PCRAFI

Pacific Catastrophe Risk Assessment & Financing Initiative

FIJI

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SPC Secretariat of the Pacific Community

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Acronyms and Abbreviations

DISMAC	Disaster Management Council
DRFI	disaster risk financing and insurance
FEA	Fiji Electricity Authority
FPCL	Fiji Ports Corporation Limited
F$GDP	gross domestic product
GFDRR	Global Facility for Disaster Reduction and Recovery
HFA	Hyogo Framework for Action
IAIS	International Association of Insurance Supervisors
ISR	Industrial Special Risks
NDMO	National Disaster Management Office
NDRFF	National Disaster Relief and Rehabilitation Fund ("Prime Minister's Fund")
PCRAFI	Pacific Catastrophe Risk Assessment and Financing Initiative
PIC	Pacific Island Country
RBF	Reserve Bank of Fiji
RFA	Regional Framework for Action
SIDS	Small Island Developing States
SOPAC	Applied Geoscience and Technology Division of SPC
SPC	Secretariat of the Pacific Community
SPREP	Secretariat of the Pacific Regional Environment Programme
TC	Tropical Cyclone
UNDP	United Nations Development Programme
UNISDR	United Nations International Strategy for Disaster Reduction

Currency: Fiji dollar (F$)
Average exchange rate: US$1 = F$1.86

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

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:

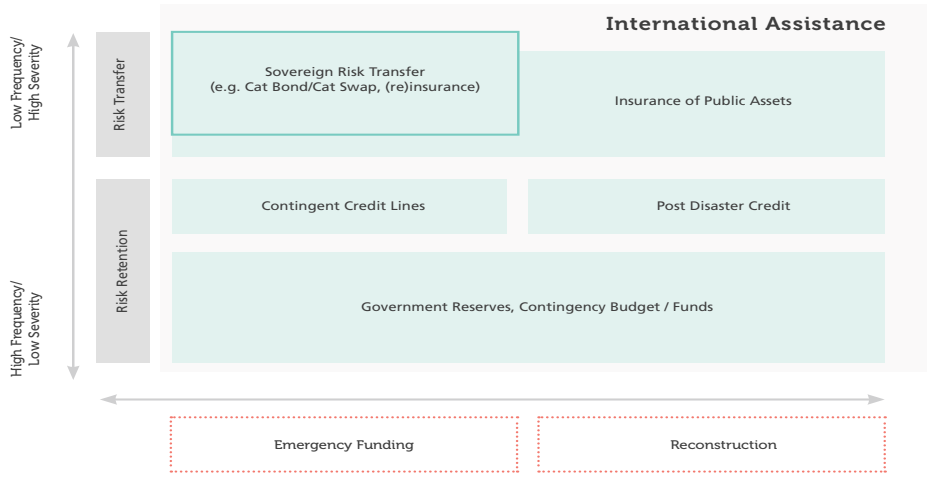
(a) Self-retention, such as a contingency budget and national reserves, to finance small but recurrent disasters;

(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.

