post-disaster, and

(b) the ability to execute funds in a timely, transparent, and accountable fashion.

This section discusses the existing procedures for post-disaster budget mobilization and execution, and where possible provides examples of their use.

Post-Disaster Budget Mobilization

Samoa has a variety of ex-ante and ex-post financial tools, and the timing for mobilizing and executing these funds varies significantly. Building on the World Bank framework for disaster risk financing and insurance (see annex 1), table 1 shows the ex-ante and ex-post financial tools available, indicates which have been utilized by Samoa, and gives indicative timings. The tools utilized by Samoa are highlighted in blue and show the indicative timing involved in mobilizing the funds. Those sections highlighted in gray are

for generic instruments that to date have not been used in Samoa.

The sections below discuss in detail both the ex-ante and the ex-post financing tools available to Samoa, including the time it takes to mobilize these funds and the amount of funding available.

Ex-Ante Practices and Arrangements

The uncertainty surrounding international assistance has increased pressure on countries to establish domestic sources of financing—such as national reserves or the transfer of risk to the international insurance market—for post-disaster relief. The ex-ante practices and arrangements that have been made by Samoa include an emergency fund, a contingency budget, and sovereign catastrophe risk insurance.

Emergency fund

Following a declaration of emergency, an emergency fund can be established to receive any monies reallocated from the government as well as donations from the international community, private enterprises, and members of the public. This was the process following the tsunami in 2009 and TC Evan in 2012.

The establishment of an emergency fund is requested by the Disaster Advisory Committee and is authorized by the financial secretary. Section 61 of the Public Finance Management Act requires the source of finance, signatories, and expenditure areas to be assigned in advance in order to prevent misuse of the funds.

Table 1— Sources of Funds Available

	SHORT TERM (1-3 MONTHS)	MEDIUM TERM (3-9 MONTHS)	LONG TERM (OVER 9 MONTHS)
Ex-post Financing			
Donor Assistance (relief)	■	■	
Budget Reallocation	■	■	
Domestic Credit	■	■	■
External Credit		■	■
Capital Budget Realignment			
Donor Assistance (reconstruction)		■	■
Tax Increae			
Flash Appeal			
Ex-ante Financing			
Emergency Fund	■		
Contingency Budget	■	■	
Contingent Credit			
Sovereign (parametric) Catastrophe Risk Insurance	■	■	
Traditional Disaster Insurance	■	■	■

Source: Government of Samoa

Box 1— The Pacific Catastrophe Risk Insurance Pilot

The Pacific Catastrophe Risk Insurance Pilot aims to provide immediate budget support following a major tropical cyclone or earthquake/tsunami. The insurance is designed to cover emergency losses, which are estimated using both a modeled representation of the event based on hazard parameters and a calculation of total modeled physical damage. Unlike a conventional insurance scheme, where a payout would be assessed against actual incurred costs, this scheme pays out on the results of a model. The advantage of this approach is that it results in a much faster payout. The payout would act as a form of budget support and would go some way to cover the costs that would be incurred by the government in the aftermath of a severe natural disaster that disrupts the provision of government services. Countries can choose between three layers of coverage—low, medium, and high—depending on the frequency of events. The lower layer will cover events with a return period of 1 in 10 years, that is, more frequent but less severe events. The medium layer will cover events with a 1-in-15-year return period, while the higher layer will cover less frequent but more severe events, or those with a return period of 1 in 20 years. However, countries may request that a more customized option be developed for them.

The emergency fund established in the aftermath of TC Evan received SAT 5.1 million (US$2.2 million) in budgetary reallocation from the unforeseen expenditure line following a request from the National Disaster Committee. This fund was approved by the legislative authority, established, and disbursing funds within 24 hours of the request from the committee.

Contingency budget

A contingency budget, known as the "unforeseen expenditure" equivalent to 3 percent of the total appropriation bill, is available subject to Article 96 of the constitution. The release of funds for unforeseen expenditure requires approval from the legislative assembly[4] following advice presented by the Minister of Finance. In 2013 the maximum contingency budget would have been equivalent to SAT 16 million (US$7 million). According to estimates, there is a 7.2 percent chance that disaster losses will exceed this amount in any given year.

Table 2— Selected Insurance Coverage, 2014–2015 Pilot Season

	TROPICAL CYCLONE	EARTHQUAKE
Policy period	November 1, 2013–October 31, 2014	
Peril selected	Tropical cyclone	Earthquake
Layer of coverage selected	1 in 20 years	1 in 20 years
Coverage limit as a percentage of contingency budget	137 percent	89 percent
Reporting agencies	Joint Typhoon Warning Center	United States Geological Survey

Source: World Bank and PCRAFI 2014.

Sovereign catastrophe risk insurance

The coverage selected by Samoa provides an aggregate coverage limit worth more than double the unforeseen payments (contingency budget) for the fiscal year 2013/14 (see table 2). Samoa chose a level of coverage designed to pay out for tropical cyclone and earthquake/tsunami events of such severity that a triggering event would be expected to occur once every 20 years on average, over the long term. The coverage is in effect from November 1, 2014, to October 31, 2015.

Ex-Post Practices and Arrangements

By definition a disaster exceeds a country's capacity to cope with it, and there will therefore always be a need for ex-post practices and arrangements. An optimal strategy for DRFI relies on a combination of ex-ante and ex-post financial instruments. Ex-post arrangements benefit from being able to establish the extent of the disaster and prioritize the response needs. For this reason these arrangements take longer to implement than ex-ante arrangements, but they can often mobilize larger amounts of finance. This section discusses the ex-post practices and arrangements that have been made by Samoa.

Budget reallocation

Intradepartmental transfers can be made following authorization from the head of the department and the financial secretary. These transfers are allowed provided that the transfer does not increase the appropriation for that line item by 20 percent or more, and the total appropriation for the department must remain unaltered.

Following the declaration of a state of emergency, the minister of finance may approve expenditure to help address needs arising from the emergency. Any such expenditures must be published in Savai'i and presented to the legislative assembly at the earliest opportunity, although such expenditures do not require their approval. The expenses must also be included in the annual financial statements.

External credit

Both the fiscal deficit and public debt have increased following the 2009 tsunami and TC Evan in 2012. In the fiscal year 2008/09, Samoa had a debt-servicing ratio equivalent to 45.4 percent of GDP. In fiscal year 2011/12—prior to TC Evan—this ratio was trending upward to 57.6 percent of GDP and was expected to increase

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further. The tsunami recovery program is being financed by grants, however, so this increase may prove to be relatively small.

Following these events, the government of Samoa revised its targeted debt threshold to 50 percent of GDP, placing restraints on any new borrowing. As a consequence the International Monetary Fund and World Bank revised the risk of debt distress from low to moderate, a change that increases the urgency of fiscal consolidation (IMF 2012).

Donor funds for relief and reconstruction

While donor funds will always be required in the event of an emergency, there is also an element of uncertainty surrounding how much will be provided, what will be provided, and when funds will arrive in country. Consequently, overdependence on international relief as a source of post-disaster financing can delay the provision of initial relief and inhibit ex-ante contingency planning. Development partners, international organizations, local nongovernmental organizations, businesses, and individuals contribute in the form of cash grants and aid in kind. The provision of aid in kind, while vital, can affect the costs borne by governments for the distribution these goods.

In the month following TC Evan, Samoa received cash donations from the international community worth over SAT 4.8 million (US$2 million); in addition, the local and international community also donated significant supplies to help with initial relief. Experience shows that donations continue even after relief work ends and recovery and reconstruction programs begin. For example, the completion report for the tsunami fund states that SAT 62.4 million (US$26.7 million) was received from development partners and private individuals and organizations (GoS 2011b.). This serves to demonstrate that while donor assistance for reconstruction may take some time to mobilize, it allows significant amounts of finance to be raised.

Total Response Funds Available

Samoa has the ability to raise a maximum of SAT 47.1 million (US$20.5 million) for disaster response, equivalent to 9 percent of total expenditures in 2013/14. This figure is based on the unforeseen expenditure allowance for the fiscal year 2013/14, the emergency fund established for TC Evan, and the aggregate coverage limit from the Pacific Catastrophe Risk Insurance Pilot (see figure 5). It should be emphasized that this amount is a maximum; given the nature of the emergency fund process, there is an element of uncertainty surrounding how much could actually be made available. In other words, the SAT 5.1 million that the Government was able to reallocate following TC Evan provides us with an indication of what can be made available. Similarly, the aggregate payout is the absolute maximum that Samoa could receive following an earthquake/tsunami or a tropical cyclone. It is estimated that there is a 2 percent chance that disaster losses will exceed this amount in any given year.

Post-Disaster Budget Execution

Following the experience of the 2009 tsunami, the response to TC Evan was triggered quickly: finance was sourced and allocated within the first week. The MoF was able to reallocate SAT 5.1 million (US$2.2 million) into an emergency fund and open a relief account for donations from members of the public and private sector entities.

Additional finance for the recovery and reconstruction framework following TC Evan was sought via the reprogramming of funds, savings in the recurrent budget, and funding from development partners. While much of the funding from development partners was sought in grants, large amounts were also made available in loans. To facilitate reconstruction of major infrastructure such as roads and electricity, the Asian Development Bank and the World Bank made loans for key infrastructure projects.

Following the tsunami in 2009, the Central Bank of Samoa (CBS) established a credit facility of SAT 5 million for tourism-related loans. The Development Bank of Samoa oversaw the day-to-day management of this facility. The aim was to expand fale (a traditional style of house in Samoa) businesses that could not be supported via grants and other financial vehicles.

The government of Samoa financed approximately 14 percent of the 2009 tsunami reconstruction program. A deficit of SAT 9.7 million (US$4.1 million) was identified and filled by the government to ensure continuation of the reconstruction program. This finance came from the reprogramming of funds and was also partially sourced from World Bank and Asian Development Bank budget support loans. Consequently, some

Figure 4 — Amount of Ex-Ante Funds Available for Immediate Response

Disaster risks	Disaster risk financing instruments	Amount of funds available
High-risk layer (E.G. Major earthquake, major tropical cyclone)	**Disaster risk insurance**	**Total catastrophe risk insurance coverage** **SAT26m** (US$11.3m)
Medium-risk layer (E.G. Floods, small earthquakes)	**Contingent credit**	
Low-risk layer (E.G. Localized flood, landslides)	**Contingency budget, national reserves, annual budget allocation**	**Unforeseen:** **SAT16m** (US$7m) **Emergency fund:** **SAT5.1m** (US$2.2m)

Source: World Bank.

work continued into the 2011/12 budget for some sectors.

Samoa has a proactive approach to DRFI and is able to reallocate resources swiftly following an event. However, post disaster financial procedures are spread across a variety of documents. The result has been delays in procurement and inefficient allocation of human resources. To avoid these issues in future, it is recommended that post-disaster policies be compiled into a single document for post-disaster budget mobilization and execution.

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Section

Domestic Catastrophe Risk Insurance Market

All classes of non-life insurance premium in Samoa are estimated to be worth SAT 41 million (US$17 million). This figure includes premiums for businesses placed with offshore insurers by locally licensed agents and brokers. The exact amount of premium for offshore-placed insurance was not available from the CBS.

The market is composed of four local insurers. While such a market would normally be classified as small, insurance industry sources advised that this market is in fact very competitive. Non-life premium per capita is estimated at US$90.00, which is consistent with other developing Pacific Island Countries (PICs).

There is legislation in place that regulates the local insurance industry (the 2007 Insurance Act), and the CBS acts as the insurance regulator. The CBS collects information to ensure that solvency margins are met. It also monitors accumulations for all classes and requests information on reinsurance protection.

International insurance companies registered in Samoa are regulated by a separate body, the Samoa International Finance Authority (SIFA). SIFA is a member of the International Association of Insurance Supervisors (IAIS) and the Group of International Insurance Center Supervisors (GIICS).

The Public Finance Management Act (2001), Section 54, requires the government to establish an insurance fund and to pay insurance premiums out of this fund. The premiums for the existing property insurance program are paid out of this fund.

The main catastrophe hazard in Samoa is tropical cyclone. Insurers will insure only those properties that meet the cyclone standard set out in the building code. Cyclone insurance is available as an extension of property policies only after the engineer's certification of compliance with the cyclone code has been received. The average premium rate for cyclone extension is 0.20 percent of the total insured value. Based

on estimates of insured-to-total losses in prior major cyclone events, it is estimated that only 20 percent of businesses and 10 percent of residential premises have cyclone insurance. Earthquake as a peril is normally offered automatically on the full sum insured. The average premium rate for the earthquake peril is 0.10 percent of total insured value, although there is some variation among insurers. Tsunami is included as an earthquake peril.

The government has a property insurance program in place for major public buildings on an indemnity value basis. At present there is no insurance of key infrastructure assets, such as bridges or roads.

Public trading bodies make their own insurance arrangements, including property insurance for key assets. These property insurance programs insure against earthquake, but the cyclone insurance extension is not always taken.

Please refer to annex 3 for the full market insurance review that was conducted in Samoa in 2013.

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Options for Consideration

Samoa has implemented several DRFI tools to improve its financial resilience to natural disasters. However, the policies are spread throughout a variety of documents, and during a disaster staff find it difficult to access needed information; they often must rely on key staff to ensure the correct policies are followed. The following recommendations for minimizing any potential loss of institutional knowledge have been suggested for consideration.

Recommendation 1: Develop an overarching disaster risk financing strategy aligned to existing processes. Samoa has a proactive ex-ante approach to DRFI. However, the activities in place have been developed in isolation; while some processes are documented, this information can be difficult to find. One way to address this issue would be to develop an overarching DRFI strategy for the Cabinet Development Committee to endorse. This would create a single document to articulate the available financing options and associated policies behind these tools. In addition, an action plan for implementation activities is also recommended.

Recommendation 2: Develop an operations manual detailing the processes required to facilitate swift post-disaster budget mobilization and execution. This manual would clearly document the post-disaster budget mobilization and execution procedures and processes for MoF staff. In addition, it could feature the disaster response plan for the MoF that is now required under the Disaster Management Act. During a disaster it is important that staff know and understand the correct procedures to follow, and having a manual that details the processes in a single document would help to embed existing processes such as the allocation of a member of staff from MoF to the DMO.

Recommendation 3: Develop an insurance program for key public assets. This would include a full review of the current insurance program for the government by MoF. In addition, it would identify assets to be included and indicate appropriate coverage selection for these assets. The potential for establishing an insurance vehicle could also be investigated if deemed appropriate.

End Notes

1 Samoa Burea of Statistics, "Key Statistics," http://www.sbs.gov.ws/index.php?option=com_content&view=article&id=35&Itemid=102.

2 Priority for Action 4—"Reduce the underlying risk factors"—has an associated key activity of financial risk-sharing mechanisms such as insurance, while Priority for Action 5—"Strengthen disaster preparedness for effective response at all levels"—includes the establishment of emergency funds such as a contingency budget.

3 Pacific Disaster Net - http://www.pacificdisaster.net/pdn2008/

4 This is the equivalent of the cabinet in some countries.

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Annex

Insurance Market Review, February 2014

Executive Summary

Non-life insurance premiums, all classes, are estimated in Samoa to be SAT 41 million (US$17 million). This figure includes premiums for business placed with offshore insurers, by locally licensed agents and brokers. The exact amount of premium for offshore placed insurance was not available, but it is estimated to be 15 percent of the market premium.

The non-life market in Samoa is composed of four local insurers. While this would normally be classified as a small market, insurance industry sources judge it to be very competitive. Non-life premium per capita is estimated at US$ 90.00, which is consistent with other developing Pacific Island Countries.

There is legislation in place that regulates the local insurance industry (the 2007 Insurance Act), and the Central Bank of Samoa (CBS) acts as the insurance regulator. The CBS collects information to ensure that solvency margins are met. It also monitors accumulations for all classes and requests information on reinsurance protection.

International insurance companies registered in Samoa are regulated by a separate body, the Samoa International Finance Authority (SIFA). SIFA is a member of the International Association of Insurance Supervisors and the Group of International Insurance Center Supervisors.

The Public Finance Management Act (2001), Section 54, requires the government to establish an insurance fund and to pay insurance premiums out of this fund. The premiums for the existing property insurance program are paid out of this fund.

The main catastrophe hazard in Samoa is tropical cyclone. Insurers will insure only those properties that meet the cyclone standard set out in the building code. Cyclone insurance is available as an extension to property policies only after the engineer's certification of compliance with the cyclone code has been received. The average premium rate for cyclone extension is 0.20 percent of the total insured value. Based on estimates of insured-to-total losses in prior major cyclone events, it is estimated that only 20 percent of businesses and 10 percent of residential premises have cyclone insurance. Earthquake as a peril is normally offered automatically on the full sum insured. The average premium rate for the earthquake peril is 0.10 percent of total insured value, although there is some variation among insurers. Tsunami is included as an earthquake peril.

The government has a property insurance program in place for major public buildings on an indemnity value basis. At present there is no insurance of key infrastructure assets, such as bridges or roads.

Public trading bodies make their own insurance arrangements, including property insurance for key assets. These property insurance programs insure earthquake, but the cyclone insurance extension is not always taken.

Table A.1— General Insurers Operating in Samoa 2012

COMPANY	COUNTRY OF INCORPORATION	STATUS	FINANCIAL SECURITY
National Pacific Insurance Limited	Samoa	Local company	Local solvency
Federal Pacific Insurance Company Limited	Samoa	Local company	Local solvency
Apia Insurance Company Limited.	Samoa	Local company	Local solvency
Progressive Insurance Co. Limited	Samoa	Local company	Local solvency

Source: Central Bank of Samoa; World Bank

Insurance Market Overview

Samoa has a small non-life (general) insurance market with four local insurers operating. These four insurers are detailed in table 1. Insurance industry sources indicated that National Pacific Insurance (NPI) and Federal Pacific are the most active in the property insurance class.

The non-life market has an estimated total premium income of SAT 41 million (US$17 million). This includes an estimate of premiums for risks placed with offshore insurers by licensed agents and brokers operating in the market, which insurance industry sources believe to be around 15 percent of the market premium.

Of the four companies, only NPI has a multinational affiliation; it is 71 percent owned by Tower Insurance Limited, a New Zealand–registered company. This affiliation gives NPI access to regional reinsurance programs and expertise, which in turn allows the Samoa insurance market to insure larger risks than would otherwise be possible.

Offshore market

Insurance industry sources suggest the main offshore insurers used for placement of risks in Samoa are Lloyds and the London market arranged by locally registered international brokers Aon and Marsh. There is no review of these placements by CBS and no collection of data on the amount of premium remitted to offshore insurers.

Distribution channels

All insurers in Samoa offer insurance products on a direct basis, but none of these insurers offer products online.

Samoa has three licensed international insurance brokers, Aon, Marsh, and Willis. None of these brokers have local offices; they visit Samoa from Fiji and New Zealand only as necessary to manage client accounts. There is one local insurance broker, Platinum Insurance Consultants Limited.

Both ANZ Bank and Westpac Bank have insurance agency licenses, allowing them to transact insurance business.

Table A.2— Pacific Non-life Insurance Premium per Capita 2012 (US$)

MARKET	GDP MILLIONS	POPULATION	GDP PER CAPITA	MARKET PREMIUM	PREMIUM PER CAPITA
Cook Islands	$305	19,300	$15,823	$6,600,000	$342
Fiji	$3,908	874,700	$4,467	$97,500,000	$111
Marshall Islands	$182	52,560	$3,470	$3,000,000	$57
Samoa	$683	188,900	$3,619	$17,000,000	$90
Solomon Islands	$1,008	549,600	$1,130	$13,000,000	$24
Tonga	$471	104,900	$4,495	$4,400,000	$42
Vanuatu	$781	247,300	$3,182	$16,500,000	$67

Source: World Bank 2014

Market penetration per capita

The general insurance penetration for Samoa, estimated on a premium per capita basis, was US$90.00 for 2012. This estimate is based on information obtained from the CBS and insurance industry sources, and includes the 15 percent of business estimated to be placed offshore. Table 2 compares Pacific Island Countries and shows that the insurance premium per capita in Samoa is close to the average of the Pacific countries sampled.

Catastrophe Risk Exposure and Capacity

Catastrophe risk insurance represents a particular challenge to insurers' exposure management, because unlike other types of insurance, it presents the possibility of large correlated losses. Insurers need to use a combination of reinsurance, reserves, and diversification within their portfolio to ensure that they can withstand large disaster shock losses without threatening their solvency.

The main catastrophe hazard in Samoa is tropical cyclone. Insurers are aware of the exposure and insure only those properties that meet the cyclone standard set out in the building code. In order to better underwrite the cyclone peril, local insurers require that buildings be inspected and certified by local structural engineers as complying with the cyclone code. Cyclone insurance is available as an extension to property policies only after the engineer's certification has been received; this certificate is then valid for seven years.

The average premium rate for cyclone extension is 0.20 percent of the total insured value, with deductibles ranging between 5.00 percent and 10.00 percent of loss, or 2 percent of the sum insured. Sea surge caused by cyclones is normally an excluded peril, even when the cyclone extension is given.

Earthquake as a peril is normally offered as an automatic peril on the full sum insured. The average premium rate for the earthquake peril is 0.10 percent of total insured value, although there is some variation among insurers. Deductible for earthquake varies between insurers, ranging between 5.00 percent and 10.00 percent of loss, or 2 percent of the sum insured, with a minimum of SAT 2,000. Tsunami is included as an earthquake peril.

A comparison of cyclone and earthquake rates across the Pacific is detailed in table 3. Samoa has below average rates for both perils, which insurance industry sources suggested was due to the high level of competition in the market.

There are a number of limitations with this comparison, such as variation in property insurance rating due to the location of premises, construction, occupation, fire protection, frequency of expected losses, and the amount and type of deductible on policies. It is not possible to use average rating data as an exact basis for a specific company or individual risk. It is possible, however, to carry out a general comparison of the property insurance rates in respective markets.

The main property risk accumulations are within the capital, Apia. Insurers report these accumulations to CBS as part of their quarterly and annual returns.

Major commercial properties are insured on a replacement basis under Industrial Special Risks (ISR) policies. One local insurer advised that it was offering property insurance on an indemnity value only, meaning that coverage would be based on the current value of the item as determined by age and condition, rather than on the replacement cost to rebuild. This approach suggests that there are some property capacity acceptance limitations in the market, which could be due to reinsurer limitations.

Another of the local insurers, NPI, appears to have adequate capacity for local large property accumulations, due to its regional reinsurance capacity. If needed, further additional capacity is available by way of offshore placements. Anecdotal market information suggests that most of these offshore placements are to the Lloyd's and London market and are arranged by the international insurance broker Aon.

Products

There are no special catastrophe insurance products available in Samoa, but the following property and engineering insurance products include catastrophe perils.

ISR policies are used for property insurance on most major commercial, government, and government public trading bodies accounts. The majority of ISR policies in Samoa are issued by NPI, using a wording based on the Papua New Guinea insurance industry policy. A major limitation of the ISR wording for governments is that infrastructure assets such as roads, bridges, and wharves are excluded by the policy. Insurers in Samoa do not include infrastructure items in the ISR schedule. Insurers reported that infrastructure items would need to be insured under a Completed Contract Works policy.

Commercial Package or Business Protection policies are used for small to medium enterprises and are offered as either a Multi-Risks policy (accidental damage including earthquake and cyclone by extension) or as a Specified Risks policy (fire and basic perils). These generally follow the perils insured under the ISR wording, but the coverage tends to be more restrictive.

Contract Works insurance is available for property under construction and may be extended to insure construction of infrastructure assets.

Completed civil works insurance for infrastructure assets is not a commonly available product in Samoa. Insurers indicated that they could, with the support of international reinsurers, provide terms under such a product for infrastructure assets.

Reinsurance

In 2011, the natural catastrophe insured losses suffered by the global reinsurance market were the second-largest ever, at over US$110 billion (Swiss Re 2012). What made this year significant for insurers (and reinsurers) in the Pacific was the number of events that occurred in the Asia Pacific region. These included earthquakes in New Zealand and Japan, floods in Australia and

Table A.3— Pacific Commercial Property Insurance Rate and Deductible Comparison

MARKET	AVERAGE EARTHQUAKE RATE	GENERAL EARTHQUAKE DEDUCTIBLE	AVERAGE CYCLONE RATE	GENERAL CYCLONE DEDUCTIBLE
Cook Islands	0.12%	2% of sum insured	0.45%	20% of sum insured
Fiji	0.08%	10% of sum insured	0.30%	20% of loss
Samoa	0.12%	2% of sum insured or 5% of loss	0.20%	2% of sum insured or 5% of loss
Solomon Islands	0.17%	1% or 5% of sum insured	0.13%	5% of loss
Tonga	0.15%	5% of sum insured	0.25%	5% of sum insured
Vanuatu	0.30%	5% of loss	0.17%	20% of loss

Source: World Bank 2013

Note: Average market rate percentage of value based on insurance industry sources.

Thailand, and a cyclone in Australia. The Global Insurance Market Report (IAIS 2012) advised that these Asia Pacific events accounted for 61 percent of the insured losses from natural catastrophes in 2011, compared to a 30-year average of 18 percent. As a consequence, IAIS said, adjustments were made in reinsurance capacity and risk premiums were increased. In 2012, the natural disaster losses dropped to US$77 million (Swiss Re 2013), but this was still the third-highest year for natural catastrophe insured losses since 1970. In December 2012, Evan caused estimated insured losses of SAT 28.3 million in Samoa and insured losses of FJ$57 million in Fiji (Reserve Bank of Fiji 2012).

NPI (Samoa) indicated that its operation is included in the group reinsurance program arranged by Tower Insurance Limited for all Pacific subsidiaries, including the NPI companies. In its 2011 annual report, Tower Insurance Limited specifically advised that its event excess (net retention) had increased to $NZ 6.7 million and that it had protection for two catastrophe events within the program for the 2011–2012 period (Tower Limited/Tower Capital Limited 2011). Although the reinsurance program is not detailed in the 2012 report, it would be expected to follow the previous arrangements.

Insurers throughout the Pacific have expressed concern at the significant increase in recent years in reinsurance premiums, especially premiums for catastrophe reinsurance. Insurers have limited ability to pass the full costs of these increases onto insured clients due to the small size and economic constraints in those markets. In Samoa, insurers complained about the lack of reinsurance capacity for catastrophe accumulations.

Access to catastrophe insurance

Public access to catastrophe insurance is limited in Samoa, particularly for the cyclone peril. The price of cyclone cover (currently 0.20 percent of insured value) and the requirement to obtain an engineer's certificate confirming compliance with cyclone standards are factors that may be putting off consumers. It is likely that only 20 percent of businesses and 10 percent of residential premises have cyclone insurance, based on the ratio of insured losses to total losses found in two prior cyclone events, Ofa and Val.

Box 1— Past Catastrophe Events

Cyclone

In December 2012, Cyclone Evan caused significant damage in Samoa. The total damage to all sectors caused by Evan has been estimated at SAT 235.7 million (US$103.3 million) (GoS 2013). Total insurance claims associated with Evan have been estimated at SAT 28.3 million. CBS advised that they do not collect claims numbers and gross claims from local insurers for any catastrophe events.

According to local engineers, following Cyclone Evan it was determined that some comparatively new government buildings, constructed with aid funding, did not comply with the building code for cyclone and suffered structural failures.

Cyclone Ofa in 1990 is estimated to have caused damage and economic loss of SAT$300 million (US$120 million) (South Pacific Disaster Reduction Programme 1997), with local insurer losses of over SAT$15 million (National Business Review 1992).

Cyclone Val in 1991 was the most significant catastrophe event ever to impact Samoa. The total economic cost of the cyclone was estimated at SAT$713 million (US$287) (South Pacific Disaster Reduction Programme 1997), with damage to private businesses and residential properties estimated at SAT$330 million (US$132 million) and damage to government buildings at SAT$16 million (US$6.4 million). Insurance company gross losses from this cyclone were SAT$33 million (National Business Review 1992), and offshore insurer losses were estimated at a further SAT$20 million. Insured losses from this event were just over 15 percent of the total building damage.

Earthquake and tsunami

On the September 30, 2009, a magnitude 8.1 earthquake occurred to the south of Samoa, in the neighboring country of Tonga. The tsunami from this earthquake caused major property damage on the south coast of Samoa and in American Samoa. The total damage in Samoa from the event was estimated at SAT 211.96 million (GoS 2009). Insurance industry sources suggest that in Samoa approximately 150 claims were lodged, with gross insured losses estimated at SAT 10 million. These sources advised that the majority of these claims were in the tourism and transportation sectors.

Catastrophe event insurance impact

Following Cyclones Ofa and Val in 1990 and 1991, NPI reportedly imposed the strict condition of cyclone engineering compliance and increased cyclone rates from 0.16 percent to 0.50 percent (National Business Review 1992). NPI advised that it had considerable difficulty in obtaining catastrophe reinsurance in the years following these significant losses. It was estimated that prior to these two cyclones, only 20 percent of buildings in Samoa were constructed to basic cyclone standards. After Cyclone Val, one American insurer, Travellers Insurance Company, withdrew from the neighboring American Samoa insurance market.

The tsunami in 2009 and Cyclone Evan have had a limited impact on local insurers, but they are likely to further restrict reinsurance capacity and increase costs for property catastrophe reinsurance, which in turn will lead to an increase in property insurance rates in Samoa over the next few years.

Insurance Law and Regulation

Samoa's current insurance legislation is the Insurance Act (2007), with the Central Bank of Samoa (CBS) as regulator. CBS accepted that no local on-site reviews of licensed insurers, agents, or brokers had been completed since 2007, when it assumed the regulation of local insurers. Staff from CBS had participated in an on-site review in Fiji in order to gain experience in undertaking reviews, but considered they required additional expertise for the actual reviews in Samoa. CBS also advised that its focus in recent years has been on banks rather than insurance.

Local general insurers are required to maintain a minimum solvency ratio of no less than SAT 1 million, or 20 percent of net premium, or 15 percent of the outstanding claims provision in the last 12 months. CBS requires local insurers to complete quarterly and annual returns. With no on-site reviews carried out by CBS, the adequacy of insurer capital, solvency, and reinsurance programs has not been tested. Testing would ensure that local insurers had adequate financial resources to provide for their clients in event of a major catastrophe in Samoa.

Box 2— Electric Power Corporation

Electric Power Corporation (EPC) is responsible for the provision of electrical supply within Samoa. Management of EPC reported that though EPC has no formal risk management plan in place, it has undertaken a self-assessment of risks at each location. Earthquake, tsunami, and cyclone are included in the property insurance program; however, the assets are insured for indemnity value only. The EPC assets were last valued 10 years ago, but EPC has started an asset revaluation process to determine both fair market value and insurance replacement value, a process that it expects to complete in 2014. Transmission and distribution lines were not insured under the program, and EPC is aware of this gap in coverage. In the future some transmission lines may be put underground to reduce their exposure to cyclone damage.

Following Cyclone Evan in December 2012, EPC suffered significant damage to property assets. An insurance claim was lodged, but the amount offered in settlement was significantly lower than the amount claimed, due to deductions for excess and indemnity value adjustments. This claim was in dispute, and EPC engaged a public adjuster to review its claim and assist with the settlement negotiations.

A public tender process was used each year for the insurance program renewal due to the amount of premium involved—over SAT $800,000. The total property sum insured now at risk is over SAT $100 million.

Samoa is listed as a member of the International Association of Insurance Supervisors (IAIS), but the Samoa International Finance Authority (SIFA) is listed as the member organization. SIFA is responsible for regulating international insurers and captives under the International Insurance Act (1988), not for regulating local insurance companies. SIFA is also a member of the Group of International Insurance Center Supervisors (GIICS).

There may be a duplication of resources within Samoa with regard to supervision of insurers, since international insurers and local insurers are regulated by different agencies. It may be worthwhile for CBS to cooperate with SIFA on insurance supervision matters, particularly because SIFA is a member of both IAIS and GIICS and therefore able to access the expertise of both bodies.

Building Control and Standards

According to local engineers, there is a draft building code, developed in 1992, that is used in designing structures; but no specific building legislation is in place to enforce the code. There are two acts that provide a general review process for building consents, the Building Alignment Ordnance (1932) and the Planning and Urban Management Act (2004). The engineers noted that discussions were underway to review and if necessary update the old draft building code.

Insurers have taken proactive steps to ensure cyclone building standard compliance by requiring engineering certificates for insured properties, rather than relying on government enforcement of the building code.

Insurance of Public Assets

Existing risk financing policy

The government of Samoa has allowed for insurance of public assets under Section 54 of the Public Finance Management Act (2001). This section establishes an insurance fund, which may include payment of premiums to insure against damage to public property caused by fire, earthquake, or other perils.

While not a comprehensive risk financing policy, this section does provide flexibility to the government either to self-retain some risks

Box 3— Concession Assets

The government of Samoa owns the fuel facility assets that are operated under a concession agreement. Under that agreement, the property insurance of those assets is arranged by the government. Every three years the government tenders the property insurance on a three-year, but annually renewable, contract basis. The last tender was in July 2012, and a local insurer was successful in that tender. The policy is required to insure, at a minimum, the perils of fire, cyclone, earthquake, tsunami, and flood. The estimated market value of those assets is SAT $40 million, with a further SAT $15.75 million in new assets to be added over the tender period. It is the standard practice within the insurance industry to offer a long-term-agreement discount of between 2.5 percent and 5 percent for insurance periods of three years.

The government may wish to consider asking the concession holder to provide quotes for insuring those government property assets at the end of the current insurance tender period. If the concession holder has other property insurance in place around the Pacific for similar fuel facilities, it may be able to obtain more favorable property insurance rates. At a minimum the government should require the assets to be insured under an Industrial Special Risks (material damage) policy for replacement value.

within the insurance fund or to insure those risks with private insurers. This fund is used by the government to insure public assets, as detailed below.

Insurance of government assets

There is a comprehensive property insurance program in place to insure key government property assets against material damage, including damage caused by the catastrophe perils of earthquake and cyclone. Multiple policies are arranged by the Ministry of Finance (MOF) for assets of ministries and departments. There is no agreed upon wording, and assets are variously insured under wordings for ISR, Business Assets Protection, and Fire, although the ISR wording is the most common. It would be preferable for the government to agree with insurers on a standard ISR wording for all government property insurances.

The MoF was able to provide copies of schedules for the property insurance program with details of coverage. The properties are insured for indemnity value only and contain small sub-limits for burglary, money, self-ignition (fusion of wiring), and plate glass. These small sub-limits for minor perils are expensive from a premium point of view. In most cases the small value of claims for these perils could be handled as retained losses within government.

The insured buildings are currently insured on an indemnity value basis only. Indemnity value is based on the cost to rebuild, less a deduction for age and wear and tear. In event of a major claim, there may be a significant shortfall between the indemnity value and the actual cost to repair or reinstate the property, particularly for older buildings. It would be more appropriate to insure the properties for replacement value and take a higher retained excess on all insured perils within the insurance program.

Insurance of public trading body assets

According to the MoF, public trading bodies make their own insurance arrangements, including property insurance for key assets. The MoF offered the Electric Power Corporation (EPC) as an example of a public trading body that had insurance for key public assets (see box 2), and indicated that there were concession assets (see box 3) for the fuel facility insured by MoF.

Options for Consideration

Recommendation 1: The existing insurance fund provided for under the Public Finance Management Act should be incorporated into a wider disaster risk financing and insurance (DRFI) strategy. The DFRI strategy should identify key public assets and provide agreed-upon retention limits for individual departments and public trading bodies. It should review existing and new risk financing and transfer options, such as captive insurance, regional risk pooling, and both parametric and indemnity insurance, to ensure that the best coverage at the lowest possible cost is being obtained.

Recommendation 2: Develop a central insurance register as part of the DFRI strategy and update the register as insurance contracts fall due. Currently, no central register of insurance held by government in respect of property insurance is in place for government and public trading bodies. The register should contain details on the class of business, reason for placement, and gross premium remitted.

Recommendation 3: The Central Bank of Samoa should cooperate with the SIFA to access information from the IAIS. This would allow the CBS to access international best practice information on insurance company regulation and supervision, which could provide further guidance and help to build its capacity as a regulator.

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Glossary

Agent	Someone who acts for the insurance company in arranging insurance contracts. There are two main types of agents: tied agents, who act for one insurer only, and general agents, who act for multiple insurance companies.
Broker	Someone who acts as an agent for the insured in arranging an insurance or reinsurance program with a provider of capacity.
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.
Captive insurer	An insurance company wholly owned by a company or entity that insures the risks of the parent entity and subsidiaries.
Indemnity insurance	Insurance that reimburses individuals or entities for loss or damage to a financial position as close as possible to the position they were in prior to the event, in the context of the financial terms of the coverage (such as deductible/excess and limit).
Intermediaries	The general term given to insurance agents and brokers.
Net retention	The amount that an insurance company retains on a reinsurance contract and in particular an excess of loss of contract.
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. May also be called 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.
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.
Solvency margin	The extent by which an insurer's assets exceed its liabilities. Minimum statutory solvency requirements are normally included in insurance acts or regulations.

Country Note

VANUATU

February 2015

Disaster Risk Financing and Insurance

CHAPTER 05

GFDRR

SPC Secretariat of the Pacific Community

WORLD BANK GROUP

Executive Summary

Vanuatu is susceptible to a variety of both hydrometeorological and geophysical disasters due to its location in the South Pacific tropical cyclone basin and the Pacific Ring of Fire. Hydrometeorological hazards include tropical cyclones, floods, and droughts, whereas geophysical hazards include volcanoes, earthquakes, and resulting tsunamis and landslides.

Sixty-three percent of recorded disasters in Vanuatu have occurred in the provinces of Malampa and Torba, where over a quarter of the population resides (SPC-SOPAC 2011). The rural population is largely dependent on subsistence agriculture, which is adversely affected by natural disasters. According to the latest national census, the population of Vanuatu is estimated to be 234,023, with 80 percent of residents living in rural areas that are spread across 80 islands in six provinces—Malampa, Penama, Sanma, Shefa, Tafea, and Torba (Vanuatu NSO 2009).

In 2010 the government of Vanuatu established a budgetary provision of US$265,000 for natural and financial disasters. This continues to be appropriated annually, but does not accrue and becomes expendable at the end of the financial year. The provision is held by the Department of Finance and Treasury (DoFT) and is released upon the approval of the National Disaster Council and a subsequent request from the National Disaster Management Office (NDMO) for immediate disbursement.

In 2010 Tropical Cyclone Vania, a category 1 cyclone, quickly depleted Vanuatu's disaster provision, and supplementary finance of VT 95 million (US$1 million) was required. There has been some discussion within DoFT about converting the disaster provision into a fund that would accrue over time, but doing so would require analysis to establish an optimal level of reserves and potentially an amendment to the Public Finance and Economic Management Act. While this change might take some time to implement, it could provide a much-needed boost to the current limited response funds.

Vanuatu has a maximum of VT 1.6 billion (US$16.6 million) available in ex-ante instruments for financing disaster-related losses. This is equivalent to more than five times the supplementary budget. There is a 21.5 percent chance that disaster losses will exceed this amount in any given year. In comparison, there is a 91 percent chance that disaster losses will exceed the disaster provision of VT 25 million (US$260,000) in any given year.

Vanuatu uses a variety of disaster risk financing and insurance (DRFI) tools, but its available funds are limited. The ex-ante instruments provide access to limited amounts of cash, and the ex-post tools can take several weeks to mobilize. Some procedures, such as the waiving of normal tendering procedures, are not embedded within the financial legislature, an omission that could significantly delay future response efforts.

A number of options to improve DRFI in the future are presented for consideration in this note:

(a) develop an integrated disaster risk financing and insurance strategy;

(b) develop a post-disaster budget execution manual to minimize the loss of institutional knowledge should personnel leave DoFT; and

(c) explore the use of contingent credit to access additional liquidity post-disaster.

Introduction

Vanuatu is susceptible to a variety of both hydrometeorological and geophysical disasters due to its location in the South Pacific tropical cyclone basin and the Pacific Ring of Fire. Hydrometeorological hazards include tropical cyclones, floods, and droughts, whereas geophysical hazards include volcanoes, earthquakes, and resulting tsunamis and landslides.

Disaster risk management (DRM) is integrated in the national Priorities and Action Agenda (PAA), and in 2012 Vanuatu established the National Advisory Board (NAB) for Disaster Risk Management and Climate Change. Vanuatu was one of the first Pacific Island Countries (PICs) to mainstream DRM into national planning. This step demonstrates its commitment to improved DRM, which can also be seen in ongoing work to enhance community preparedness and resilience to natural disasters via the National Disaster Management Office (NDMO), and in the establishment of the NAB, which created staff positions responsible for continued improvement in this area.

