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Statistical Summary

Seismic Disasters in the Pacific

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INTRODUCTION

It is a long accepted fact that the Pacific is one of the most natural disaster prone regions in the world. Aside from the threat of hydrometeorological events, such as tropical cyclones, floods and storm surges, the Pacific region is subject to a range of seismic hazards, such as earthquakes, tsunamis and volcanic activities.

Data on the frequency, type and impact of seismic disasters in the Pacific are comprehensively hosted in the Pacific Damage and Loss (PDaLo - http://www.pdalo.net) information system (using the DesInventar methodology). PDaLo comprises synthesised records of around 1200 Pacific events that are officially reported to have negatively impacted at least one Pacific Island community since the 1600s. As a living database that is supplemented on a regular basis, the figures presented in this paper reflect the state of knowledge from PDaLo at the time of writing.

SEISMIC DISASTERS 1983-2012

Based on available PDaLo records, Pacific Island countries and territories (PICTs) reported 1105 events caused by 'natural' hazards since records began[1]. Around 615 of these occurred over the 30-year period, extending from 1983-2012. Of those events, seismic events represented the minority, accounting for around a quarter of all disaster events reported[2].

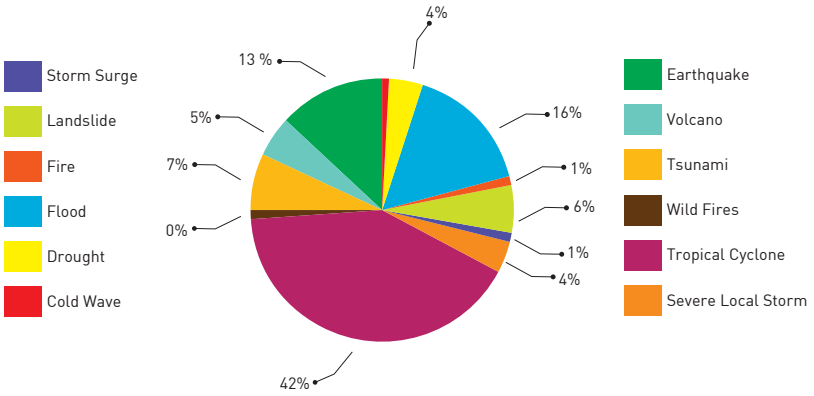


Figure 1 Natural type disasters in the Pacific 1983-2012

The most commonly reported seismic disasters were earthquakes, accounting for just over half of all seismic disasters reported in the region. Tsunamis were the second most common (Figure 2).

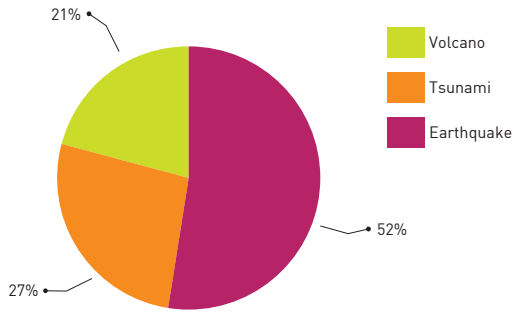
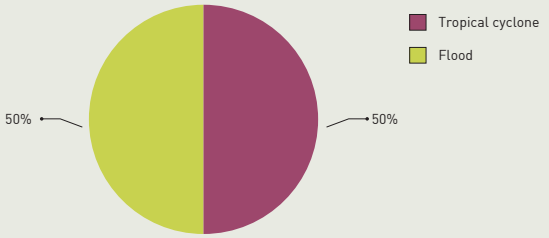
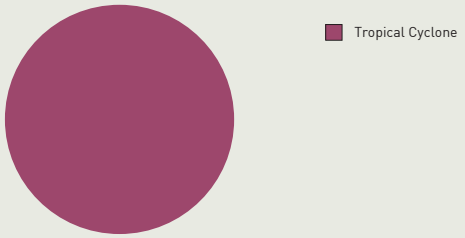