Section 01

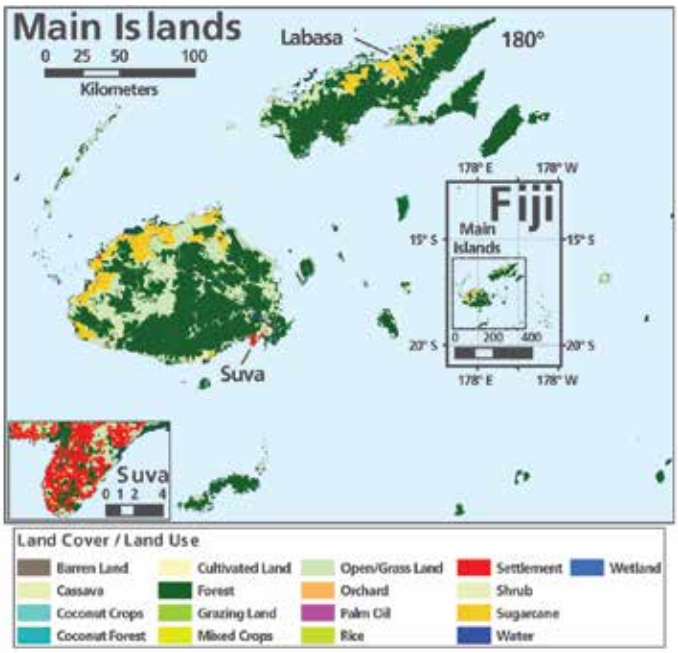
Economic Impact of Natural Disasters

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

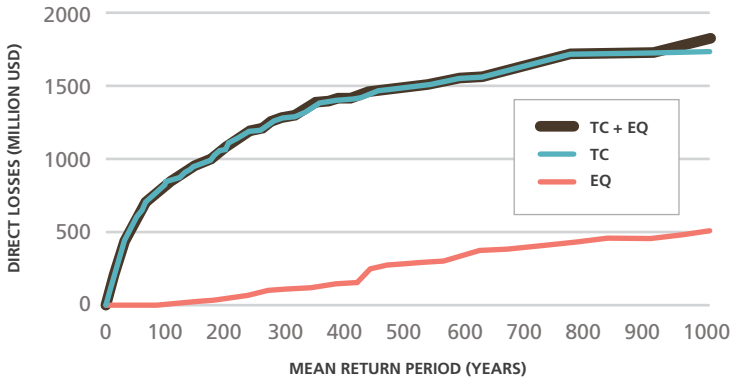
Figure 2 — Land Cover and Land Use in Fiji



Source: PCRAFI 2011.