The government of Vanuatu, in conjunction with the Secretariat of the Pacific Community Applied Geoscience Division (SPC-SOPAC), Secretariat of the Pacific Regional Environment Programme (SPREP), United Nations Development Programme (UNDP) Pacific Centre, the United Nations International Strategy for Disaster Risk Reduction (UNISDR), and other partners, has adopted several institutional frameworks on disaster risk management and climate change adaptation at the national, subregional, and international level, including the following:

- Hyogo Framework for Action (HFA) 2005–2015
- Pacific Disaster Risk Reduction and Disaster Management Framework for Action (Regional Framework for Action, or RFA) 2005–2015
- Priorities and Action Agenda (PAA) 2006–2015
- National Action Plan (NAP) for Disaster Risk Management, 2006–2016
- National Adaptation Programme of Action, 2004

Disaster risk financing and insurance (DRFI) is a key activity of the HFA Priorities for Action 4 and 5.[1] The HFA is a result-based plan of action adopted by 168 countries to reduce disaster risk and vulnerability to natural hazards and to increase the resilience of nations and communities to disasters over the period 2005–2015. In the Pacific, the HFA formed the basis for the development of the Regional Framework for Action.

The RFA cites disaster risk financing and insurance activities as a key national and regional activity. Theme 4—"Planning for effective preparedness, response and recovery"—

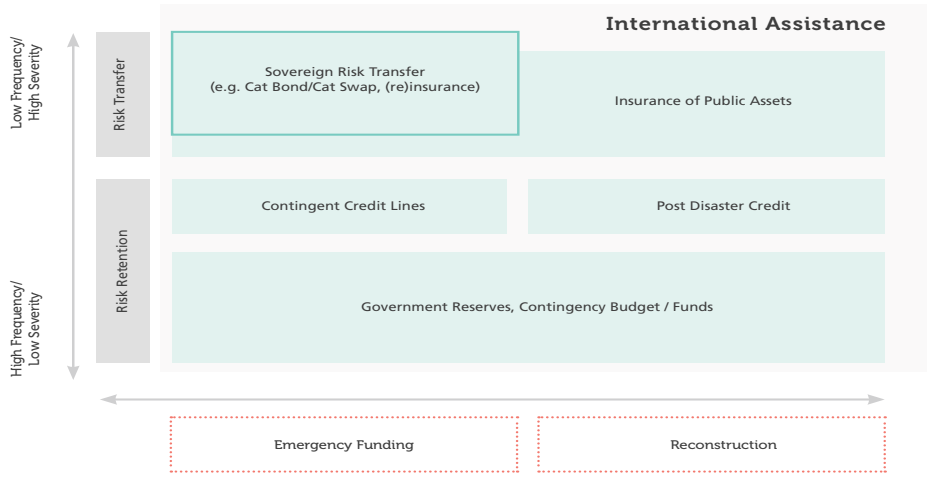
has an associated key national activity, "Establish a national disaster fund for response and recovery." Theme 6 of the RFA—"Reduction of underlying risk factors"—cites the development of "financial risk-sharing mechanisms, particularly insurance, re-insurance and other financial modalities against disasters as both a key national and regional activity" (SOPAC 2005). These regional implementation activities align with the three-tiered disaster risk financing strategy developed by the World Bank.

Goal 2 of the NAP seeks to "mainstream DRM into all national planning, decision-making and budgetary processes at the national and local levels," which includes establishing a sustainable fund for DRM. The NAP also aims to encourage public-private partnerships as a way of developing financing schemes for risk management, particularly insurance, reinsurance, and other financial modalities against disasters; this approach is in keeping with its commitments to key regional and global agreements (Government of Vanuatu 2006). The NAP was endorsed by Vanuatu's Council of Ministers in 2006 and has received support from the highest level of government.

The Pacific DRFI Program enables countries to increase their financial resilience against natural disasters by improving their capacity to meet post-disaster funding needs without compromising their fiscal balance. This program is one application of the Pacific Catastrophe Risk Assessment and Financing Initiative (PCRAFI). The Pacific DRFI Program is built upon a three-tiered approach to disaster risk financing. These layers align to the basic principles of sound public financial management, such as the efficient allocation of resources, access to sufficient resources, and macroeconomic stabilization. The three tiers acknowledge the different financial requirements associated with different levels of risk: (i) self-retention, such as a contingency budget and national reserves, to finance small but recurrent disasters; (ii) a contingent credit mechanism for less frequent but more severe events; and (iii) disaster risk transfer (such as insurance) to cover major natural disasters. See figure 1.

This note aims to build understanding of the existing DRFI tools in use in Vanuatu and to identify gaps where engagement could further develop financial resilience. In addition, it aims to encourage peer exchange of regional knowledge, specifically by encouraging dialogue on past experiences, lessons learned, optimal use of these financial tools, and their effect on the execution of post-disaster funds, including any areas of regulation or legislation that need to be addressed to better complement the flow of post-disaster funds.

Figure 1 — Three-Tiered Disaster Risk Financing Strategy



Source: World Bank 2010.

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Economic Impact of Natural Disasters

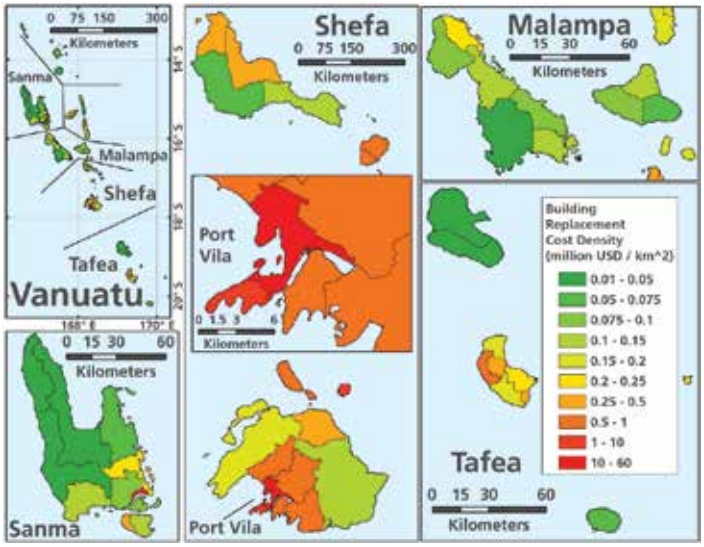
During the period 1980 to 2012, Vanuatu experienced approximately 53 disaster events. Earthquakes account for 46 percent of these events, and tropical cyclones account for a further 35 percent. Floods, volcanic activity, and storm surges account for the rest. It is estimated that these events affected around 300,000 people during the period examined (PDN 2013).

Approximately 63 percent of recorded disasters occurred in the provinces of Malampa and Torba, where over a quarter of the population resides (SPC-SOPAC 2011).

This rural population is largely dependent on subsistence agriculture, which is adversely affected by natural disasters. According to the latest national census, the population of Vanuatu is estimated to be 234,023, with 80 percent of residents living in rural areas that are spread across 80 islands in six provinces—Malampa, Penama, Sanma, Shefa, Tafea, and Torba (Vanuatu NSO 2009).

In February 1987, Vanuatu was struck by Tropical Cyclone (TC) Uma, a category 4 cyclone that subjected Port Vila to high winds

Figure 2 — Building Replacement Cost Density by Village



Source: PCRAFI 2011.

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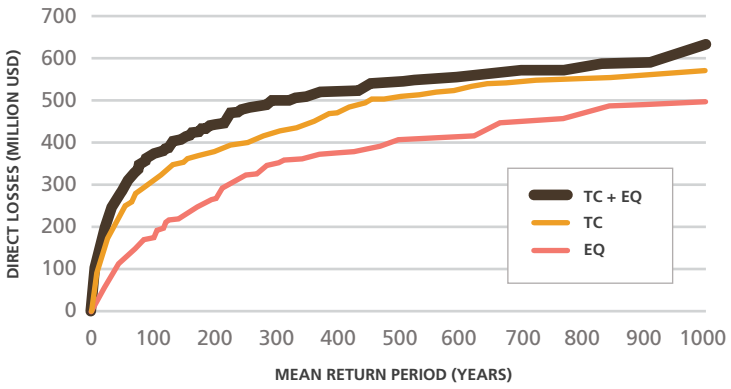
Figure 3 — Direct Losses by Return Period



Source: PCRAFI 2011

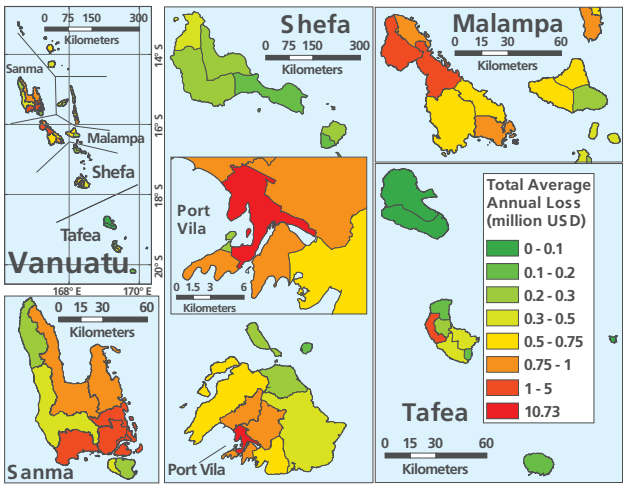
Note: TC = tropical cyclone; EQ = earthquake.

for a period of seven hours and that caused damage of VT 14.4 billion (US$150 million) (VMS 1994). It is estimated that 95 percent of the building stock was damaged, although insured losses were valued at only VT 1.9 billion (US$20 million).

The economy of Vanuatu is largely driven by tourism, agriculture, and construction—industries that are susceptible to tropical cyclones and earthquakes, the major perils in Vanuatu. The expansion of the tourism industry has seen an increase in assets along the coastline of the main island of Efate, where the main air and cruise ship terminals are located. Figure 2 shows the estimated building replacement cost for Vanuatu. Red indicates areas with the highest building replacement cost, those with estimated values of US$10–60 million per km2. Port Vila, the main economic center, falls into this category.

In January 2011, TC Vania caused damage of VT 71 million (US$742,000) in Vanuatu and affected over 10,000 households (NDMO 2011). TC Vania caused considerable damage to several staple and cash crops, destroyed livelihoods, and damaged houses, water system infrastructure, roads, and schools. The main cash

Figure 4 — Average Annual Losses for Tropical Cyclone and Earthquake (ground shaking and tsunami)



Source: PCRAFI 2011

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crops affected were sandalwood and kava, which take years to recover. An immediate supply of food was required for the three months following the event to compensate for the loss of staple crops. This situation demonstrates the islands' high dependence on natural resources and the potential post-disaster economic cost an event imposes. It also argues for a substantial disaster fund to cater for such losses.

Inter-island and intra-island travel and communication were difficult and expensive following TC Vania. Located as they are on large volcanic islands with rugged terrain and dense tropical forest, Vanuatu villages tend to be scattered over large distances. This poses difficulty for facilitating initial damage assessments and quantifying how much funding is required for initial response.

Vanuatu is expected to incur, on average over the long term, annual losses of VT 4.6 billion (US$48 million) due to earthquakes and tropical cyclones. In the next 50 years, Vanuatu has a 50 percent chance of experiencing a loss exceeding VT 31.6 billion (US$330 million) from a single event, and has a 10 percent chance of experiencing a loss exceeding VT 51.8 billion (US$540 million) (see figure 3).

Figure 4 indicates the average annual loss in Vanuatu by area; those areas highlighted in red are likely to experience the highest level of loss, VT 1 billion (US$10.73 million) per year. The full country risk profile can be found in annex 4.

Public Financial Management of Natural Disasters

Since 2010, the NDMO budget allocation has almost tripled, from around VT 11 million (US$115,000) in 2005 to VT 32 million (US$335,000) (Government of Vanuatu 2010). This increase was the direct result of a successful New Policy Proposal drafted in 2009 following the attendance of NDMO officials at a New Policy Proposal training given by the Ministry of Finance and Economic Management (MFEM). The increase demonstrates the increased priority of disaster risk within central government.

Effective post-disaster financial response relies on two fundamental capabilities:

(a) The ability to rapidly mobilize funds post-disaster; and

(b) The ability to execute funds in a timely, transparent, and accountable fashion. This section discusses the existing procedures for post-disaster budget mobilization and execution and where possible provides examples of their use.

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Post-Disaster Budget Mobilization

The Department of Finance and Treasury (DoFT) and the NDMO together play a significant role in mobilizing funds in the wake of an event. When a disaster occurs, both agencies act to ensure that payments are executed rapidly. This simple process requires the NDMO to provide an initial disaster report and to prioritize its essential needs and the associated costs. In addition, it must submit a formal letter requesting the release of the disaster relief fund. Upon receipt of these, the DoFT must verify all submitted documents, release the requested funds, commit a local purchase order to facilitate immediate payment, and subsequently issue the check.

Vanuatu uses a combination of ex-ante and ex-post financial tools to facilitate initial response, and these take significantly different lengths of time to mobilize and execute. Building on the World Bank's disaster risk financing and insurance framework (see annex 1), table 1 shows the ex-ante and ex-post financial tools available, indicates those used by Vanuatu, and gives indicative timings. The tools utilized by the Vanuatu are highlighted in blue. Those sections highlighted in gray are for generic instruments that to date have not been used in Vanuatu.

The sections below discuss the financing tools available to the Vanuatu government, including information on the time it takes to mobilize funds and the amount of funds available.

Table 1— Sources of Funds Available

	SHORT TERM (1-3 MONTHS)	MEDIUM TERM (3-9 MONTHS)	LONG TERM (OVER 9 MONTHS)
Ex-post Financing			
Donor Assistance (relief)	■	■	
Budget Reallocation	■	■	
Domestic Credit	■	■	■
External Credit		■	■
Capital Budget Realignment			
Donor Assistance (reconstruction)			■
Tax Increase			
Flash Appeal			
Ex-ante Financing			
Emergency Fund	■		
Contingency Budget	■	■	
Contingent Credit			
Sovereign (parametric) Catastrophe Risk Insurance	■	■	
Traditional Disaster Insurance	■	■	

Source: Government of Vanuatu; World Bank.

Box 1— The Pacific Catastrophe Risk Insurance Pilot

The Pacific Catastrophe Risk Insurance Pilot aims to provide immediate budget support following a major tropical cyclone or earthquake/tsunami. The insurance is designed to cover emergency losses, which are estimated using both a modeled representation of the event based on hazard parameters and a calculation of total modeled physical damage. Unlike a conventional insurance scheme, where a payout would be assessed against actual incurred costs, this scheme pays out on the results of a model. The advantage of this approach is that it results in a much faster payout. The payout would act as a form of budget support and would go some way to cover the costs that would be incurred by the government in the aftermath of a severe natural disaster that disrupts the provision of government services. Countries can choose between three layers of coverage—low, medium, and high—depending on the frequency of events. The lower layer will cover events with a return period of 1 in 10 years, that is, more frequent but less severe events. The medium layer will cover events with a 1-in-15-year return period, while the higher layer will cover less frequent but more severe events, or those with a return period of 1 in 20 years. However, countries may request that a more customized option be developed for them.

Ex-Ante Practices and Arrangements

The uncertainty surrounding international assistance has put pressure on countries to establish domestic sources of finance for post-disaster relief, such as the establishment of national reserves or the transfer of risk to the international insurance market. Vanuatu's ex-ante practices and arrangements include a disaster provision, sovereign catastrophe risk insurance, and external debt.

Disaster provision

In 2010 the government of Vanuatu established a budgetary provision of VT 25 million (US$260,000) for natural and financial disasters. This continues to be appropriated annually, but does not accrue and becomes expendable at the end of the financial year. The provision is held by the DoFT and is released upon the approval of the National Disaster Council and a subsequent request from the NDMO for immediate disbursement.

In 2010 TC Vania depleted the disaster provision, and supplementary finance of VT 95 million (US$989,000 million) was required. There is a 91 percent chance that disaster losses will exceed the disaster provision in any given year. TC Vania, a category 1 cyclone, exhausted the disaster provision quickly, demonstrating that one event may deplete the fund in full. There has been some discussion within DoFT about converting the disaster provision into a fund that would accrue over time, but this step would require analysis to establish an optimal level of reserves and potentially an amendment to the Public Finance and Economic Management (PFEM) Act. While this might take some time to implement, it could provide a much-needed boost to the limited response funds currently available.

Sovereign catastrophe risk insurance

The coverage selected by Vanuatu could provide an aggregate injection of liquidity equivalent to almost five times the estimated supplementary budget of 2013. Table 2 shows that the selected coverage is designed to pay out for cyclone and earthquake/tsunami events of such

severity that a triggering event would be expected to occur once every 20 years on average, over the long term. The coverage is in effect from November 1, 2014, to October 31, 2015.

External Debt

While Vanuatu's stock of total public debt has remained generally low, it nevertheless increased from 19.4 percent of GDP in 2010 to 21.6 percent of GDP in 2012 (IMF 2013). Within the total public debt, external borrowing was equivalent to only 14 percent of GDP in 2012. However, contingent liabilities are estimated to be equivalent to 30 percent of GDP, and this share is expected to increase in light of government plans to increase borrowing to finance key public investment projects.

Overall, therefore, Vanuatu's public debt level is low, and it should remain manageable despite a significant increase in debt (by an estimated 4.5 percent of GDP) expected by 2017 (IMF 2013). This is in line with the government's cautious approach to borrowing and assumes strict public expenditure restraint and constant revenues. Given this prudent approach to debt, the government may wish to consider the use of contingent credit to establish an injection of liquidity following a natural disaster. This step would require examination of the costs of using a contingent credit facility (including any potential opportunity costs) and balance them against the benefit of the additional contingent liquidity.

Ex-Post Practices and Arrangements

Because disasters generally exceed a country's capacity to cope with them, there will always be a need for ex-post practices and arrangements. An optimal strategy for DRFI relies on a combination of ex-ante and ex-post financial instruments. Ex-post arrangements benefit from being able to establish the extent of the disaster and prioritize the response needs. These arrangements take longer to implement than ex-ante arrangements, but they can often mobilize larger amounts of finance. This section discusses the ex-post practices and arrangements that have been made by Vanuatu.

Budget reallocation

Transfers (or virements) within ministries require authorization from both the minister responsible and the minister of finance and are processed within a maximum of three working days. These virements are managed under strict conditions stipulated in the PFEM Act, Section 34(A) and (B): funds may be transferred

Table 2— Selected Insurance Coverage, 2014–2015 Pilot Season

	TROPICAL CYCLONE	EARTHQUAKE
Policy period	November 1, 2014–October 31, 2015	
Peril selected	Tropical cyclone	Earthquake
Layer of coverage selected	1 in 20 years	1 in 20 years
Coverage limit as a percentage of contingency budget	>300 percent	>300 percent
Reporting agencies	Joint Typhoon Warning Center	United States Geological Survey

Source: World Bank and PCRAFI 2013.

Table 3— 2013 Budget Appropriation

	FISCAL YEAR 2013 (VT MILLION)	FISCAL YEAR 2013 (US$ MILLION)	% OF TOTAL BUDGET
Personnel emoluments	900.1	9.4	60
Other goods and services	516.5	5.4	34
Capital expenditure	9.0	0.9	6
Total budget	1,425.6	15.7	100

Source: Government of Vanuatu 2013.

only within the agency and must come from the operational budget for other goods and services. Payroll and transfers across ministries are not permitted through a virement (Government of Vanuatu 1998).

Approximately 34 percent of Vanuatu's total budget could potentially be transferred via virements. The budget is classified into three core categories— personnel emoluments, other goods and services, and capital expenditure. Of the three categories, only funds under goods and services are considered operational funds and can be reallocated in the wake of a disaster. In 2013 these funds amounted to VT 516.5 million (US$5.4 million), or 55.6 percent of the total budget that could potentially be reallocated for the fiscal year (see table 3).

Supplementary

Following a declared state of emergency or a financial emergency, the PFEM Act, Section 34C (1)–(2), allows for a supplementary allocation[2] of up to 1.5 percent of the total appropriation for that fiscal year (Government of Vanuatu 1998). The definitions of "emergency" are clearly stipulated under Article 69 of the Constitution,[3] and declaration of a state of emergency requires authorization from the Council of Ministers[4] and Parliament prior to the disbursement of funds. The need for parliamentary approval can result in significant delays for post-disaster response.

Supplementary funding of approximately VT 95 million (US$1 million) was released following TC Vania. This funding allowed school fees for the children of Tafea Province to be waived and made possible the provision of general relief supplies.[5]

Donor funds for relief and reconstruction

While donor funds will always be required after a disaster, there is often an element of uncertainty surrounding how much will be provided, what will be provided, and when the funds will arrive in country. Consequently, overdependence on international relief as a source of post-disaster financing can delay the provision of initial relief and can inhibit ex-ante contingency planning. Development partners,

international organizations, local nongovernmental organizations, businesses, and individuals contribute in the form of cash grants and aid in kind. The provision of aid in kind, while vital, can affect the costs borne by governments for the distribution these goods.

According to information compiled by the Financial Tracking Service of the United Nations Office for the Coordination of Humanitarian Affairs, the government of Vanuatu received VT 18.7 million (US$195,000) in donations following TC Vania (OCHA FTS 2011). This is equivalent to approximately 13 percent of the funds provided by the government. After TC Vania, many international partners came to assist with the post-disaster assessment, but little finance arrived on the back of this, leaving the government to meet a large portion of the total costs. This experience suggests how much uncertainty governments face where donor funding is concerned.

Total Response Funds Available

Vanuatu has a maximum of VT 1.2 billion (US$12.5 million) available in DRFI instruments. This is equivalent to seven times the supplementary budget. Figure 5 shows the three-tiered DRFI strategy alongside the sources of funds and the maximum amounts of funding available to Vanuatu following an event, made up of the combined resources of the disaster provision, the supplementary funding, and the maximum aggregate payout under the catastrophe risk insurance pilot.

It is estimated that there is a 21.5 percent chance in any year that disaster losses will exceed the VT 1.2 billion (US$13.5 million) ex-ante provision. The probability of exceeding ex-ante funds may actually be higher, however, given that the supplementary funding is not exclusively for disaster response and that the full amount is unlikely to be available for disaster response. In comparison, there is as stated earlier a 91 percent chance that disaster losses could exceed the dedicated disaster provision of VT 25 million (US$260,000) in any given year.

Figure 5 — Amount of Ex-Ante Funds Available for Immediate Response

Disaster risks	Disaster risk financing instruments	Amount of funds available
High-risk layer (E.G. Major earthquake, major tropical cyclone)	**Disaster risk insurance**	**Total catastrophe risk insurance coverage VT950m** (US$9.9m)
Medium-risk layer (E.G. Floods, small earthquakes)	**Contingent credit**	
Low-risk layer (E.G. Localized flood, landslides)	**Contingency budget, national reserves, annual budget allocation**	**Supplementary: VT214m** (US$2.3m) **Disaster Provision: VT25m** (US$0.26m)

Source: World Bank.

Post-Disaster Budget Execution

Following TC Vania the disaster provision was drained, and supplementary funds of VT 37 million (US$383,400) were also used to meet response costs. Over half of this funding was used to cover transportation costs, and 22 percent was used to cover the cost of food. The remainder was used for communications and on-the-ground logistics to facilitate distribution of goods. In addition, a further supplementary amount of VT 66 million (US$680,000) was approved to cover the cost of school fees within the Tafea Province.

Anecdotal evidence revealed that the endorsement of the supplementary budget took several weeks, largely because Parliament had yet to meet. As a result, there were temporary budget reallocations from other programs to continue response and relief efforts. The diverted budgets were replenished to their respective programs immediately after the supplementary budget was published.

While it is commonly accepted that following a Statement of Emergency normal tendering procedures are waived, this practice has yet to be formally documented. In the past, this omission has caused significant delays to the purchase of necessary relief supplies. If this procedure remains undocumented or unlegislated, problems may arise in the future.

Overall, the post-disaster budget execution process works well in Vanuatu, although there is limited access to immediate cash. Vanuatu uses a mix of ex-ante and ex-post financial tools; the ex-ante instruments provide access to limited amounts of cash and the ex-post tools can take several weeks to mobilize. Not all post-disaster procedures, such as the waiving of normal tendering procedures, are embedded within the financial legislature, an omission that could significantly delay future response efforts.

Insurance of Public Assets

In 2012, all classes of non-life insurance premiums in Vanuatu were estimated to total VT 1.5 billion (US$15.6 million). Of this, VT 1.3 billion (US$13.5 million) was placed with local insurers and VT 0.2 billion (US$2.1 million) with offshore insurers. Vanuatu's non-life (general) insurance market is small and currently has two locally registered insurers, QBE Insurance (Vanuatu) Limited and Dominion Insurance Limited.

Non-life premium per capita is estimated at VT 6,400 (US$67.00), which is lower than the rate in most other Pacific Island Countries.

There is legislation in place—the Insurance Act (2005) and regulations—that regulates the insurance industry. The Reserve Bank of Vanuatu (RBV) is the regulator. The RBV undertakes reviews to ensure that solvency margins are met, that there is adequate reinsurance protection in place for large and catastrophe risks, and that property and other accumulations are monitored. Offshore insurance placements must be approved by RBV before coverage is placed overseas.

Insurance for catastrophe insurance perils of earthquake and cyclone is available in the market and can be included in property insurance products. Cyclone insurance is not automatically included in standard property coverage wordings, and is available by extension only. Property insurance rates for cyclone in Vanuatu are below average rates for PICs, while the earthquake insurance rates are higher than in other PICs due to the frequency of earthquake events in Vanuatu.

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Photo Credit
Maarten Danial/Flickr

The Vanuatu government does not have indemnity property insurance programs in place for its assets. It does have an asset register, however. This is in place for land, building, property, and infrastructure assets and is managed by the Ministry of Finance and Economic Management. The MFEM advised that a project has been proposed to identify and reconcile all land, building, and infrastructure assets and ensure that values in the register are correct.

At present there is no insurance of government key infrastructure assets, including major transportation assets such as wharves, roads, and bridges. This situation could result in delays in reconstruction following a catastrophic event.

Most statutory bodies and state-owned enterprises in Vanuatu that manage public assets have insurance programs in place; these include indemnity property insurance, although some programs do not include the cyclone extension. The utility (electricity and water) concession holders are not required by the Utilities Regulatory Authority to purchase indemnity property insurance for the assets they manage.

For the full insurance review that was undertaken in Vanuatu, please refer to annex 3.

Options for Consideration

Vanuatu has developed some DRFI tools to mitigate its fiscal exposure to natural disasters. To further these developments, the following recommendations for future consideration have been made.

Recommendation 1: Develop an integrated DRFI strategy. This strategy would identify options for the provision of quick liquidity. It could also consider transforming the existing disaster provision into a fund that could accrue over time, subject to estimation of opportunity costs and benefits of such an accrual; an optimal amount of finance would need to be established and the fund maintained at this level. The establishment of such a fund would also require amendments to the PFEM Act and the financial regulations of Vanuatu to provide clear guidelines on access and expenditures to avoid misuse.

Recommendation 2: Develop a post-disaster budget execution manual to minimize the loss of institutional knowledge should personnel leave DoFT. This document would build on the policies and procedures already in existence and collate them into a single document. This would provide staff with a step-by-step procedural guide to facilitate swift budget mobilization and execution. The guide would help to reduce the loss of institutional knowledge should key staff leave DoFT.

Recommendation 3: Explore the use of contingent credit to access additional liquidity post-disaster, including identification of the providers of this type of finance. The advantage of this approach is that countries would receive a pre-agreed upon amount of finance shortly after the event. This would act as a form of budget support and could be spent on previously agreed upon options or at the discretion of the government.

End Notes

1 Priority for Action 4—"Reduce the Underlying Risk Factors"—has an associated key activity of financial risk-sharing mechanisms, such as insurance, while Priority for Action 5—"Strengthen disaster preparedness for effective response at all levels"—includes the establishment of emergency funds such as contingency budget, national reserves, and annual budgetary allocations. See UNISDR (2005).

2 This is equivalent to a contingency budget in many other countries.

3 The Vanuatu Constitution is available at http://www.paclii.org/vu/legis/consol_act/cotrov406/.

4 This is equivalent to the cabinet in many other countries.

5 Information was provided anecdotally during the research for this report, so the figures may vary.

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Annex 3

Insurance Market Review, March 2014

Executive Summary

Total non-life insurance premium, all classes, was VT 1.5 billion (US$15.6 million) in Vanuatu in 2012. Of this premium, VT 1.3 billion (US$13.5 million) was placed with local insurers and VT 0.2 billion (US$2.1 million) with offshore insurers.

The Vanuatu non-life (general) insurance market is small and currently has two locally registered insurers, QBE Insurance (Vanuatu) Limited (QBE) and Dominion Insurance Limited (Dominion).

Non-life premium per capita is estimated at VT 6,400 (US$67.00), which is lower than the rate in most other Pacific Island Countries (PICs).

There is legislation in place—the Insurance Act (2005) and regulations—that regulates Vanuatu's insurance industry. The Reserve Bank of Vanuatu (RBV) is the regulator. The RBV undertakes reviews to ensure that solvency margins are met, that there is adequate reinsurance protection in place for large and catastrophe risks, and that property and other accumulations are monitored. Offshore insurance placements must be approved by RBV before coverage is placed overseas.

Insurance for catastrophe insurance perils of earthquake and cyclone is available in the market and can be included in property insurance products. Cyclone insurance is not automatically included in standard property coverage wordings and is available by extension only. Property insurance rates for cyclone in Vanuatu are below average rates for PICs, at 0.17 percent of the sum insured, while the earthquake insurance rates are higher than in other PICs, at 0.30 percent, due to the frequency of recent earthquake events in Vanuatu.

The Vanuatu government does not have indemnity property insurance programs in place for its assets.

The government does have an asset register in place for land, building, property, and infrastructure assets. This is managed by the Ministry of Finance and Economic Management (MFEM). The MFEM advised that a project has been proposed to identify and reconcile all land, building, and infrastructure assets and ensure that values are correct in the register.

At present there is no insurance of government key infrastructure assets, including major transportation assets such as wharves, roads, and bridges. This situation could result in delays in reconstruction following a catastrophic event.

Most statutory bodies and state-owned enterprises in Vanuatu that manage public assets have insurance programs in place that include indemnity property insurance,

although some programs do not include the cyclone extension.

The utility (electricity and water) concession holders are not required by the Utilities Regulatory Authority to purchase indemnity property insurance for the assets managed by them.

Insurance Market Overview

Total non-life insurance premium, all classes, in 2012 was VT 1.5 billion (US$15.6 million). Of this premium, VT 1.3 billion (US$13.5 million) was placed with local insurers and VT 0.2 billion (US$2.1 million) (13 percent) with offshore insurers.

The Vanuatu non-life (general) insurance market is small and currently has two locally registered insurers, Dominion Insurance Limited (Dominion) and QBE Insurance (Vanuatu) Limited (QBE). Dominion has no additional financial security in place beyond that provided by the solvency requirements of the Insurance Act (2005). Dominion does not have an independent security rating. QBE Insurance (Vanuatu) Limited is a wholly owned subsidiary of QBE Insurance Group Limited, an Australian company listed on the Australian stock exchange. As a subsidiary, QBE (Vanuatu) has no additional financial security in place beyond that provided under the solvency requirements of the Insurance Act (2005). QBE (Vanuatu) does not have its own financial security rating. The ultimate parent, QBE Insurance Group Limited, has a security rating of A- from Standard & Poor's (dated May 22, 2013) and an A+ rating for core operating entities.

The Insurance Act (2005) and regulations restrict the placement of insurance offshore, and all offshore placements must be approved by the Reserve Bank of Vanuatu (RBV). Insurance industry sources suggested that most of these offshore placements are for specialist marine and aviation insurance and are placed with the London market (including Lloyd's), the major international insurance market. As part of the approval process for offshore placements, the RBV checks the financial status of the offshore insurer.

The non-life premium per capita in Vanuatu, at VT 6,400 (US$67.00), is lower than the rate in most other Pacific Island Countries (PICs) and equates to 2.11 percent of gross domestic product (GDP) (see table 1). This low premium per capita is likely the result of low market penetration by non-life insurers and a concentration of insurance channels in the main cities of Port Vila

Table A.1— Pacific Non-life Insurance Premium per Capita 2012 (US$)

MARKET	GDP MILLIONS	POPULATION	GDP PER CAPITA	MARKET PREMIUM	PREMIUM PER CAPITA
Cook Islands	$305	19,300	$15,823	$6,600,000	$342
Fiji	$3,908	874,700	$4,467	$97,500,000	$111
Marshall Islands	$182	52,560	$3,470	$3,000,000	$57
Samoa	$683	188,900	$3,619	$17,000,000	$90
Solomon Islands	$1,008	549,600	$1,130	$13,000,000	$24
Tonga	$471	104,900	$4,495	$4,400,000	$42
Vanuatu	$781	247,300	$3,182	$16,500,000	$67

Source: World Bank 2014

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and Luganville, as well as the lack of an insurance program for government assets.

Distribution channels

Agents and bancassurance

RBV advises that Vanuatu has four licensed general insurance agents, Surata Tomaso Travel Limited., John Lum and Associates, ANZ Bank (Vanuatu) Limited., and National Bank of Vanuatu. All four have agency arrangements with QBE.

Brokers

Vanuatu has four licensed insurance brokers, Aon (Vanuatu) Limited. (Aon), Marsh Limited., Willis New Zealand Limited, and a local broker, Chartered Pacific Insurance Brokers Limited (CPIB). Only Aon and CPIB have local offices; Marsh and Willis service clients from Fiji and New Zealand respectively.

Direct

Both of the non-life insurers in Vanuatu offer domestic household, medical, and motor vehicle insurance products on a direct basis. No insurance services are available via the Internet in Vanuatu.

There is a wide range of distribution channels available in the marketing of general insurance products in Vanuatu.

Catastrophe Risk Exposure and Capacity

Catastrophe risk insurance represents a particular challenge to insurers' exposure management, since unlike other types of insurance, it presents the possibility of large correlated losses. Insurers need to use a combination of reinsurance, reserves, and diversification within their portfolios to ensure

Box 1— Reinsurance Programs

QBE (Vanuatu) is reinsured for catastrophe events under the QBE Group reinsurance program. QBE Group has a detailed risk management process that includes monitoring of catastrophe claims concentration and reinsurance protection to mitigate the exposures (QBE Insurance Group Limited 2012).

Reinsurance arrangements for Dominion were not available for review. It is known, however, that Dominion is regulated by the Reserve Bank of Fiji, which undertakes annual reviews of all Fijian insurers and publishes a comprehensive insurance annual report (Reserve Bank of Fiji 2012).

that they can withstand large disaster shock losses without threatening their solvency.

There are two major catastrophe hazards in Vanuatu, tropical cyclones and earthquakes. Insurers advised that they were aware of the potential cyclone exposure and insured only those properties that had an engineer's certification of compliance with the cyclone (wind load) standard. Around 80 percent of their accumulation exposure was in Port Vila and the island of Efate; 15 percent was in Luganville on Santo; and the balance was spread throughout the islands.

The market is constrained by its small size. Although additional capacity is available offshore from the London market, restrictions on offshore placement and the often higher premium costs involved have discouraged use of this option. New Zealand–based insurers have shown limited willingness to provide such capacity to Vanuatu in the past, as evidenced by the withdrawal in 1987, following Cyclone Uma, of Pan Pacific Underwriters Limited. (Crocombe 1992) and Tower Insurance Limited.

All insurers with catastrophe exposures need to obtain reinsurance to increase their capacity. Reinsurance is even more important when the insurer or the insurance market pool is small, such as in the Pacific. As regulators become increasingly vigilant about insurers having sufficient capital and a good solvency margin to protect their interests from catastrophic events, they are requiring adequate reinsurance programs, placed with robust reinsurers.

Reinsurance

In 2011, natural catastrophe insured losses in the global reinsurance market were the second-largest ever, at over US$110 billion (Swiss Re 2012). What made this year significant for insurers (and reinsurers) in the Pacific was the number of events that occurred in the Asia Pacific region: earthquakes in New Zealand and Japan, floods in Australia and Thailand, and a cyclone in Australia. According to the Global Insurance Market Report (IAIS 2012), these Asia Pacific events accounted for 61 percent of the insured losses from natural catastrophes in 2011, compared to a 30-year average of 18 percent. As a consequence, there

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were adjustments in reinsurance capacity and higher risk premiums. In 2012 the natural disaster losses dropped to US$77 million (Swiss Re 2013), but this was still the third-highest year for natural catastrophe insured losses since 1970. In the Pacific, Tropical Cyclone Evan caused insured losses of F$57 million in Fiji (Reserve Bank of Fiji 2012) and estimated insured losses of SAT 3 million in Samoa in December 2012.

Insurers throughout the Pacific have expressed concern at recent increases in reinsurance premiums, especially premiums for catastrophe reinsurance. They have limited ability to pass on the full costs of these increases to insured clients due to the small size and economic constraints in those markets.

Products

There are no specific catastrophe insurance products available in the Vanuatu market. The property and engineering insurance products include the catastrophe perils of earthquake and tsunami. Cyclone insurance is not automatically available and is included only as an extension to property policies once an engineer's cyclone certification has been received.

QBE uses Industrial Special Risks (ISR) wordings for major commercial, public authority, and state-owned enterprise property insurance. The ISR wording, which is based on the Australian Mark IV insurance industry standard wording, is for material damage and includes natural perils such as earthquake and tsunami; it does not automatically include cyclone. Dominion uses a Commercial Package policy with defined perils; it

Table A.2— Pacific Commercial Property Insurance Rate and Deductible Comparison

MARKET	AVERAGE EARTHQUAKE RATE	GENERAL EARTHQUAKE DEDUCTIBLES	AVERAGE CYCLONE RATE	GENERAL CYCLONE DEDUCTIBLE
Cook Islands	0.12%	2% of sum insured	0.45%	20% of sum insured
Fiji	0.08%	10% of sum insured	0.30%	20% of loss
Samoa	0.12%	2% of sum insured or 5% of loss	0.20%	2% of sum insured or 5% of loss
Solomon Islands	0.17%	1% or 5% of sum insured	0.13%	5% of loss
Tonga	0.15%	5% of sum insured	0.25%	5% of sum insured
Vanuatu	0.30%	5% of loss	0.17%	20% of loss

Source: World Bank 2013.

Note: Tables shows average market rate percentage of value based on insurance industry sources.

makes cyclone/earthquake available by extension only.

A major limitation of the ISR wording for governments is that infrastructure assets such as roads, bridges, and wharves are specifically excluded. Insurance brokers advised that it was common practice for major commercial accounts to include smaller infrastructure items in an ISR schedule and waive the exclusion. Major infrastructure items, however, would need to be insured under a Completed Civil Works policy.

Commercial Package or Business Protection wordings are used for small and medium enterprises, and coverage is taken as either Multi Risks (accidental damage including earthquake and cyclone by extension) or Specified Risks (fire and extraneous perils). These policies generally follow the perils insured under the ISR, although coverage may be more restricted.

Cyclone insurance is available by extension only from local insurers and is limited to those buildings with an engineering cyclone certificate confirming that the building meets the building code for cyclone. The certificates are valid for seven years.

Completed Civil Works insurance for infrastructure assets is available from QBE, and local insurance brokers advised that a number of major resorts had such insurance in place for their infrastructure assets.

Market capacity

The local market does not appear to have any major capacity limitations for property insurance. Insurance intermediaries advised that QBE is the only local insurer with reasonable capacity for large property risks and accumulations. If additional capacity is necessary, it is available by way of offshore placements, but these need to be approved by RBV. According to insurance industry sources, only a small number of property insurance

Box 2— Past Catastrophe Events

Cyclones

The most destructive cyclones within Vanuatu occurred in 1959 (Amanda), 1985 (Eric, Nigel, and Odette), 1987 (Uma), and 1999 (Dani) (VMS 1994). Of these, Cyclone Uma was the most destructive, with estimated damage and economic losses at over VT 1.4 billion (US$150 million) in 1987 values. The government expended over VT 87 million (US$9 million) for initial emergency relief in the two months following the cyclone (Government of Vanuatu 1987). Insurance sources advised that over 750 claims were lodged following Cyclone Uma, with damage valued at over VT 460 million (US$4.7 million). There was significant property damage in the capital city, Port Vila, with some estimates suggesting that 90 percent of properties suffered extensive or major damage. There was also a loss of over 40 vessels throughout the islands.