Figure 2 Share of seismic disasters regionally 1983-2012

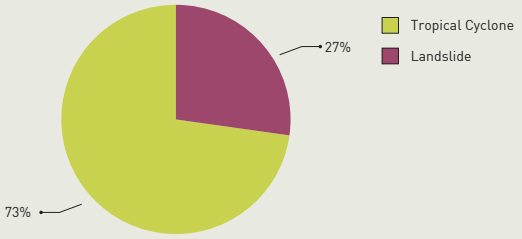
American Samoa



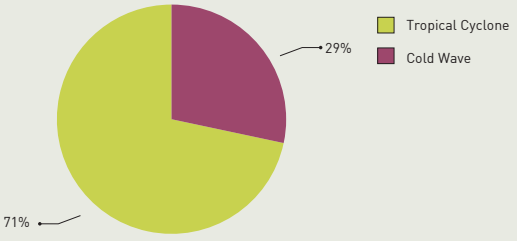
French Polynesia



Wallis and Futuna



Guam



[1] Does not include epidemics and other disasters such as plane crashes, building fires and so on.

[2] Landslides may be caused by both seismic and hydrometeorological events but their cause is rarely specified in the records. (This data gap is likely to be addressed in the future as record keeping improves.) Landslides may thus be omitted from statistics or attributed for illustrative purposes. If landslides are included in hydrometeorological statistics, seismic events account for 25 per cent of all natural hazard disasters in the Pacific for the last 30 years. If landslides are instead attributed to seismic events, this proportion rises to 31 per cent.

At a general level, the PICT most prone to seismic disasters was PNG, accounting for almost half of all reported events, followed by Vanuatu (Figure 3). In both cases, the most commonly reported seismic disaster event was earthquakes, followed by volcanic eruptions (see Annex for details).

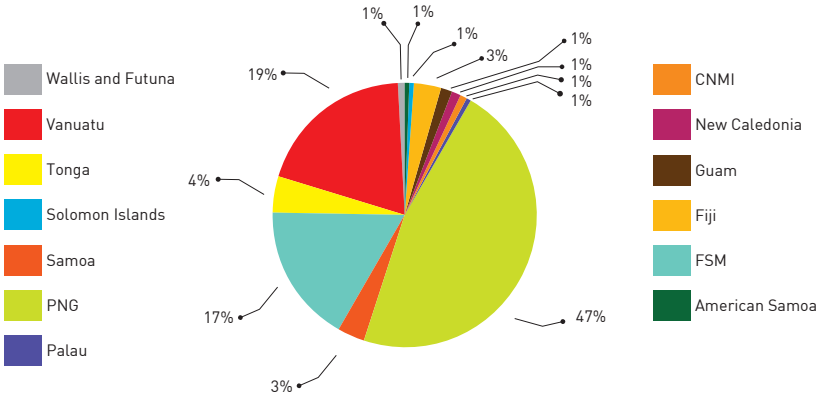


Figure 3 Seismic disasters in the Pacific 1983-2012 by type

REPORTED COSTS

Indexed to 2012[3], the total cost of seismic disasters over the period was reported to be in the order of US$ 522 million. By far, the largest portion of the costs went to PNG which reported costs of around US$ 370 million, followed by Samoa (US$ 127 million) (Figure 4). Detailed figures can be found in the annex.

While PNG did sustain the highest number of events and reported costs, a high number of events will not automatically imply large costs. This is because:

- Data on the impact of disasters in the Pacific are highly patchy. Disasters are often reported but their costs not assessed in money terms, either at all, or in total. As a result, the costs of some disasters may be missing from the picture so that a PICT with many disasters may officially only report relatively low costs.
- No disaster is the same as another. The intensity and scale changes from one event to the next.

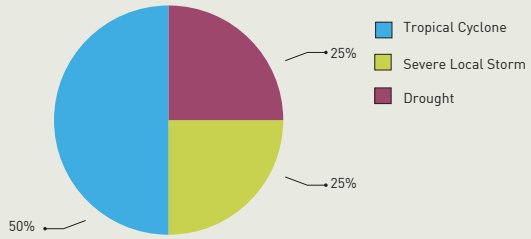
This latter point is evidenced by the fact that Vanuatu reported the second highest number (30 per cent) of seismic disasters over 1983-2012, yet accounted for only 3 per cent of reported costs. By comparison, Samoa accounted for only 3 per cent of reported seismic disaster events, but accounted for almost a quarter of all reported costs. The cost of seismic disasters in Samoa was particularly influenced by the 2009 tsunami which was assessed to have cost the country US$ 39 million (PDaLo; GLIDE records).