Section 02

Figure 3 — Direct Losses by Return Period



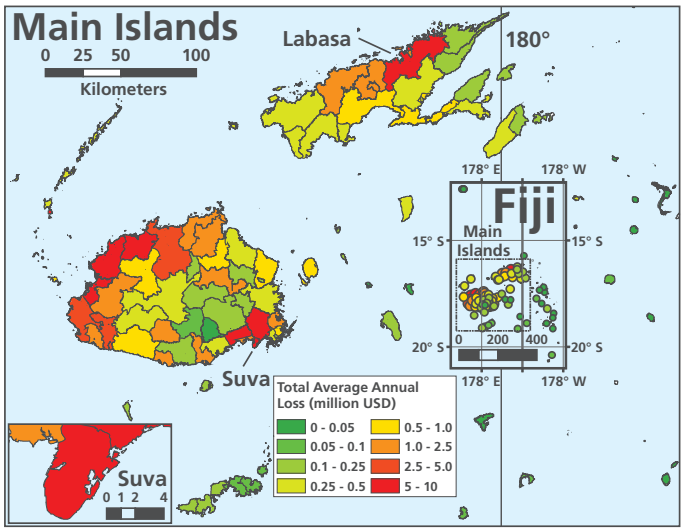
Source: PCRAFI 2011

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

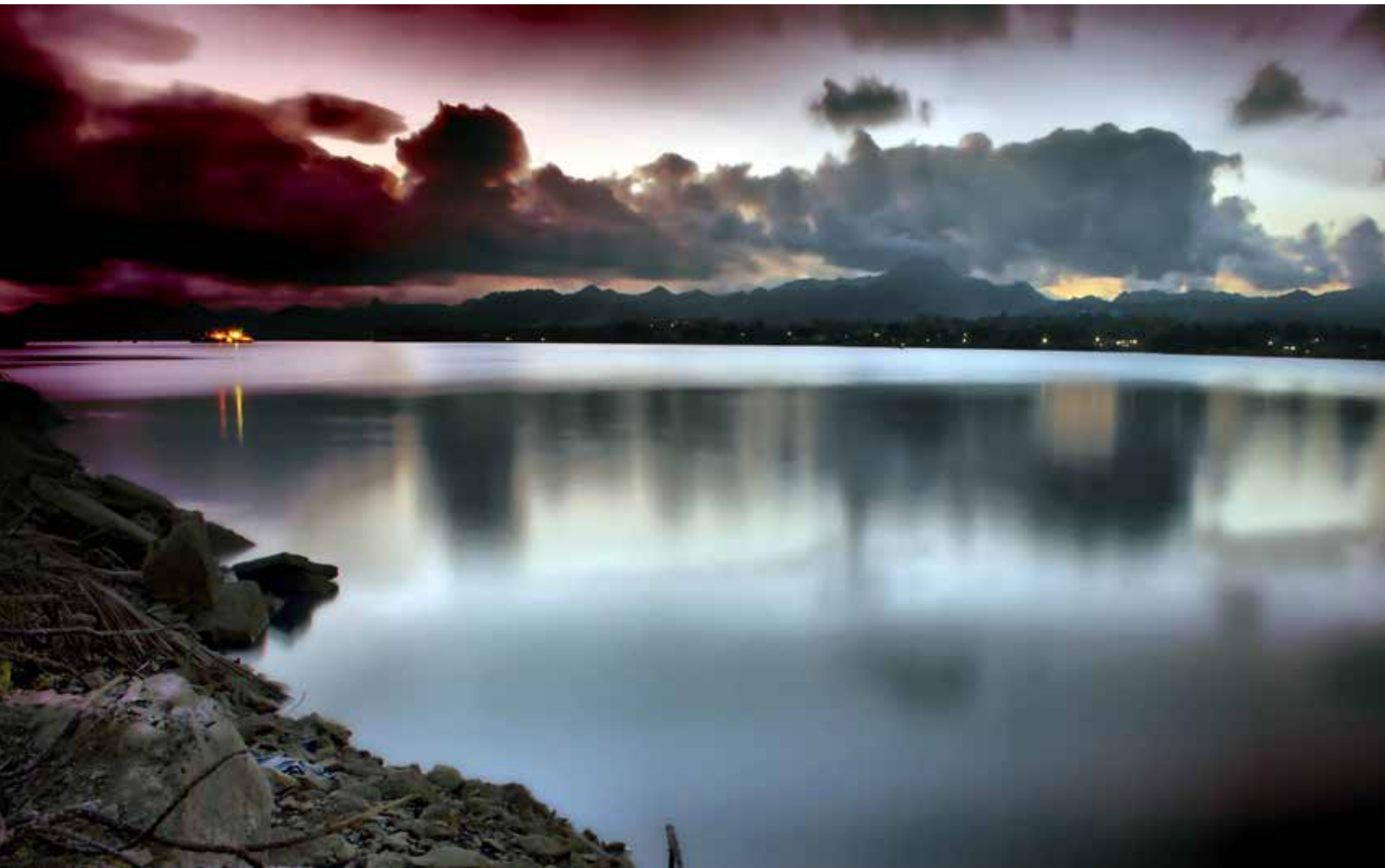


Source: PCRAFI 2011

Section 02

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.



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.

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).

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: FJ$2m** (US$1m) **NRRRF: FT$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.

▼ **Photo Credit**
Maarten Danial

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.

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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About PCRAFI

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

The initiative aims to provide the Pacific Island Countries (PICs) with disaster risk modeling and assessment tools for enhanced disaster risk management, and to engage PICs in a dialogue on integrated financial solutions to increase their financial resilience to natural disasters and climate change. The initiative is part of the broader agenda on disaster risk management and climate change adaptation in the Pacific region.

The Pacific Disaster Risk Financing and Insurance (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. Through DRFI, technical assistance is available to PICs to build capacity in the public financial management of natural disasters. The technical assistance will build on the underlying principles of the three-tiered disaster risk financing strategy and focus on three core aspects:

- the development of a public financial management strategy for natural disasters, recognizing the need for ex-ante and ex-post financial tools;
- the post-disaster budget execution process, to ensure that funds can be accessed and disbursed easily post-disaster; and
- the insurance of key public assets, to resource the much larger funding requirements of recovery and reconstruction needs.

The PICs involved in PCRAFI are the Cook Islands, the Federated States of Micronesia, Fiji, Kiribati, the Marshall Islands, Nauru, Niue, Palau, Papua New Guinea, Samoa, the Solomon Islands, Timor-Leste, Tonga, Tuvalu, and Vanuatu.