Earthquakes

On January 3, 2002, Vanuatu experienced a 7.4 magnitude earthquake, with an epicenter approximately 30km to the west of Efate island and Port Vila. According to a report by SOPAC (2003), the earthquake caused damage estimated at over VT 880 million (US$8.8 million). The report indicated that insured losses totaled A$8.4 million (US$7.11 million), and damage from uninsured government buildings and infrastructure losses came to a further A$2 million (US$1.69 million). The report did not analyze any uninsured private properties but did estimate the total cost of damage at A$15 million (US$12.675 million), which indicates a high level of insurance market penetration. Analysis by engineers undertaken after the event indicated that some older commercial buildings were constructed to only 40 percent of the earthquake code (NZS4203).

In 2010 and 2011, there were three earthquakes with a magnitude of between 7.0 and 7.1; the epicenters were 40–60km from Port Vila. Insurance industry sources advised that these earthquakes caused insured damage estimated at VT 100 million (US$1 million).

Insurance consequences of catastrophe events

Cyclone Uma was a major catastrophe for the insurance industry in Vanuatu. Industry sources advise that while there were eight insurers operating in the market in 1987, within two years only three insurers remained. These remaining insurers were unable to provide cyclone insurance following the event because their reinsurance coverage had been exhausted and they were unable to access alternative reinsurance capacity for windstorm.

The 2002 earthquake had a similar impact. Five insurers were operating prior to the event, and within two years there were only three. There was no limitation of earthquake insurance coverage following this event, but prices for earthquake insurance coverage did increase due to reduction of global reinsurance capacity that year and the consequential increase in reinsurance premium costs.

There were no actual insurer financial failures in either event, although there were reportedly some significant delays in claim settlements after Cyclone Uma and some settlement delays after the 2002 earthquake.

offshore placements are made into corporate global programs. The absence of significant capacity issues notwithstanding, insurance intermediaries were concerned about possible competition issues arising from the dominant market position of QBE (estimated at over 90 percent for the commercial property class).

Property insurance rates for cyclone in Vanuatu are below average for PICs, although earthquake rates are higher, as detailed in table 2. These high earthquake rates are due to the frequency of major earthquake events in recent years.

There are a number of limitations with this comparison related to variables in property insurance rating, such as location of premises, construction, occupation, fire protection, frequency of expected losses, and the amount and type of deductible on policies. It is not possible to use average rating data as an exact basis for a specific company or individual risk. It is possible,

Box 3— Unelco Suez

The supply of electricity and water within Port Vila, Malekula, and Tanna is the responsibility of concession holder, Unelco Suez. The utility assets are managed by Unelco during the periods of the concession agreements and revert to the government of Vanuatu, in good order and condition, at the end of those concessions. The concession agreements require that a replacement fund for assets be set up and that any damage caused by force majeure events be repaired out of that fund or from operating expenses if the replacement fund is exhausted. There is no requirement in the concession agreements for the assets to be insured (Government of Vanuatu and Unelco Suez 1975).

Vanuatu Utilities and Infrastructure

The supply of electricity to Luganville town on the island of Espiritu Santo is the responsibility of the concession holder, VUI. The concession agreement was not available for review, but URA advised that it had investigated property insurance with VUI when the concession was first granted in 2011 and concluded that it was an unnecessary additional cost to consumers. Insurance industry sources advised that VUI has a property insurance program, including earthquake, for some of the concession assets.

however, to offer a general comparison of the property insurance rates in respective markets.

Insurance Law and Regulation

In Vanuatu, insurance companies, agents, brokers, and loss adjusters are all required to be licensed under the Insurance Act (2005) and are regulated by the Insurance Regulations (2006). The RBV is the current regulator; it requires quarterly and annual returns from insurers and brokers and also undertakes biannual on-site reviews of licensed entities. In addition to the 2005 law and 2006 regulations that govern the insurance industry, there are a number of guidance notes on relevant issues that the RBV provides.

Local insurers must provide a quarterly update of their solvency to the RBV. RBV requires insurers to annually submit a reinsurance management strategy with their insurance license renewal application. During the on-site reviews, RBV checks the reinsurance arrangements and the financial security of insurers. These reviews ensure that reasonable financial protection is in place for consumers of insurance products within Vanuatu.

Building Control and Standards

Vanuatu does not have a building act in place as at March 2014. A bill for the National Building Code Act was presented to Parliament in 1999, but was never enacted. A further bill for a National Building Code Act was presented and passed by Parliament in January 2014, and government sources advised in March 2014 that the act was awaiting gazetting before becoming law.

A Vanuatu draft National Building Code was distributed in 1990. It used the New Zealand earthquake code (NZS4203) and Australian wind loads (AS1170.2) for cyclone code. Local engineers advised that major commercial and public buildings, as well as the more substantial residential buildings, are constructed in accordance with these codes. Prior to building construction, plans for all buildings in the Port Vila and Luganville municipalities are submitted to the municipalities for approval, and these plans are also checked by the Public Works Department.

In the absence of a legally enforceable building code, insurers have taken proactive steps to ensure building cyclone standard compliance by requiring engineering certificates for insured properties.

Insurance of Public Assets

Government assets

The Ministry of Finance and Economic Management (MFEM) advised that there is no property insurance program in place for government building or infrastructure assets in Vanuatu. According to insurance industry sources, some individual ministries have property insurance in place for specific assets. In the 1990s a comprehensive risk management program was developed for the Vanuatu government, one including risk financing and insurance. This risk management program is no longer in place.

The government does have an asset register in place for land, building, property, and infrastructure assets, managed by MFEM. MFEM advised that a project has been proposed that would identify and reconcile all government land, building, and infrastructure assets and ensure that these are recorded correctly in the register. The existing asset register could be used to identify key government assets for any risk financing or insurance program.

Statutory bodies and state-owned enterprises

MFEM is responsible for the overall supervision of all statutory bodies and state-owned enterprises. The ministry advised that it does not require statutory bodies and state-owned enterprises to have property insurance programs in place for public assets. Because of notes in annual reports, the MFEM is aware that a number of these entities have insurance programs, but the ministry does not keep a record of those programs, leaving it to the individual statutory bodies and state-owned enterprises to report to their respective boards on insurance arrangements.

Insurance industry sources advised that some statutory bodies and most state-owned enterprises that held major public assets had property insurance programs that included earthquake and cyclone perils. Among these entities are Air Vanuatu (Operations) Limited, National Bank of Vanuatu Limited., Reserve Bank of Vanuatu, Vanuatu Financial Services Commission, and Vanuatu Post Limited. Airports Vanuatu Limited has a property insurance program but does not include the cyclone peril for buildings, and the airport runways are not insured (SOPAC 2003).

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The government keeps no centralized register of insurance arrangements made by individual statutory bodies or state-owned enterprises. A register of this type would allow a more coordinated approach to property insurance management and purchasing, which could in turn generate premium cost benefits.

Public assets managed under concession agreements

The Utilities Regulatory Authority (URA) advised that it did not require concession holders to insure the assets under their management. There are two concession holders, Unelco Suez and Vanuatu Utilities and Infrastructure (VUI).

Options for Consideration

Recommendation 1: The government should develop a broad disaster risk financing and insurance strategy that includes an insurance program for key public assets. This approach would use the existing asset register to identify key assets, would assess probable losses, and would carry out a costing of indemnity insurance for the major catastrophe perils of earthquake/tsunami and cyclone/sea surge.

Recommendation 2: The government should include the current replacement value of key public assets in the asset register held by the Ministry of Finance and Economic Development.

Recommendation 3: The government should set up a central insurance register, for all government departments, statutory bodies, or state-owned enterprises as part of the disaster risk financing and insurance strategy and update the register as insurance contracts fall due.

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Glossary

Agent	Someone who acts for the insurance company in arranging insurance contracts. There are two main types of agents: tied agents, who act for one insurer only, and general agents, who act for multiple insurance companies.
Broker	Someone who acts as an agent for the insured in arranging an insurance or reinsurance program with a provider of capacity.
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.
Captive insurer	An insurance company wholly owned by a company or entity that insures the risks of the parent entity and subsidiaries.
Indemnity insurance	Insurance that reimburses individuals or entities for loss or damage to a financial position as close as possible to the position they were in prior to the event, in the context of the financial terms of the coverage (such as deductible/excess and limit).
Intermediaries	The general term given to insurance agents and brokers.
Net retention	The amount that an insurance company retains on a reinsurance contract and in particular an excess of loss of contract.
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. May also be called 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.
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.
Solvency margin	The extent by which an insurer's assets exceed its liabilities. Minimum statutory solvency requirements are normally included in insurance acts or regulations.

Country Note

TONGA

February 2015

Disaster Risk Financing and Insurance

CHAPTER 06

GFDRR

SPC Secretariat of the Pacific Community

WORLD BANK GROUP

Executive Summary

Tonga is an archipelago composed of 172 islands spread across a combined land and sea area of 720,000km². According to the 2011 census, Tonga had a population of 103,252 people spread across 36 of the 172 islands. A population scattered so widely across such a large area can pose logistical problems for efforts to facilitate and finance disaster response.

In January 2014, Tropical Cyclone Ian caused widespread damage and destruction on the islands of Ha'apai and Vava'u. Approximately 1,094 buildings in Ha'apai were either destroyed or damaged, and some 2,335 people sought shelter in evacuation centers. There were reports of significant damage to houses, infrastructure, and agriculture across 18 villages located on the islands of Ha'apai, including Uiha, Uoleva, Lifuka, Foa, Ha'ano, and Mo'unga'one. Total ground-up loss for this event was estimated at T$90 million (US$50.3 million), of which T$20.5 million (US$11.5 million) was attributable to emergency loss (PCRAFI 2014).[1]

Tonga is expected to incur, on average, T$28.2 million (US$15.8 million) per event per year in losses due to earthquakes and tropical cyclones. In the next 50 years, Tonga has a 50 percent chance of experiencing a per event loss exceeding T$319 million (US$178.2 million), and a 10 percent chance of experiencing a per event loss exceeding T$783 million (US$437.4 million) (PCRAFI, 2012).

Tonga has the ability to raise a maximum of T$21.5million (US$12 million) for disaster response. This figure is based on the contingency budget for the fiscal year 2013/14, the maximum annual appropriation into the emergency fund, and the aggregate coverage limit from the catastrophe risk insurance pilot. It should be emphasized that this amount is a maximum and—given the nature of the contingency budget—dependent on how much remains in the budget during the fiscal year when the event occurs. Similarly, the aggregate payout is the absolute maximum that Tonga could receive following an earthquake/tsunami or tropical cyclone. It is estimated that there is a 4.4 percent chance that disaster losses will exceed this amount in any given year.

The Tongan government does not have an indemnity property insurance program in place for its infrastructure assets or property. The government keeps no centralized register of insurance arrangements made by individual government departments, public authorities, or state-owned enterprises.

This report presents for consideration a number of options for improving current measures for disaster risk financing and insurances:

(a) develop an overarching disaster risk financing strategy aligned to existing processes;

(b) develop an operations manual detailing the processes required to facilitate swift post-disaster budget mobilization and execution; and

(c) develop an insurance program for key public assets.

Introduction

Tonga is an archipelago composed of 172 islands spread across a combined land and sea area of 720,000km². According to the 2011 census Tonga had a population of 103,252 people spread across 36 of the 172 islands; this represents an increase of only 1.2 percent since 2006. A population scattered so widely over such a large area can pose logistical problems for efforts to facilitate and finance disaster response.

In January 2014, Tropical Cyclone (TC) Ian caused widespread damage and destruction on the islands of Ha'apai and Vava'u. Approximately 1,094 buildings in Ha'apai were either destroyed or damaged, and some 2,335 people sought shelter in evacuation centers. Significant damage was reported to houses, infrastructure, and agriculture across 18 villages located on the islands of Ha'apai, including Uiha, Uoleva, Lifuka, Foa, Ha'ano, and Mo'unga'one. Total ground-up loss for this event was estimated at T$90 million (US$50.3 million), of which T$20.5 (US$11.5 million) was attributable to emergency loss (PCRAFI 2014).[2]

The government of Tonga, in conjunction with the Secretariat of the Pacific Community Applied Geoscience Division (SPC-SOPAC), the Secretariat of the Pacific Regional Environment Programme (SPREP), the United Nations Development Programme (UNDP) Pacific Centre, and the United Nations International Strategy for Disaster Risk Reduction (UNISDR) as well as other partners, has developed several institutional frameworks on disaster risk management and climate change adaptation at the national, subregional, and international level. These include the following:

- Hyogo Framework for Action (HFA) 2005–2015
- Pacific Disaster Risk Reduction and Disaster Management Framework for Action (Regional Framework for Action, or RFA) 2005–2015
- Tonga's National Disaster Management Plan and Emergency Procedures
- Tonga's Joint National Action Plan (JNAP) for Disaster Risk Management and Climate Change Adaptation, 2010–2015

Disaster risk financing and insurance (DRFI) is a key activity of the HFA Priorities for Action 4 and 5.[3] The HFA is a result-based plan of action adopted by 168 countries to reduce disaster risk and vulnerability to natural hazards and to increase the resilience of nations and communities to disasters over the period 2005–2015. In the Pacific, the HFA formed the basis for the development of the Pacific Disaster Risk Reduction and Disaster Management Framework for Action (Regional Framework for Action, or RFA).

The Regional Framework for Action cites DRFI activities as a key national and regional activity. Theme 4—"Planning for effective preparedness, response and recovery"—has an associated key national activity, "Establish a national disaster fund for response and recovery." Moreover, Theme 6 of the RFA—"Reduction of underlying risk factors"—cites the development

of "financial risk-sharing mechanisms, particularly insurance, re-insurance and other financial modalities against disasters as both a key national and regional activity" (SOPAC 2005). These regional implementation activities align with the three-tiered disaster risk financing strategy promoted by the World Bank.

DRFI is included in Goal 1 of Tonga's Joint National Action Plan for Disaster Risk Management and Climate Change Adaptation (GoT 2010). The overarching outcome for this goal is to mainstream disaster risk management and climate change adaptation into planning, decision making, and budgetary processes.

The Pacific DRFI Program enables countries to increase their financial resilience against natural disasters by improving their capacity to meet post-disaster funding needs without compromising their fiscal balance. This program is one application of the Pacific Catastrophe Risk Assessment and Financing Initiative (PCRAFI). The Pacific DRFI Program is built upon a three-tiered approach to disaster risk financing. These layers align to the basic principles of sound public financial management, such as the efficient allocation of resources, access to sufficient resources, and macroeconomic stabilization. The three tiers acknowledge the different financial requirements associated with different levels of risk:

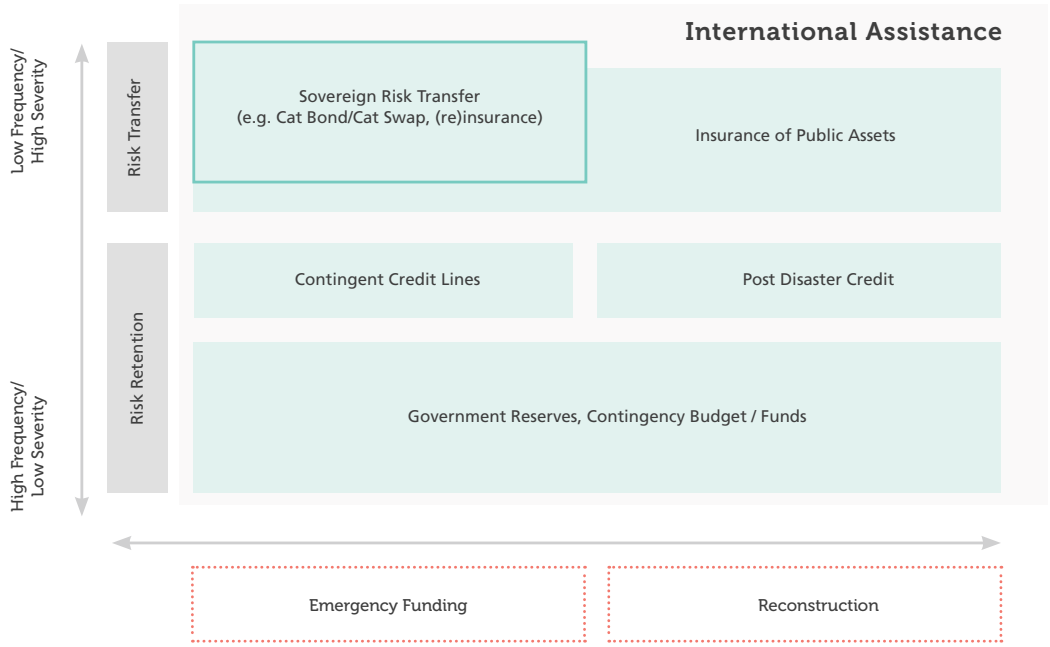
(a) Self-retention, such as a contingency budget and national reserves, to finance small but recurrent disasters;

(b) A contingent credit mechanism for less frequent but more severe events; and

(c) Disaster risk transfer (such as insurance) to cover major natural disasters. See Figure 1.

This report aims to build understanding of the existing DRFI tools in use in Tonga. Specifically, it aims to encourage peer exchange of regional knowledge through dialogue on past experiences, lessons learned, optimal use of these financial tools, and their effect on the execution of post-disaster funds.

Figure 1 — Three-Tiered Disaster Risk Financing Strategy



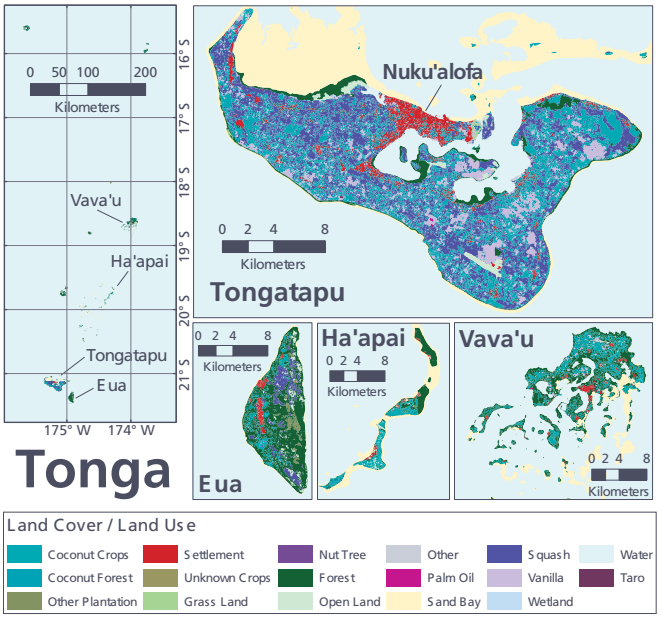
Source: World Bank 2010.

Economic Impact of Natural Disasters

Since 1997 Tonga has experienced approximately 14 natural disasters. These affected a total of 109,000 people and damaged over 1,500 homes.[4] In 1982 TCs Isaac and Waka destroyed many homes along with much of the country's agricultural crops, causing T$134.2 million (US$75 million) in losses and severely harming the local economy. Tonga is also susceptible to earthquakes and was affected by the 2009 magnitude 8.1 earthquake and subsequent tsunami, which destroyed over half of the houses on NiuaT$utapu before continuing to cause further damage on the shore of Samoa.

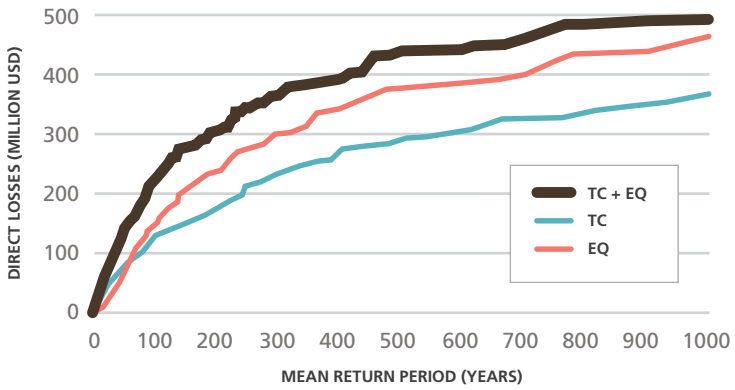
Tonga has a narrow economic base that is led by the agriculture sector, closely followed by tourism; both of these industries are susceptible to natural disasters. In 2012/13, the commerce, restaurants, and hotels sector and the agriculture, fisheries, and forestry sectors grew by 2.1 percent. Figure 2 shows land use and land cover in Tonga and demonstrates the level of agricultural production, in particular the level of investment in coconut and squash production.

Figure 2 — Land Use/Land Cover



Source: PCRAFI 2012.

Figure 3 — Direct Losses by Return Period



Source: PCRAFI 2012

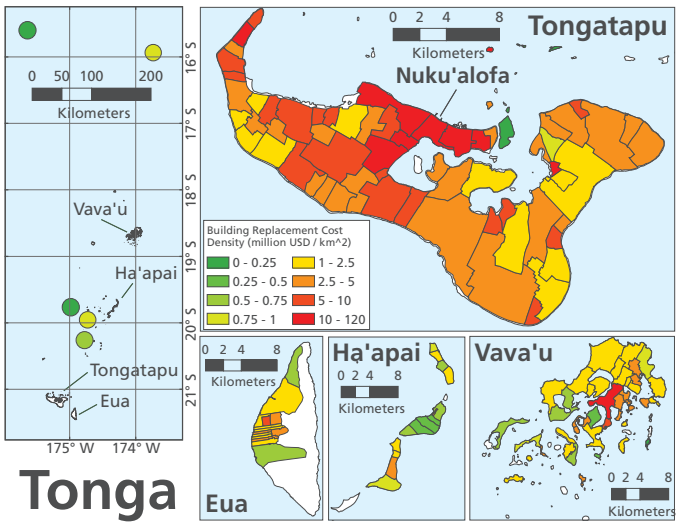
Note: TC = tropical cyclone; EQ = earthquake

Tonga is expected to incur, on average, T$28.2 million (US$ 15.8 million) per event per year in losses due to earthquakes and tropical cyclones. In the next 50 years, Tonga has a 50 percent chance of experiencing per event loss exceeding T$319 million (US$178.2 million), and a 10 percent chance of experiencing a per event loss exceeding T$783 million (US$437.4 million) (see Figure 3).

Average annual loss is depicted by area in Figure 4. Those areas in red indicate high levels of average annual losses, with a range of loss between T$0.9 million and T$2.3 million (US$0.5 million–1.3million).

The post-disaster economic assessment conducted following TC Ian estimates the combined physical damage and economic loss from this event to be T$90 million (US$50.3 million), equivalent to 11 percent of Tonga's gross domestic product (GDP). This figure is based on the immediate physical damage, which was largely to houses, transport infrastructure, and agriculture. Recorded damage accounts for 80 percent of this figure, with losses accounting for the remaining 20 percent.

Figure 4 — Average Annual Loss by Area



Source: PCRAFI 2012

Section 06

Public Financial Management of Natural Disasters

Effective post-disaster financial response relies on two fundamental capabilities:

(a) The ability to rapidly mobilize funds post-disaster; and

(b) The ability to execute funds in a timely, transparent, and accountable fashion. This section discusses the existing procedures for post-disaster budget mobilization and execution.

Where possible, the discussion will use examples from Tonga's experience with TC Ian, a category 5 cyclone (with winds over 200kph recorded) that struck on January 11–12, 2014. TC Ian caused widespread damage and destruction over the northeast islands of Ha'apai, and the response efforts placed considerable pressure on core government staff.

In particular, there was pressure on the National Emergency Management Office (NEMO) and the Ministry of Finance (MoF), both of which act immediately following a disaster. Following a statement of emergency, the MoF relocates a member of staff to the NEMO. This move helps to ensure that procurement of emergency supplies occurs as quickly as possible; normally it is senior staff with signing authority who are relocated.

Post-Disaster Budget Mobilization

Tonga has a variety of ex-ante and ex-post financial tools at its disposal, and the timing for mobilizing and executing these funds varies significantly. Building on the World Bank framework for disaster risk financing and insurance (see annex 1), table 1 shows the ex-ante and ex-post financial tools available, indicates those utilized by Tonga, and gives indicative timings for mobilization of the funds. The tools utilized by Tonga are highlighted in blue. Those sections highlighted in gray are for generic instruments that to date have not been used in Tonga.

The sections below discuss in detail the ex-ante and ex-post finance tools available to Tonga, including the time it takes to mobilize these funds and the amount of funds available.

Ex-Ante Practices and Arrangements

The uncertainty surrounding international assistance following a disaster has put pressure on countries to establish domestic sources of finance for post-disaster relief, such as national reserves and instruments that transfer risk to the international insurance market. The ex-ante arrangements that have been made by Tonga include an emergency fund, a contingency budget, and sovereign catastrophe risk insurance.

Emergency fund

Tonga's emergency fund was established in June 2008. An annual appropriation up to a maximum of T$5 million (US$2.79 million) can be placed into the fund in any fiscal year. The fund is able to accrue, and the monies are used exclusively for the purpose of providing timely and efficient relief and reconstruction following an emergency. It is estimated that there is a 21 percent chance that disaster losses will exceed the maximum amount that can be appropriated in any given year.

On January 10, 2014, the day before TC Ian made landfall, the early warning system and subsequent statement of emergency facilitated access to the emergency fund via the national emergency operations account. Access to the fund facilitated the purchase of rations and electrical supplies and ensured that sufficient stock was available for mobilization immediately after the event.

Contingency budget

Each year, the level of the contingency fund is agreed upon by the Legislative Assembly, with the stipulation that it must not exceed 5 percent of the Tonga Government Fund. With

Table 1— Sources of Funds Available

	SHORT TERM (1-3 MONTHS)	MEDIUM TERM (3-9 MONTHS)	LONG TERM (OVER 9 MONTHS)
Ex-post Financing			
Donor Assistance (relief)	■	■	
Budget Reallocation	■	■	
Domestic Credit	■	■	■
External Credit		■	■
Capital Budget Realignment			
Donor Assistance (reconstruction)		■	■
Tax Increase			
Flash Appeal	■	■	
Ex-ante Financing			
Emergency Fund	■		
Contingency Budget	■	■	
Contingent Credit			
Sovereign (parametric) Catastrophe Risk Insurance	■	■	
Traditional Disaster Insurance	■	■	

Source: Government of Tonga; World Bank.

Box 1— The Pacific Catastrophe Risk Insurance Pilot

The Pacific Catastrophe Risk Insurance Pilot aims to provide immediate budget support following a major tropical cyclone or earthquake/tsunami. The insurance is designed to cover emergency losses, which are estimated using both a modeled representation of the event based on hazard parameters and a calculation of total modeled physical damage. Unlike a conventional insurance scheme, where a payout would be assessed against actual incurred costs, this scheme pays out on the results of a model. The advantage of this approach is that it results in a much faster payout. The payout would act as a form of budget support and would go some way to cover the costs that would be incurred by the government in the aftermath of a severe natural disaster that disrupts the provision of government services. Countries can choose between three layers of coverage—low, medium, and high—depending on the frequency of events. The lower layer will cover events with a return period of 1 in 10 years, that is, more frequent but less severe events. The medium layer will cover events with a 1-in-15-year return period, while the higher layer will cover less frequent but more severe events, or those with a return period of 1 in 20 years. However, countries may request that a more customized option be developed for them.

the approval of the Privy Council, the minister of finance may release funds from the contingency fund as deemed necessary, as long as they remain within the limits of the set contingency. In 2013/14, the contingency budget was set at T$1.5 million (US$0.84 million), equivalent to 0.75 percent of total expenditure.

Sovereign catastrophe risk insurance

The coverage selected by Tonga provides an aggregate coverage limit worth more than five times the unforeseen payments (contingency budget) for the fiscal year 2014/15 (see table 2). Tonga chose the lowest level of coverage available, that is, it opted for coverage of more frequent but less severe events (those with a return period of 1 in 10 years) for both tropical cyclone and earthquake/tsunami. The coverage is in effect from November 1, 2014, to October 31, 2015.

In January 2014, the government of Tonga received T$2.3 million (US$1.27 million) from its catastrophe risk insurance policy,

Table 2— Sources of Funds Available

	TROPICAL CYCLONE	EARTHQUAKE
Policy period	November 1, 2014–October 31, 2015	
Peril selected	Tropical cyclone	Earthquake
Layer of coverage selected	1 in 10 years	1 in 10 years
Coverage limit as a percentage of contingency budget	>300 percent	>300 percent
Reporting agencies	Joint Typhoon Warning Center	United States Geological Survey

Source: Government of Tonga; World Bank.

equivalent to more than the 2013 contingency budget, or half of the current reserves of the Tonga National Reserve Fund. Following TC Ian, Tonga was the first country to receive a payout under the Pacific Catastrophe Risk Insurance Pilot.

Ex-Post Practices and Arrangements

By definition, a disaster exceeds a country's capacity to cope with it, and there will therefore always be a need for ex-post practices and arrangements. An optimal strategy for DRFI relies on a combination of ex-ante and ex-post financial instruments. Ex-post arrangements benefit from being able to establish the extent of the disaster and prioritize the response needs. Hence these arrangements take longer to implement than ex-ante arrangements, but they can often mobilize larger amounts of finance. This section discusses the ex-post practices and arrangements that have been made by Tonga.

Budget reallocation

Under the Public Financial Management Act (2002), program funds may be transferred within a ministry at the request of the minister and with the approval of the minister of finance. The amount transferred must leave the total appropriation for that ministry unaltered and cannot increase the appropriation for that particular program by more than 10 percent.

These budget variations must be reported in the financial statements for that year. Anecdotally it is understood that it may take two to three days to transfer funds.

External debt

The stock of debt at the end of fiscal year 2013/14 was T$368.2 million (US$206 million), equivalent to 44 percent of GDP, with external debt accounting for approximately 92 percent of this. Following steps to strengthen fiscal management, including a debt sustainability analysis conducted by the World Bank and the International Monetary Fund, in 2013 Tonga's rate of debt distress was downgraded from high to moderate.

Debt-servicing costs in fiscal year 2013/14 amounted to T$19.5 million (US$10.9 million), of which 61.5 percent was attributable to external creditors. This figure is expected to increase in fiscal year 2014/15, as repayments for three major loans commence. The majority of loans are spilt between three main providers, the Asian Development Bank, the International Development Association, and the Export-Import Bank of China.

Flash appeal

The Cyclone Ian Relief Account was established by Ministry of Finance and had received over T$1.5 million (US$837,000) in contributions by March 20, 2014. These donations came from development partners, communities, businesses, individuals, and the Tongan diaspora, all of whom wished to contribute toward the relief efforts.

Five weeks after TC Ian, all relief and early recovery expenditures were diverted to the Cyclone Ian Relief Account. This means that any further contributions will be deposited into this account; the goal is to keep any remaining funds in the emergency fund in case another event occurs during the same fiscal year.

Donor funds for relief and reconstruction

While donor funds will always be required following a disaster, there is often an element of uncertainty surrounding how much will be provided, what will be provided, and when funds will arrive in country. Consequently, overdependence on international relief as a source of post-disaster financing can delay the provision of initial relief and inhibit ex-ante contingency planning. Development partners, international organizations, local nongovernmental organizations, businesses, and individuals contribute in the form of cash grants and aid in kind. The provision of aid in kind, while vital, can affect the costs borne by governments for the distribution of these goods.

In addition to the cash donations received from the international community in the month after TC Ian—as mentioned above, worth over T$1.5 million (US$837,000)—a further T$25.7 million (US$14.4 million) has been committed to facilitate the Tropical Cyclone Ian Response Plan (GoT 2014). As of March 2014, however, a further T$64.5 million (US$36 million), which was needed to fully implement the response plan, was still lacking. It is anticipated that this figure will get smaller as donors align the work to their existing development priorities in country. This experience serves to demonstrate that while smaller amounts for initial relief and recovery may arrive quickly, it can take time to mobilize larger amounts of funding to finance reconstruction activities.

Total Response Funds Available

Tonga has the ability to raise a maximum of T$21.5million (US$12 million) for disaster response. This figure is based on the contingency budget for the fiscal year 2013/14, the maximum annual appropriation into the emergency fund, and the aggregate coverage limit from the Pacific Catastrophe Risk Insurance Pilot (see figure 5). It should be emphasized that this amount is a maximum and—given the nature of the contingency budget—dependent on how much remains in the budget during the fiscal year when the event occurs. Similarly, the aggregate payout is the absolute maximum that Tonga could receive following an earthquake/tsunami or a tropical cyclone. It is estimated that there is a 4.4 percent chance that disaster losses will exceed this amount in any given year.

Post-Disaster Budget Execution

Because of the early warning system and subsequent statement of emergency, access to the emergency fund was granted before TC Ian made landfall. This early access facilitated the purchase of rations and electrical supplies and ensured that sufficient stock was available for mobilization immediately after the event.

The Cyclone Ian Relief Account was established alongside the emergency fund to facilitate donations from members of the public, donors, and development partners. One month after TC Ian made landfall, all relief and response expenditures were diverted to this account; the goal is to preserve the remaining balance of the emergency fund in case another event occurs within the same fiscal year.

On January 31, 2014, T$2.3 million (US$1.27 million) was received under Tonga's policy with the Pacific Catastrophe Risk Insurance Pilot and deposited into the emergency fund. Anecdotal evidence from the government suggests that knowledge of the payout not only enabled initial expenditures (since the government knew it would be reimbursed), but also provided an injection of cash to ensure that relief efforts could continue.

During the first week after TC Ian, some line ministries made internal budget reallocations to facilitate their own response efforts. It is not known how much was reallocated via these intraministry transfers, since at the time of writing the acquittal process was still underway.

Figure 5 — Sources of Response Funds Available

Disaster risks	Disaster risk financing instruments	Amount of funds available
High-risk layer (E.G. Major earthquake, major tropical cyclone)	**Disaster risk insurance**	**Total catastrophe risk insurance coverage** **T$ 15m** (US$8.4M)
Medium-risk layer (E.G. Floods, small earthquakes)	**Contingent credit**	
Low-risk layer (E.G. Localized flood, landslides)	**Contingency budget, national reserves, annual budget allocation**	**Contingency:** **T$ 1.5M** (US$0.8m) **Emergency fund:** **T$ 5m** (US$2.8m)

Source: Government of Tonga; World Bank.

Fuel, distribution, and travel and freight accounted for 39 percent of initial relief expenditures from the emergency fund. This large share demonstrates how costly it can be to access the outer islands when facilitating response efforts.

On January 31, 2014, the cabinet approved the Tropical Cyclone Ian Response Plan, which identified T$90.2 million (US$50.4 million) in total requirements for the 12 to 18 months following TC Ian (GoT 2014). By March the government had been able to identify T$25.7 million (US$14.4 million) toward this amount from a combination of government and donor funds.

One of the key lessons learned following TC Ian was the importance of adequately equipping the NEMO for response and ensuring that its budgetary allocation is sufficient to pay for satellite phones subscriptions and stockpile relief goods. NEMO was provided with the funds to purchase satellite phones but not for the required subscription; this meant that communications to Ha'apai were delayed while NEMO sought to source access to satellite phones from Tonga Communications Corporation and New Zealand.

Domestic Catastrophe Risk Insurance Market

The non-life (general) insurance market in Tonga is small not only in absolute terms, but also relative to the size of the country's population and economy. Total non-life insurance premium is T$$7.6 million (US$4.3 million). This equates to premium per capita of around T$75.2 (US$42), which is lower than rates in other Pacific Island Countries (PICs). It is estimated that around 15 percent of the insurance business in Tonga is placed offshore by international insurance brokers.

Tonga has no legislation in place to regulate its insurance industry. In the absence of a regulator, the solvency of domestic insurers, and hence their ability to pay claims and withstand shocks such as natural disasters, are not being assessed by any government agency. It is not possible to confirm that insurers have adequate financial security to meet any catastrophe exposures. The absence of a regulator also has implications for consumer protection, as no government agency is ensuring the appropriateness of insurance products sold in the market.

The main catastrophic hazard in Tonga is the tropical cyclone, although earthquake and tsunami exposures are also present. Insurers advised that they were aware of the potential cyclone exposure and that they insured only those properties that had an engineer's certification of compliance with the cyclone (wind load) standard. The primary accumulation of exposure is on the island of Tongatapu, which includes the capital, Nuku'alofa.

Tonga's comparatively low non-life premium per capita—T$75.2 (US$42), as mentioned above—suggests low uptake of insurance across the country. This could be because Tonga, unlike many other PICs, does not make motor vehicle insurance compulsory.

Insurance for catastrophic perils of earthquake and cyclone is available in the market and can be included in property insurance products. The peril of earthquake is covered as standard under property policies (such as homeowner policies, for example). Cyclone insurance is not covered under standard property coverage wordings, and is available by extension only. Property insurance rates for the cyclone peril (0.25 percent) and earthquake peril (0.15 percent) are average for PICs.

The Tongan government does not have an indemnity property insurance program in place for its infrastructure assets or property. The government keeps no centralized register of insurance arrangements made by individual government departments, public authorities, or state-owned enterprises (SOEs).

Most public enterprises in Tonga that manage public assets have insurance programs in place that include indemnity property insurance. The Ministry of Public Enterprises does not keep a central record of those programs, leaving it to the individual public trading authorities and SOEs to report to their respective boards. It is not known whether catastrophe risks are covered in the existing property insurance programs.

Options for Consideration

Tonga has implemented several DRFI tools to improve its financial resilience to natural disasters. To strengthen those tools, the following recommendations have been suggested for consideration.

Recommendation 1: Develop an overarching disaster risk financing strategy aligned to existing processes. Tonga has a proactive ex-ante approach to DRFI. To further enhance existing procedures, it is recommended that Tonga create an overarching DRFI strategy for endorsement by the cabinet. This would create a single document that articulated the financing options available along with the associated policies behind these tools. An action plan for implementation activities is also recommended.

Recommendation 2: Develop an operations manual detailing the processes required to facilitate swift post-disaster budget mobilization and execution. This manual should clearly document the post-disaster budget mobilization and execution procedures and processes for MoF staff. A manual that details the processes in a single document would embed existing process, such as the transfer of a staff member from MoF to the NEMO, and would thus be useful to staff who need to understand the correct procedures to follow during a disaster.

Recommendation 3: Develop an insurance program for key public assets. This program would include a full review of the current insurance program for the government by MoF. In addition, it would identify assets to be included and indicate appropriate coverage selection for these assets. The potential for establishing an insurer vehicle could also be investigated if deemed if appropriate.

End Notes

1 Modeled emergency loss is estimated to be 23 percent of total ground-up losses. Losses are modeled to provide an estimate of some of the costs that governments face when providing relief supplies to those affected.

2 Modeled emergency loss is estimated to be 23 percent of total ground-up losses. Losses are modeled to provide an estimate of some of the costs that governments face when providing relief supplies to those affected.

3 Priority for Action 4—"Reduce the Underlying Risk Factors"—has an associated key activity of financial risk-sharing mechanisms, such as insurance, while Priority for Action 5—"Strengthen disaster preparedness for effective response at all levels"—includes the establishment of emergency funds such as contingency budget, national reserves, and annual budgetary allocations (UNISDR 2005).

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Annex 3

Insurance Market Review, February 2014

Executive Summary

The non-life (general) insurance market in Tonga is small not only in absolute terms, but also relative to the size of the country's population and economy. Total non-life insurance premium is T$7.6 million (US$4.2 million). This equates to premium per capita of around T$75.2 (US$42), which is lower than rates in other Pacific Island Countries. It is estimated that around 15 percent of the insurance business in Tonga is placed offshore by international insurance brokers.

Tonga has no legislation in place to regulate its insurance industry. In the absence of a regulator, the solvency of domestic insurers, and hence their ability to pay claims and withstand shocks such as natural disasters, are not being assessed by any government agency. It is not possible to confirm that insurers have adequate financial security to meet any catastrophe exposures. The absence of a regulator also has implications for consumer protection, as no government agency is ensuring the appropriateness of insurance products sold in the market.

The main catastrophe hazard in Tonga is tropical cyclone, although earthquake and tsunami exposures are also present. Insurers advised that they were aware of the potential cyclone exposure and that they insured only those properties that had an engineer's certification of compliance with the cyclone (wind load) standard. The primary accumulation of exposure is on the island of Tongatapu, which includes the capital, Nuku'alofa.