DATA CHALLENGES

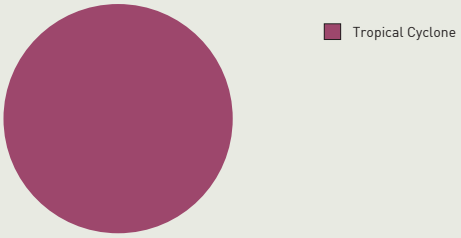
In practice, the patchy nature of reporting on Pacific seismic disasters means that the cost of these disasters is massively understated. In the first instance, few countries or territories in the Pacific assess all costs associated with a disaster. Conventional assessment focuses on damage costs but does not assess losses arising from that damage (such as the cost of interrupted transport arising from damaged roads).

Moreover, PDaLo records presently indicate that over two thirds (68 per cent) of all seismic disasters reported in the region contain no reported values at all for the costs of the event (105 out of 154 events without costings).

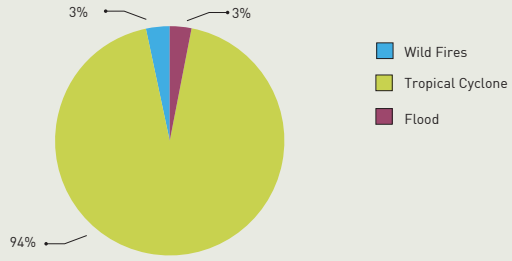
Tokelau



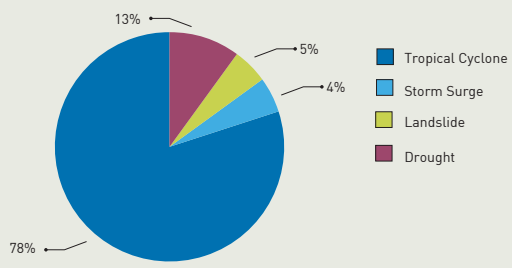
New Caledonia



Cook Islands



FSM



[3] All costs reported over time have been converted to constant dollars, representing the value of those costs in 2012.

Typically, tsunami events are not costed at all while almost half of the earthquake-related disasters are. Of those events that are costed, volcanic eruptions generate the highest average costs of all disasters although, with so few costed volcanic eruptions to consider, it is impossible to tell the true costs associated with such events in-country. Generally speaking, the use of average costs for seismic disasters in the Pacific is, therefore, likely to be unhelpful until more events are assessed.

As a proportion of total disasters reported, the PICT most likely to provide data on the costs of their disasters is Samoa. Having said this and as already indicated, Samoa has experienced relatively few events overall. By comparison, PNG and Vanuatu have only reported costs for 43 and 20 per cent of their seismic disasters in the last 30 years respectively, despite suffering the highest number of events.

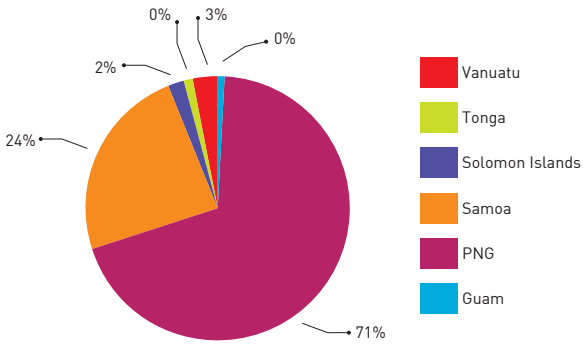
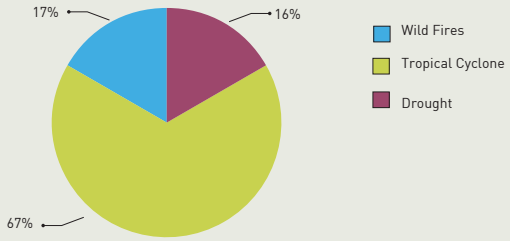


Figure 4 Reported cost of Pacific seismic disasters (1983-2012) US$[4]