For further information, please visit http://pacrisk.sopac.org or contact PCRAFI@spc.int.

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).

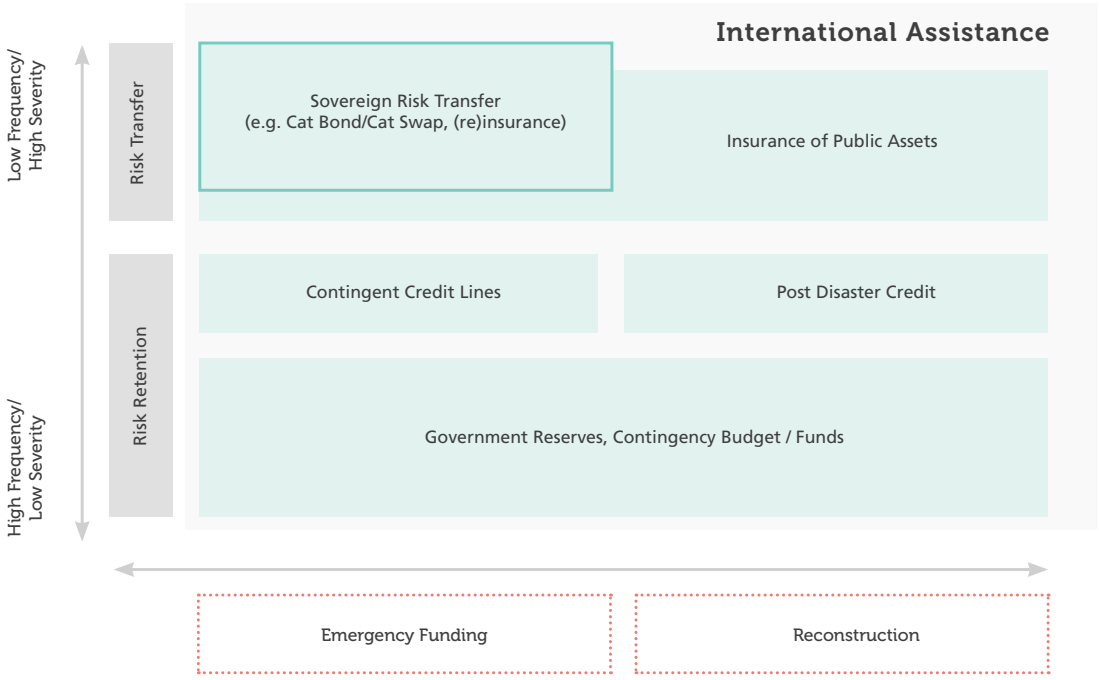
The World Bank framework for disaster risk financing and insurance advocates a three-tiered approach for the development of financing arrangements to cover the residual disaster risk that cannot be mitigated. These layers align to the basic principles of sound public financial management, such as the 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