Table A.1— Non-life Insurers Operating in Tonga 2012

COMPANY	COUNTRY OF INCORPORATION	STATUS	FINANCIAL SECURITY
National Pacific Insurance (Tonga) Ltd	Tonga	Local company	None prescribed
Federal Pacific Insurance Company Ltd	Samoa	Branch	None prescribed
Dominion Insurance (Tonga) Ltd.	Tonga	Local company	None prescribed

Source: World Bank

Table A.2— Pacific Non-life Insurance Premium per Capita 2012 (US$)

MARKET	GDP MILLIONS	POPULATION	GDP PER CAPITA	MARKET PREMIUM	PREMIUM PER CAPITA
Cook Islands	$305	19,300	$15,823	$6,600,000	$342
Fiji	$3,908	874,700	$4,467	$97,500,000	$111
Marshall Islands	$182	52,560	$3,470	$3,000,000	$57
Samoa	$683	188,900	$3,619	$17,000,000	$90
Solomon Islands	$1,008	549,600	$1,130	$13,000,000	$24
Tonga	$471	104,900	$4,495	$4,400,000	$42
Vanuatu	$781	247,300	$3,182	$16,500,000	$67

Source: World Bank

Tonga's comparatively low non-life premium per capita—T$75.2 (US$42), as mentioned above—suggests low uptake of insurance across the country. This could be because unlike many other PICs, Tonga does not make motor vehicle insurance compulsory.

Insurance for catastrophic perils of earthquake and cyclone is available in the market and can be included in property insurance products. The peril of earthquake is covered as standard under property policies (such as homeowner policies, for example). Cyclone insurance is not covered under standard property cover wordings, and is available by extension only. Property insurance rates for the cyclone peril (0.25 percent) and earthquake peril (0.15 percent) are average for PICs.

The Tongan government does not have an indemnity property insurance program in place for its infrastructure assets or property. The government keeps no centralized register of insurance arrangements made by individual government departments, public authorities, or state-owned enterprises (SOEs).

Most public enterprises in Tonga that manage public assets have insurance programs in place that include indemnity property insurance. The Ministry of Public Enterprises does not keep a central record of those programs, leaving it to the individual public trading authorities and SOEs to report to their respective boards. It is not known whether catastrophe risks are covered in the existing property insurance programs.

Insurance Market Overview

Total non-life (general) insurance premium, all classes including aviation, is estimated in Tonga at T$$7.6 million (US$4.2 million). The majority of risks underwritten are placed with domestic insurers. Insurance industry sources estimated that only 15 percent of the local insurance business is placed with offshore insurers, which is low in the context of the region.

There are three non-life insurers operating in the Tongan market: National Pacific Insurance (Tonga) Limited (NPI) is a subsidiary of NPI (Samoa); Dominion Insurance (Tonga) Limited is a subsidiary of Dominion Insurance Limited (Fiji); and Federal Pacific Insurance Company Limited is a branch of a Samoan company (see table 1).

Table A.3— Pacific Commercial Property Insurance Rate and Deductible Comparison

MARKET	AVERAGE EARTHQUAKE RATE	GENERAL EARTHQUAKE DEDUCTIBLES	AVERAGE CYCLONE RATE	GENERAL CYCLONE DEDUCTIBLE
Cook Islands	0.12%	2% of sum insured	0.45%	20% of sum insured
Fiji	0.08%	10% of sum Insured	0.30%	20% of loss
Samoa	0.12%	2% of sum insured, or 5% of loss	0.20%	2% of sum insured, or 5% of loss
Tonga	0.15%	5% of sum insured	0.25%	5% of sum insured
Vanuatu	0.30%	5% of loss	0.17%	20% of loss

Source: World Bank 2013

Note: Average market rate percentage of value based on insurance industry sources.

The main broker active in the market is Willis New Zealand Limited; it handles most insurance arrangements for commercial businesses, public authorities, and state-owned enterprises (SOEs) in Tonga. Insurance industry sources reported that there were other brokers from New Zealand and Australia who managed some smaller business insurance accounts.

As shown in table 2, the estimated non-life premium per capita in Tonga—T$75.2 (US$42)—is lower than rates in other Pacific Island Countries (PICs). The low premium per capita could be explained by a number of factors. On the supply side, limited market penetration by non-life insurers could result from the pricing of policies, an effect of competition in a small market and of insurers having offices on Tongatapu only. On the demand side, there could be limited awareness of the role and value of insurance products, or issues with products' affordability. A mix of all these factors may explain why take-up of insurance is low in Tonga.

There are no restrictions on placing insurance offshore. Of the estimated 15 percent of the market premium that is placed offshore by Willis New Zealand Limited, most is placed into the London market, a major international insurance market that includes Lloyd's of London.

Local property insurance rates in Tonga are similar to those charged in other PICs, as detailed in table 3. The local earthquake insurance average basis rate used in Tonga is 0.15 percent, which is consistent with the earthquake basis rate used in other Pacific countries and by New Zealand's Earthquake Commission. The local average basis rate for cyclone extension was quoted at 0.25 percent, again consistent with other PICs.

There are a number of limitations with this comparison, such as variation in property insurance rating due to the location of premises, construction, occupation, fire protection, frequency of expected losses, and the amount and type of deductible on policies. It is not possible to use average rating data as an exact basis for a specific company or individual risk. It is possible, however, to get a general sense of how property insurance rates in respective markets compare to one another.

Catastrophe Risk Exposure and Capacity

The main catastrophe hazard in Tonga is from tropical cyclones, although earthquake and tsunami exposures are also present. Insurers advised that they were aware of the potential exposure and insured only those properties that had an engineer's certification of compliance with the cyclone (wind load) standard. Anecdotal comments suggest that under half of insured properties are insured for cyclone. The primary insurance accumulation exposure was on the main island of Tongatapu, which includes the capital, Nuku'alofa.

Catastrophe risk insurance presents a particular challenge to insurers' exposure management, because unlike other types of insurance, it presents the possibility of large correlated losses. Insurers need to use a combination of reinsurance, reserves, and diversification within their portfolio to ensure that they can withstand large disaster shocks without threatening their solvency. The capacity of the domestic market in Tonga is constrained by the small number of participants and the limited premium volume. Although some risk is placed offshore, the high cyclone risk has proved a deterrent to market expansion in the past. In 1985, for example, New Zealand Insurance Limited withdrew from the Tonga market; and in general New Zealand–based insurers have shown limited willingness to provide catastrophe risk insurance capacity to Tonga because of its exposure to cyclones (Crocombe 1992).

Reinsurance

It is understood that at least one of the three domestic insurers uses the international reinsurance markets to increase its capacity to underwrite catastrophe risks. NPI (Samoa) advised that its operation in Tonga is included in the group reinsurance program arranged by Tower Insurance Limited for all Pacific subsidiaries, including the NPI companies. In its 2011 annual report, Tower Insurance Limited specifically advised that its event excess (net retention) had increased to $NZ 6.7 million and that it had protection for two catastrophe events within the program for the 2011–2012 period (Tower Limited/Tower Capital Limited 2011). The reinsurance program is not detailed in the 2012 report, but it would be expected to follow the previous arrangements.

Insurers in the Pacific region using the international reinsurance markets have been adversely impacted by significant increases in reinsurance costs in recent years. These increases have been partly driven by a number of catastrophe events in the Asia Pacific region, which have caused large losses to the international markets and prompted them to review their pricing of "nonpeak risks—that is, risks underwritten outside of the core markets of the United States, Europe, and Japan. In particular, in 2011 the global market suffered natural catastrophe insured losses of over US$110 billion—the second-largest ever (Swiss Re 2012). What made this year significant for insurers (and reinsurers) in the Pacific was the number of events that occurred in the Asia Pacific region: earthquakes in New Zealand and Japan, floods in Australia and Thailand, and a cyclone in Australia. The Global Insurance Market Report (IAIS 2012) advised that these Asia Pacific events accounted for 61 percent of the insured losses from natural catastrophes in 2011, compared to a 30-year average of 18 percent. As a consequence, adjustments were made in reinsurance capacity and risk premiums went up.

Products

NPI uses Industrial Special Risks (ISR) wordings for major commercial, public authority, and SOE property insurance. Its ISR wording is based on PNG insurance industry standard wording. If the insurance is placed with the London market, then a Material Damage/Business Interruption (MDBI) wording, which is similar to the ISR wording, is

Box 2— Past Catastrophe Events

Cyclones

Damaging cyclones within Tonga have been reported in 1961 (unnamed), 1982 (Isaac), 1997 (Hina), 2001 (Waka), and 2004 (Heta). Of these, Cyclone Hina caused the most damage—the total was estimated at T$$18.2 million (US$10.2 million) in 1997 values (Fiji Meteorological Service 1997). Information on the insurance impacts of these earlier events is not available.

More recently—that is, in January 2014—Cyclone Ian caused significant damage to property in the Ha'apai island group. Modeled ground-up losses from the cyclone have been estimated at US$49.3 million (PCRAFI 2014), with damage reported to 1,094 buildings. As Tonga has no insurance regulator, it has not been possible to obtain accurate details of insurance claims. But according to industry sources, 70 claims have been lodged locally with an estimated incurred value of T$$1.18 million (US$660,000). There are no data available on insurance claims lodged with offshore insurers. The low number of claims and low value suggest a very low insurance penetration in the Ha'apai group, and this was confirmed by Darryl Williamson, NPI (Samoa) General Manager, in a Radio New Zealand International interview on February 11, 2014.

Earthquakes

On September 29, 2009, an 8.1 magnitude earthquake struck 185km (115 miles) east-northeast of Hihifo in northern Tonga. It is reported that houses on islands nearest to the epicenter suffered damage. The resulting tsunami killed nearly 200 people, injured hundreds more, and caused damage in Tonga, American Samoa, and Samoa. There have been no insurance claims reported in Tonga, but insurance industry sources in Samoa advised that approximately 150 claims were lodged there, with insured losses estimated at SAT $10 million (US$4.3 million).

Insurance consequences of recent catastrophe events

The earthquake and tsunami in 2009 and Cyclone Ian in 2014 have had limited impact on local insurers in Tonga. But these events are likely to affect reinsurance capacity and rates for property catastrophe risk over the next few years, and possibly to raise property insurance rates for Tonga.

used. These wordings include coverage of specified natural perils, such as earthquake, but do not automatically cover cyclone risk.

Cyclone insurance is available only by extension from local insurers and is limited to those buildings where the insurers are provided with an engineering cyclone certificate confirming that the building meets the building code for cyclone. These certificates are valid for seven years. The London market may include windstorm automatically, but with higher deductibles, increasing the risk retained by the insured party.

Commercial Package or Business Protection wordings are used for small to medium enterprises, and coverage is taken as either Multi Risks (accidental damage including earthquake and cyclone by extension) or as Specified Risks (fire and extraneous perils). These policies generally follow the perils insured under the MDBI, although coverage may be more restricted.

Insurance Law and Regulation

There is currently no insurance law or regulation in place in Tonga. The National Reserve Bank of Tonga is currently the regulator for banks, and in many PICs the reserve or central bank also acts as insurance regulator. The National Reserve Bank of Tonga advised that it would give consideration to taking the role of supervisor of pension funds and insurance, but would need technical assistance with any legislation.

With no insurance law, there are no specific requirements for local insurers in relation to capital and solvency, other than those provided in the Companies Act 1995. Insurance accounting is specialized, and most countries have recognized that specific insurance capital and solvency requirements are needed, over and above those provided in company legislation.

Box 3— Tonga Airports Ltd.

Tonga Airports Ltd. (TAL) is a state-owned entity managing the airport facilities. TAL has an operational risk management policy in place, which includes risk mitigation and financial solutions. It also has a risk register in place and is able to assess the potential financial impacts of identified risks. TAL advised that it has property insurance, though this insurance is for current market (indemnity) value only. The property insurance includes the perils of earthquake and cyclone. The airport runway pavements are also insured for physical damage. TAL advised that its insurance is placed with the London market (Lloyd's).

TAL has a reserve fund and contingency budget to cater for small events that are below policy deductibles. They also have retained earnings to cover a long-term development plan, and in the event of a major disaster these could be reallocated to assist with reconstruction.

Tonga Power Ltd.

Tonga Power Ltd. (TPL) is a state-owned entity that has the concession to manage the electricity supply. TPL has a risk management policy and risk register in place, and its risk management committee meets every six months to review them. Included in the policy is a section on risk financing, including insurance. Under the terms of the concession agreement, TPL is required to insure the public assets and report details of the insurance program to the Electricity Commission. TPL has a coinsured MDBI property insurance policy; 50 percent is placed with NPI and 50 percent is with a panel of London market (Lloyd's) insurers. Buildings, generation plant, and other contents are insured. Transmission and distribution lines are excluded. The perils insured include earthquake, tsunami, cyclone, and flood. TPL is aware of deductibles and property excluded from the coverage, and has set aside T$$1 million to allow for potential disasters, such as earthquakes or cyclones.

In January 2014, when Cyclone Ian passed over the outer island Ha'apai group, it damaged property managed by TPL. It has been reported that the costs to repair the damage to transmission and distribution lines will exceed T$$3 million (US$1.7 million) (PACNEWS 2014). Because the existing coverage excludes damage to transmission and distribution lines, these costs will be an uninsured loss. TPL advised that insured losses to generator building, transformers, and equipment totalled over T$$700,000 (US$391,000). In addition to the insurance claim, T$2.1 million (US$1.2 million) has been donated by the New Zealand government for restoration and upgrading of the power network (Radio New Zealand International 2014).

Building Controls and Standards

Tonga has a solid legal basis for all construction in the Building Act 2002, Building Regulations 2007, and a standard building code. The code is based on Australian and New Zealand standards, including the New Zealand earthquake code (NZS4203) and Australian wind loads code (AS1170.2) for cyclone. A local engineer in Tonga advised that most commercial and government buildings constructed after 2007 were built in accordance with the code for both earthquakes and cyclones. Building inspectors are known to carry out inspections on larger construction projects, which suggests that the building code is being followed for commercial structures. According to the engineer, there is limited supervision of residential construction, and it is not clear whether residential properties comply with codes.

Insurers have taken proactive steps to ensure cyclone building standard compliance by requiring engineering certificates for insured properties, rather than relying on the government's enforcement of the building code.

Insurance of Public Assets

There is no insurance program in place for government property or infrastructure assets in Tonga. The Ministry of Finance and National Planning has a project underway to complete an asset register, which will allow the government to identify those key public assets to be insured. According to the Ministry of Finance and National Planning, consideration was being given to including government property indemnity insurance in the 2015 plan.

The Ministry of Public Enterprises is responsible for the overall supervision of all public trading

authorities and SOEs. The ministry advised that most public trading authorities and SOEs had property insurance programs in place. It does not keep a central record of those programs, leaving it to the individual public trading authorities and SOEs to report to their respective boards. It is not known whether catastrophe risks are covered in the insurance programs in place.

The government keeps no centralized register of insurance arrangements made by individual government departments, public authorities, or SOEs. A register of this type would allow a more coordinated approach to property insurance management and purchasing, which in turn might provide premium cost benefits.

Options for Consideration

Recommendation 1: The government should develop an insurance program for key public assets and include this in a broader disaster risk financing and insurance strategy. This approach would include completing a centralized asset register with up-to-date replacement values, an assessment of probable losses, and a review of existing indemnity insurance to ensure that the major catastrophe perils of earthquake/tsunami and cyclone/ sea surge are included, and that the government and SOEs are getting the best available terms and conditions for the property insurance premiums paid.

Recommendation 2: The government should set up a central insurance register as part of the disaster risk financing and insurance strategy and update the register as insurance contracts fall due. The government currently has no central register of property insurance in place for individual government departments, public authorities, and SOEs.

Recommendation 3: Tonga should introduce legislation to regulate insurance companies, modeled on insurance acts already in place in other PICs. Tonga has no regulator, so insurer capital, solvency, reinsurance, catastrophe exposures, and aggregates are not reviewed by any government agency. Proper regulation would ensure that local insurers have adequate financial security and capacity to meet any catastrophe exposures.

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Glossary

Agent	Someone who acts for the insurance company in arranging insurance contracts. There are two main types of agents: tied agents, who act for one insurer only, and general agents, who act for multiple insurance companies.
Broker	Someone who acts as an agent for the insured in arranging an insurance or reinsurance program with a provider of capacity.
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.
Captive insurer	An insurance company wholly owned by a company or entity that insures the risks of the parent entity and subsidiaries.
Indemnity insurance	Insurance that reimburses individuals or entities for loss or damage to a financial position as close as possible to the position they were in prior to the event, in the context of the financial terms of the coverage (such as deductible/excess and limit).
Intermediaries	The general term given to insurance agents and brokers.
Net retention	The amount that an insurance company retains on a reinsurance contract and in particular an excess of loss of contract.
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. May also be called 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.
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.
Solvency margin	The extent by which an insurer's assets exceed its liabilities. Minimum statutory solvency requirements are normally included in insurance acts or regulations.

Country Note

MARSHALL ISLANDS

February 2015

Disaster Risk Financing and Insurance

CHAPTER 07

GFDRR

SPC Secretariat of the Pacific Community

WORLD BANK GROUP

Executive Summary

The likelihood that a hazardous event will have a significant impact on the Marshall Islands has risen with the increasing levels of population and assets in the urban areas of Majuro and Ebeye. The low-lying atolls are at risk of damage to both assets and people as a result of storm surges and tsunamis. In December 2008, a state of emergency was declared following weeks of high seas, which resulted from storm surges coinciding with high tides and two tropical depressions (Marshall Islands Government 2009; UNOCHA 2008). These events caused damage to roads, houses, and other infrastructure on the low-lying atolls of Majuro and Ebeye. Similar events are expected to become more frequent with climate change and rising sea levels.

The Marshall Islands is expected to incur, on average over the long term, annual losses of US$3 million due to earthquakes and tropical cyclones. In the next 50 years, the Marshall Islands has a 50 percent chance of experiencing a loss exceeding US$53 million, and a 10 percent chance of experiencing a loss exceeding US$160 million (PCRAFI 2011).

The government takes an ex-ante approach to financing the cost of disasters, but the resources available are limited. While the government has a contingency budget and access to the Disaster Assistance Emergency Fund (DAEF), the immediate cash available through the former is only US$200,000 and through the later only US$100,000. Consequently the government relies heavily on donor support to fund post-disaster expenditures.

The Marshall Islands has a maximum amount of US$15.6 million potentially available in ex-ante instruments to facilitate disaster response, which is equivalent to 44 percent of the recurrent budget in 2013. These contingent funds are composed of US$0.2 million from the contingency budget, US$0.1 million from the DAEF, and the maximum payout of US$15.3 million from the Pacific Catastrophe Risk Insurance Pilot. It is estimated that there is a 1 percent chance in any year that disaster losses will exceed the total amount available. However, it should be noted that the risk insurance pilot will release funds only if certain pre-agreed upon event magnitudes are reached. If the contingency budget and DAEF alone are considered, there is an 18.6 percent chance that funds will be exceeded in any one year.

The government's post-disaster budget execution process relies on a variety of financial tools, but the size of the economy limits access to immediate post-disaster cash resources. The government has dedicated, yet limited, funds that can be accessed following an event and used effectively; however, not all currently followed procedures are embedded within the financial legislature, including those

related to the unique requirements of post-disaster financing.

A number of options for improving disaster risk financing and insurance are presented here for consideration:

(a) **develop an integrated disaster risk financing and insurance strategy;**

(b) **assess the domestic insurance market for both public and private assets to establish what products are currently offered and to determine their level of uptake;**

(c) **carry out a quantitative analysis to determine whether contingent credit could be an effective tool to access additional liquidity post-disaster; and**

(d) **investigate the possibility of establishing policies for financial assistance to disaster victims in remote communities.**

Photo Credit
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Introduction

The Marshall Islands has a land area of 181km² scattered across a collection of 29 atolls and five islands. Most of the atolls and islands have an elevation of less than 6m above sea level, including the capital, Majuro, many parts of which are less than 1m above sea level. The low-lying atolls and islands lie in an expanse of ocean of almost 2 million km2. This scattered geography increases both the time and cost involved in initial post-disaster response.

According to the 2011 Population and Household Census, the population of the Marshall Islands is 53,158.[1] The two urban centers, Majuro and Ebeye (a small islet on Kwajalein atoll), have populations of 28,000 and 9,614, respectively. Ebeye has the highest population density in the Pacific, equivalent to an estimated 66,750 people per square mile; this is higher than the population density in Tokyo, estimated at 15,619 people per square mile.[2]

Events in 2013 demonstrated that the Marshall Islands is extremely vulnerable to the threat of both storm surge and drought. In May 2013 a statement of emergency was issued because of severe drought conditions in the atolls of Mejit and Utrik, located in the north. In contrast, flooding forced the airport on the main island of Majuro to close on June 25, 2013. The seawall that protects the runway broke in four places as a result of high tides and an associated storm surge. Both of these incidents highlight the vulnerability of the population and their assets, both public and private.

The Marshall Islands government, in conjunction with the Secretariat of the Pacific Community Applied Geoscience Division (SPC-SOPAC), the Secretariat of the Pacific Regional Environment Programme (SPREP), the United Nations Development Programme (UNDP) Pacific Centre, the United Nations International Strategy for Disaster Reduction (UNISDR), and other partners, has developed several institutional frameworks on disaster risk management (DRM) and climate change adaptation at the national, subregional, and international level, including the following:

- Hyogo Framework for Action (HFA) 2005–2015
- Pacific Disaster Risk Reduction and Disaster Management Framework for Action (Regional Framework for Action or RFA) 2005–2015
- National Action Plan for Disaster Risk Management, 2008–2018
- Marshall Islands Emergency Response Plan, 2010
- Policy for Climate Change Adaptation, 2006
- Joint National Action Plan (JNAP) for Disaster Risk Management and Climate Change Adaptation, 2011–2014

Disaster risk financing and insurance (DRFI) is a key activity of the HFA Priorities for Action 4 and 5. The HFA is a result-based plan of action adopted by 168 countries to reduce disaster risk and vulnerability to natural hazards and to increase the resilience of nations and communities to

disasters over the period 2005–2015. In the Pacific, the HFA formed the basis for the development of the Regional Framework for Action.

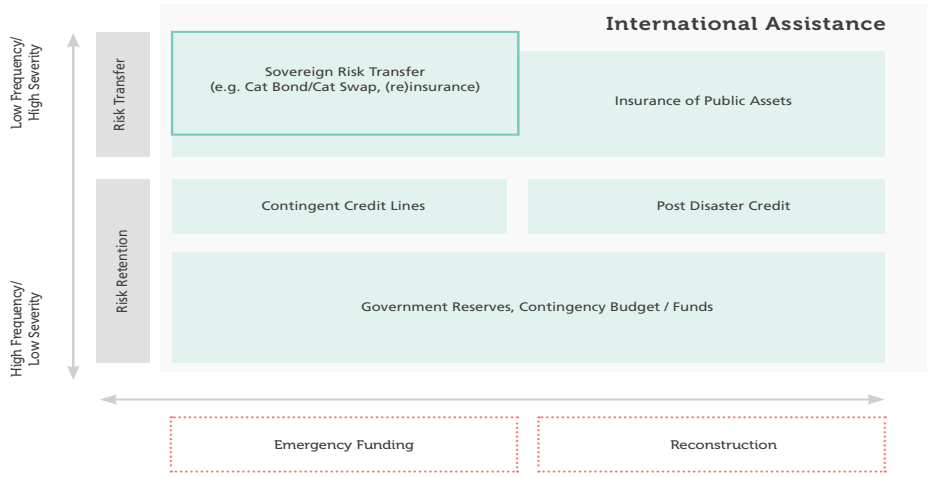
The RFA cites DRFI activities as a key national and regional activity. Theme 4—"Planning for effective preparedness, response and recovery"—has an associated key national activity, "Establish a national disaster fund for response and recovery." Theme 6 of the RFA—"Reduction of underlying risk factors"—cites the development of "financial risk-sharing mechanisms, particularly insurance, re-insurance and other financial modalities against disasters as both a key national and regional activity" (SOPAC 2005). These regional implementation activities align with the three-tiered disaster risk financing strategy developed by the World Bank.

Goal 2 of the Marshall Islands (2007) National Action Plan for Disaster Risk Management seeks to "mainstream DRM in planning, decision making and budgetary processes at national and local levels." This goal includes establishing a sustainable fund for DRM.

The Pacific Disaster Risk Financing and Insurance Program enables countries to increase their financial resilience against natural disasters by improving their capacity to meet post-disaster funding needs without compromising their fiscal balance. This program is one application of the Pacific Catastrophe Risk Assessment and Financing Initiative (PCRAFI). The Pacific DRFI Program is built upon a three-tiered approach to disaster risk financing. These layers align to the basic principles of sound public financial management, such as the efficient allocation of resources, access to sufficient resources, and macroeconomic stabilization. The three tiers acknowledge the different financial requirements associated with different levels of risk: (i) self-retention, such as a contingency budget and national reserves, to finance small but recurrent disasters; (ii) a contingent credit mechanism for less frequent but more severe events; and (iii) disaster risk transfer (such as insurance) to cover major natural disasters. See figure 1.

This report aims to build understanding of the existing DRFI tools in use in the Marshall Islands and to identify gaps where engagement could further develop financial resilience. The report also aims to encourage peer exchange of regional knowledge, specifically by encouraging dialogue on past experiences, lessons learned, optimal use of these financial tools, and the effect these tools may have on the execution of post-disaster funds.

Figure 1 — Three-Tiered Disaster Risk Financing Strategy



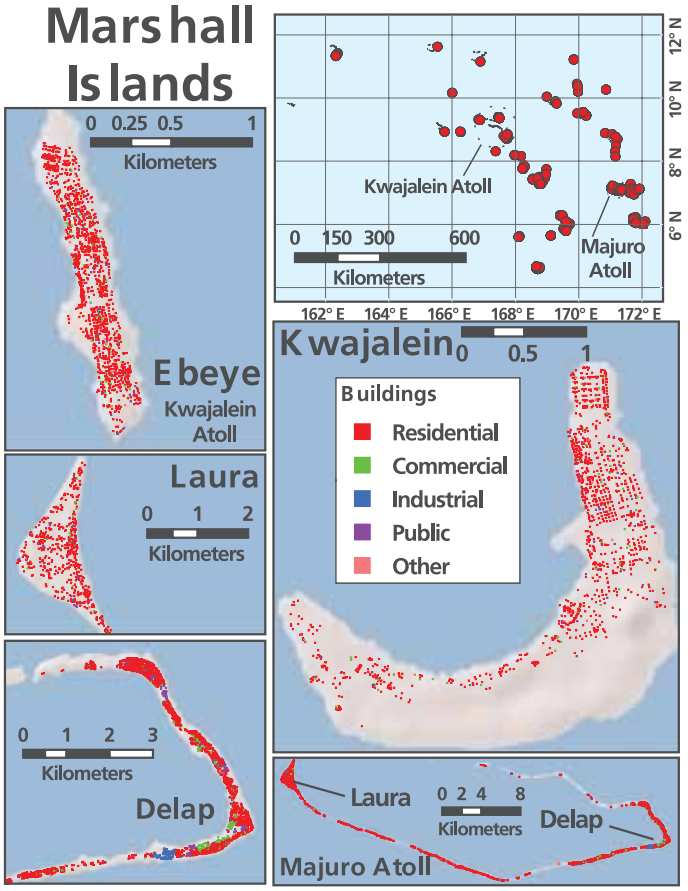
Source: World Bank 2010.

Economic Impact of Natural Disasters

Between 1988 and 2008, 18 natural disasters affected around 12,700 people in the Marshalls Islands. The estimated direct cost of these events was US$317 million (SPC-SOPAC 2012). Half of these disasters were slow-onset disasters such as droughts. Droughts have made access to safe water an especially important issue for the Marshall Islands. Droughts also increase the risk of water-borne diseases, since the supply of water for both drinking and sanitation is limited. The frequency of drought events suggests that there may be a case for establishing a drought response budget line.

The likelihood that a hazardous event will have a significant impact on the Marshall Islands has risen with the increasing levels of population and assets in the urban areas of Majuro and Ebeye. These low-lying atolls are at risk of damage to both assets and people as a result of storm surges and tsunamis. In December 2008, a state of emergency was declared following weeks of high seas, which resulted from storm surges coinciding with high tides and two tropical depressions (Marshall Islands Government 2009; UNOCHA 2008). These events caused damage to roads, houses, and other infrastructure on the low-lying atolls of Majuro and Ebeye. Similar events are expected to become more frequent with climate

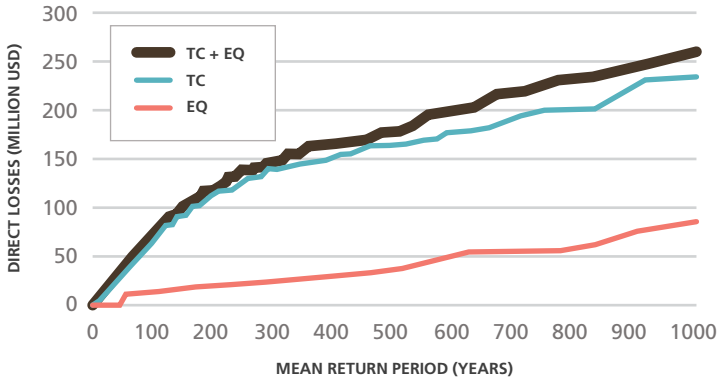
Figure 2 — Building Locations



Source: PCRAFI 2011.

Section 07

Figure 3 — Direct Losses by Return Period



Source: PCRAFI 2011

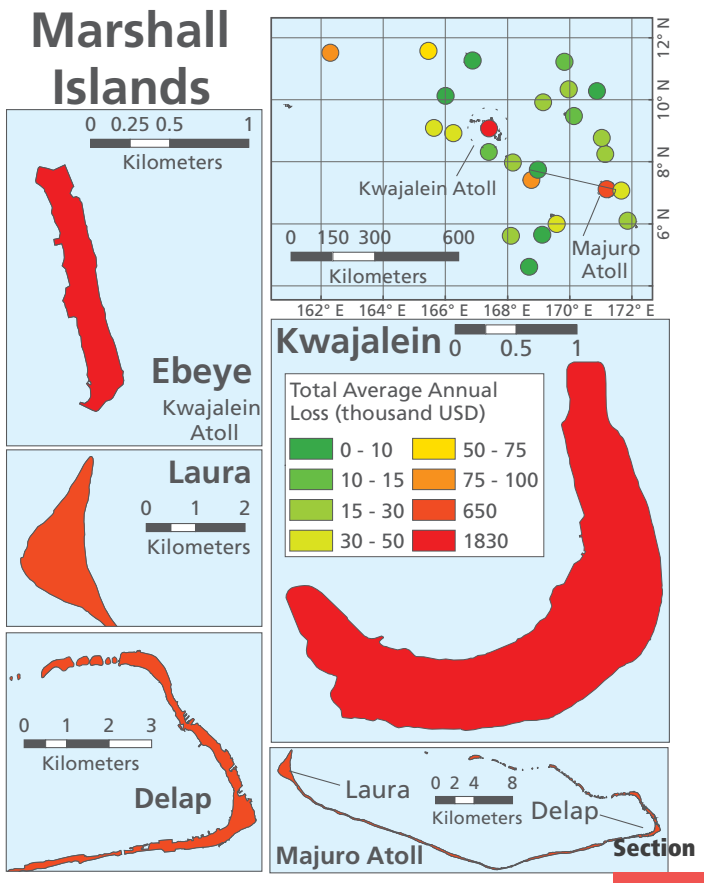
Note: TC = tropical cyclone; EQ = earthquake.

change and rising sea levels. Figure 2 shows the location of buildings in the Marshall Islands and provides an indication of the assets that have accrued over time.

The remote atoll and island subsistence economies are highly dependent on agriculture, which in turn is highly susceptible to adverse weather conditions. An estimated 6,384 people were affected by the drought in 2013 (RMI 2013b). Household water catchments and other water storage facilities ran out of water, and levels of salinity in underground water sources breached safety levels for consumption. The prolonged drought and high groundwater salinity levels devastated food crops such as breadfruit, banana, and taro. This situation will have long-lasting impacts on food security and the health of the populations of the affected atolls.

The Marshall Islands is vulnerable to losses from tropical cyclones, which cause damage to buildings, infrastructure, and livelihoods. In 1997, for example, Typhoon Paka caused US$80 million of damage to crops and affected 70 percent of houses on Ailinglaplap Atoll (PCRAFI 2011). During a 20-year period, cyclones in the Marshall Islands caused on average US$63 million per

Figure 4 — Average Annual Losses by Area



Source: PCRAFI 2011

cyclone (SPC-SOPAC 2012); Typhoons Zelda, Axel, and Gay caused significant damage and loss within the span of one year (1991–1992).

The Marshall Islands is expected to incur, on average, US$3 million per year in losses due to earthquakes and tropical cyclones. In the next 50 years, it has a 50 percent chance of experiencing a per-event loss exceeding US$53 million, and a 10 percent chance of experiencing a per-event loss exceeding US$160 million (see figure 3).

The expected average annual loss can also be shown by area, as in figure 4. Areas colored in red indicate high levels of average annual losses, ranging from US$0.78 million to US$2.1 million. The full risk profile for the Marshall Islands can be found in annex 3.

Photo Credit
Stefan Lins/Flickr

Public Financial Management of Natural Disasters

In the Marshall Islands, a major constraint in financial response to natural disasters is the limited number of staff to implement activities. Authority lies with a few key individuals who are also responsible for many other portfolios of work. The drought response occurred at an already busy time—that is, when the Ministry of Finance was preparing for the annual regional Forum Leaders Meeting and working on the 2014 budget and annual donor round table.

The Compact of Free Association (CFA) agreement, established with the United States in 1986, provides the Marshall Islands with economic assistance worth around US$45 million a year until the agreement expires in 2023. In 2013 the CFA agreement provided over US$72 million in funds in total. But use of the funds must be related to the specific areas detailed in the agreement, which states that "funds received under the CFA, as amended shall not be transferred to any other activity, or reprogrammed or expended for any other purpose during the financial year" (Marshall Islands Government 2013a).[4]

The CFA agreement was amended in 2004 to include specific guidance on establishing the Disaster Assistance Emergency Fund (DAEF)—discussed below—and accessing additional post-disaster financial support from the U.S. Agency for International Development (USAID). According to the amended CFA, additional finance is available once one of the following criteria is met: "(i) the President of the Republic of the Marshall Islands officially declares a national state of emergency in accordance with the laws of the Government of the Republic of the Marshall Islands; (ii) the disaster is deemed to be beyond the ability of the Government of the Republic of the Marshall Islands to respond, including taking into account the available resources of the Disaster Assistance Emergency Fund and the need to protect the sustainability of the Fund; or (iii) the Government of the Republic of the Marshall Islands has requested assistance through the United Nations designated representative for the coordination of disaster and humanitarian assistance." (CFA 2004).

In 2004, the renewal of the CFA agreement provided a stream of grants, due to decline over time, that were aimed primarily at

the education, health, and infrastructure sectors. When the annual grants under the CFA agreement cease in 2023, the Marshall Islands' fiscal stress is likely to increase, as is its financial vulnerability to natural disasters. The Marshall Island already faces many challenges associated with gaining economic and fiscal self-sufficiency, and these are made greater by the occurrence of natural disasters.

Effective post-disaster financial response relies on two fundamental capabilities:

(a) The ability to rapidly mobilize funds post-disaster; and

(b) The ability to execute funds in a timely, transparent, and accountable fashion.

The next section discusses the existing procedures for post-disaster budget mobilization and execution and where possible provides examples of their use.

Post-Disaster Budget Mobilization

The Ministry of Finance plays a leading role in facilitating disaster response efforts. The ministry waives normal tendering procedures upon receipt of the statement of emergency, and it executes payments rapidly, sometimes on the same day. Following the declaration of disaster in May 2013, the Ministry of Finance led a national post-disaster assessment of the ongoing drought in the northern islands, and it led a flash-funds appeal to generate and consolidate donations from members of the public and local businesses.

The government takes an ex-ante approach to DRFI, but its available resources are limited. While the government has a contingency budget and access to the DAEF, the immediate cash available through the former is US$200,000 and

Table 1— Sources of Funds Available

	SHORT TERM (1-3 MONTHS)	MEDIUM TERM (3-9 MONTHS)	LONG TERM (OVER 9 MONTHS)
Ex-post Financing			
Donor Assistance (relief)	■	■	
Budget Reallocation	■	■	
Domestic Credit		■	■
External Credit		■	■
Capital Budget Realignment			
Donor Assistance (reconstruction)			■
Tax Increase			
Tax Incentives (Flash Appeal)	■		
Ex-ante Financing			
Emergency Fund	■		
Contingency Budget	■	■	
Contingent Credit			
Sovereign (parametric) Catastrophe Risk Insurance	■	■	
Traditional Disaster Insurance	■	■	■

Source: Government of Marshall Islands; World Bank.

Box 1— The Pacific Catastrophe Risk Insurance Pilot

The Pacific Catastrophe Risk Insurance Pilot aims to provide immediate budget support following a major tropical cyclone or earthquake/tsunami. The insurance is designed to cover emergency losses, which are estimated using both a modeled representation of the event based on hazard parameters and a calculation of total modeled physical damage. Unlike a conventional insurance scheme, where a payout would be assessed against actual incurred costs, this scheme pays out on the results of a model. The advantage of this approach is that it results in a much faster payout. The payout would act as a form of budget support and would go some way to cover the costs that would be incurred by the government in the aftermath of a severe natural disaster that disrupts the provision of government services. Countries can choose between three layers of coverage—low, medium, and high—depending on the frequency of events. The lower layer will cover events with a return period of 1 in 10 years, that is, more frequent but less severe events. The medium layer will cover events with a 1-in-15-year return period, while the higher layer will cover less frequent but more severe events, or those with a return period of 1 in 20 years. However, countries may request that a more customized option be developed for them.

through the latter is US$100,000. Consequently the government relies heavily on donor support to fund post-disaster expenditures.

Ex-post financial measures such as post-disaster budget reallocation take between one and two weeks to mobilize and require cabinet approval. Reprogramming of funds can be done only following the declaration of disaster, which is normally a few weeks after the statement of emergency. This means that the reprogramming of funds between ministries can take up to six weeks, although ministers can reprogram up to 5 percent of their budget between departments with relative ease. Interdepartment reprogramming can be done within one or two days following the declaration of disaster.

The Marshall Islands has a variety of ex-ante and ex-post financial tools, and the time it takes to mobilize and execute these funds varies significantly. Building on the World Bank disaster risk financing and insurance framework (see annex 1), table 1 shows the ex-ante and ex-post financial tools available, indicates those utilized by the Marshall Islands, and gives indicative timings. The tools utilized by the Marshall Islands are highlighted in blue. Those sections highlighted in gray are for generic instruments that to date have not been used in the Marshall Islands.

Ex-Ante Practices and Arrangements

The uncertainty surrounding international assistance has increased pressure on countries to establish domestic sources of finance for post-disaster relief. This includes the establishment of national reserves or the transfer of risk to the international insurance market. The ex-ante practices and arrangements that have been made by the Marshall Islands are described below.

Disaster Assistance Emergency Fund

Under the CFA agreement with the United States government, the DAEF was legally established in 2004. The fund, which may be drawn on only to pay for assistance and rehabilitation after a disaster or emergency, was first implemented in 2005. Each year, upon receipt of US$200,000 from the Marshall Islands government, the DAEF receives an equal amount in the form of a grant from the United States. The funds held within the DAEF can accrue interest until they are released post-disaster. The total

amount in the fund as of June 2013 was just over $1.5 million.

The amount of funding released following an event was increased in 2013 as a means of setting a precedent for other donor funds. After the government declares a state of national emergency, it can withdraw an amount of up to US$100,000 per event. This amount reflects renegotiation in 2013: initially, the amount was S$50,000, but it became apparent that other donors saw this amount as a precedent and contributed the same amount. The same pattern was witnessed during the drought response in March 2013: after the government withdrew US$100,000, other donors matched this amount with their initial contributions.

Contingency budget

The Marshall Islands holds a nominal contingency budget for the payment of unforeseen expenditures equivalent to US$200,000 each year. The process for deciding to draw on these funds is not legislated but reflects self-imposed restraint and prudence by the staff at the Ministry of Finance. The limited amount of cash means it can be easily exhausted either by a disaster or another unforeseen event.