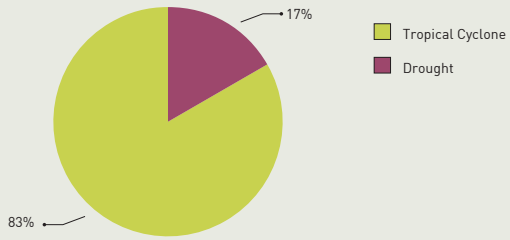
The fact that two thirds of all existing records on seismic disasters in the region lack any cost data will undoubtedly impact the ability of the region to plan strategically to reduce risk. While disasters remain unvalued, PICTs will be hard pressed to make a convincing argument to increase investment in solutions. How can a Disaster Management Organisation convince Treasuries or development partners to dedicate budgets to seismic disasters when they cannot state how much these events actually cost? How can they persuade agencies to develop strategies for different groups when they do not know how much one sector loses compared to another, or in what way?

Actions to address data gaps in assessing and reporting the costs of disasters in the Pacific will improve over time. As an example, economic assessment of disasters will becomes better institutionalised in the Pacific as databases, such as the PDaLo increase in usage and as collaboration between government agencies in data management improves. However, the existing gaps present challenges for strategic investment.

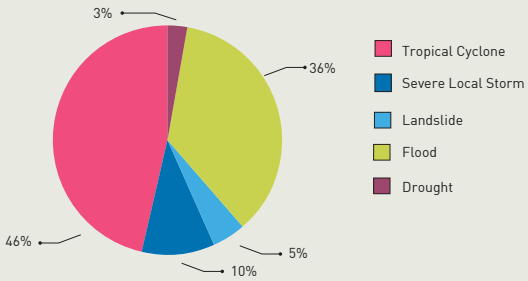
Niue



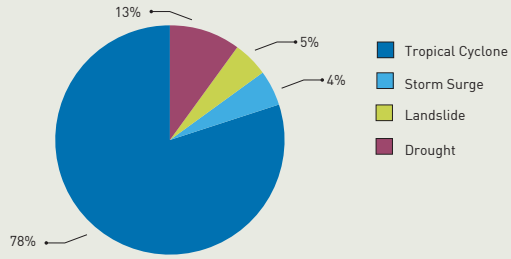
Palau



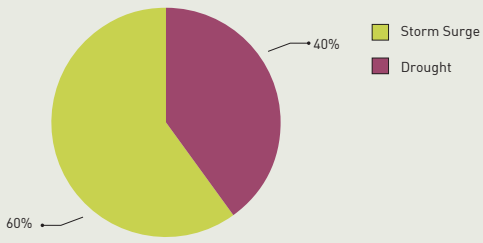
Fiji



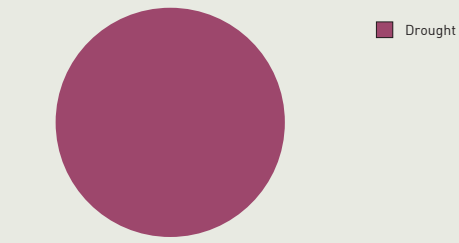
RMI



Kiribati



Nauru

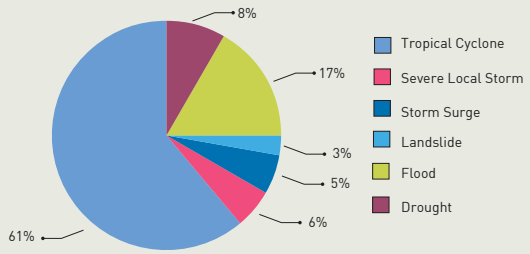


[4] Values are indexed to 2012.

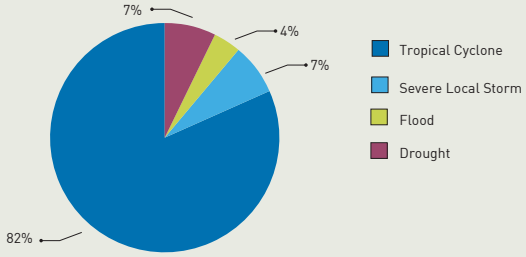
Table 1 Data omissions by PICT

PICT	# EVENTS	US$ 2012 TERMS	EVENTS NOT COSTED	% EVENTS NOT COSTED
Samoa	5	127,373,152	2	40
Guam	2	276,619	1	50
PNG	72	369,850,901	41	57
Tonga	7	2,476,488	5	71
Solomon Islands	26	8,034,766	20	77
Vanuatu	30	14,085,065	24	80
American Samoa	1	0	1	100
FSM	1	0	1	100
Fiji	5	0	5	100
New Caledonia	2	0	2	100
CNMI	1	0	1	100
Palau	1	0	1	100
Wallis and Futuna	1	0	1	100
TOTAL	154	522,096,992	105	68