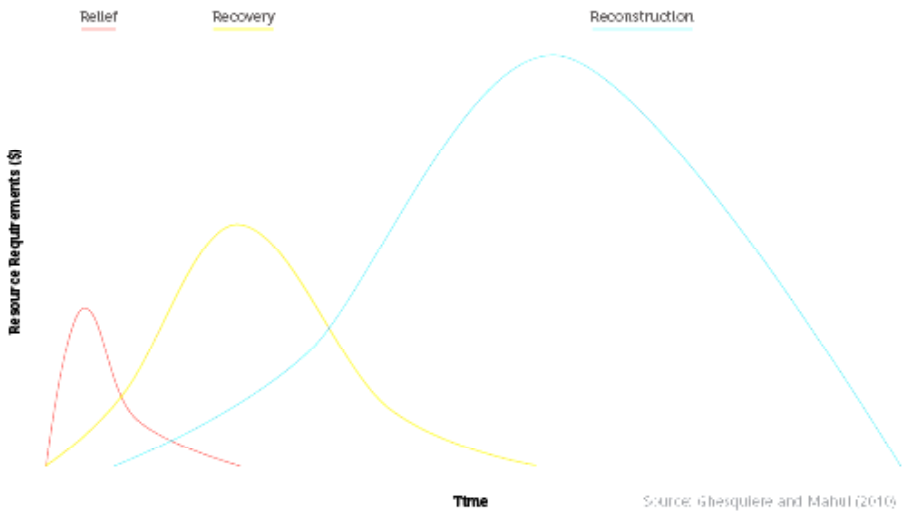


The initial relief phase requires a quick injection of liquidity from day 0 but does not need to be sustained for a long period of time (see figure A.3). Rapid budget mobilization and execution are key for financing initial disaster response, and governments should develop appropriate policies and procedures 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`



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.1— Availability of Financial Instruments Over Time

	SHORT TERM (1-3 MONTHS)	MEDIUM TERM (3-9 MONTHS)	LONG TERM (OVER 9 MONTHS)
Ex-ante 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.

Annex 3

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.

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.

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

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

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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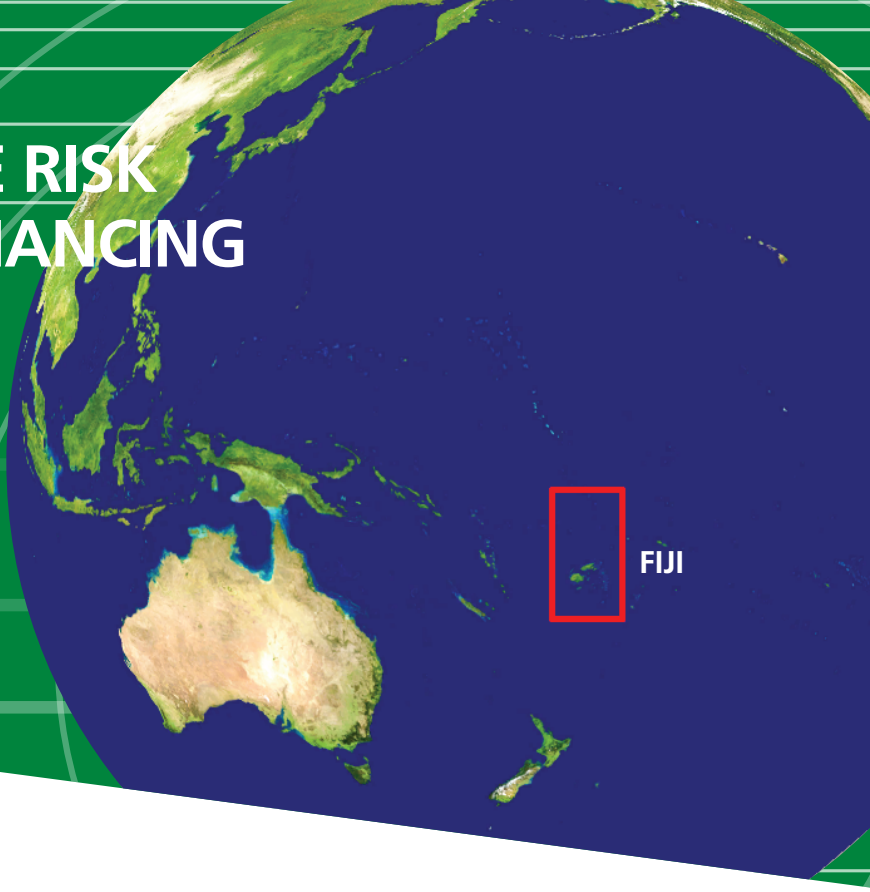
Glossary

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.

Annex 4

Country Risk Profile

PACIFIC CATASTROPHE RISK ASSESSMENT AND FINANCING INITIATIVE



SEPTEMBER 2011

COUNTRY RISK PROFILE: FIJI

Fiji is expected to incur, on average, 79 million USD per year in losses due to earthquakes and tropical cyclones. In the next 50 years, Fiji has a 50% chance of experiencing a loss exceeding 750 million USD and casualties larger than 1,200 people, and a 10% chance of experiencing a loss exceeding 1.5 billion USD and casualties larger than 2,100 people.