Sovereign catastrophe risk insurance

The Marshall Islands' participation in the Pacific Catastrophe Risk Insurance Pilot provides access to an injection of liquidity within the first month of an eligible disaster. The pilot was launched on January 17, 2013, and the Marshall Islands opted for coverage against tropical cyclones with the associated hazards of storm surge, precipitation from tropical cyclone, and flooding caused by tropical cyclone (see table 2).

In the event that the Marshall Islands experiences a tropical cyclone with an estimated emergency loss that exceeds the selected attachment point, the country will be eligible for a payout worth over five times its contingency budget. Events that generate an emergency loss[5] beneath the attachment point must be managed by optimizing the use other financial tools.

External debt

The current stock of public debt is equivalent to 55.9 percent of gross domestic product (IMF 2013). Of this, approximately 97 percent is external. An estimated 64 percent of the external debt is central government debt

Table 2— Selected Insurance Coverage, 2014–2015 Pilot Season

	TROPICAL CYCLONE
Policy period	November 1, 2014–October 31, 2015
Peril selected	Tropical cyclone
Layer of coverage selected	1 in 15 years
Coverage limit as a percentage of contingency budget	>500 percent
Reporting agency	Joint Typhoon Warning Center

Source: World Bank.

to the Asian Development Bank, with the balance being state-owned enterprise debt guaranteed by the central government. The Asian Development Bank debt is all on concessional terms. It is therefore expected that the level of existing debt will remain manageable in the coming years, although an increase in both principal repayments and interest is expected to occur from about 2017. The current debt-service ratio is estimated to be equivalent to 10 percent of the export of goods and services, down from 16.5 percent in 2010 (IMF 2013).

Given the relatively low levels of debt servicing, increasing the use of contingent credit could be explored as an alternative to securing cash reserves for disaster response. The opportunity cost of holding cash is high for a country that is driven by the expenditures of the public sector. Holding cash may also result in the diversion of funds from investment in the health and education sectors, which would have long-term development impacts.

Ex-Post Practices and Arrangements

Because disasters often exceed a country's capacity to cope with them, there will always be a need for ex-post practices and arrangements. An optimal strategy for DRFI relies on a combination of ex-ante and ex-post financial instruments. Ex-post arrangements benefit from being able to establish the extent of the disaster and prioritize the response needs. As a result these arrangements take longer to implement than ex-ante arrangements, but they can often mobilize larger amounts of finance. This section discusses the ex-post practices and arrangements that have been made by the Marshall Islands.

Budget reallocation

The Marshall Islands, like many small island states, has limited sources of domestic revenue and limited budget flexibility. The largest sources of domestic revenue are taxes on trade and consumption, closely followed by revenue from taxes on income and profits, which respectively generated US$17.3 million and US$11.3 million in fiscal year 2012/13 (IMF 2013). Grants from the CFA and from development partners amounted to $59.2 million. This means that contributions from donors account for approximately 62 percent of the annual budget. The country's limited budget flexibility and limited immediate access to cash make it difficult to fund disaster response domestically.

The reprogramming of funds requires cabinet approval under Article VII, Section 7 of the Marshall Islands Constitution, and a maximum of 5 percent of funds can be reprogrammed. However, under the Financial Management Act 1990, ministers may reprogram funds between their departments with approval from the Secretary of Finance (Marshall Islands Government 1990). Table 3 shows the total budget classified into three core categories: wages, commitments, and operations. Of those three categories, only the amount allocated for operations could be reprogrammed in the wake of a disaster—that is, US$3.6 million for the fiscal year 2013.

Donor funds for relief and reconstruction

While donor funds will always be required following a disaster, there will always be an element of uncertainty surrounding how much will be provided, what will be provided, and when the funds will arrive in country. Consequently, overdependence on international relief as a source of post-disaster financing can

Table 3— Fiscal Year 2013 Proportion of General Budget Expenditures

	FISCAL YEAR 2013 US$M	% OF TOTAL NUDGET
Wages and salaries	19	53 percent
Commitments	13.1	37 percent
Operations	3.6	10 percent
Total budget	**35.7**	**100 percent**

Source: Marshall Islands Government 2013a.

delay the provision of initial relief and can inhibit ex-ante contingency planning. Development partners, international organizations, local nongovernmental organizations, businesses, and individuals contribute in the form of cash grants and aid in kind. The provision of aid in kind, while vital, can affect the costs borne by governments for the distribution these goods.

Donor assistance for reconstruction often takes significant amounts of time and involves negotiation between the country and its donors to establish key priorities. However, significant amounts of finance can be assigned. For example, the total response plan for the drought in 2013 was estimated at US$4.8 million, of which US$1.5 million was funded by contributions from donors and development partners.

Flash appeal

Following the statement of emergency for the drought in 2013, the Ministry of Finance led a flash appeal to generate and consolidate donations from members of the public and local businesses. This is the first time the government has led such an appeal to collect funds for relief and response efforts.

Total Response Funds Available

The Marshall Islands has a maximum amount of US$11.2 million available in ex-ante instruments to facilitate disaster response, which is equivalent to 44 percent of the recurrent budget in 2013. Figure 5 shows the three-tiered DRFI strategy alongside the sources of funds and the maximum amounts of funding available to the Marshall Islands following an event. However, it should be acknowledged that the contingency budget is not exclusively for disaster response, and it is unlikely that the full US$0.2 million would be available for response. In addition, there is likely to be a significant gap after the contingency and DAEF have been exhausted before a payout under the catastrophe risk insurance pilot would be triggered. Additional tools and donor funds should be used to minimize any such gap. It is estimated that there is a 1 percent chance in any year that disaster losses will exceed total response funds available. However, there is an 18.6 percent chance that disaster losses will exceed the combined funds of the contingency and DAEF in any one year.

Post-Disaster Budget Execution

While it is commonly accepted that the Ministry of Finance waives normal tendering procedures following the statement of emergency this process has yet to be formally documented. This oversight could give rise to problems in the future. At the moment, the process depends on the knowledge of a few key individuals, but without adequate formal documentation ministry staff could cease this practice in the future. Given that the statement of emergency allows access to the DAEF and enables expenditure from the contingency fund, this possibility poses some concern.

The CFA clearly lays out the eligibility process for accessing funds post-disaster. This means that it has been easy to access and expend funds following events such as the storm surge in 2008 and the drought in 2013. However, the initial disbursement of US$100,000 from the DAEF sets a precedent for other donors that in the future could prove insufficient and that will require regular revisions.

The process for budget reallocation is detailed in Article VII, Section 7 of the Marshall Islands Constitution and appears to be working well. The process for the transfer of funds between subcategories in the same program area is stipulated in the Financial Management Act, which says that budget reallocation from one ministry to another requires cabinet approval, while transfers between subcategories in the same department require the approval of the minister responsible and the secretary of finance.

In the past, ministers have made only limited use of their authority to reprogram funds following a disaster. Anecdotal evidence suggests that on average, only 1 percent of funds are reprogrammed. Instead the favored approach has been to reduce budgetary allocations for the

Figure 5 — Amount of Ex-Ante Funds Available for Immediate Response

Disaster risks	Disaster risk financing instruments	Amount of funds available
High-risk layer (E.G. Major earthquake, major tropical cyclone)	**Disaster risk insurance**	**Catastrophe risk insurance coverage:** (US$10.9m)
Medium-risk layer (E.G. Floods, small earthquakes)	**Contingent credit**	
Low-risk layer (E.G. Localized flood, landslides)	**Contingency budget, national reserves, annual budget allocation**	**Contingency budget:** (US$0.2m) **DAEF:** (US$2.8m)

Source: World Bank.

following fiscal year. In 2008 a national state of emergency was declared as the prices of imports, notably fuel, soared. To help fund the rising import bill, all government departments were asked to reduce their total budget expenditure by 5 percent in 2011. As a small island economy with limited reserves, the Marshall Islands has little capacity to deal with increasing prices.

The 2013 drought highlights the vulnerability of communities located in the outer islands and the high cost of facilitating response to these areas. The estimated cost of transporting the relief supplies to the affected islands was over US$1 million (Marshall Islands Government 2013b). This includes the hire of five boats to visit three islands each, with each trip expected to take 14 days. It also includes the charter of a plane to bring necessary medical supplies to all 15 of the affected islands. The total response plan was estimated to cost US$4.8 million, of which US$2.1 million was financed by contributions from donors and the government. This left a financing gap of US$2.7 million, of which US$1.1 million was identified for immediate needs.

The government covered about 10 percent of the total cost of the 2013 drought response plan, equivalent to 14 percent of the operational budget, and more than could be reprogrammed under section Article VII of the constitution. Given the limited availability of immediate cash, the Marshall Islands government could have trouble meeting its financial commitments beyond 2013.

Overall, the post-disaster budget execution process works well in the Marshall Islands and employs a variety of financial tools, but the small size of the economy means that access to immediate cash is limited. The government has dedicated, yet limited, funds that can be accessed following an event and is able to utilize these effectively, but not all procedures are embedded within the financial legislature, especially those related to the unique requirements of post-disaster financing.

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Australian Department of Foreign Affairs and Trade/Flickr

Domestic Catastrophe Risk Insurance Market

The non-life (general) insurance market in the Marshall Islands is small, with an estimated total premium of US$3 million.

There are no local non-life insurers, and all business is placed offshore by two insurance agencies. The Marshalls Insurance Agency advised that it places the majority of its insurance business with Century Insurance Co. Ltd., a company based out of Saipan in Northern Mariana Islands, with an A. M. Best financial security rating of BBB. Meanwhile, Moylan's Insurance Underwriters Inc. is based in Guam and has a branch in the Marshall Islands. Moylan's (Marshall Islands) advised that it places its insurance business with two companies, Dongbu Insurance Co. Ltd., which is based in South Korea and has an A. M. Best financial security rating of A, or First Net Insurance Co. Ltd., which is based in Guam and has an A. M. Best financial security rating of B

The non-life insurance premium in the Marshall Islands is approximately US$57.00 per capita, lower than the average for Pacific Island Countries, which indicates relatively low insurance penetration.

At present the insurance industry is unregulated. However, anecdotal evidence suggests that the government is looking to change this and hopes to encourage growth in this industry going forward.

Insurance for catastrophe insurance perils of typhoon (cyclone) and earthquake are not readily available in the market. Typhoon (cyclone) insurance is available only on an individual building-by-building basis, subject to insurance underwriters' express acceptance. Property insurance rates for the typhoon peril are considerably higher than the Pacific average, at between 1 percent and 3 percent of value (depending on construction and value), with a deductible of 10 percent of the sum insured. No rating information was available on the earthquake/tsunami peril.

The Marshall Islands government does not have a formal risk financing or property insurance program in place for key public buildings or infrastructure assets. Consequently, it is not known whether government-owned statutory authorities and utility companies have property insurance programs in place. It is known that the Ministry of Public Works insures some individual public buildings but not whether those policies include the perils of typhoon and earthquake/tsunami.

Options for Consideration

The Marshall Islands has implemented several DRFI tools to improve its financial resilience to natural disasters. To build further on these developments and minimize any potential loss of institutional knowledge the following recommendations are suggested for consideration.

Recommendation 1: Develop an integrated disaster risk financing and insurance strategy. This strategy would identify solutions to provide additional liquidity to complement the US$0.3 million available. It would also aim to produce a post-disaster budget execution manual to help embed the existing processes and remove the risk of lapse should key staff leave the Ministry of Finance.

Recommendation 2: Conduct an assessment of the domestic insurance market for both public and private assets to establish what products are currently offered and to determine their uptake. At present the domestic insurance market is extremely limited. It appears that insurance can be purchased only on the two largest atolls of Majuro and Ebeye. The extent of insurance coverage remains to be ascertained.

Recommendation 3: Explore the use of other DRFI instruments, such as contingent credit, to access additional liquidity post-disaster, and identify providers of this type of finance. The advantage of this type of instrument is that countries would only be receive the funds following an event. This could be a plausible option for financing response to comparatively frequent events, such as droughts and storm surge.

Recommendation 4: Investigate the possibility of establishing disaster-linked social safety net programs. These could involve the application of insurance to a social safety net program or perhaps the utilization of cash-for-work programs. These measures could help those located furthest away from the main economic centers. These communities are often the most vulnerable to natural hazards and suffer disproportionate impacts on their living standards following an event.

▼ **Photo Credit**
Kyle Post/Flickr

End Notes

[1] A summary of the Marshall Islands 2011 Population and Household Census is available at http://www.doi.gov/oia/reports/upload/RMI-2011-Census-Summary-Report-on-Population-and-Housing.pdf.

[2] The calculation is based on figures from Tokyo Metropolitan Government, http://www.metro.tokyo.jp/ENGLISH/PROFILE/overview03.htm.

[3] Priority for Action 4—"Reduce the Underlying Risk Factors"—has an associated key activity of financial risk-sharing mechanisms, such as insurance, while Priority for Action 5—"Strengthen disaster preparedness for effective response at all levels"—includes the establishment of emergency funds such as contingency budget, national reserves, and annual budgetary allocations. See UNISDR (2005).

[4] "Reprogrammed" funds are those transferred between ministries; as defined in the Financial Management Act 1990, they are "appropriated funds which are shifted to another program area" (Marshall Islands Government 1990).

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Annex 1 & 2

World Bank Framework for
Disaster Risk Financing and Insurance

Annex 1

World Bank Framework for Disaster Risk Financing and Insurance

Major disasters increase public spending requirements and reduce revenues, placing further strain on limited national budgets. The immediate and long-term fiscal consequences of a disaster depend on the sources of revenue available to the government versus its public expenditure commitments. Investment in disaster risk financing instruments can help prevent the diversion of funds from key development projects and significantly reduce the time needed to activate an initial response. Financial protection is a core component of any comprehensive disaster risk management strategy, and should be implemented alongside the pillars of risk identification, risk reduction, preparedness, and post-disaster reconstruction (see figure A.1).

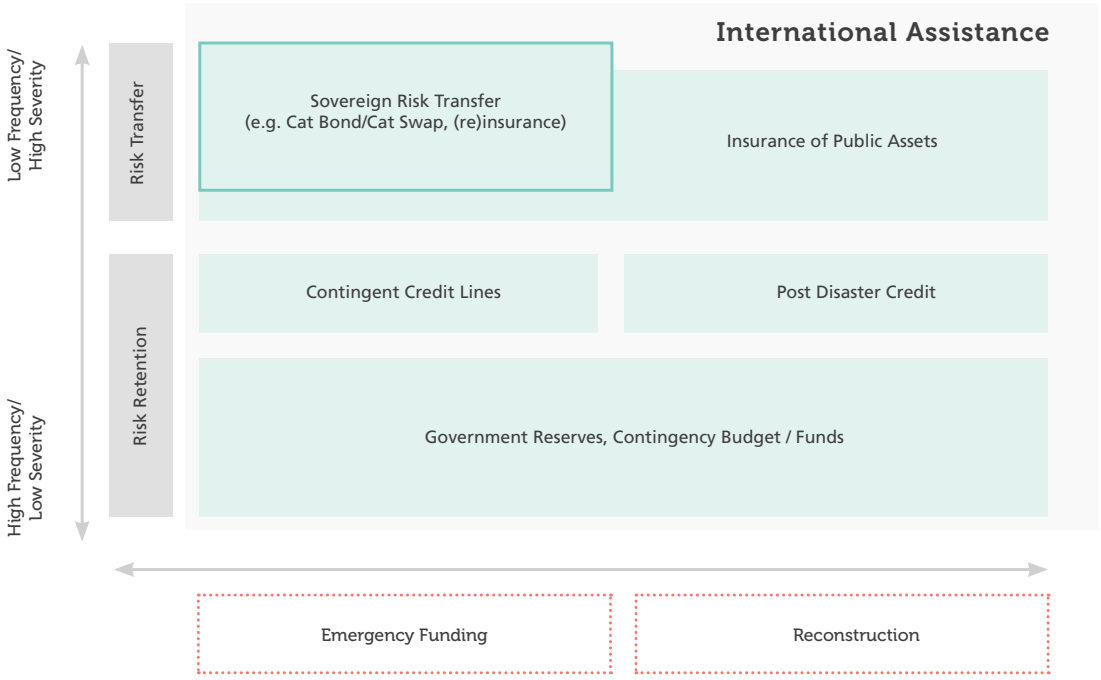
The World Bank framework for disaster risk financing and insurance advocates a three-tiered approach for the development of financing arrangements to cover the residual disaster risk that cannot be mitigated. These layers align to the basic principles of sound public financial management, such as the efficient allocation of resources, access to sufficient resources, and macroeconomic stabilization. The first layer, retention, relates to countries' development of an internal layer of protection against natural disasters to prevent the diversion of funds from development projects (see figure A.2). This layer uses tools such as contingency budgets and national reserves. The aim is to finance small but high-frequency disasters. The second layer is aimed at less frequent but more severe events that are too costly to pre-finance through retention mechanisms. Here, liquidity mechanisms—such as contingent credit, which can mobilize additional funds immediately following an event—become cost-effective.

The third layer, disaster risk transfer (such as insurance), focuses on mobilizing large volumes of funds for large but infrequent natural disasters. For events of this type, risk transfer instruments—such as insurance or catastrophe swaps and bonds—become cost-effective in averting a liquidity crunch.

There is a clear time dimension to post-disaster funding needs and the various phases of relief, recovery, and reconstruction. Some financing instruments can be activated rapidly. Others may take longer to activate but can generate substantial funding. The disaster risk financing strategy needs to reflect both time and cost dimensions, ensuring that the volume of funding available at different stages in the response efforts matches actual needs in a cost-efficient manner.

Figure A.1 — Disaster Risk Management Framework

Figure A.2 — Three-Tiered Disaster Risk Financing Strategy

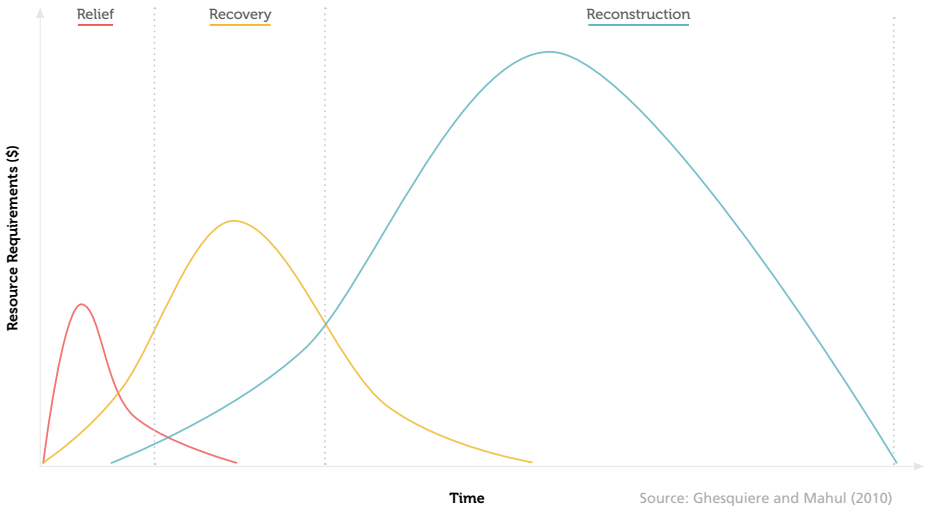


The initial relief phase requires a quick injection of liquidity from day 0 but does not need to be sustained for a long period of time (see figure A.3). Rapid budget mobilization and execution are key for financing initial disaster response, and governments should develop appropriate policies and procedures for procurement and acquittals to facilitate them. Initial relief should be met via annual budget allocations and the establishment of dedicated reserves for disaster response that can be accessed immediately; major catastrophes will exhaust these funds quickly. The residual risk associated with higher-cost events should be transferred to third parties via a mixture of more expensive (re)insurance tools and catastrophe bonds and, for the most extreme events, international assistance.

The recovery phase requires additional funds but not immediately (see figure A.3). Some of the funds for this phase can therefore be raised via post-disaster budget reallocation and the realignment of national investment priorities. However, the opportunity cost for these options is high, given that they can lead to reduced expenditure on other key investment areas, such as health and education. Consequently, governments may also choose to utilize development partner contingent credit arrangements.

In contrast, the reconstruction phase has much larger financing requirements needed over a much longer period of time (see figure A.3). Given the large funding requirements associated with reconstruction, this phase often requires post-disaster reconstruction loans to complement traditional disaster insurance. Governments may also introduce temporary post-disaster tax increases aligned to budget restructuring.

Figure A.3 — Post-Disaster Phases: Funding Requirements and Duration`



Source: Ghesquiere and Mahul (2010)

If adequate and timely funding arrangements are not in place, the adverse socioeconomic impact of a disaster can be significantly exacerbated, at both the macroeconomic and household levels. An optimal disaster risk financing and insurance strategy aims to combine ex-ante and ex-post financial instruments to secure adequate and timely funding at lower cost for the successive post-disaster phases. The optimal mix of finance instruments will be unique to each country based upon its associated hazard and exposure. Table A.1 lists potential finance instruments that can be used to address disasters. Those that are shaded in blue indicate the generic timelines for mobilizing and executing these funds, though each country may be slightly faster or slower depending on its internal processes. The table can be adapted by countries to reflect these differences according to the financial instruments they have utilized and the time it takes to mobilize these funds. Given the innovative nature of the work in this area and the number of products under development, this list is not exhaustive.

Ex-post financing vehicles are those that become available in the wake of an event. The most familiar form of ex-post disaster financing is donor assistance for relief. There are two forms this finance can take, cash grants and aid in kind, and both play an important role in response. The provision of aid in kind, while vital, can affect the distribution costs for these goods. While donor funds will always be required, there can often be an element of uncertainty surrounding how much will be provided, what will be provided, and when funds will arrive in country.

Budget reallocation often plays a key role for the continuation of relief and the initial stages of the recovery program. Generally, this process takes time, as the reallocation of funds will need to be

Table A.4— Availability of Financial Instruments Over Time

	SHORT TERM (1-3 MONTHS)	MEDIUM TERM (3-9 MONTHS)	LONG TERM (OVER 9 MONTHS)
Ex-post Financing			
Donor Assistance (relief)	■	■	
Budget Reallocation	■	■	
Domestic Credit		■	■
External Credit		■	■
Capital Budget Realignment			■
Donor Assistance (reconstruction)			■
Tax Increase		■	■
Flash Appeal	■	■	
Ex-ante Financing			
Emergency Fund	■		
Contingency Budget	■	■	
Contingent Credit	■	■	
Sovereign (parametric) Catastrophe Risk Insurance	■	■	
Traditional Disaster Insurance	■	■	■

Source: World Bank 2013.

agreed upon by the cabinet and across ministries. Budget reallocation can sometimes divert funds from key development projects and hence seriously harm the long-term growth prospects of the country. The same issues are relevant to capital budget realignment, although the timelines for that process are typically significantly longer.

Domestic credit, such as the issuance of government bonds, can be used to raise additional revenue to fund post-disaster expenditures. Again, due to the processes involved, domestic credit will take some time to operationalize and is best suited to financing recovery and reconstruction activities. External credit will likewise take time to be agreed upon with providers and will require clear articulation of the activities it is to finance. Both of these forms of credit will have an impact on the debt-servicing ratio of a country and may not be a viable option for heavily indebted countries.

Donor assistance for reconstruction can be delivered as a form of direct budget support, grant, or a post-disaster reconstruction loan. The form of finance used here will depend on the size of the event, the development status of a country (for example, low-income countries may have access to concessional loans and have more access to grants), and the debt-servicing ratio of a country. Typically, this form of finance is conditional and requires sufficient lead time for aligning the priorities of countries and donors to meet reconstruction and recovery needs.

Tax increases will help redress the increase in public expenditure following a disaster by generating additional revenue. Although higher taxes could be politically unfavorable, they create a sustainable source of finance for reconstruction activities. Conversely, some governments have applied tax incentives to encourage donations to response

funds from both the private sector and members of the public. This approach can be popular when tax credits are written off on annual tax returns.

Ex-ante financing provides an element of financial certainty during a disaster, because governments have established these sources of finance in advance. These funds can be quickly disbursed following an event so that essential relief work commences immediately. A reserve fund provides a dedicated amount of funding for response and if properly managed can accrue over time to increase the level of funding available. However, the opportunity cost of holding money in a dedicated fund is high, as it diverts funds from the operational budget. Careful analysis should be undertaken to identify the optimal level of reserves that a country should hold and maintain.

Contingent credit is a relatively new instrument, with current forms offering disbursement following an event whose magnitude has been agreed upon in advance. It can be fungible or conditional by design. As with other sources of credit, the amount available will depend on the development status of the country and the debt-servicing ratio. The advantage of contingent credit is that a drawdown can be made within a 24-hour period.

Parametric insurance uses hazard triggers, linking immediate post-disaster insurance payouts to specific hazard events. Unlike traditional insurance settlements that require an assessment of individual losses on the ground, parametric policies do not pay based on actual losses incurred. Instead, the payout disbursements are triggered by specific physical parameters for the disaster (e.g., wind speed and earthquake ground motion). The payouts provide a rapid, yet limited, injection of liquidity that can be a valuable boost to relief funds.

Traditional disaster insurance offers indemnity coverage. Receipt of funds may take longer than with parametric insurance, as a detailed damage assessment is required. However, as payouts are directly linked to the damage experienced, the payout will better match the needs of the insured party.

Public financial management in the Pacific is dictated by the fact that many PICs are classified as Small Island Developing States (SIDS). Typically, countries in this classification have a narrow revenue base, are net importers, and have a consequential reliance on aid as an income stream. These characteristics can limit the options available for post-disaster finance. It is unlikely that a SIDS government could afford to reallocate the capital

budget, and a tax increase could make many items unaffordable and hence be detrimental to citizens' quality of life. Given these constraints on the national budget, alternatives such as contingent credit and risk transfer options should be used to reduce the drain on limited public funds.

PIC governments face critical challenges for financial resilience to natural disasters. Most PICs have restricted options for securing immediate liquidity for swift post-disaster emergency response without compromising their long-term fiscal balance. In addition, PICs are constrained by their size, borrowing capacity, and limited access to international insurance markets. In the absence of easy access to debt and well-functioning insurance markets, a large portion of the economic losses stemming from adverse natural events is borne by governments and households, with support from development partners.

The Pacific has seen several recent cases that show the need for immediate liquidity post-disaster. In the Cook Islands, in the immediate aftermath of TC Pat in 2010, a delay in the receipt of travel funds meant that key government personnel could not immediately commence the initial damage assessment. Following TC Vania in 2010, Vanuatu had to reallocate a significant amount of the national budget. Similarly, Fiji and Samoa had to reallocate budgetary funds in the wake of TC Evan in 2012 and 2013; and the Santa Cruz earthquake in the Solomon Islands in February2013 drained the annual budget for the National Disaster Management Office and used the majority of the national contingency budget.

Lacking contingency reserves and access to short-term loan funds, PICs have limited post-disaster budget flexibility and rely heavily on post-disaster donor assistance. Studies by SPC (2011 and 2012) that look at the fiscal impact of past disasters in selected PICs demonstrate the financial constraints in post-disaster budget reallocation and build a case for establishing national reserves. While international assistance will always play a valuable role, overdependence on such assistance as a source of financing carries limitations; international aid can be uncertain, which inhibits contingency planning, and can be slow to materialize. Increasingly, PICs such as the Cook Islands are establishing national reserves for funding initial response.

The World Bank, SPC, and their partners, with grant funding from the government of Japan, have implemented the Pacific Disaster Risk Financing and Insurance Program to help the PICs increase their financial resilience to natural disasters and improve their financial response capacity in the aftermath of natural disasters. This program is part of the Pacific Catastrophe Risk Assessment and Financing Initiative (PCRAFI).

Annex 2

Glossary

Attachment point. The attachment point (deductible) amount is essentially the excess payable before any payout is made under a policy. That is, anything under this value will be borne by the policy holder.

Catastrophe swap. A catastrophe swap, also known as a cat swap, is a financial tool used to transfer some of the risk that the covered party faces from catastrophes to the international reinsurance or capital markets. In the case of the Pacific Catastrophe Risk Insurance Pilot, tropical cyclone and/or earthquake risk is passed to the financial markets.

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.

Exhaustion point. The exhaustion point indicates the loss level at which the payout under a policy reaches its maximum point.

Ground-up losses. Ground-up losses in this context refer to estimated total damage to buildings, infrastructure, and cash crops.

Payout. A payout refers to the amount of cash that countries will receive following an eligible event.

Premium. The premium is the cost that an insured party will pay for a given level of coverage: the more that is included in the coverage provided, the higher the premium will be. Premiums are determined by the amount of coverage a country chooses, the event attachment point (deductible) and exhaustion point (limit) of that coverage, and the risk profile of the country.

Risk pool. A risk pool is a group of people, institutions, or countries that collaborate to manage risk financially as a single group.

Risk Profiles

Risk Profile: Fiji

Population, Buildings, Infrastructure and Crops Exposed to Natural Perils

An extensive study has been conducted to assemble a comprehensive inventory of population and properties at risk. Properties include residential, commercial, public and industrial buildings; infrastructure assets such as major ports, airports, power plants, bridges, and roads; and major crops, such as coconut, palm oil, taro, sugar cane and many others.

Table 1 summarizes population and the inventory of buildings, infrastructure assets, and major crops (or "exposure") at risk as well as key economic values for Fiji. It is estimated that the replacement value of all the assets in Fiji is 22.2 billion USD, of which about 85% represents buildings and 14% represents infrastructure.

Figures 1 and 2 illustrate the building exposure location and replacement cost distribution, respectively. The footprints of about 100,000 of the approximately 266,000 buildings shown in Figure 1 were digitized from high-resolution satellite imagery. More than 18,000 of such buildings, most near the vicinity of the nation's capital of Suva, were also field surveyed and photographed by a team of inspectors deployed for this purpose. Figure 3 displays the land cover/land use map that includes the location of major crops. The data utilized for these exhibits was assembled, organized and, when unavailable, produced in this study.

Table 1— Summary of Exposure in Fiji (2010)

GENERAL INFORMATION:	
Total Population:	847,000
GDP Per Capita (USD):	3,550
Total GDP (million USD):	3,009.4
Asset Counts:	
Residential Buildings:	240,958
Public Buildings:	8,204
Commercial, Industrial, and Other Buildings:	16,974
All Buildings:	266,140
Hectares of Major Crops:	169,733
COST OF REPLACING ASSETS (MILLION USD):	
Buildings:	18,865
Infrastructure:	3,094
Crops:	216
Total:	22,175
GOVERNMENT REVENUE AND EXPENDITURE:	
Total Government Revenue	
(Million USD):	652.5
(% GDP):	21.7%
Total Government Expenditure	
(Million USD):	2,734.5
(% GDP):	24.4%

[1] Data assembled from various references including WB, ADB, IMF and The Secretariat of the Pacific Community (SPC).
[2] The projected 2010 population was trended from the 2006 census using estimated growth rates provided by SPC.

Tropical Cyclone and Earthquake Hazards in Fiji

The Pacific islands region is prone to natural hazards. Fiji is located south of the equator in an area known for the frequent occurrence of tropical cyclones with damaging winds, rains and storm surge between the months of October and May. In the South Pacific region from the equator to New Zealand in latitude and from Indonesia to east of Hawaii in longitude, almost 1,000 tropical cyclones with hurricane-force winds spawned in the last 60 years, with an average of about 16 tropical storms per year. Fiji was affected by devastating cyclones multiple times in the last few decades. For example, tropical cyclones Kina and Ami, in 1993 and 2003, caused about 40 fatalities. Strong winds and widespread coastal flooding damaged homes, infrastructure and crops in the main islands of Viti Levu and Vanua Levu with about 200 to 300 million USD in losses that weakened the local economy. Figure 4 shows the levels of wind speed due to tropical cyclones that have about a 40% chance to be exceeded at least once in the next 50 years (100-year mean return period). These wind speeds, if they were to occur, are capable of generating severe damage to buildings, infrastructure and crops with consequent large economic losses.

Fiji is situated in a relatively quiet seismic area but is surrounded by the Pacific "ring of fire," which aligns with the boundaries of the tectonic plates. These boundaries are extremely active seismic zones capable of generating large earthquakes and, in some cases, major tsunamis traveling great distances. Local faults can also generate from time to time damaging earthquakes. A tragic example is the 1953 magnitude 6.5 earthquake, which triggered a tsunami that killed 8 people and severely damaged the wharf and buildings in the Fijian capital of Suva with significant monetary losses. Figure 5 shows that Fiji has a 40% chance

Figure 1 — Building Locations

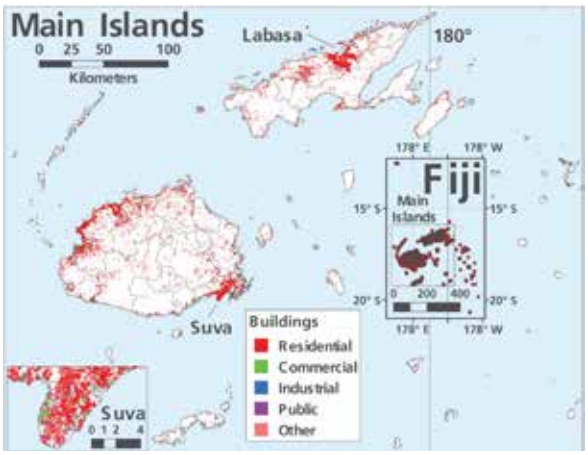


Figure 2 — Building replacement cost density by district.

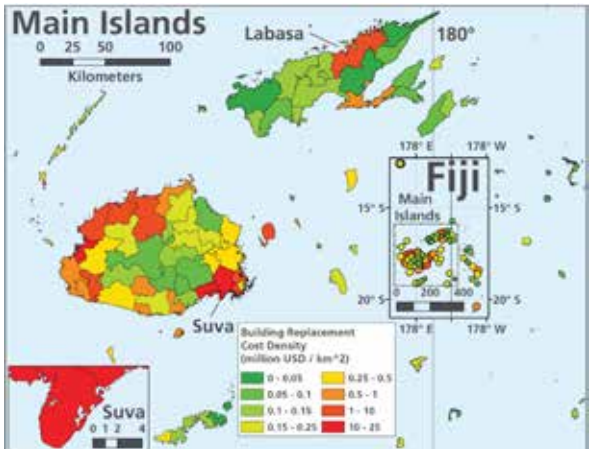
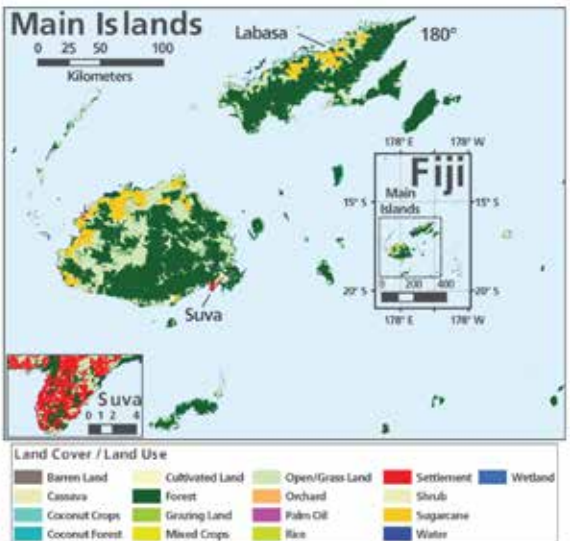


Figure 3 — Land Cover / Land Use Map



in the next 50 years of experiencing, at least once, moderate to strong levels of ground shaking. These levels of shaking are expected to cause light to moderate damage to well-engineered buildings and moderate to heavy damage to structures built with less stringent criteria.

Risk Analysis Results

To estimate the risk profile for Fiji posed by tropical cyclones and earthquakes, a simulation model of potential storms and earthquakes that may affect the country in the future was constructed. This model, based on historical data, simulates more than 400,000 tropical cyclones and about 7.6 million earthquakes, grouped in 10,000 potential realizations of the next year's activity in the entire Pacific Basin. The catalog of simulated earthquakes also includes large magnitude events in South and North America, Japan and the Philippines, which could generate tsunamis that may affect Fiji's shores.

The country's earthquake and tropical cyclone risk profiles are derived from an estimation of the direct losses to buildings, infrastructure assets and major crops caused by all the simulated potential future events. The direct losses comprise the cost of repairing or replacing the damaged assets, but do not include other losses such as contents losses, business interruption losses and losses to primary industries other than agriculture. The direct losses for tropical cyclones are caused by wind and flooding due to rain and storm surge, while for earthquakes they are caused by ground shaking and tsunami inundation. After assessing the cost of repairing or rebuilding the damaged assets due to the impact of all the simulated potential future events, it is possible to estimate in a probabilistic sense the severity of losses for future catastrophes.

The simulations of possible next-year tropical cyclone and earthquake activity show that some years will see no storms or earthquakes affecting

Figure 4 — Maximum 1-minute sustained wind speed (in miles per hour) with a 40% chance to be exceeded at least once in the next 50 years.

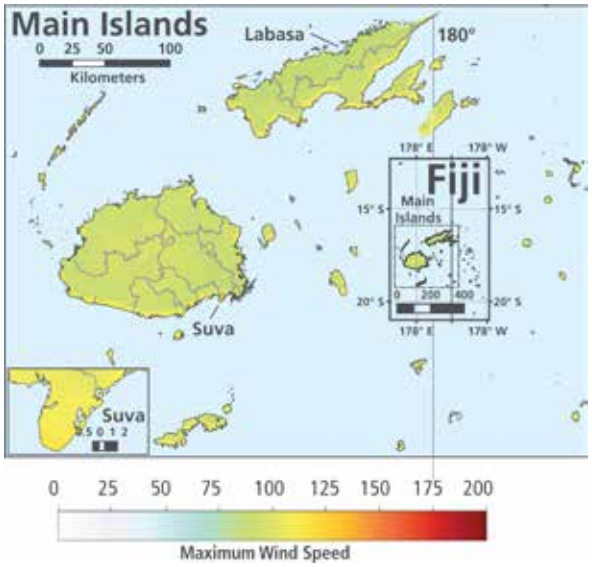
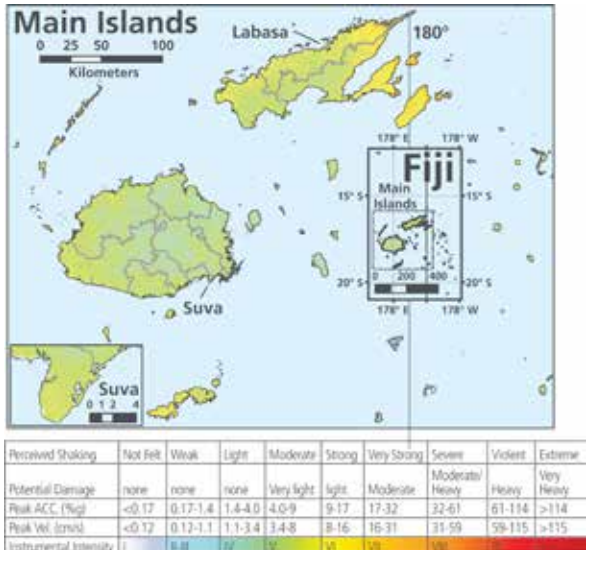


Figure 5 — Peak horizontal acceleration of the ground (Note: 1g is equal to the acceleration of gravity) that has about a 40% chance to be exceeded at least once in the next 50 years.



Fiji, while other years may see one or more events affecting the islands, similar to what has happened historically. The annual losses averaged over the many realizations of next-year activity are shown in Figure 6 separately for tropical cyclone and for earthquake and tsunami, while the contributions to the average annual loss from the different tikinas are displayed in absolute terms in Figure 7 and normalized by the total asset values in each tikina in Figure 8. Figure 8 shows how the relative risk varies by tikina across the country.

The same risk assessment carried out for Fiji was also performed for the 14 other Pacific Island Countries. The values of the average annual loss of Fiji and of the other 14 countries are compared in Figure 9.

In addition to estimating average risk per calendar year, another way of assessing risk is to examine large and rather infrequent, but possible, future tropical cyclone and earthquake losses. Table 2 summarizes the risk profile for Fiji in terms of both direct losses and emergency losses. The former are the expenditures needed to repair or replace the damaged assets while the latter are the expenditures that the Fijian government may need to incur in the aftermath of a natural catastrophe to provide necessary relief and conduct activities such as debris removal, setting up shelters for homeless or supplying medicine and food. The

Figure 6 — Average annual loss due to tropical cyclones and earthquakes (ground shaking and tsunami) and its contribution from the three types of assets.