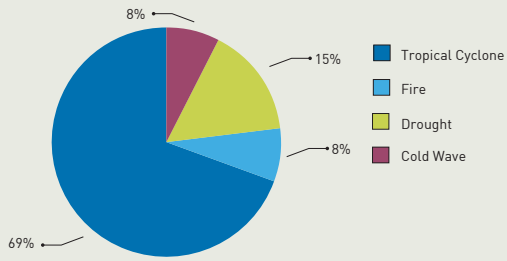
Solomon Islands



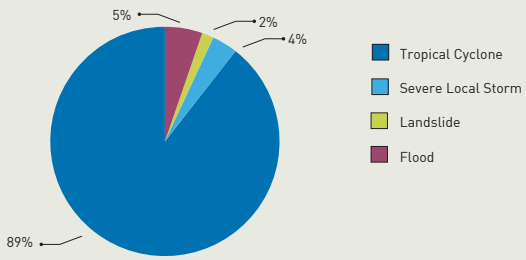
Tonga



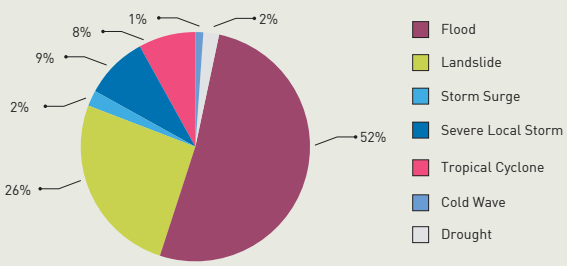
Tuvalu



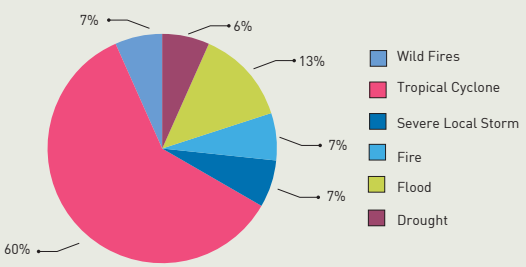
Vanuatu



PNG



Samoa



ANNEX – STATISTICS ON SEISMIC DISASTERS IN DETAIL

Reported number of disasters by country (1983–2012)

	# EVENTS			
	EARTHQUAKE	TSUNAMI	VOLCANO	TOTAL
American Samoa		1		1
FSM		1		1
Fiji	4	1		5
Guam	1	1		2
New Caledonia		2		2
CNMI		1		1
Palau		1		1
PNG	41	12	19	72
Samoa	2	3		5
Solomon Islands	15	10	1	26
Tonga	3	3	1	7
Vanuatu	14	5	11	30
Wallis and Futuna	1			1
TOTAL	81	41	32	154

Reported cost of disasters by country (1983–2012)

	EVENT US$[5]			
	EARTHQUAKE	TSUNAMI	VOLCANO	TOTAL
American Samoa		[no costings]		[no costings]
FSM		[no costings]		[no costings]
Fiji	[no costings]	[no costings]		[no costings]
Guam	276,619	[no costings]		276,619
New Caledonia		[no costings]		[no costings]
CNMI		[no costings]		[no costings]
Palau		[no costings]		[no costings]
PNG	106,242,412	[no costings]	263,608,490	369 ,850 ,901
Samoa	85,636,002	41 ,737 ,149		127,373,152
Solomon Islands	8,034,766	[no costings]	[no costings]	8,034,766
Tonga	2,476,488	[no costings]	[no costings]	2 ,476,488
Vanuatu	14,085,065	[no costings]	[no costings]	14 ,085 ,065
Wallis and Futuna	[no costings]			[no costings]
TOTAL	216,751,354	41,737,149	263,608,490	522,096,992

[5] Values are indexed to 2012.

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