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:
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):	2734.5
(% 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 2007 census using estimated growth rates provided by SPC.

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

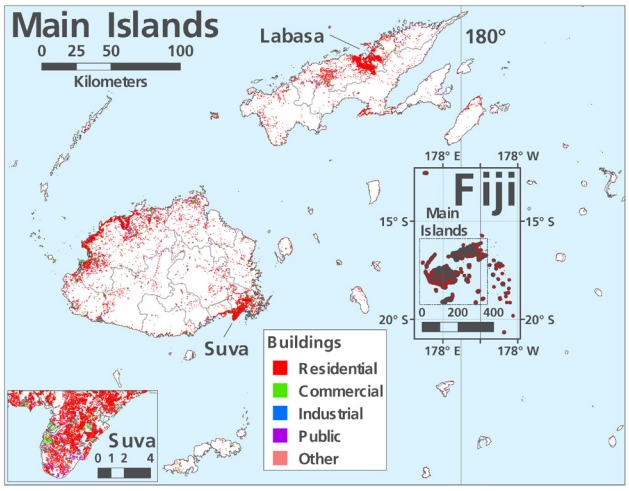


Figure 1: Building locations.

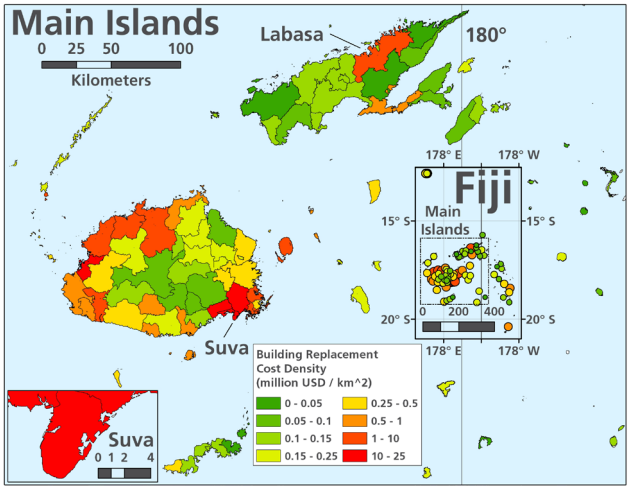


Figure 2: Building replacement cost density by district.

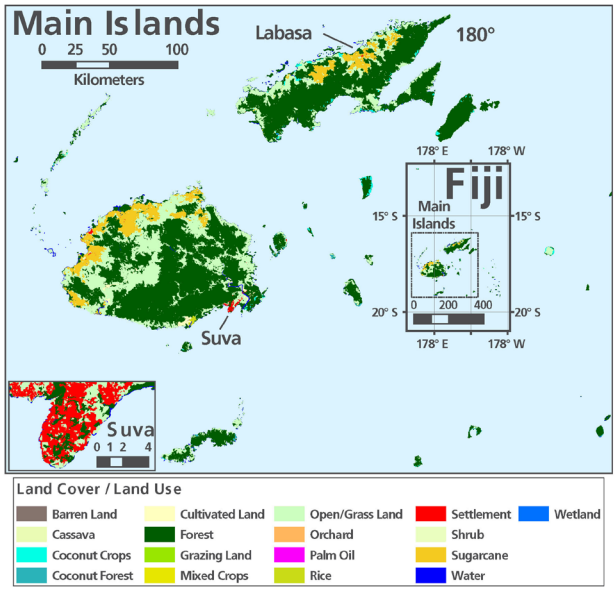


Figure 3: Land cover/land use map.