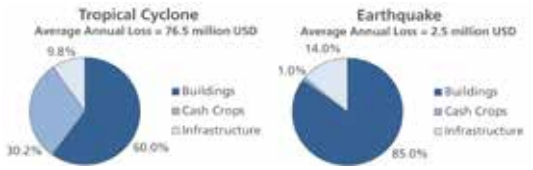


Figure 7 — Contribution from the different villages to the average annual loss for tropical cyclone and earthquake (ground shaking and tsunami).

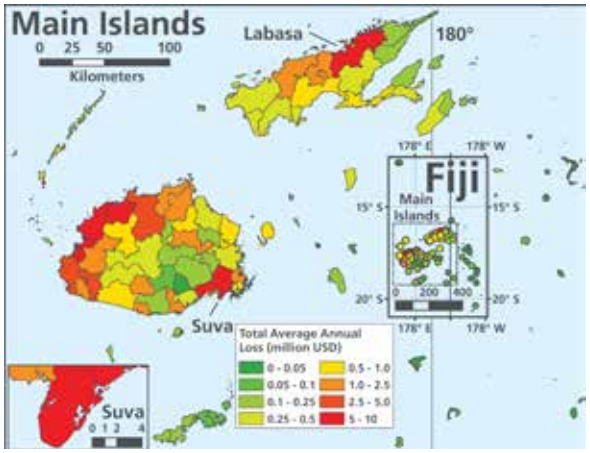
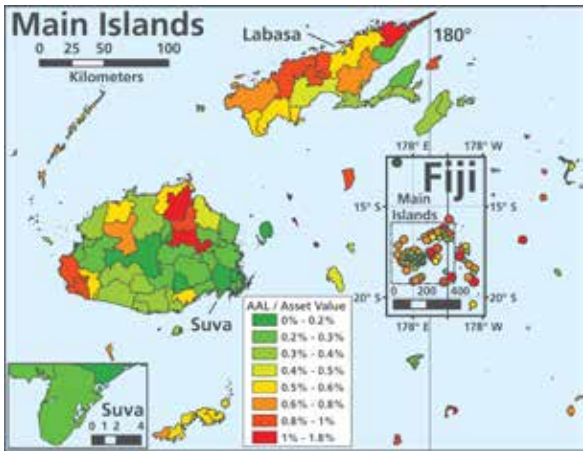


Figure 8 — Contribution from the different villages to the tropical cyclone and earthquake (ground shaking and tsunami) average annual loss divided by the replacement cost of the assets in each village.



emergency losses are estimated as a percentage of the direct losses.

Table 2 includes the losses that are expected to be exceeded, on average, once every 50-, 100-, and 250-years. For example, a tropical cyclone loss exceeding 834 million USD, which is equivalent to about 28% of Fiji's GDP, is to be expected, on average, once every 100 years. In Fiji, tropical cyclone losses are expected to be substantially more frequent and severe than losses due to earthquake ground shaking and tsunami. The latter, however, remain potentially catastrophic events.

A more complete picture of the risk can be found in Figure 10, which shows the mean return period of direct losses in million USD generated by earthquake, tsunami and tropical cyclones combined. The 50-, 100-, and 250-year mean return period losses in Table 2 can also be determined from the curves in this figure. The direct losses are expressed both in absolute terms and as a percent of the national GDP.

In addition to causing damage and losses to the built environment and crops, future earthquakes and tropical cyclones will also have an impact on population. The same probabilistic procedure described above for losses has been adopted to estimate the likelihood that different levels of casualties (i.e., fatalities and injuries) may result from the future occurrence of these events. As shown in Table 2, our model estimates, for example, that there is a 40% chance in the next fifty years (100 year mean return period) that one or more events in a calendar year will cause casualties exceeding 1,300 people in Fiji. Events causing 2,000 or more casualties are also possible but have much lower likelihood of occurring.

Figure 9 — Average annual loss for all the 15 Pacific Island Countries considered in this study.

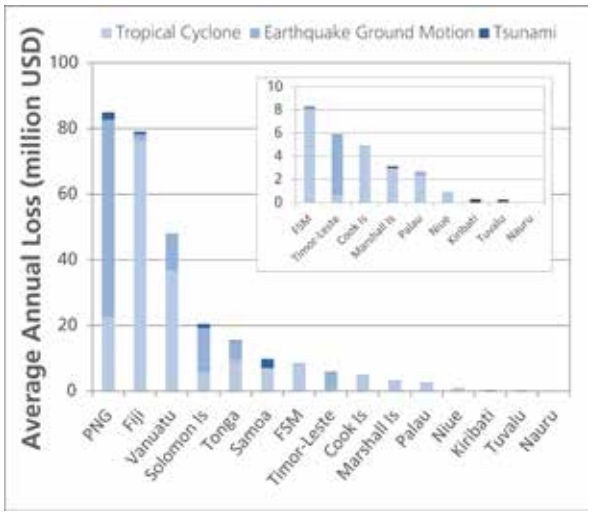


Figure 10 — Direct losses caused by either tropical storms or earthquakes that are expected to be equaled or exceeded, on average, once in the time period indicated. Losses represented in absolute terms and normalized by GDP.

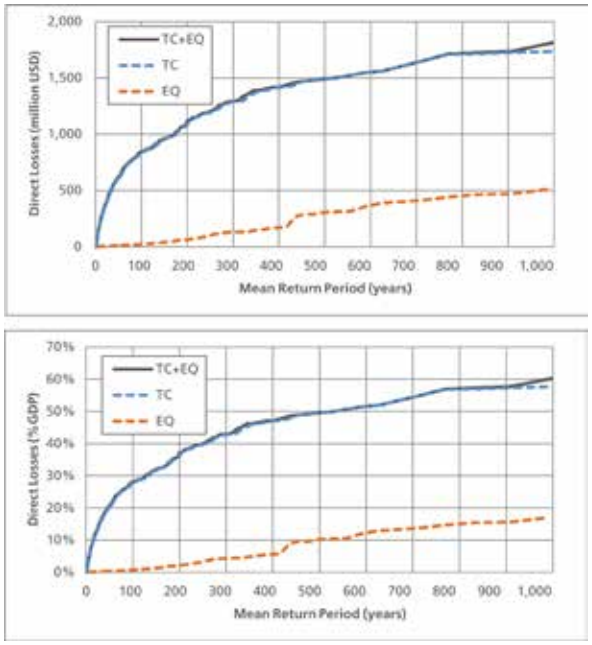


Table 2— Estimated Losses and Casualties Caused by Natural Perils

Mean Return Period (years)	AAL	50	100	250
Risk Profile: Tropical Cyclone				
Direct Losses				
(Million USD)	76.5	609.9	834.0	1,190.9
(% GDP)	2.5%	20.3%	27.7%	39.6%
Emergency Losses				
(Million USD)	17.6	140.0	191.6	274.3
(% of total government expenditures)	2.4%	19.1%	26.1%	37.3%
Casualties	126	988	1,292	1,773
Risk Profile: Earthquake, and Tsunami				
Direct Losses				
(Million USD)	2.5	10.1	22.3	98.2
(% GDP)	0.1%	0.3%	0.7%	3.3%
Emergency Losses				
(Million USD)	0.0	2.1	4.4	17.5
(% of total government expenditures)	0.0%	0.3%	0.6%	2.4%
Casualties	5	35	64	167
Risk Profiles: Tropical Cyclone, Earthquake, and Tsunami				
Direct Losses				
(Million USD)	79.1	620.1	844.8	1,203.6
(% GDP)	2.6%	20.6%	28.1%	40.0%
Emergency Losses				
(Million USD)	18.1	141.0	193.4	274.6
(% of total government expenditures)	2.5%	19.2%	26.3%	37.4%
Casualties	131	996	1,323	1,835

Risk Profile: Cook Islands

Population, Buildings, Infrastructure and Crops Exposed to Natural Perils

An extensive study has been conducted to assemble a comprehensive inventory of population and properties at risk. Properties include residential, commercial, public and industrial buildings; infrastructure assets such as major ports, airports, power plants, bridges, and roads; and major crops, such as coconut, palm oil, taro and many others.

Table 1 summarizes population and the inventory of buildings, infrastructure assets, and major crops (or "exposure") at risk as well as key economic values for the Cook Islands. It is estimated that the replacement value of all the assets in the Cook Islands is 1.4 billion USD of which about 91% represents buildings and 8% represents infrastructure.

Figures 1 and 2 illustrate the building exposure location and replacement cost distribution, respectively. The footprints of almost 10,000 of the approximately 11,000 buildings shown in Figure 1 were digitized from high-resolution satellite imagery. More than 5,000 of such buildings, almost all in the main island of Rarotonga and the rest in the island of Aitutaki, were also field surveyed and photographed by a team of inspectors deployed for this purpose. Figure 3 displays the land cover/ land use map that includes the location of major crops. The data utilized for these exhibits was assembled, organized and, when unavailable, produced in this study.

Table 1— Summary of Exposure in Cook Islands (2010)

GENERAL INFORMATION:	
Total Population:	19,800
GDP Per Capita (USD):	12,330
Total GDP (million USD):	244.1
Asset Counts:	
Residential Buildings:	8,357
Public Buildings:	503
Commercial, Industrial, and Other Buildings:	1,742
All Buildings:	10.602
Hectares of Major Crops:	6,390
COST OF REPLACING ASSETS (MILLION USD):	
Buildings:	1,296
Infrastructure:	118
Crops:	8
Total:	1,422
GOVERNMENT REVENUE AND EXPENDITURE:	
Total Government Revenue	
(Million USD):	86.9
(% GDP):	35.6%
Total Government Expenditure	
(Million USD):	77.9
(% GDP):	31.9%

[1] Data assembled from various references including WB, ADB, IMF and The Secretariat of the Pacific Community (SPC).
[2] The projected 2010 population was trended from the 2006 census using estimated growth rates provided by SPC.

Tropical Cyclone and Earthquake Hazards in Cook Islands

The Pacific islands region is prone to natural hazards. The Cook Islands are located south of the equator in an area known for the frequent occurrence of tropical cyclones with damaging winds, rains and storm surge between the months of October and May. In the South Pacific region from the equator to New Zealand in latitude and from Indonesia to east of Hawaii in longitude, almost 1,000 tropical cyclones with hurricane-force winds spawned in the last 60 years, with an average of about 16 tropical storms each year. The Cook Islands affected by devastating cyclones multiple times in the last few decades. For example, in 1997, tropical cyclones Martin and Pam caused 22 fatalities, 19 of which were on Manihiki Atoll alone, where wind and storm surge destroyed essentially every building on the island, incurring about 48 million USD in losses that crippled the local economy. More recently, in 2010, tropical cyclone Pat wrought widespread damage on the island of Aitutaki. Figure 4 shows the levels of wind speed due to tropical cyclones that have about a 40% chance to be exceeded at least once in the next 50 years (100- year mean return period). These wind speeds, if they were to occur, are capable of generating severe damage to buildings, infrastructure and crops with consequent large economic losses.

The Cook Islands are situated in a relatively quiet seismic area, but is surrounded by the Pacific "ring of fire," which aligns with the boundaries of the tectonic plates. These boundaries are extremely active seismic zones capable of generating large earthquakes and, in some cases, major tsunamis that can travel great distances. No significant earthquakes have been reported in recent times. However, in 1909, a tsunami with waves up to three meters damaged bridges and crop fields in Rarotonga. Figure 5 shows that the Cook

Figure 1 — Building Locations

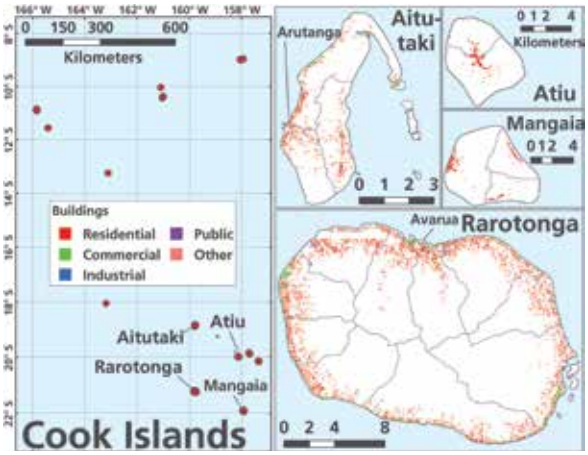


Figure 2 — Building replacement cost density by district.

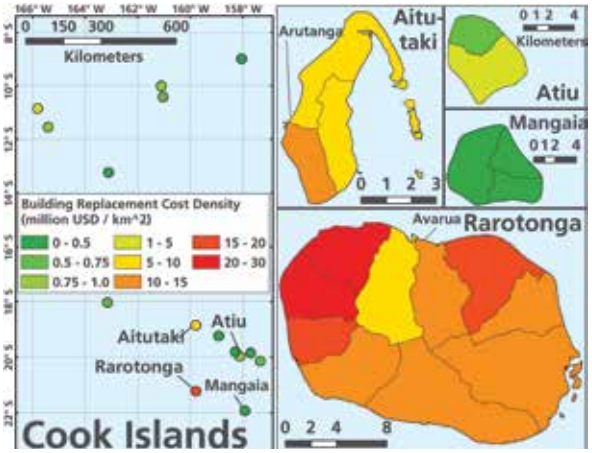
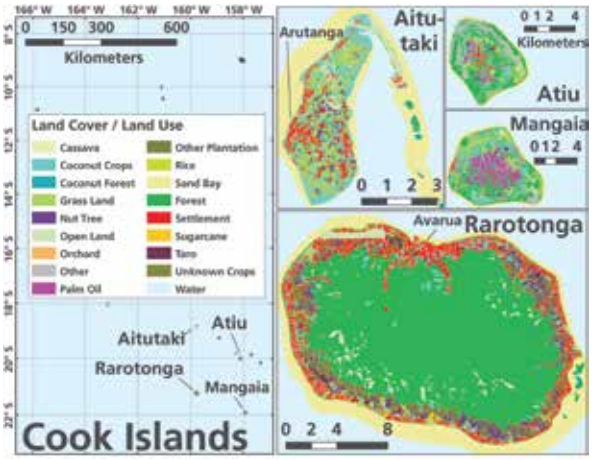


Figure 3 — Land Cover / Land Use Map



Islands have a 40% chance in the next 50 years of experiencing, at least once, very weak levels of ground shaking. These levels of shaking are not expected to cause any damage to well-engineered buildings and infrastructure assets.

Risk Analysis Results

To estimate the risk profile for the Cook Islands posed by tropical cyclones and earthquakes, a simulation model of potential storms and earthquakes that may affect the country in the future was constructed. This model, based on historical data, simulates more than 400,000 tropical cyclones and about 7.6 million earthquakes, grouped in 10,000 potential realizations of the next year's activity in the entire Pacific Basin. The catalog of simulated earthquakes also includes large magnitude events in South and North America, Japan and the Philippines, which could generate tsunamis that may affect the Cook Islands' shores.

The country's earthquake and tropical cyclone risk profiles are derived from an estimation of the direct losses to buildings, infrastructure assets and major crops that are caused by all the simulated potential future events. The direct losses include the cost of repairing or replacing the damaged assets, but do not include other losses such as contents losses, business interruption losses and losses to primary industries other than agriculture. The direct losses for tropical cyclones are caused by wind and flooding due to rain and storm surge, while losses for earthquakes are caused by ground shaking and tsunami inundation. After assessing the cost of repairing or rebuilding the damaged assets due to the impact of all the simulated potential future events, it is possible to estimate in a probabilistic sense the severity of losses for future catastrophes.

The simulations of possible next-year tropical cyclone and earthquake activity show that some years will see no storms or earthquakes affecting

Figure 4 — Maximum 1-minute sustained wind speed (in miles per hour) with a 40% chance to be exceeded at least once in the next 50 years.

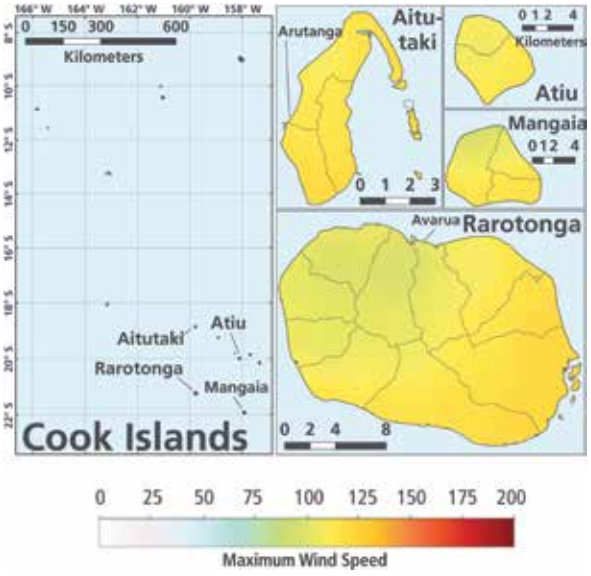
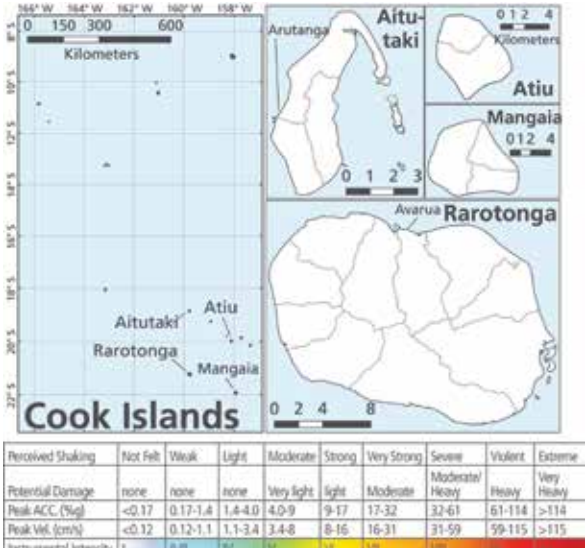


Figure 5 — Peak horizontal acceleration of the ground (Note: 1g is equal to the acceleration of gravity) that has about a 40% chance to be exceeded at least once in the next 50 years.



the Cook Islands, while other years may see one or more events affecting the islands, similar to what has happened historically. The annual losses averaged over the many realizations of next-year activity are shown in Figure 6 separately for tropical cyclone and for earthquake and tsunami, while the contributions to the average annual loss from the different electoral boundaries are displayed in absolute terms in Figure 7 and normalized by the total asset values in each electoral boundary in Figure 8. Figure 8 shows how the relative risk varies by electoral boundary across the country.

In addition to estimating average risk per calendar year, another way of assessing risk is to examine large and rather infrequent, but possible, future tropical cyclone and earthquake losses. Table 2 summarizes the risk profile for the Cook Islands in terms of both direct losses and emergency losses. The former are the expenditures needed to repair or replace the damaged assets while the latter are the expenditures that the Cook Islands government may need to incur in the aftermath of a natural catastrophe to provide necessary relief and conduct activities such as debris removal, setting up shelters for homeless or supplying medicine and food. The emergency losses are estimated as a percentage of the direct losses.

Table 2 includes the losses that are expected to be exceeded, on average, once every 50, 100, and 250 years. For example, **a tropical cyclone**

Figure 6 — Average annual loss due to tropical cyclones and earthquakes (ground shaking and tsunami) and its contribution from the three types of assets.

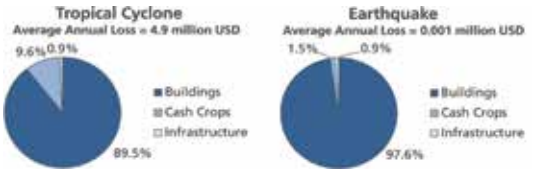


Figure 7 — Contribution from the different villages to the average annual loss for tropical cyclone and earthquake (ground shaking and tsunami).

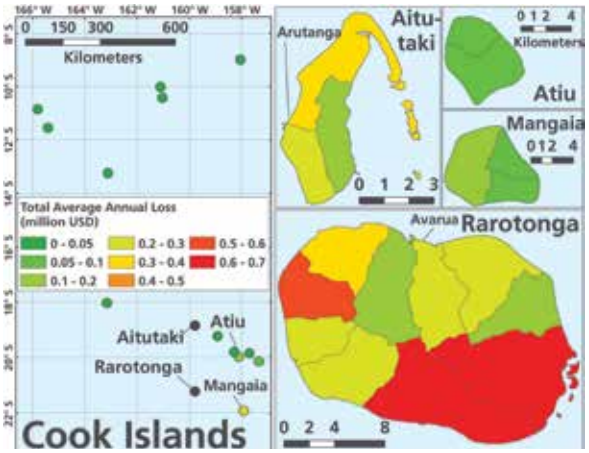
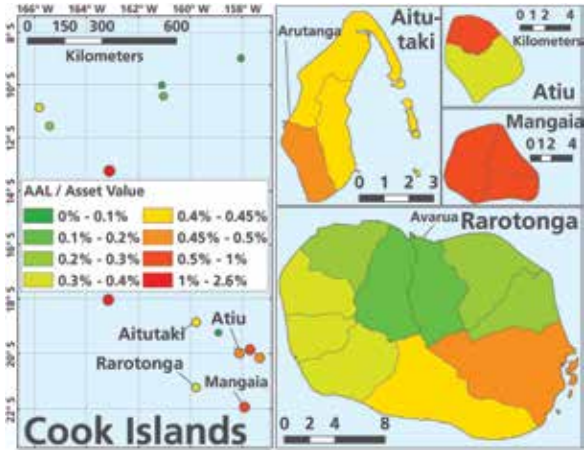


Figure 8 — Contribution from the different villages to the tropical cyclone and earthquake (ground shaking and tsunami) average annual loss divided by the replacement cost of the assets in each village.



loss exceeding 103 million USD, which is equivalent to about 42% of the Cook Islands' GDP, is to be expected on average once every 100 years. In the Cook Islands, tropical cyclone losses are clearly prominent in the risk profile although earthquakes and earthquake-induced tsunamis are also capable of generating losses.

A more complete picture of the risk can be found in Figure 10, which shows the mean return period of direct losses in million USD generated by earthquake, tsunami and tropical cyclones combined. The 50-, 100-, and 250-year mean return period losses in Table 2 can also be determined from the curves in this figure. The direct losses are expressed both in absolute terms and as a percent of the national GDP.

In addition to causing damage and losses to the built environment and crops, future earthquakes and tropical cyclones will also have an impact on population. The same probabilistic procedure described above for losses has been adopted to estimate the likelihood that different levels of casualties (i.e., fatalities and injuries) may result from the future occurrence of these events. As shown in Table 2, our model estimates, for example, that there is a 40% chance in the next fifty years (100 year mean return period) that one or more events in a calendar year will cause casualties exceeding 145 people in the Cook Islands. Events causing 300 or more casualties are also possible but have much lower likelihood of occurring.

Figure 9 — Average annual loss for all the 15 Pacific Island Countries considered in this study.

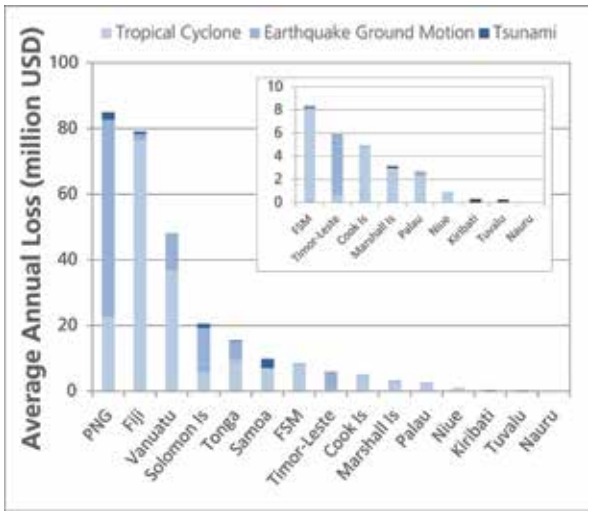


Figure 10 — Direct losses caused by either tropical storms or earthquakes that are expected to be equaled or exceeded, on average, once in the time period indicated. Losses represented in absolute terms and normalized by GDP.

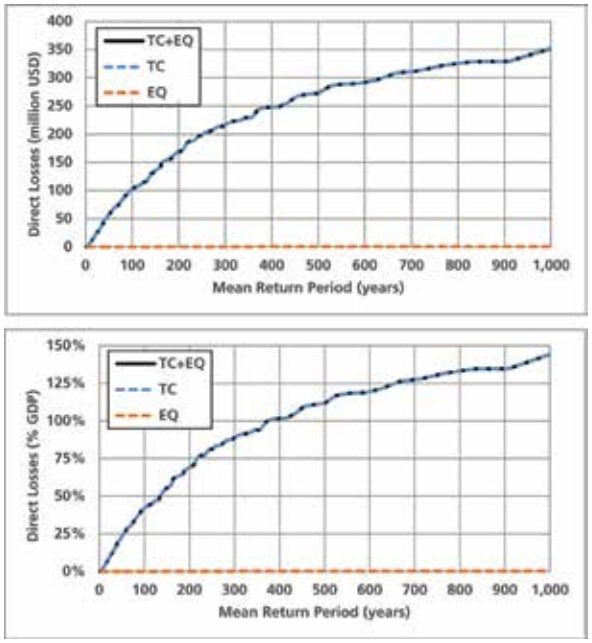


Table 2— Estimated Losses and Casualties Caused by Natural Perils

Mean Return Period (years)	AAL	50	100	250
Risk Profile: Tropical Cyclone				
Direct Losses				
(Million USD)	4.9	56.8	103.0	198.1
(% GDP)	2.0%	23.3%	42.2%	81.2%
Emergency Losses				
(Million USD)	1.1	13.1	23.6	45.5
(% of total government expenditures)	1.4%	16.8%	30.3%	58.4%
Casualties	9	112	145	183
Risk Profile: Earthquake, and Tsunami				
Direct Losses				
(Million USD)	0	0	0	0
(% GDP)	0.0%	0.0%	0.0%	0.0%
Emergency Losses				
(Million USD)	0	0	0	0
(% of total government expenditures)	0.0%	0.0%	0.0%	0.0%
Casualties	0	0	0	0
Risk Profiles: Tropical Cyclone, Earthquake, and Tsunami				
Direct Losses				
(Million USD)	4.9	56.8	103.0	198.1
(% GDP)	2.0%	23.3%	42.2%	81.2%
Emergency Losses				
(Million USD)	1.1	13.1	23.6	45.5
(% of total government expenditures)	1.4%	16.8%	30.3%	58.4%
Casualties	9	112	145	183

Risk Profile: Solomon Islands

Population, Buildings, Infrastructure and Crops Exposed to Natural Perils

An extensive study has been conducted to assemble a comprehensive inventory of population and properties at risk. Properties include residential, commercial, public and industrial buildings; infrastructure assets such as major ports, airports, power plants, bridges, and roads; and major crops, such as coconut, palm oil, taro, cocoa, rice and many others.

Table 1 summarizes population and the inventory of buildings, infrastructure assets, and major crops (or "exposure") at risk as well as key economic values for the Solomon Islands. It is estimated that the replacement value of all the assets in the Solomon Islands is 3.6 billion USD, of which about 86% represents buildings and 12% represents infrastructure.

Figures 1 and 2 illustrate the building exposure location and replacement cost distribution, respectively. The footprints of about 35,000 of the approximately 169,000 buildings shown in Figure 1 were digitized from high-resolution satellite imagery. More than 12,000 of such buildings, including more than 7,000 near the national capital of Honiara, were also field surveyed and photographed by a team of inspectors deployed for this purpose. Figure 3 displays the land cover/ land use map that includes the location of major crops. The data utilized for these exhibits was assembled, organized and, when unavailable, produced in this study.

Table 1— Summary of Exposure in Solomon Islands (2010)

GENERAL INFORMATION:	
Total Population:	547,000
GDP Per Capita (USD):	1,240
Total GDP (million USD):	678.6
Asset Counts:	
Residential Buildings:	157,035
Public Buildings:	4,615
Commercial, Industrial, and Other Buildings:	7,462
All Buildings:	169,112
Hectares of Major Crops:	83,955
COST OF REPLACING ASSETS (MILLION USD):	
Buildings:	3,059
Infrastructure:	420
Crops:	117
Total:	3,596
GOVERNMENT REVENUE AND EXPENDITURE:	
Total Government Revenue	
(Million USD):	297.6
(% GDP):	43.9%
Total Government Expenditure	
(Million USD):	283.1
(% GDP):	41.7%

[1] Data assembled from various references including WB, ADB, IMF and The Secretariat of the Pacific Community (SPC).
[2] The projected 2010 population was trended from the 2006 census using estimated growth rates provided by SPC.

Tropical Cyclone and Earthquake Hazards in Solomon Islands

The Pacific islands region is prone to natural hazards. The Solomon Islands are situated along one segment of the Pacific "ring of fire," which aligns with the boundaries of the tectonic plates. These boundaries are extremely active seismic zones capable of generating large earthquakes and, in some cases, major tsunamis that can travel great distances. A recent and tragic example is the 2007 magnitude 8.1 earthquake, which struck the islands of the Western and Choiseul Provinces of the Solomon Islands. The earthquake generated a tsunami that killed 52 people and caused widespread damage to housing, infrastructure, schools, and medical facilities, resulting in about 100 million USD in losses. Figure 4 shows that the Solomon Islands have a 40% chance in the next 50 years of experiencing, at least once, very strong to severe levels of ground shaking. These levels of shaking are expected to cause damage ranging from moderate to heavy to well-engineered buildings and even more severe damage to structures built with less stringent criteria.

The Solomon Islands are located south of the equator at the northern extremity of an area known for the frequent occurrence of tropical cyclones with damaging winds, rains and storm surge between the months of October and May. In the South Pacific region from the equator to New Zealand in latitude and from Indonesia to east of Hawaii in longitude, almost 1,000 tropical cyclones with hurricane-force winds spawned in the last 60 years, with an average of about 16 tropical storms per year. The Solomon Islands were affected by devastating cyclones multiple times in the last few decades. For example, tropical cyclone Namu in 1986 claimed more than 100 lives and tens of thousands were left homeless. The storm caused massive landslides and flooding with severe damage to the building stock, infrastructure and

Figure 1 — Building Locations

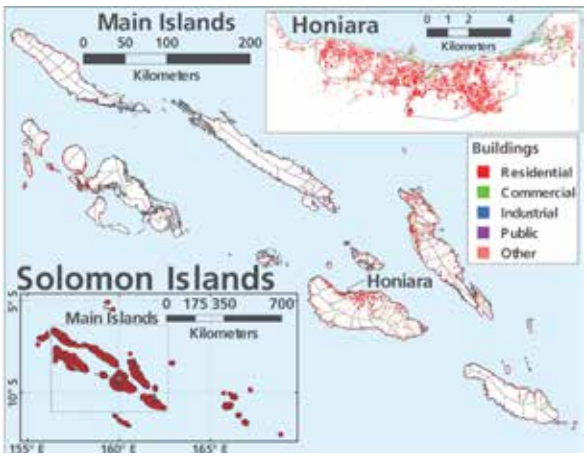


Figure 2 — Building replacement cost density by district.

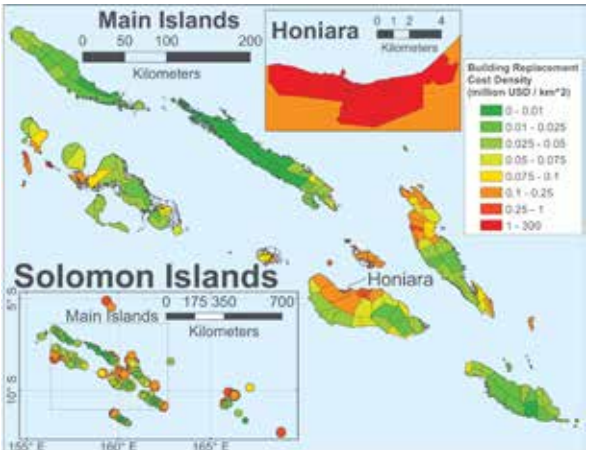


Figure 3 — Land Cover / Land Use Map

crops, incurring losses between 30 and 60 million USD that considerably set back the country's development. Figure 5 shows the levels of wind speed due to tropical cyclones that have about a 40% chance to be exceeded at least once in the next 50 years (100-year mean return period). These wind speeds, if they were to occur, are capable of generating moderate to severe damage to buildings, infrastructure and crops with consequent significant economic losses.

Risk Analysis Results

To estimate the risk profile for the Solomon Islands posed by tropical cyclones and earthquakes, a simulation model of potential storms and earthquakes that may affect the country in the future was constructed. This model, based on historical data, simulates more than 400,000 tropical cyclones and about 7.6 million earthquakes, grouped in 10,000 potential realizations of the next year's activity in the entire Pacific Basin. The catalog of simulated earthquakes also includes large magnitude events in South and North America, Japan and the Philippines, which could generate tsunamis that may affect the Solomon Islands' shores.

The country's earthquake and tropical cyclone risk profiles are derived from an estimation of the direct losses to buildings, infrastructure assets and major crops that are caused by all the simulated potential future events. The direct losses include the cost of repairing or replacing the damaged assets, but do not include other losses such as contents losses, business interruption losses and losses to primary industries other than agriculture. The direct losses for tropical cyclones are caused by wind and flooding due to rain and storm surge, while for earthquakes they are caused by ground shaking and tsunami inundation. After assessing the cost of repairing or rebuilding the damaged assets due to the impact of all the simulated potential future

Figure 4 — Maximum 1-minute sustained wind speed (in miles per hour) with a 40% chance to be exceeded at least once in the next 50 years.

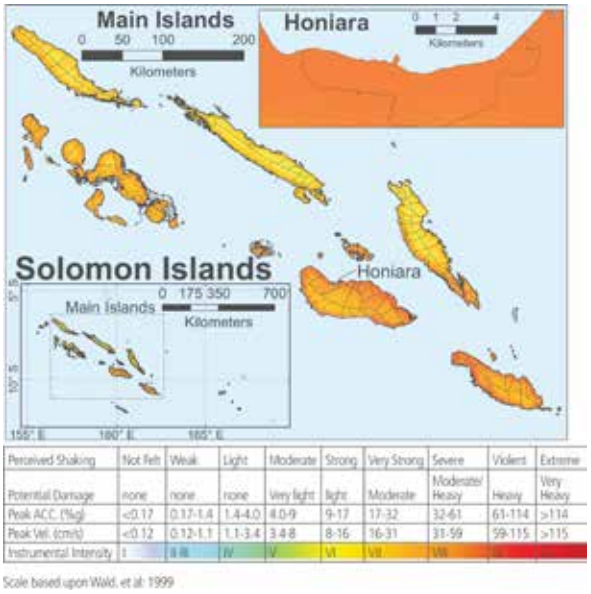
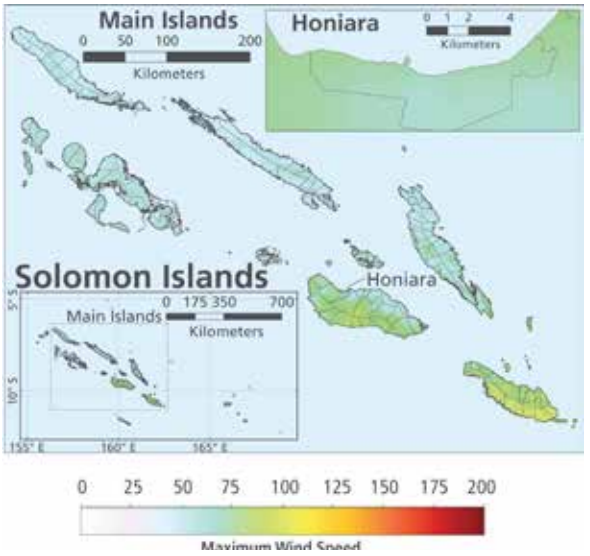


Figure 5 — Peak horizontal acceleration of the ground (Note: 1g is equal to the acceleration of gravity) that has about a 40% chance to be exceeded at least once in the next 50 years.



events, it is possible to estimate in a probabilistic sense the severity of losses for future catastrophes.

The simulations of possible next-year tropical cyclone and earthquake activity show that some years will see no storms or earthquakes affecting the Solomon Islands, while other years may see one or more events affecting the islands, similar to what has happened historically. The annual losses averaged over the many realizations of next-year activity are shown in Figure 6 separately for tropical cyclone and for earthquake and tsunami, while the contributions to the average annual loss from the different wards are displayed in absolute terms in Figure 7 and normalized by the total asset values in each ward in Figure 8. Figure 8 shows how the relative risk varies by ward across the country.

The same risk assessment carried out for the Solomon Islands was also performed for the 14 other Pacific Island Countries. The values of the average annual loss of the Solomon Islands and of the other 14 countries are compared in Figure 9.

In addition estimating average risk per calendar year, another way of assessing risk is to examine large and rather infrequent, but possible, future tropical cyclone and earthquake losses. Table 2 summarizes the risk profile for the Solomon Islands in terms of both direct losses and emergency losses. The former are the expenditures needed to repair or replace the damaged assets while the latter are the expenditures that the Solomon Islands

Figure 6 — Average annual loss due to tropical cyclones and earthquakes (ground shaking and tsunami) and its contribution from the three types of assets.

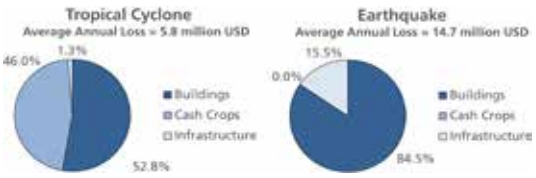


Figure 7 — Contribution from the different villages to the average annual loss for tropical cyclone and earthquake (ground shaking and tsunami).

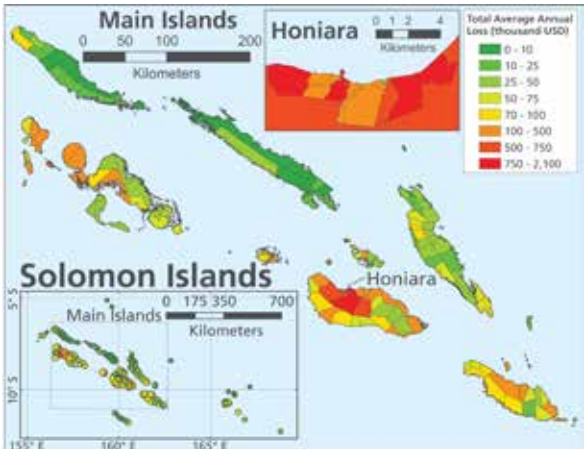
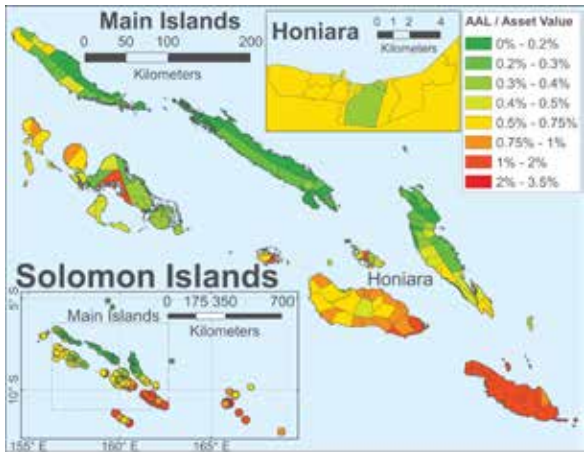


Figure 8 — Contribution from the different villages to the tropical cyclone and earthquake (ground shaking and tsunami) average annual loss divided by the replacement cost of the assets in each village.



government may need to incur in the aftermath of a natural catastrophe to provide necessary relief and conduct activities such as debris removal, setting up shelters for homeless or supplying medicine and food. The emergency losses are estimated as a percentage of the direct losses.

Table 2 includes the losses that are expected to be exceeded, on average, once every 50, 100, and 250 years. For example, an earthquake loss exceeding 270 million USD, which is equivalent to about 40% of the Solomon Islands' GDP, is to be expected, on average, once every 100 years. In the Solomon Islands, earthquake losses are expected to be substantially more frequent and severe than losses due to tropical cyclones. The latter, however, remain potentially catastrophic events.