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 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

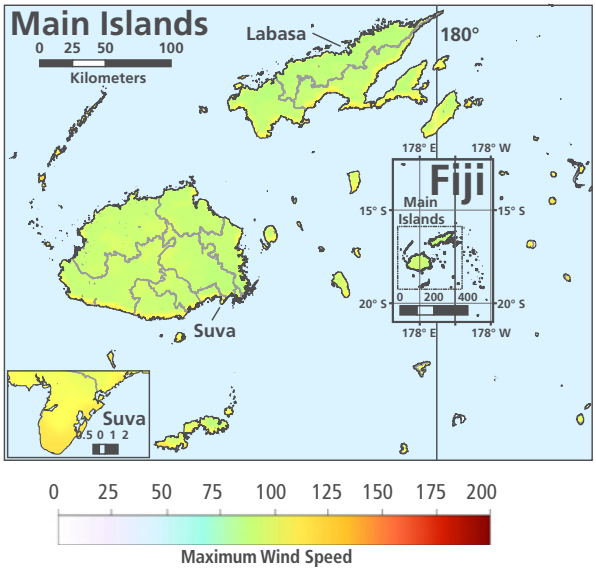
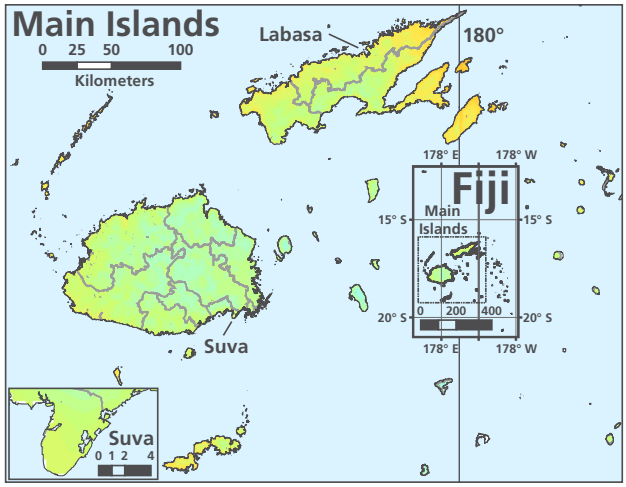


Figure 4: Maximum 1-minute sustained wind speed (in miles per hour) with a 40% chance to be exceeded at least once in the next 50 years (100-year mean return period).

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 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.



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
Instrumental Intensity	I	II-III	IV	V	VI	VII	VIII	IX	X+

Scale based upon Wald. et al: 1999

Figure 5: Peak horizontal acceleration of the ground (Note: 1g is equal to the acceleration of gravity) that have about a 40% chance to be exceeded at least once in the next 50 years (100-year mean return period).

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 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.

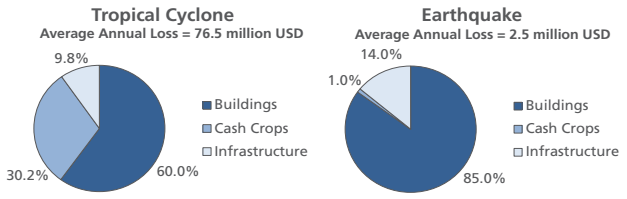


Figure 6: Average annual loss due to tropical cyclones and earthquakes (ground shaking and tsunami) and its contribution from the three types of assets.

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 emergency losses are estimated as a percentage of the direct losses.

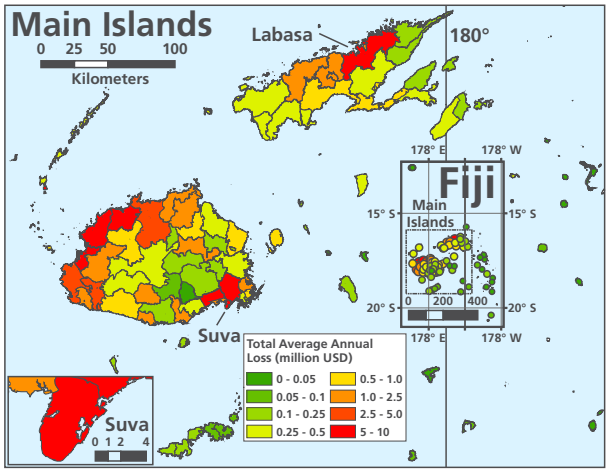


Figure 7. Contribution from the different districts to the average annual loss for tropical cyclone and earthquake (ground shaking and tsunami).

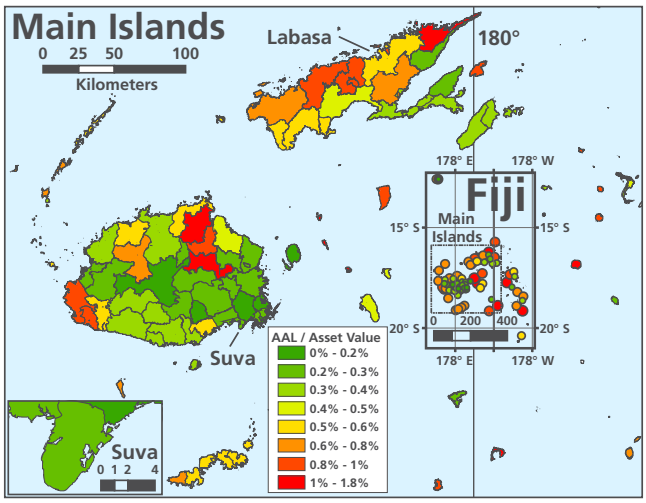


Figure 8. Contribution from the different districts to the tropical cyclone and earthquake (ground shaking and tsunami) average annual loss divided by the replacement cost of the assets in each district.

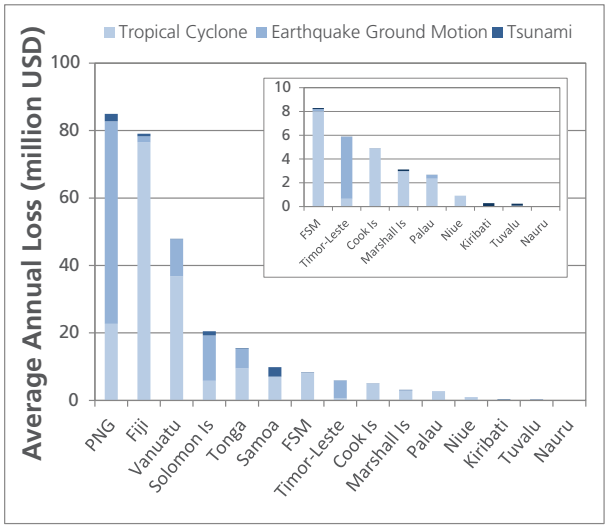


Figure 9: Average annual loss for all the 15 Pacific Island Countries considered in this study.

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.

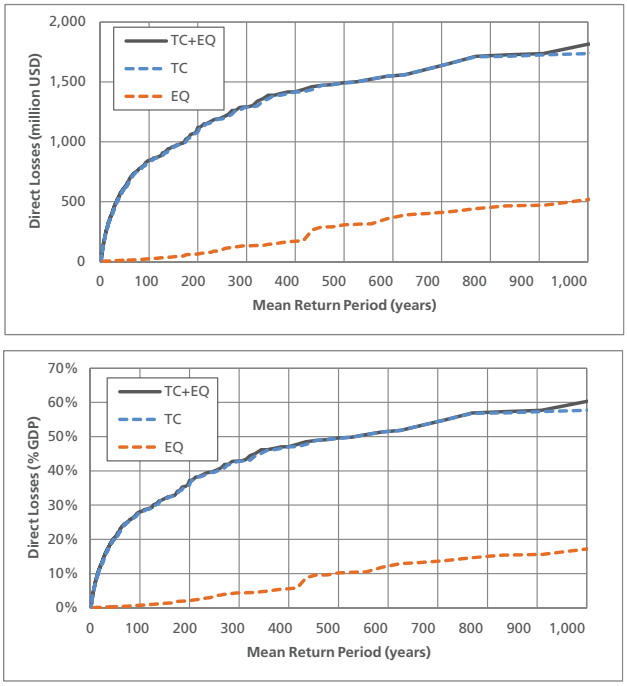


Figure 10: Direct losses (in absolute terms and normalized by GDP) caused by either tropical storms or earthquakes that are expected to be exceeded, on average, once in the time period indicated.

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 Profile: 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

[1]Casualties include fatalities and injuries

PCRAFI 2015

Country Note

FIJI

This note on Fiji 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.