A more complete picture of the risk can be found in Figure 10, which shows the mean return period of direct losses in million USD generated by earthquake, tsunami and tropical cyclones combined. The 50-, 100-, and 250-year mean return period losses in Table 2 can also be determined from the curves in this figure. The direct losses are expressed both in absolute terms and as a percent of the national GDP.

In addition to causing damage and losses to the built environment and crops, future earthquakes and tropical cyclones will also have an impact on population. The same probabilistic procedure described above for losses has been adopted to estimate the likelihood that different levels of casualties (i.e., fatalities and injuries) may result from the future occurrence of these events. As shown in Table 2, our model estimates, for example, that there is a 40% chance in the next fifty years (100 year mean return period) that one or more events in a calendar year will cause casualties exceeding 1,900 people in the Solomon Islands. Events causing 3,000 or more casualties

Figure 9 — Average annual loss for all the 15 Pacific Island Countries considered in this study.

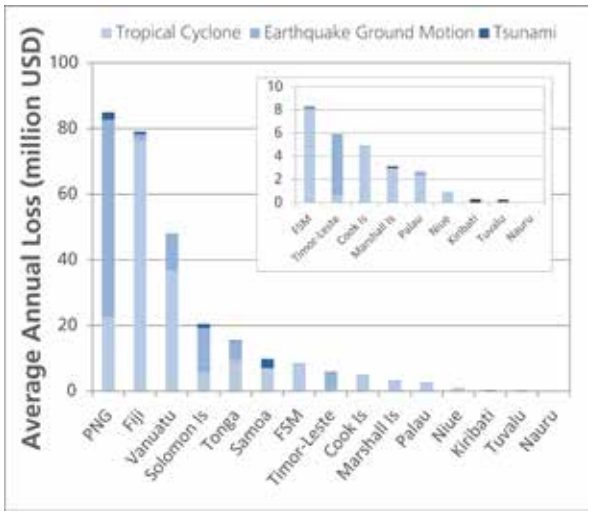
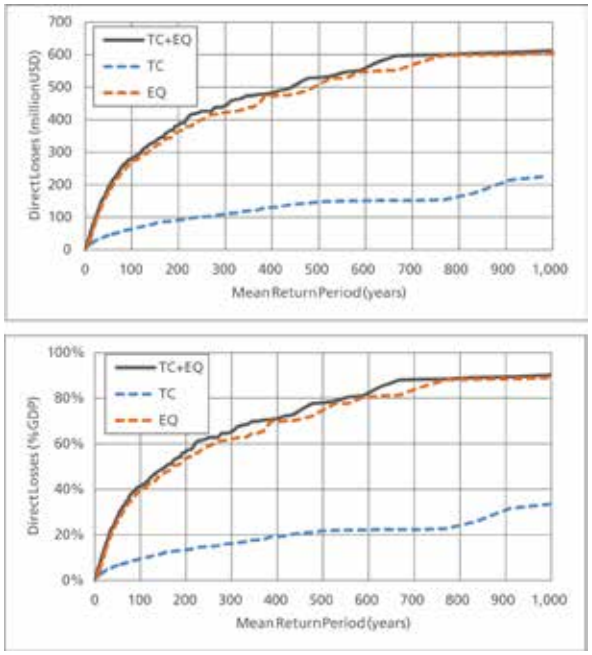


Figure 10 — Direct losses caused by either tropical storms or earthquakes that are expected to be equaled or exceeded, on average, once in the time period indicated. Losses represented in absolute terms and normalized by GDP.



are also possible but have much lower likelihood of occurring.

Table 2— Estimated Losses and Casualties Caused by Natural Perils

Mean Return Period (years)	AAL	50	100	250
Risk Profile: Tropical Cyclone				
Direct Losses				
(Million USD)	**5.8**	**44.5**	**63.9**	**101.5**
(% GDP)	0.9%	6.6%	9.4%	15.0%
Emergency Losses				
(Million USD)	1.3	10.2	14.7	23.4
(% of total government expenditures)	0.5%	3.6%	5.2%	8.2%
Casualties	63	489	691	1,019
Risk Profile: Earthquake, and Tsunami				
Direct Losses				
(Million USD)	14.7	175.3	268.7	400.8
(% GDP)	2.2%	25.8%	39.6%	59.1%
Emergency Losses				
(Million USD)	0.0	28.2	43.7	65.3
(% of total government expenditures)	0.0%	10.0%	15.4%	23.1%
Casualties	96	1,043	1,780	3,106
Risk Profiles: Tropical Cyclone, Earthquake, and Tsunami				
Direct Losses				
(Million USD)	20.5	189.6	280.6	426.2
(% GDP)	3.0%	27.9%	41.4%	62.8%
Emergency Losses				
(Million USD)	3.8	32.8	46.6	68.6
(% of total government expenditures)	1.3%	11.6%	16.4%	24.2%
Casualties	159	1,234	1,914	3,246

Risk Profile: Samoa

Population, Buildings, Infrastructure and Crops Exposed to Natural Perils

An extensive study has been conducted to assemble a comprehensive inventory of population and properties at risk. Properties include residential, commercial, public and industrial buildings; infrastructure assets such as major ports, airports, power plants, bridges, and roads; and major crops, such as coconut, banana, taro, sugarcane, papaya and many others.

Table 1 summarizes population and the inventory of buildings, infrastructure assets, and major crops (or "exposure") at risk as well as key economic values for Samoa. It is estimated that the replacement value of all the assets in Samoa is 2.6 billion USD of which about 81% represents buildings and 18% represents infrastructure.

Figures 1 and 2 illustrate the building exposure location and replacement cost distribution, respectively. The footprints of all the approximately 49,000 buildings shown in Figure 1 were digitized from high-resolution satellite imagery. More than 6,500 of such buildings, most of them in Apia, were also field surveyed and photographed by a team of inspectors deployed for this purpose. Figure 3 displays the land cover/land use map that includes the location of major crops. The data utilized for these exhibits was assembled, organized and, when unavailable, produced in this study.

Table 1— Summary of Exposure in Samoa (2010)

GENERAL INFORMATION:	
Total Population:	183,000
GDP Per Capita (USD):	3,090
Total GDP (million USD):	565.2
Asset Counts:	
Residential Buildings:	41,960
Public Buildings:	1,720
Commercial, Industrial, and Other Buildings:	5,151
All Buildings:	48,831
Hectares of Major Crops:	35,553
COST OF REPLACING ASSETS (MILLION USD):	
Buildings:	2,148
Infrastructure:	465
Crops:	25
Total:	2,638
GOVERNMENT REVENUE AND EXPENDITURE:	
Total Government Revenue	
(Million USD):	170.8
(% GDP):	30.2%
Total Government Expenditure	
(Million USD):	224.4
(% GDP):	39.7%

[1] Data assembled from various references including WB, ADB, IMF and The Secretariat of the Pacific Community (SPC).
[2] The projected 2010 population was trended from the 2006 census using estimated growth rates provided by SPC.

Tropical Cyclone and Earthquake Hazards in Samoa

The Pacific islands region is prone to natural hazards. Samoa is located south of the equator in an area known for the frequent occurrence of tropical cyclones with damaging winds, rains and storm surge between the months of October and May. In the South Pacific region from the equator to New Zealand in latitude and from Indonesia to east of Hawaii in longitude almost 1,000 tropical cyclones with hurricaneforce winds spawned in the last 60 years, with an average of about 16 tropical storms per year. Samoa was affected by devastating cyclones multiple times in the last few decades. For example, tropical cyclones Ofa and Val, in 1990 and 1991, caused 21 fatalities and widespread destruction with total economic losses between 300 and 500 million USD that crippled the local economy. Figure 4 shows the levels of wind speed due to tropical cyclones that have about a 40% chance to be exceeded at least once in the next 50 years (100-year mean return period). These wind speeds, if they were to occur, are capable of generating severe damage to buildings, infrastructure and crops with consequent large economic losses.

Samoa is situated in a relatively quiet seismic area but is surrounded by the Pacific "ring of fire," which aligns with the boundaries of the tectonic plates. These boundaries are extremely active seismic zones capable of generating large earthquakes and, in some cases, major tsunamis that can travel great distances. The 2009 magnitude 8.1 earthquake, which generated a devastating tsunami destroying many villages on the island of Upolu, is a recent and tragic example. Figure 5 shows that Samoa has a 40% chance in the next 50 years of experiencing, at least once, moderate to very strong levels of ground shaking. These levels of shaking are expected to cause damage, ranging from light to moderate, to well-engineered buildings and even more severe damage to structures built with less stringent criteria.

Figure 1 — Building Locations

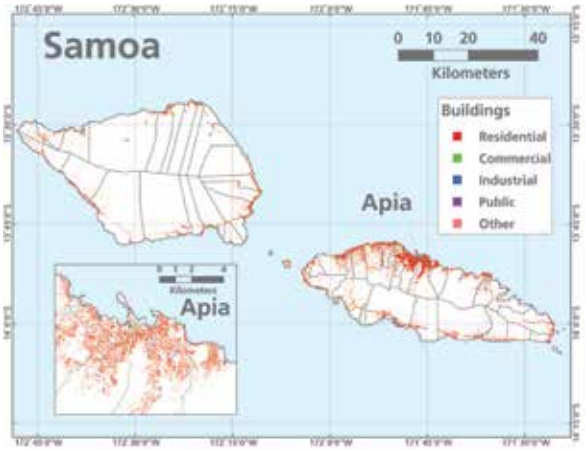


Figure 2 — Building replacement cost density by district.

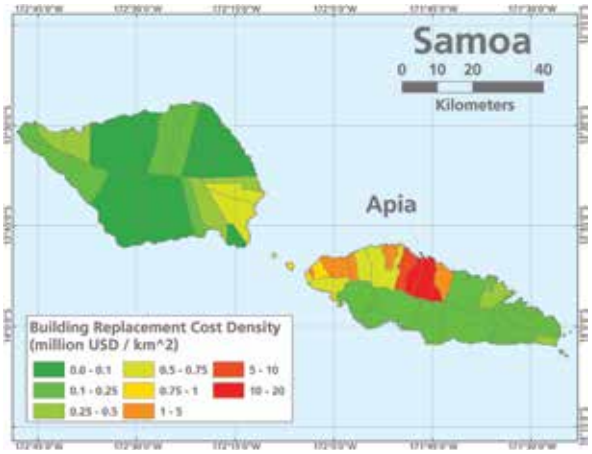
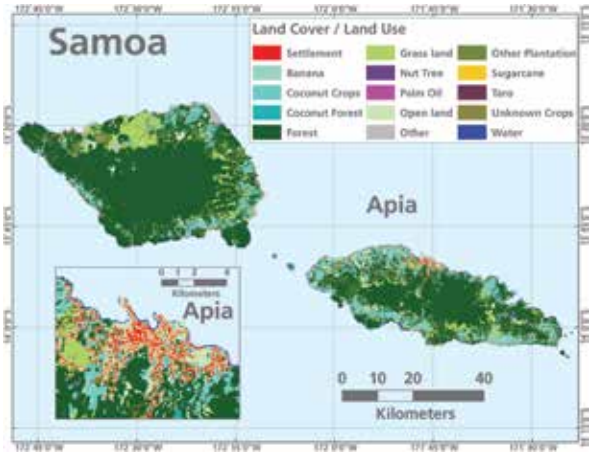


Figure 3 — Land Cover / Land Use Map



Risk Analysis Results

To estimate the risk profile for Samoa posed by tropical cyclones and earthquakes, a simulation model of potential storms and earthquakes that may affect the country in the future was constructed. This model, based on historical data, simulates more than 400,000 tropical cyclones and about 7.6 million earthquakes, grouped in 10,000 potential realizations of the next year's activity in the entire Pacific Basin. The catalog of simulated earthquakes also includes large magnitude events in South and North America, Japan and the Philippines, which could generate tsunamis that may affect Samoa's shores.

The country's earthquake and tropical cyclone risk profiles are derived from an estimation of the direct losses to buildings infrastructure assets and major crops caused by all the simulated potential future events. The direct losses comprise the cost of repairing or replacing the damaged assets but do not include other losses such as contents losses, business interruption losses and losses to primary industries other than agriculture. The direct losses for tropical cyclones are caused by wind and flooding due to rain and storm surge, while losses for earthquakes are caused by ground shaking and tsunami inundation. After assessing the cost of repairing or rebuilding the damaged assets due to the impact of all the simulated potential future events, it is possible to estimate in a probabilistic sense the severity of losses for future catastrophes.

The simulations of possible next-year tropical cyclone and earthquake activity show that some years will see no storms or earthquakes affecting Samoa, while other years may see one or more events affecting the islands, similar to what has happened historically. The annual losses averaged over the many realizations of next-year activity are shown in Figure 6 separately for tropical cyclone and for earthquake and tsunami, while the

Figure 4 — Maximum 1-minute sustained wind speed (in miles per hour) with a 40% chance to be exceeded at least once in the next 50 years.

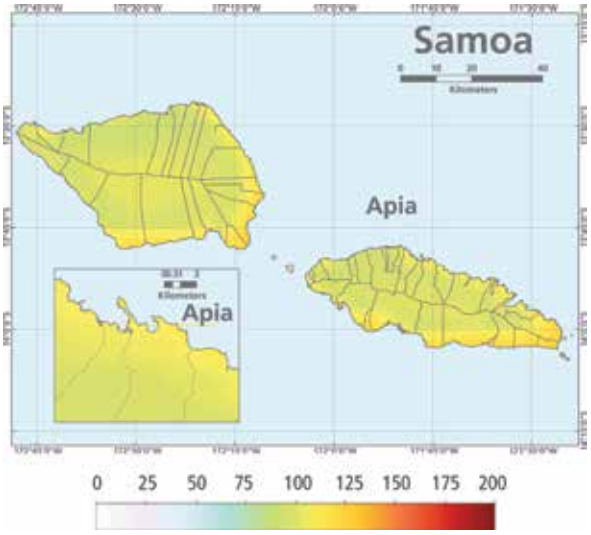
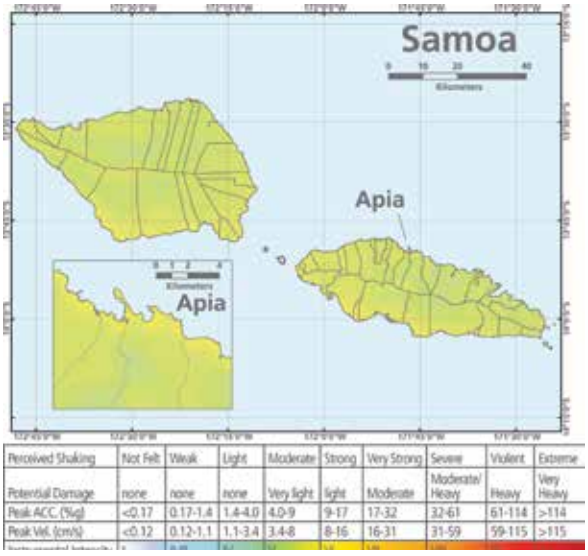


Figure 5 — Peak horizontal acceleration of the ground (Note: 1g is equal to the acceleration of gravity) that has about a 40% chance to be exceeded at least once in the next 50 years.



contributions to the average annual loss from the different districts are displayed in absolute terms in Figure 7 and normalized by the total asset values in each district in Figure 8. Figure 8 shows how the relative risk varies by district across the country.

The same risk assessment carried out for Samoa was also performed for the 14 other Pacific Island Countries. The values of the average annual loss of Samoa and of the other 14 countries are compared in Figure 9.

In addition to estimating average risk per calendar year, another way of assessing risk is to examine large and rather infrequent but possible future tropical cyclone and earthquake losses. Table 2 summarizes the risk profile for Samoa in terms of both direct losses and emergency losses. The former are the expenditures needed to repair or replace the damaged assets while the latter are the expenditures that the Samoan government may need to incur in the aftermath of a natural catastrophe to provide necessary relief and conduct activities such as debris removal, setting up shelters for homeless or supplying medicine and food. The emergency losses are estimated as a percentage of the direct losses.

Table 2 includes the losses that are expected to be exceeded, on average, once every 50, 100, and 250 years. For example, a tropical cyclone loss exceeding 134 million USD, which is equivalent to about 24% of Samoa's GDP, is to be expected

Figure 6 — Average annual loss due to tropical cyclones and earthquakes (ground shaking and tsunami) and its contribution from the three types of assets.

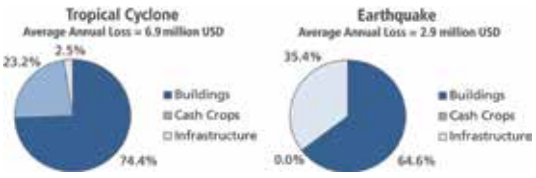


Figure 7 — Contribution from the different villages to the average annual loss for tropical cyclone and earthquake (ground shaking and tsunami).

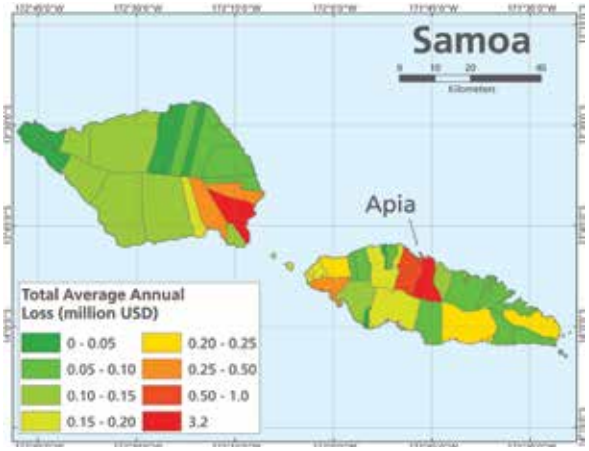
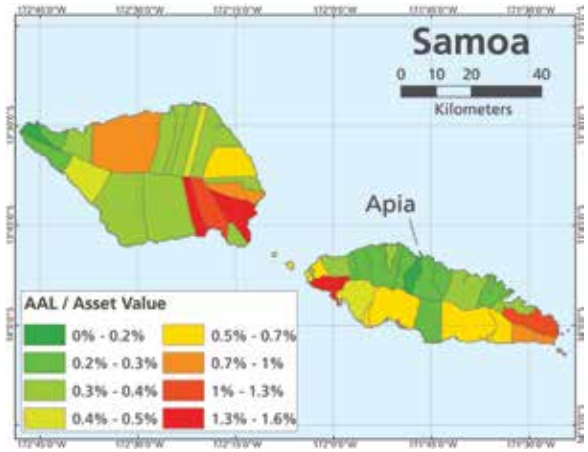


Figure 8 — Contribution from the different villages to the tropical cyclone and earthquake (ground shaking and tsunami) average annual loss divided by the replacement cost of the assets in each village.



on average once every 100 years. In Samoa, tropical cyclone

losses are expected to be substantially more frequent and severe than losses due to earthquake ground shaking and tsunami. The latter, however, remain potentially catastrophic events.

A more complete picture of the risk can be found in Figure 10, which shows the mean return period of direct losses in million USD generated by earthquake, tsunami and tropical cyclones combined. The 50, 100, and 250 year mean return period losses in Table 2 can also be determined from the curves in this figure. The direct losses are expressed both in absolute terms and as a percent of the national GDP.

In addition to causing damage and losses to the built environment and crops, future earthquakes and tropical cyclones will also have an impact on population. The same probabilistic procedure described above for losses has been adopted to estimate the likelihood that different levels of casualties (i.e., fatalities and injuries) may result from the future occurrence of these events. As shown in Table 2, our model estimates, for example, that there is a **40% chance in the next fifty years (100 year mean return period) that one or more events in a calendar year will cause casualties exceeding 370 people in Samoa.** Events causing approximately 1,000 casualties are also possible but have much lower likelihood of occurring.

Figure 9 — Average annual loss for all the 15 Pacific Island Countries considered in this study.

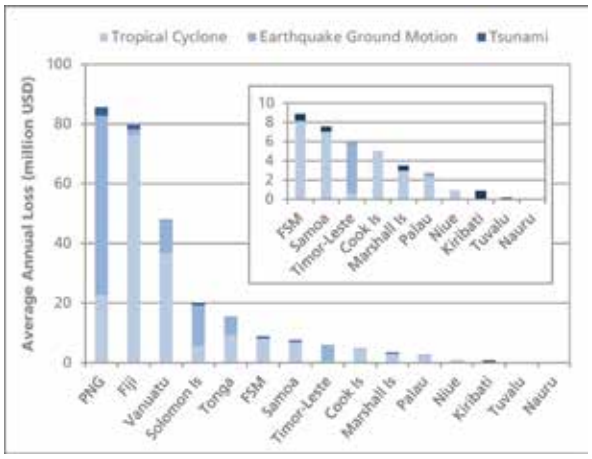


Figure 10 — Direct losses caused by either tropical storms or earthquakes that are expected to be equaled or exceeded, on average, once in the time period indicated. Losses represented in absolute terms and normalized by GDP.

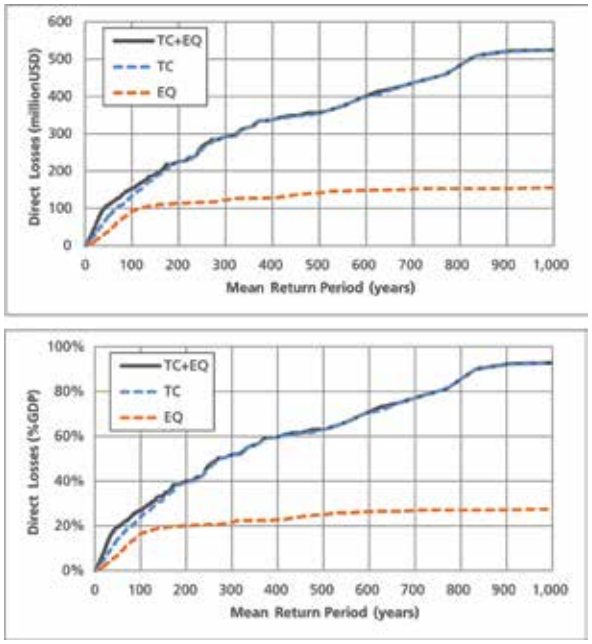


Table 2— Estimated Losses and Casualties Caused by Natural Perils

Mean Return Period (years)	AAL	50	100	250
Risk Profile: Tropical Cyclone				
Direct Losses				
(Million USD)	6.9	78.6	134.1	267.8
(% GDP)	1.2%	13.9%	23.7%	45.6%
Emergency Losses				
(Million USD)	1.6	18.1	30.9	59.2
(% of total government expenditures)	0.7%	8.1%	13.7%	26.4%
Casualties	11	131	212	303
Risk Profile: Earthquake, and Tsunami				
Direct Losses				
(Million USD)	2.9	39.1	93.1	116.3
(% GDP)	0.5%	6.9%	16.5%	26.6%
Emergency Losses				
(Million USD)	0.0	8.9	21.4	26.6
(% of total government expenditures)	0.0%	3.9%	9.5%	11.9%
Casualties	8	145	302	410
Risk Profiles: Tropical Cyclone,, Earthquake, and Tsunami				
Direct Losses				
(Million USD)	9.9	109.8	152.9	266.1
(% GDP)	1.7%	19.4%	27.0%	471.%
Emergency Losses				
(Million USD)	2.3	25.2	35.1	61.2
(% of total government expenditures)	1.0%	11.2%	15.7%	27.3%
Casualties	19	254	374	469

Risk Profile: Vanuatu

Population, Buildings, Infrastructure and Crops Exposed to Natural Perils

An extensive study has been conducted to assemble a comprehensive inventory of population and properties at risk. Properties include residential, commercial, public and industrial buildings; infrastructure assets such as major ports, airports, power plants, bridges, and roads; and major crops, such as coconut, palm oil, taro, vanilla and many others.

Table 1 summarizes population and the inventory of buildings, infrastructure assets, and major crops (or "exposure") at risk as well as key economic values for Vanuatu. It is estimated that the replacement value of all the assets in Vanuatu is 3.3 billion USD, of which about 86.5% represents buildings and 12.5% represents infrastructure.

Figures 1 and 2 illustrate the building exposure location and replacement cost distribution, respectively. The footprints of about 32,500 of the approximately 101,000 buildings shown in Figure 1 were digitized from high-resolution satellite imagery. More than 10,600 of such buildings, including about 7,500 near the nation's capital of Port Vila, were also field surveyed and photographed by a team of inspectors deployed for this purpose. Figure 3 displays the land cover/land use map that includes the location of major crops. The data utilized for these exhibits was assembled, organized and, when unavailable, produced in this study.

Table 1— Summary of Exposure in Vanuatu (2010)

GENERAL INFORMATION:	
Total Population:	246,000
GDP Per Capita (USD):	2,960
Total GDP (million USD):	729.0
Asset Counts:	
Residential Buildings:	90,699
Public Buildings:	3,280
Commercial, Industrial, and Other Buildings:	6,767
All Buildings:	100,749
Hectares of Major Crops:	78.434
COST OF REPLACING ASSETS (MILLION USD):	
Buildings:	2,858
Infrastructure:	420
Crops:	25
Total:	3,303
GOVERNMENT REVENUE AND EXPENDITURE:	
Total Government Revenue	
(Million USD):	173.7
(% GDP):	23.8%
Total Government Expenditure	
(Million USD):	178.8
(% GDP):	24.5%

[1] Data assembled from various references including WB, ADB, IMF and The Secretariat of the Pacific Community (SPC).
[2] The projected 2010 population was trended from the 2006 census using estimated growth rates provided by SPC.

Tropical Cyclone and Earthquake Hazards in Vanuatu

The Pacific islands region is prone to natural hazards. Vanuatu is located south of the equator in an area known for the frequent occurrence of tropical cyclones with damaging winds, rains and storm surge between the months of October and May. In the South Pacific region from the equator to New Zealand in latitude and from Indonesia to east of Hawaii in longitude almost 1,000 tropical cyclones with hurricaneforce winds spawned in the last 60 years, with an average of about 16 tropical storms per year. Vanuatu was affected by devastating cyclones several times in the last few decades. For example, since 1990, Vanuatu has been subject to at least 20 damaging tropical cyclones. The most significant cyclones in recent years were Uma in 1987 and Ivy in 2004, each affecting nearly 50,000 people and causing destruction that amounted to losses in the tens to hundreds of million USD. Figure 4 shows the levels of wind speed due to tropical cyclones that have about a 40% chance to be exceeded at least once in the next 50 years (100-year mean return period). These wind speeds, if they were to occur, are capable of generating severe damage to buildings, infrastructure and crops with consequent large economic losses.

Vanuatu is situated along one segment of the Pacific "ring of fire," which aligns with the boundaries of the tectonic plates. These tectonic plate boundaries are extremely active seismic zones capable of generating large earthquakes and, in some cases, major tsunamis that can travel great distances. Vanuatu was affected by devastating earthquakes and tsunamis several times in the last few decades. In 1999, a magnitude 7.5 earthquake caused extensive damage to Pentecost Island, leaving more than 10 dead, over 100 injured, and millions of USD in losses. The earthquake generated a large tsunami, including a six meter

Figure 1 — Building Locations

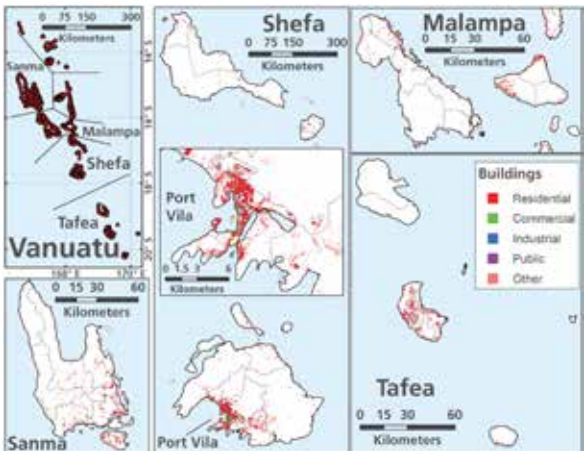


Figure 2 — Building replacement cost density by district.

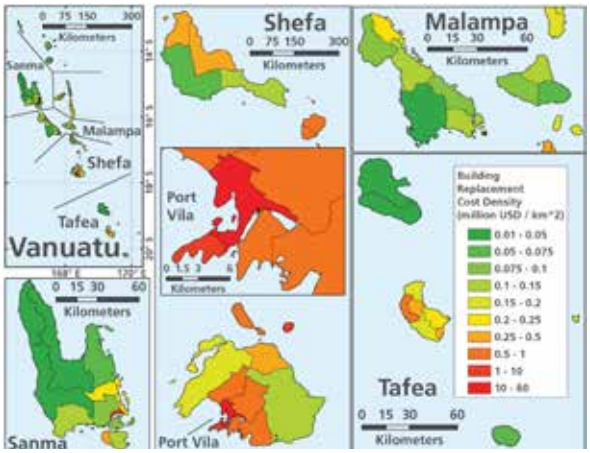
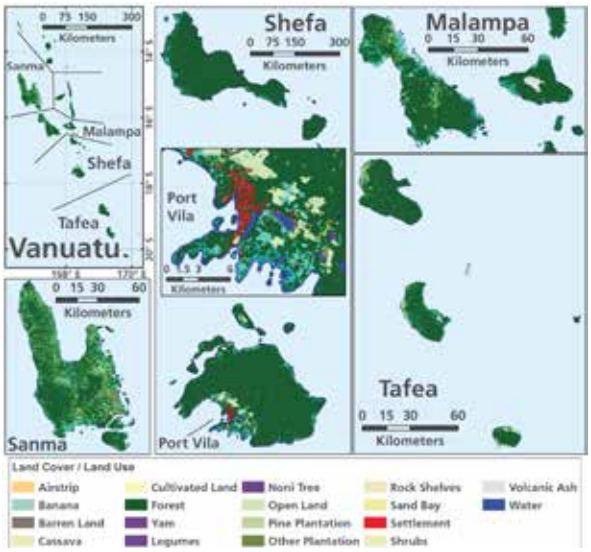


Figure 3 — Land Cover / Land Use Map



wave that completely destroyed the village of Baie Martelli. In 2002, a magnitude 7.3 earthquake struck near the national capital of Port Vila, causing millions of USD in damage to buildings and infrastructure. Figure 5 shows that Vanuatu has a 40% chance in the next 50 years of experiencing, at least once, very strong to severe levels of ground shaking. These levels of shaking are expected to cause damage ranging from moderate to heavy to well-engineered buildings and even more significant damage to structures built with less stringent criteria.

Risk Analysis Results

To estimate the risk profile for Vanuatu posed by tropical cyclones and earthquakes, a simulation model of potential storms and earthquakes that may affect the country in the future was constructed. This model, based on historical data, simulates more than 400,000 tropical cyclones and about 7.6 million earthquakes, grouped in 10,000 potential realizations of the next year's activity in the entire Pacific Basin. The catalog of simulated earthquakes also includes large magnitude events in South and North America, Japan and the Philippines, which could generate tsunamis that may affect Vanuatu's shores.

The country's earthquake and tropical cyclone risk profiles are derived from an estimation of the direct losses to buildings, infrastructure assets and major crops caused by all the simulated potential future events. The direct losses include the cost of repairing or replacing the damaged assets but do not include other losses such as contents losses, business interruption losses and losses to primary industries other than agriculture. The direct losses for tropical cyclones are caused by wind and flooding due to rain and storm surge, while for earthquakes they are caused by ground shaking and tsunami inundation. After assessing the cost of repairing or rebuilding the damaged assets

Figure 4 — Maximum 1-minute sustained wind speed (in miles per hour) with a 40% chance to be exceeded at least once in the next 50 years.

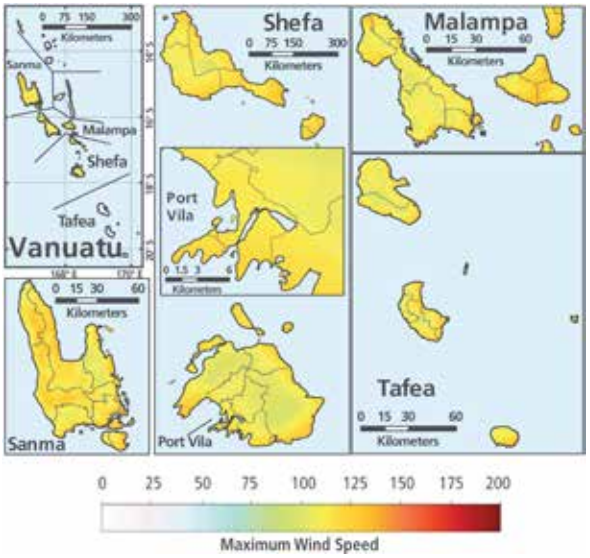
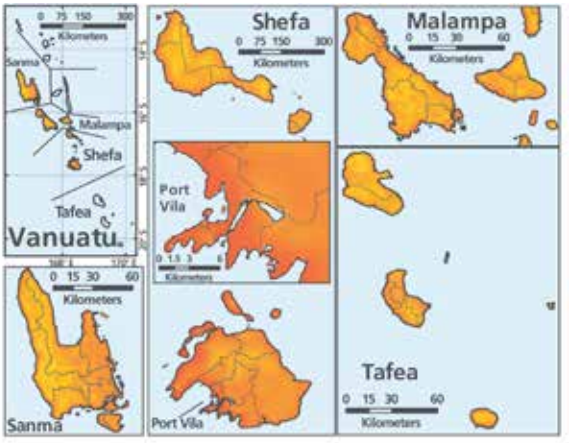


Figure 5 — Peak horizontal acceleration of the ground (Note: 1g is equal to the acceleration of gravity) that has about a 40% chance to be exceeded at least once in the next 50 years.



Perceived Shaking	Not Felt	Weak	Light	Moderate	Strong	Very Strong	Severe	Violent	Extreme
Potential Damage	none	none	none	Very light	Light	Moderate	Moderate/ Heavy	Heavy	Very Heavy
Peak ACC (%g)	<0.17	0.17-1.4	1.4-4.0	4.0-9	9-17	17-32	32-61	61-114	>114
Peak Vel. (cm/s)	<0.12	0.12-1.1	1.1-3.4	3.4-8	8-16	16-31	31-59	59-115	>115

due to the impact of all the simulated potential future events, it becomes possible to estimate in a probabilistic sense the severity of losses for future catastrophes.

The simulations of possible next-year tropical cyclone and earthquake activity show that some years will see no storms or earthquakes affecting Vanuatu, while other years may see one or more events affecting the islands, similar to what has happened historically. The annual losses averaged over the many realizations of next-year activity are shown in Figure 6 separately for tropical cyclone and for earthquake and tsunami, while the contributions to the average annual loss from the different area councils are displayed in absolute terms in Figure 7 and normalized by the total asset values in each area council in Figure 8. Figure 8 shows how the relative risk varies by area council across the country.

The same risk assessment carried out for Vanuatu was also performed for the 14 other Pacific Island Countries. The values of the average annual loss of Vanuatu and of the other 14 countries are compared in Figure 9.

In addition to estimating average risk per calendar year, another way of assessing risk is to examine large and rather infrequent, but possible, future tropical cyclone and earthquake losses. Table 2 summarizes the risk profile for Vanuatu in terms of both direct losses and emergency losses. The

Figure 6 — Average annual loss due to tropical cyclones and earthquakes (ground shaking and tsunami) and its contribution from the three types of assets.

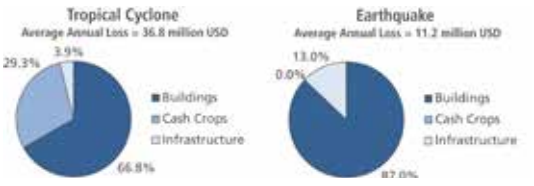


Figure 7 — Contribution from the different villages to the average annual loss for tropical cyclone and earthquake (ground shaking and tsunami).

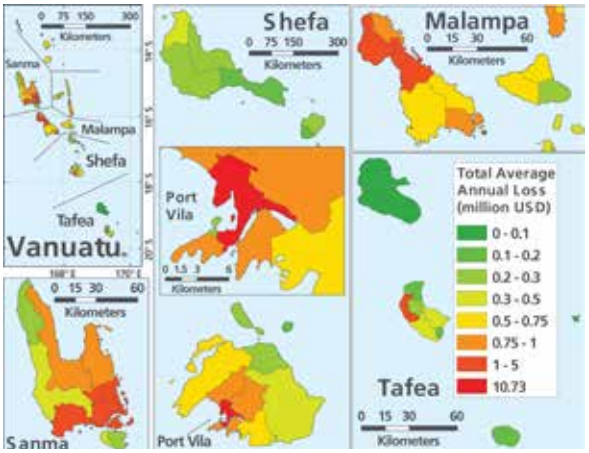
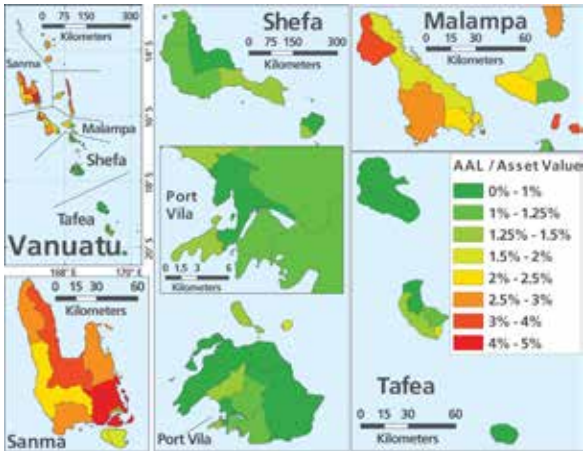


Figure 8 — Contribution from the different villages to the tropical cyclone and earthquake (ground shaking and tsunami) average annual loss divided by the replacement cost of the assets in each village.



former are the expenditures needed to repair or replace the damaged assets while the latter are the expenditures that the Vanuatuan government may need to incur in the aftermath of a natural catastrophe to provide necessary relief and conduct activities such as debris removal, setting up shelters for homeless or supplying medicine and food. The emergency losses are estimated as a percentage of the direct losses.

Table 2 includes the losses that are expected to be exceeded, on average, once every 50, 100, and 250 years. For example, a **tropical cyclone loss exceeding 312 million USD, which is equivalent to about 43% of Vanuatu's GDP, is to be expected, on average, once every 100 years.** In Vanuatu, tropical cyclone losses are expected to be more frequent and severe than losses due to earthquake ground shaking and tsunami. The latter, however, remain potentially catastrophic events.

A more complete picture of the risk can be found in Figure 10, which shows the mean return period of direct losses in million USD generated by earthquake, tsunami and tropical cyclones combined. The 50-, 100-, and 250-year mean return period losses in Table 2 can also be determined from the curves in this figure. The direct losses are expressed both in absolute terms and as a percent of the national GDP.

In addition to causing damage and losses to the built environment and crops, future earthquakes and tropical cyclones will also have an impact on population. The same probabilistic procedure described above for losses has been adopted to estimate the likelihood that different levels of casualties (i.e., fatalities and injuries) may result from the future occurrence of these events. As shown in Table 2, our model estimates, for example, that there is a **40% chance in the next fifty years (100-year mean return period)**

Figure 9 — Average annual loss for all the 15 Pacific Island Countries considered in this study.

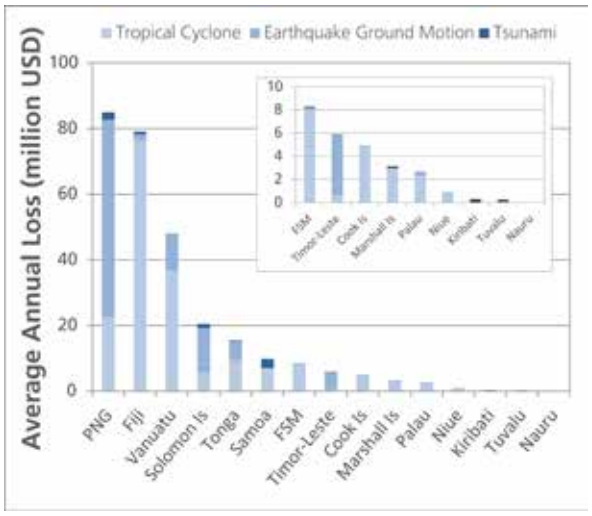
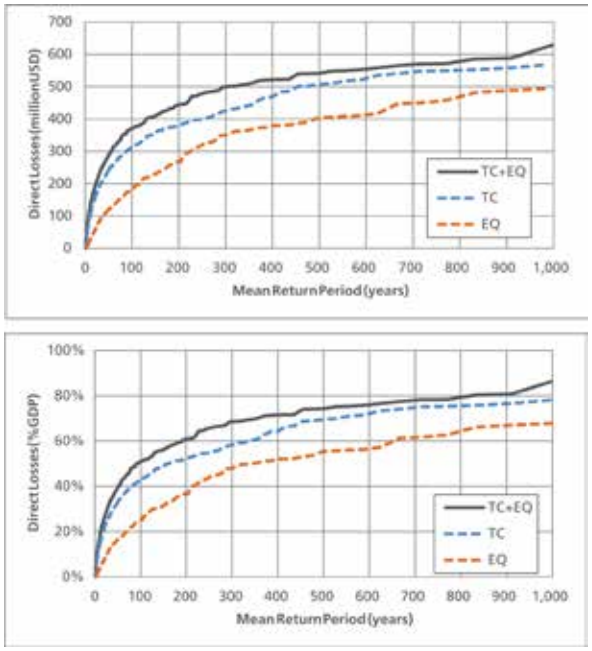


Figure 10 — Direct losses caused by either tropical storms or earthquakes that are expected to be equaled or exceeded, on average, once in the time period indicated. Losses represented in absolute terms and normalized by GDP.



that one or more events in a calendar year will cause casualties exceeding 900 people in Vanuatu. Events causing 2,000 or more casualties are also possible but have much lower likelihood of occurring.

Table 2— Estimated Losses and Casualties Caused by Natural Perils

Mean Return Period (years)	AAL	50	100	250
Risk Profile: Tropical Cyclone				
Direct Losses				
(Million USD)	36.8	240.6	311.8	398.8
(% GDP)	5.0%	33.0%	42.8%	54.7%
Emergency Losses				
(Million USD)	8.5	55.3	71.7	91.7
(% of total government expenditures)	4.7%	30.9%	40.1%	51.3%
Casualties	41	260	333	415
Risk Profile: Earthquake, and Tsunami				
Direct Losses				
(Million USD)	11.2	119.6	182.6	319.7
(% GDP)	1.5%	16.4%	25.0%	43.9%
Emergency Losses				
(Million USD)	0.0	19.2	29.3	51.7
(% of total government expenditures)	0.0%	10.8%	16.4%	28.9%
Casualties	45	471	877	1,627
Risk Profiles: Tropical Cyclone, Earthquake, and Tsunami				
Direct Losses				
(Million USD)	47.9	284.9	370.1	478.5
(% GDP)	6.6%	39.1%	50.8%	65.6%
Emergency Losses				
(Million USD)	10.3	61.4	77.9	97.5
(% of total government expenditures)	5.7%	34.3%	43.6%	54.5%
Casualties	86	577	901	1,675

Risk Profile: Tonga

Population, Buildings, Infrastructure and Crops Exposed to Natural Perils

An extensive study has been conducted to assemble a comprehensive inventory of population and properties at risk. Properties include residential, commercial, public and industrial buildings; infrastructure assets such as major ports, airports, power plants, bridges, and roads; and major crops, such as coconut, palm oil, taro, vanilla and many others.

Table 1 summarizes population and the inventory of buildings, infrastructure assets, and major crops (or "exposure") at risk as well as key economic values for Tonga It is estimated that the replacement value of all the assets in Tonga is 2.8 billion USD of which about 90% represents buildings and 9% represents infrastructure.

Table 1— Summary of Exposure in Tonga (2010)

GENERAL INFORMATION:	
Total Population:	103,000
GDP Per Capita (USD):	3,470
Total GDP (million USD):	358
Asset Counts:	
Residential Buildings:	30,156
Public Buildings:	1,594
Commercial, Industrial, and Other Buildings:	3,001
All Buildings:	34,751
Hectares of Major Crops:	36,010
COST OF REPLACING ASSETS (MILLION USD):	
Buildings:	2,525
Infrastructure:	259
Crops:	32
Total:	2,816
GOVERNMENT REVENUE AND EXPENDITURE:	
Total Government Revenue	
(Million USD):	82
(% GDP):	22.90%
Total Government Expenditure	
(Million USD):	99.2
(% GDP):	27.70%

Figures 1 and 2 illustrate the building exposure location and replacement cost distribution, respectively. The footprints of about 28,000 of the approximately 35,000 buildings shown in Figure 1 were digitized from high-resolution satellite imagery. More than 10,000 of such buildings, all in the main island of Tongatapu, and most near the vicinity of the nation's capital of Nuku'alofa, were also field surveyed and photographed by a team of inspectors deployed for this purpose. Figure 3 displays the land cover/land use map that includes the location of major crops. The data utilized for these exhibits was assembled, organized and, when unavailable, produced in this study.

Tropical Cyclone and Earthquake Hazards in Tonga

The Pacific islands region is prone to natural hazards. Tonga is located south of the equator in an area known for the frequent occurrence of tropical cyclones with damaging winds, rains and storm surge between the months of October and May. In the South Pacific region from the equator to New Zealand in latitude and from Indonesia to east of Hawaii in longitude almost 1,000 tropical cyclones with hurricaneforce winds spawned in the last 60 years, with an average of about 16 tropical storms per year. Tonga was affected by devastating cyclones multiple times in the last few decades. For example, tropical cyclones Isaac and Waka, in 1982 and 2001, caused 7 fatalities, destroyed the shelters of tens of thousands of people as well as much of the nation's agriculture crops and caused about 75 million USD in losses that crippled the local economy. Figure 4 shows the levels of wind speed due to tropical cyclones that have about a 40% chance to be exceeded at least once in the next 50 years (100- year mean return period). These wind speeds, if they were to occur, are capable of generating severe damage to buildings, infrastructure and crops with consequent large economic losses.

Figure 1 — Building Locations

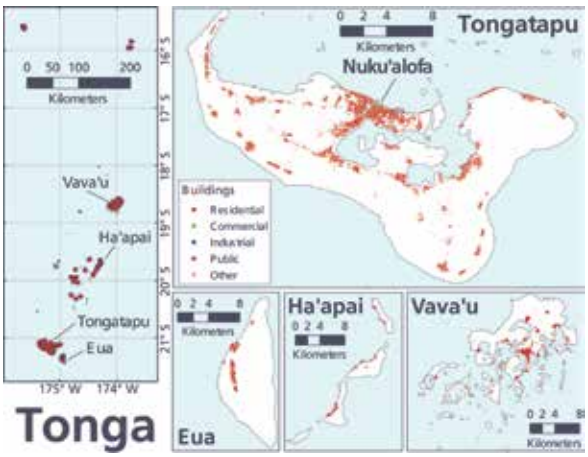


Figure 2 — Building Replacement cost Density by village

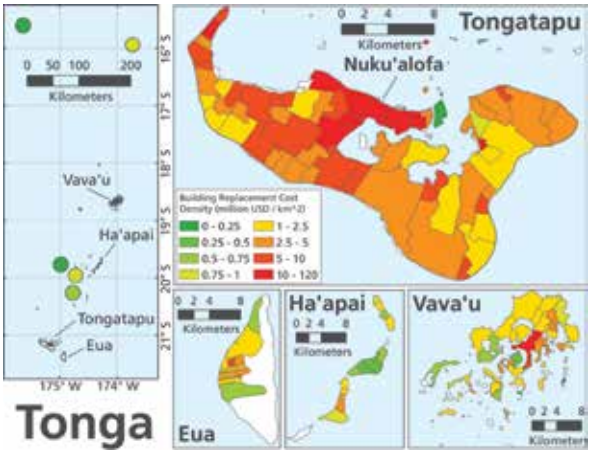
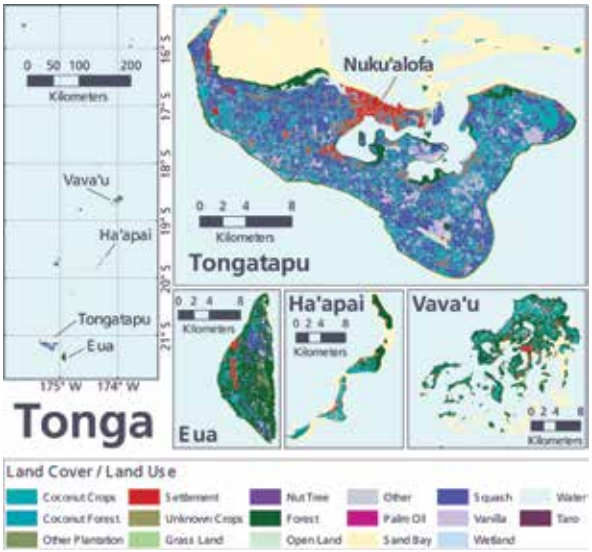


Figure 3 — Land Cover / Land Use Map



Tonga is situated along one segment of the Pacific "ring of fire," which aligns with the boundaries of the tectonic plates. These tectonic plate boundaries are extremely active seismic zones capable of generating large earthquakes and, in some cases, major tsunamis that can travel great distances. In 1977, a magnitude 7.2 earthquake violently shook the southern islands of Tonga caused considerable damage to structures. A recent and tragic example is the offshore magnitude 8.1 earthquake in 2009, which generated a devastating tsunami that killed 9 people and destroyed over half of the houses in the Tongan island of Niuatoputapu before hitting the shores of Samoa. Figure 5 shows that Tonga has a 40% chance in the next 50 years of experiencing, at least once, moderate to very strong levels of ground shaking. These levels of shaking are expected to cause damage ranging from moderate to heavy to well-engineered buildings and even more severe damage to structures built with less stringent criteria.

Risk Analysis Results

To estimate the risk profile for Tonga posed by tropical cyclones and earthquakes, a simulation model of potential storms and earthquakes that may affect the country in the future was constructed. This model, based on historical data, simulates more than 400,000 tropical cyclones and about 7.6 million earthquakes, grouped in 10,000 potential realizations of the next year's activity in the entire Pacific Basin. The catalog of simulated earthquakes also includes large magnitude events in South and North America, Japan and the Philippines, which could generate tsunamis that may affect Tonga's shores.

Figure 4 — Maximum 1-minute sustained wind speed (in miles per hour) with a 40% chance to be exceeded at least once in the next 50 years (100-year mean return period).

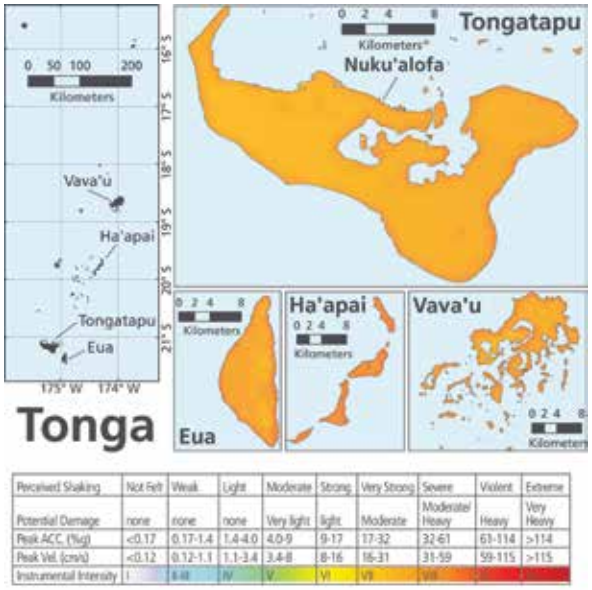
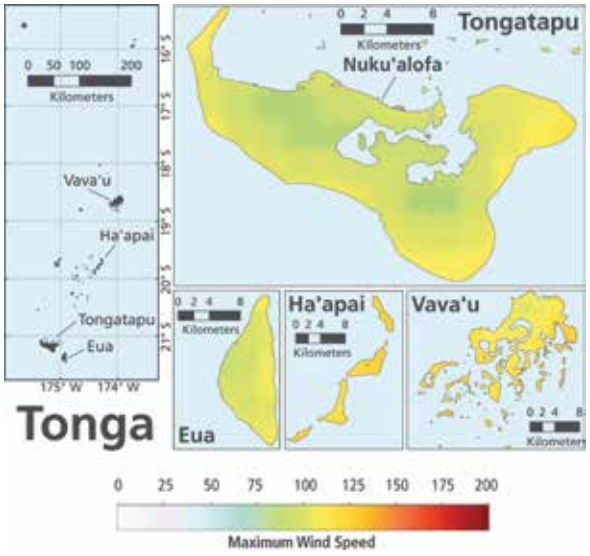


Figure 5 — Peak horizontal acceleration of the ground (Note: 1g is equal to the acceleration of gravity) that has about a 40% chance to be exceeded at least once in the next 50 years (100-year mean return period).



The country's earthquake and tropical cyclone risk profiles are derived from an estimation of the direct losses to buildings, infrastructure assets and major crops caused by all the simulated potential future events. The direct losses include the cost of repairing or replacing the damaged assets, but do not include other losses such as contents losses, business interruption losses and losses to primary industries other than agriculture. The direct losses for tropical cyclones are caused by wind and flooding due to rain and storm surge, while for earthquakes they are caused by ground shaking and tsunami inundation. After assessing the cost of repairing or rebuilding the damaged assets due to the impact of all the simulated potential future events, it is possible to estimate in a probabilistic sense the severity of losses for future catastrophes.

The simulations of possible next-year tropical cyclone and earthquake activity show that some years will see no storms or earthquakes affecting Tonga, while other years may see one or more events affecting the islands, similar to what has happened historically. The annual losses averaged over the many realizations of next-year activity are shown in Figure 6 separately for tropical cyclone and for earthquake and tsunami, while the contributions to the average annual loss from the different villages are displayed in absolute terms in Figure 7 and normalized by the total asset values in each village in Figure 8. Figure 8 shows how the relative risk varies by village across the country.

Figure 6 — Average annual loss due to tropical cyclones and earthquakes (ground shaking and tsunami) and its contribution from the three types of assets.

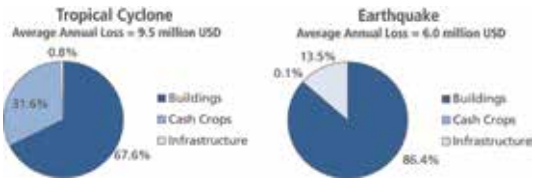


Figure 7 — Contribution from the different villages to the average annual loss for tropical cyclone and earthquake (ground shaking and tsunami).

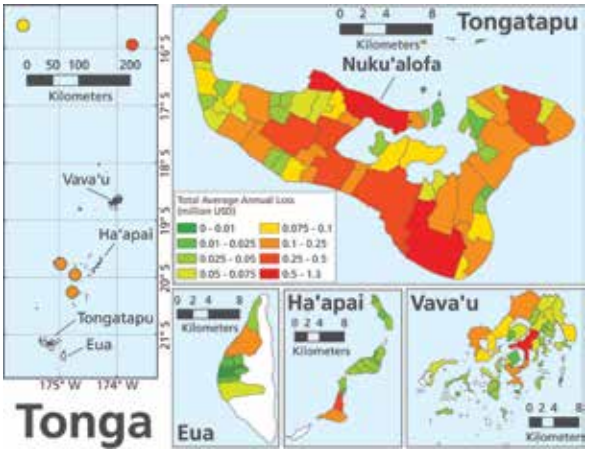
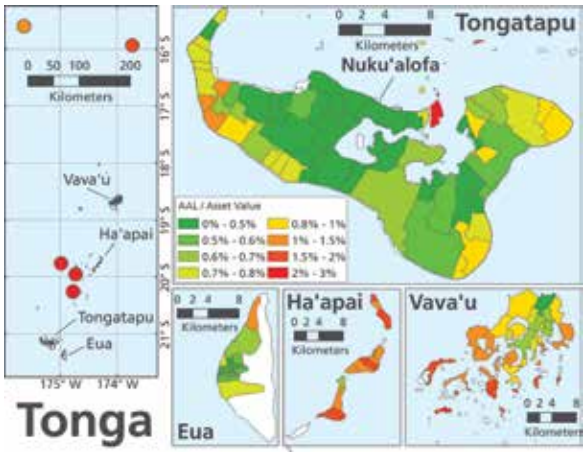


Figure 8 — Contribution from the different villages to the tropical cyclone and earthquake (ground shaking and tsunami) average annual loss divided by the replacement cost of the assets in each village.



The same risk assessment carried out for Tonga was also performed for the 14 other Pacific Island Countries. The values of the average annual loss of Tonga and of the other 14 countries are compared in Figure 9.

In addition to estimating average risk per calendar year, another way of assessing risk is to examine large and rather infrequent, but possible, future tropical cyclone and earthquake losses. Table 2 summarizes the risk profile for Tonga in terms of both direct losses and emergency losses. The former are the expenditures needed to repair or replace the damaged assets while the latter are the expenditures that the Tongan government may need to incur in the aftermath of a natural catastrophe to provide necessary relief and conduct activities such as debris removal, setting up shelters for homeless or supplying medicine and food. The emergency losses are estimated as a percentage of the direct losses.

Table 2 includes the losses that are expected to be exceeded, on average, once every 50, 100, and 250 years. For example, an **earthquake and tsunami loss exceeding 154 million USD, which is equivalent to about 43% of Tonga's GDP, is to be expected, on average, once every 100 years.** In Tonga, tropical cyclone losses are comparable to losses due to earthquake ground shaking and tsunami. The latter, however, remain potentially catastrophic events.

A more complete picture of the risk can be found in Figure 10, which shows the mean return period of direct losses in million USD generated by earthquake, tsunami and tropical cyclones combined. The 50-, 100-, and 250-year mean return period losses in Table 2 can also be determined from the curves in this figure. The direct losses are expressed both in absolute terms and as a percent of the national GDP.

Figure 9 — Average annual loss for all the 15 Pacific Island Countries considered in this study.

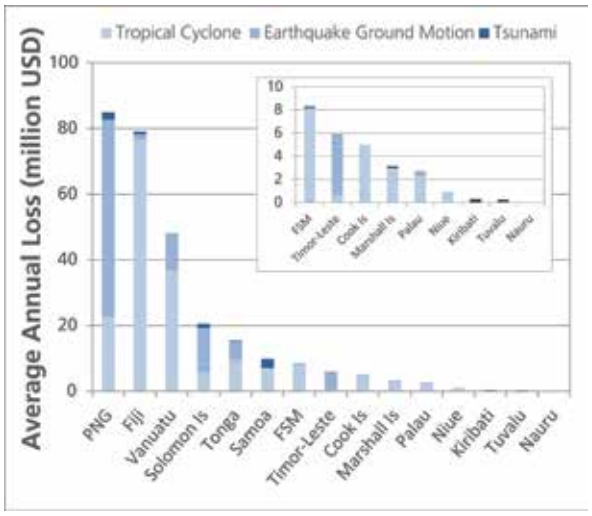
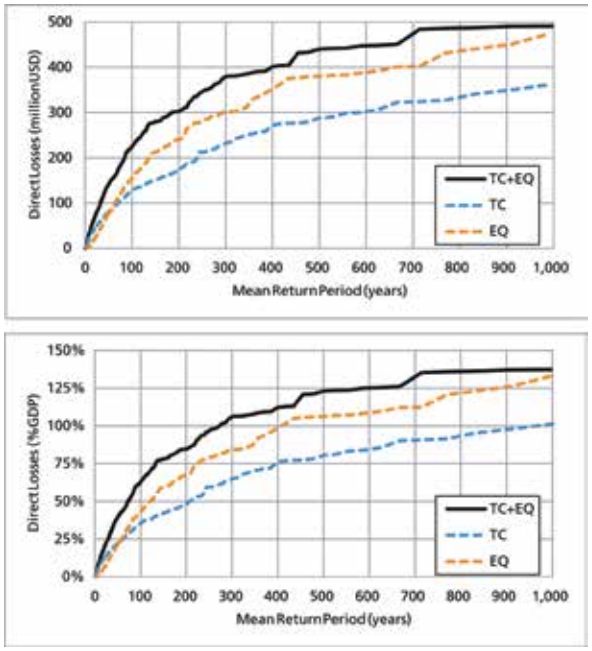


Figure 10 — Direct losses caused by either tropical storms or earthquakes that are expected to be equaled or exceeded, on average, once in the time period indicated. Losses represented in absolute terms and normalized by GDP.



In addition to causing damage and losses to the built environment and crops, future earthquakes and tropical cyclones will also have an impact on population. The same probabilistic procedure described above for losses has been adopted to estimate the likelihood that different levels of casualties (i.e., fatalities and injuries) may result from the future occurrence of these events. As shown in Table 2, our model estimates, for example, that there is a 40% chance in the next fifty years (100-year mean return period) that one or more events in a calendar year will cause casualties exceeding about 600 people in Tonga. Events causing 2,000 or more casualties are also possible but have much lower likelihood of occurring.

Table 2— Estimated Losses and Casualties Caused by Natural Perils

Mean Return Period (years)	AAL	50	100	250
Risk Profile: Tropical Cyclone				
(Million USD)	9.5	78.7	126	212.6
(% GDP)	2.70%	22.00%	35.20%	59.50%
Emergency Losses				
(Million USD)	2.2	18.1	28.9	48.9
(% of total government expenditures)	2.20%	18.20%	29.10%	49.30%
Casualties	10	87	134	209
Risk Profile: Earthquake, and Tsunami				
(Million USD)	6	76.3	154.2	280.1
(% GDP)	1.70%	21.40%	43.10%	78.40%
(Million USD)	0	12.4	24.7	44.8
(% of total government expenditures)	0.00%	12.50%	24.90%	45.20%
Casualties	24	245	575	1,160
Risk Profiles: Tropical Cyclone,, Earthquake, and Tsunami				
Direct Losses				
(Million USD)	15.5	140.2	225.3	345.6
(% GDP)	4.30%	39.20%	63.00%	96.70%
Emergency Losses				
(Million USD)	3.2	28.1	41.8	63.6
(% of total government expenditures)	3.20%	28.30%	42.10%	64.10%
Casualties	34	299	600	1,174

Risk Profile: Marshall Islands

Population, Buildings, Infrastructure and Crops Exposed to Natural Perils

An extensive study has been conducted to assemble a comprehensive inventory of population and properties at risk. Properties include residential, commercial, public and industrial buildings; infrastructure assets such as major ports, airports, power plants, bridges, and roads; and major crops, such as coconut, palm oil, taro, vanilla and many others.

Table 1 summarizes population and the inventory of buildings, infrastructure assets, and major crops (or "exposure") at risk as well as key economic values for the Republic of the Marshall Islands. It is estimated that the replacement value of all the assets in the Republic of the Marshall Islands is 1.7 billion USD of which about 83% represents buildings and 17% represents infrastructure.

Figures 1 and 2 illustrate the building exposure location and replacement cost distribution, respectively. The footprints of about 7,700 of the approximately 13,000 buildings shown in Figure 1 were digitized from high-resolution satellite imagery. Figure 3 displays the land cover/land use map that includes the location of major crops. The data utilized for these exhibits was assembled, organized and, when unavailable, produced in this study.

Table 1— Summary of Exposure in Marshall Islands (2010)

GENERAL INFORMATION:	
Total Population:	54,800
GDP Per Capita (USD):	2,840
Total GDP (million USD):	155.8
Asset Counts:	
Residential Buildings:	11,407
Public Buildings:	608
Commercial, Industrial, and Other Buildings:	879
All Buildings:	12,894
Hectares of Major Crops:	8,601
COST OF REPLACING ASSETS (MILLION USD):	
Buildings:	1,404
Infrastructure:	286
Crops:	6
Total:	1,696
GOVERNMENT REVENUE AND EXPENDITURE:	
Total Government Revenue	
(Million USD):	103.8
(% GDP):	66.6%
Total Government Expenditure	
(Million USD):	104.1
(% GDP):	66.8%

[1] Data assembled from various references including WB, ADB, IMF and The Secretariat of the Pacific Community (SPC).
[2] The projected 2010 population was trended from the 2006 census using estimated growth rates provided by SPC.

Tropical Cyclone and Earthquake Hazards in Marshall Islands

The Pacific islands region is prone to natural hazards. The Republic of the Marshall Islands is located north of the equator in an area known for the frequent occurrence of tropical cyclones with damaging winds, rains and storm surge all year round. In the North Pacific region from Taiwan to the equator in latitude and from Indonesia to east of Hawaii in longitude, more than 1,400 tropical cyclones with hurricaneforce winds spawned in the last 60 years, with an average of about 25 tropical storms per year. The Republic of the Marshall Islands was affected by devastating cyclones several times in the last few decades. For example, typhoon Paka in 1997 caused severe damage to crops and damaged 70% of houses on Ailinglaplap Atoll, with total damages estimated at 80 million USD for the entire nation. Typhoons Zelda, Axel and Gay each caused significant damage and losses within a span of one year (1991-1992). Figure 4 shows the levels of wind speed due to tropical cyclones that have about a 40% chance to be exceeded at least once in the next 50 years (100- year mean return period). These wind speeds, if they were to occur, are capable of generating moderate to severe damage to buildings, infrastructure and crops with consequent large economic losses.

The Republic of the Marshall Islands is situated along a relatively quiet seismic area but is surrounded by the Pacific "ring of fire," which aligns with the boundaries of the tectonic plates. These boundaries are extremely active seismic zones capable of generating large earthquakes and, in some cases, major tsunamis that can travel great distances. No significant earthquakes have been observed in recent history. However, in 1899, a large earthquake off the eastern coast of New Ireland, Papua New Guinea generated a tsunami that caused a considerable amount of

Figure 1 — Building Locations

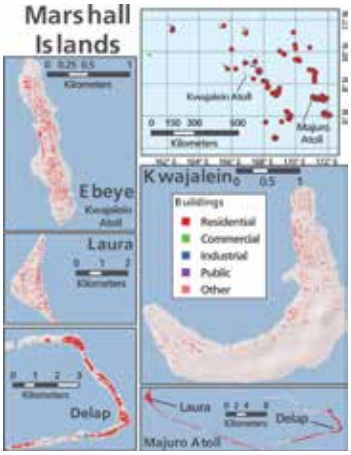


Figure 2 — Building replacement cost density by district.

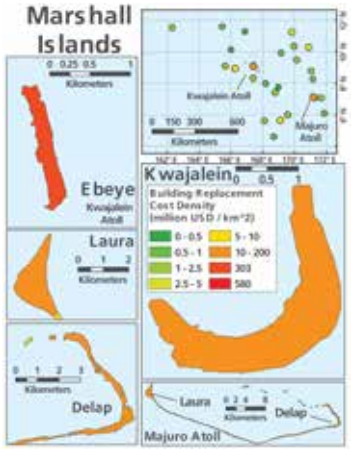
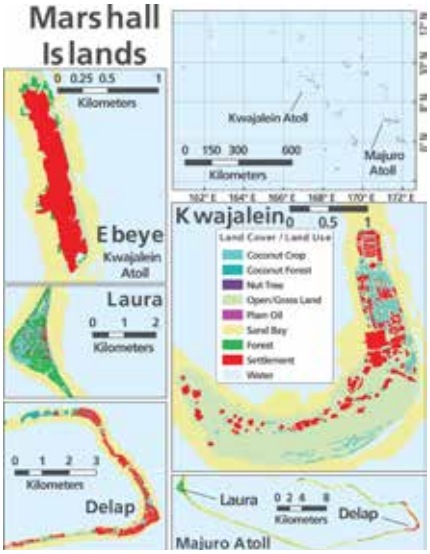


Figure 3 — Land Cover / Land Use Map



damage in the Republic of the Marshall Islands. Figure 5 shows that the Republic of the Marshall Islands has a 40% chance in the next 50 years of experiencing, at least once, very weak levels of ground shaking. These levels of shaking are not expected to cause any significant damage to well-engineered buildings.

Risk Analysis Results

To estimate the risk profile for The Republic of the Marshall Islands posed by tropical cyclones and earthquakes, a simulation model of potential storms and earthquakes that may affect the country in the future was constructed. This model, based on historical data, simulates more than 400,000 tropical cyclones and about 7.6 million earthquakes, grouped in 10,000 potential realizations of the next year's activity in the entire Pacific Basin. The catalog of simulated earthquakes also includes large magnitude events in South and North America, Japan and the Philippines, which could generate tsunamis that may affect Marshall Islands' shores.

The country's earthquake and tropical cyclone risk profiles are derived from an estimation of the direct losses to buildings, infrastructure assets and major crops caused by all the simulated potential future events. The direct losses include the cost of repairing or replacing the damaged assets, but do not include other losses such as contents losses, business interruption losses and losses to primary industries other than agriculture. The direct losses for tropical cyclones are caused by wind and flooding due to rain and storm surge, while for earthquakes they are caused by ground shaking and tsunami inundation. After assessing the cost of repairing or rebuilding the damaged assets due to the impact of all the simulated potential future events, it is possible to estimate in a probabilistic sense the severity of losses for future catastrophes.

Figure 4 — Maximum 1-minute sustained wind speed (in miles per hour) with a 40% chance to be exceeded at least once in the next 50 years.

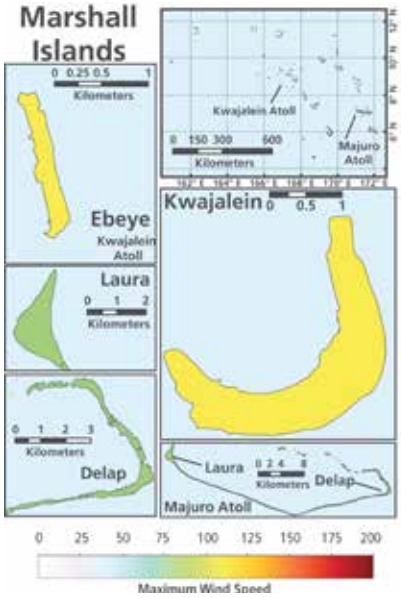
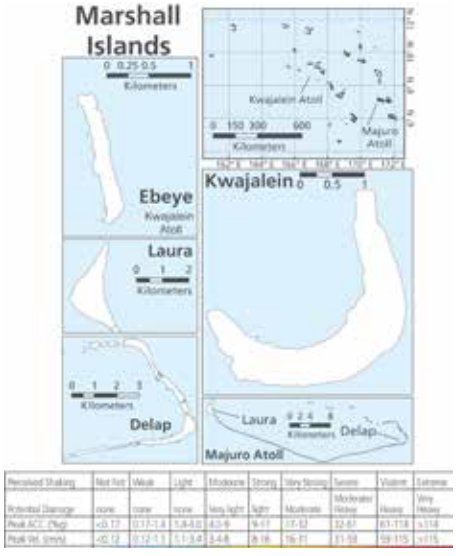


Figure 5 — Peak horizontal acceleration of the ground (Note: 1g is equal to the acceleration of gravity) that has about a 40% chance to be exceeded at least once in the next 50 years.



The simulations of possible next-year tropical cyclone and earthquake activity show that some years will see no storms or earthquakes affecting the Republic of the Marshall Islands, while other years may see one or more events affecting the islands, similar to what has happened historically. The annual losses averaged over the many realizations of next-year activity are shown in Figure 6 separately for tropical cyclone and for earthquake and tsunami, while the contributions to the average annual loss from the different atolls are displayed in absolute terms in Figure 7 and normalized by the total asset values in each atoll in Figure 8. Figure 8 shows how the relative risk varies by atoll across the country.

The same risk assessment carried out for the Republic of the Marshall Islands was also performed for the 14 other Pacific Island Countries. The values of the average annual loss of Republic of the Marshall Islands and of the other 14 countries are compared in Figure 9.

In addition to estimating average risk per calendar year, another way of assessing risk is to examine large and rather infrequent, but possible, future tropical cyclone and earthquake losses. Table 2 summarizes the risk profile for the Republic of the Marshall Islands in terms of both direct losses and emergency losses. The former are the expenditures needed to repair or replace the damaged assets while the latter are the expenditures that the

Figure 6 — Average annual loss due to tropical cyclones and earthquakes (ground shaking and tsunami) and its contribution from the three types of assets.

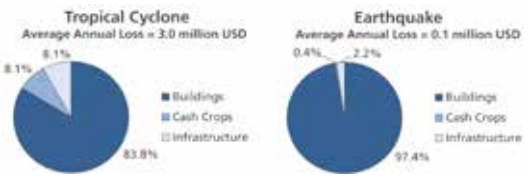


Figure 7 — Contribution from the different villages to the average annual loss for tropical cyclone and earthquake (ground shaking and tsunami).

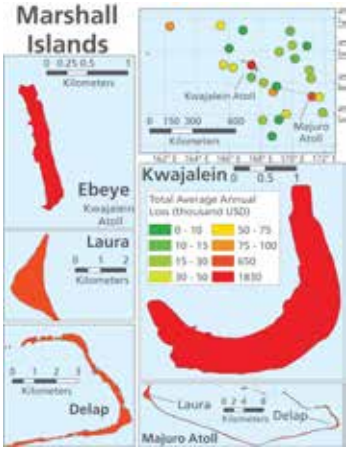
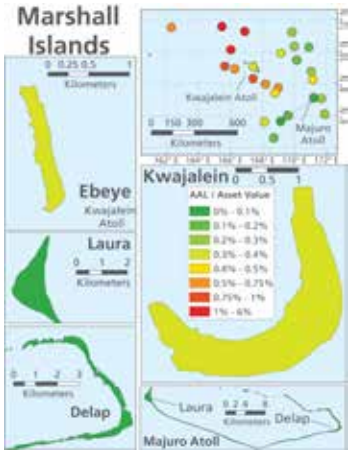


Figure 8 — Contribution from the different villages to the tropical cyclone and earthquake (ground shaking and tsunami) average annual loss divided by the replacement cost of the assets in each village.



Marshallese government may need to incur in the aftermath of a natural catastrophe to provide necessary relief and conduct activities such as debris removal, setting up shelters for homeless or supplying medicine and food. The emergency losses are estimated as a percentage of the direct losses.

Table 2 includes the losses that are expected to be exceeded, on average, once every 50, 100, and 250 years. For example, **a tropical cyclone loss exceeding 66 million USD, which is equivalent to about 42% of Marshall Islands' GDP, is to be expected, on average, once every 100 years.** In the Republic of the Marshall Islands, tropical cyclone losses are expected to be substantially more frequent and severe than losses due to earthquake ground shaking and tsunami. The latter, however, remain potentially catastrophic events.

A more complete picture of the risk can be found in Figure 10, which shows the mean return period of direct losses in million USD generated by earthquake, tsunami and tropical cyclones combined. The 50-, 100-, and 250-year mean return period losses in Table 2 can also be determined from the curves in this figure. The direct losses are expressed both in absolute terms and as a percent of the national GDP.

In addition to causing damage and losses to the built environment and crops, future earthquakes and tropical cyclones will also have an impact on population. The same probabilistic procedure described above for losses has been adopted to estimate the likelihood that different levels of casualties (i.e., fatalities and injuries) may result from the future occurrence of these events. As shown in Table 2, our model estimates, for example, that there is a **40% chance in the next fifty years (100-year mean return period) that one or more events in a calendar year will cause casualties exceeding 70 people in the**

Figure 9 — Average annual loss for all the 15 Pacific Island Countries considered in this study.

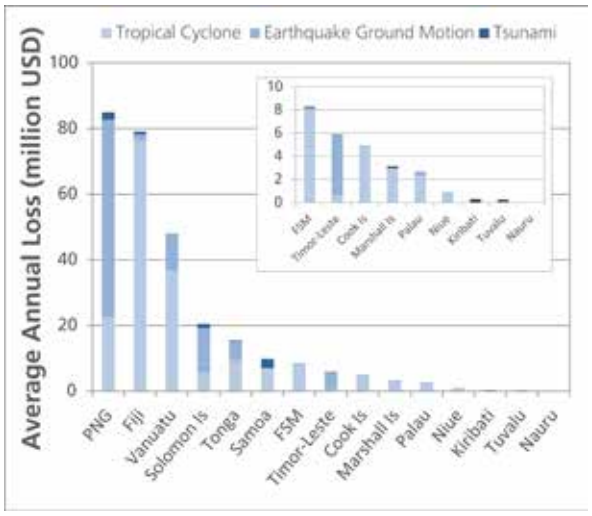
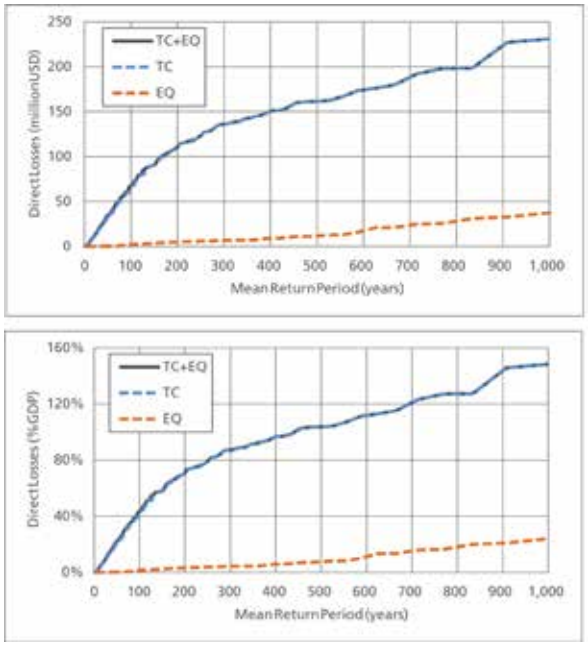


Figure 10 — Direct losses caused by either tropical storms or earthquakes that are expected to be equaled or exceeded, on average, once in the time period indicated. Losses represented in absolute terms and normalized by GDP.



Republic of the Marshall Islands. Events causing 200 or more casualties are also possible but have much lower likelihood of occurring.

Table 2— Estimated Losses and Casualties Caused by Natural Perils

Mean Return Period (years)	AAL	50	100	250
Risk Profile: Tropical Cyclone				
Direct Losses				
(Million USD)	3.0	32.8	66.2	123.0
(% GDP)	1.9%	21.1%	42.5%	78.9%
Emergency Losses				
(Million USD)	0.7	7.6	15.2	28.3
(% of total government expenditures)	0.7%	7.3%	14.6%	27.2%
Casualties	3	36	69	118
Risk Profile: Earthquake, and Tsunami				
Direct Losses				
(Million USD)	0.1	0.3	2.3	5.9
(% GDP)	0.1%	0.2%	1.5%	3.8%
Emergency Losses				
(Million USD)	0.0	0.1	0.5	1.4
(% of total government expenditures)	0.0%	0.1%	0.5%	1.3%
Casualties	0	0	1	3
Risk Profiles: Tropical Cyclone, Earthquake, and Tsunami				
Direct Losses				
(Million USD)	3.1	34.1	67.4	123.0
(% GDP)	2.0%	21.9%	43.3%	78.9%
Emergency Losses				
(Million USD)	0.7	7.8	15.5	28.3
(% of total government expenditures)	0.7%	7.5%	14.9%	27.2%
Casualties	3	38	76	128v

PCRAFI 2015

Regional Summary Note & Options for Consideration

This regional note on Tonga, Samoa, the Cook Islands, Vanuatu, Fiji, the Marshall Islands and, the Solomon Islands forms part of a series of country Disaster Risk Finance and Insurance (DRFI) notes that were developed to build understanding of the existing DRFI tools in use in each country and to identify gaps future engagements in DRFI that could further improve financial resilience. These notes were developed as part of the technical assistance provided to countries under the Pacific DRFI program jointly implemented by the World Bank and the Secretariat of the Pacific Community financed by the Government of Japan. The technical assistance builds on the underlying principles of the three-tiered disaster risk financing strategy and focuses on three core aspects: (i) the development of a public financial management strategy for natural disasters, recognizing the need for ex-ante and ex-post financial tools; (ii) the post-disaster budget execution process, to ensure that funds can be accessed and disbursed easily post-disaster; and (iii) the insurance of key public assets, to resource the much larger funding requirements of recovery and reconstruction needs. The Pacific DRFI Program is one of the many applications of PCRAFI. It is designed to increase the financial resilience of PICs by improving their capacity to meet post-disaster financing needs without compromising their fiscal balance.

The Pacific Catastrophe Risk Assessment and Financing Initiative (PCRAFI) is a joint initiative of SOPAC/SPC, World Bank, and the Asian Development Bank with the financial support of the Government of Japan, the Global Facility for Disaster Reduction and Recovery (GFDRR) and the ACP-EU Natural Disaster Risk Reduction Programme, and technical support from AIR Worldwide, New Zealand GNS Science, Geoscience Australia, Pacific Disaster Center (PDC), OpenGeo and GFDRR Labs.