NATURAL DISASTER REDUCTION IN PACIFIC ISLAND COUNTRIES

International Decade for Natural Disaster Reduction 1990-2000

REPORT TO THE WORLD CONFERENCE ON NATURAL DISASTER REDUCTION YOKOHAMA, JAPAN 23 TO 27 MAY 1994

Prepared by:

South Pacific Regional Environment Programme

South Pacific Programme Office
United Nations Department of Humanitarian Affairs

Emergency Management Australia

Cover picture: Aftermath of Cyclone Prema, Tongoa, Vanuatu, April 1993
(photo by: Luc Vrolijks)

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FOREWORD

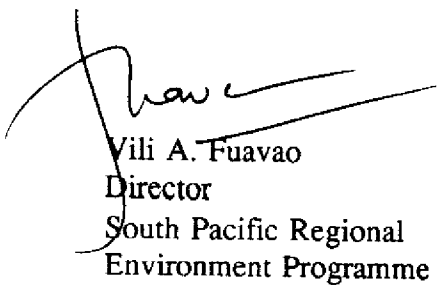
Those of us who are fortunate to call the Pacific Islands home are often reminded of the ravages inflicted on the region by the frequent occurrences of natural disasters. Tropical cyclones, drought, floods, earthquakes, landslides, tsunami and volcanic eruptions are a selection of the hazards in the region. Because of their unique environmental, economic and social circumstances, Pacific island countries (PICs) are particularly vulnerable to natural hazards.

The decision of the United Nations General Assembly to designate the 1990s as the International Decade for Natural Disaster Reduction (IDNDR) means that all countries and agencies should collaborate and pool their resources to reduce the devastation and massive loss of lives often caused by natural disasters. Frequency of disaster occurrence is high in the Pacific region, resulting in constant disruption to social and economic development of countries. In normal circumstances, these vulnerable countries do have difficulties implementing projects successfully without any external disruptions from natural hazards. Therefore for any meaningful and sustained development to be possible, PICs must take up the challenge of the Decade and work towards a programme that will mitigate the long-term impact of natural disasters, thus reducing or hopefully eliminating one of the major constraints to development. The Decade has provided the challenge and the catalyst for all the disaster-prone PICs to actively and persistently strive towards achieving the goals of IDNDR. It was adopted by the UN General Assembly that, by the year 2000, all countries, as part of their plans to achieve sustainable development, should have in place the following:

- Comprehensive national assessment of risks from natural hazards, with these assessments taken into account in development plans.
- Mitigation plans at national and/or local levels, involving long-term prevention and preparedness and community awareness.
- Ready access to global, regional, national and local warning systems and broad dissemination of warnings.

This regional report provides the framework and a clear starting point for all countries in the region to begin to analyse the disaster issues that affect them and to review current activities and future programmes planned to achieve the IDNDR targets at the local, national and regional levels. It is a collective policy statement of the PICs. It maps out a common policy that will enable countries to achieve their own goals and that of the Decade. Only through real commitment by PICs and the international community will these goals are possible.

The role of both SPREP and DHA-SPPO is to provide, wherever possible, technical assistance and funds towards the achievement of the goals of IDNDR. They will work closely with bilateral, multilateral donors, NGOs and other regional organizations to ensure the success of disaster reduction strategies as outlined in this regional report.



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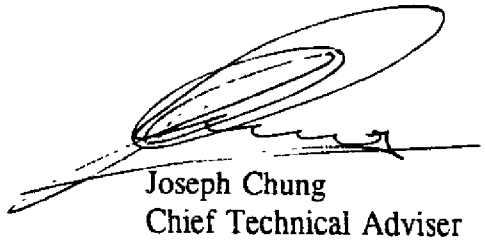

Joseph Chung
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CONTENTS

PREFACE

AUSTRALIA'S INVOLVEMENT

Australia's participation in the International Decade for Natural Disaster Reduction was announced by the Prime Minister on 21 April 1989. To pursue the objectives of the Decade, an Australian IDNDR Coordination Committee was formed under the chairmanship of the Director General Emergency Management Australia, with wide representation from government and from academic, scientific and local communities.

Although the Committee is concerned about disaster reduction within Australia, it also gives significant attention to the needs of neighbours in the South Pacific region. Strong links have been established with the United Nations Department of Humanitarian Affairs in Fiji (UNDHA-SPPO) and on a collective and bilateral basis with Pacific nations.

The development of this regional report began when the Australian IDNDR Coordination Committee held a workshop for South Pacific disaster managers in Honiara, Solomon Islands in May 1992. At that time only three Pacific island countries were members of IDNDR.

A second meeting was sponsored by Australia in August 1993 in Port Vila, Vanuatu. By that time a further two Pacific island countries were members of IDNDR. This activity was organized in response to the resolution of the third session of the IDNDR Scientific and Technical Committee (STC) which encouraged the holding of preparatory meetings, both regional and technical, relevant to the World Conference. The meeting resolved to develop this South Pacific Regional Report for the World Conference.

Subsequently, it was also resolved that a regional organization should coordinate the preparation of the report. This has been done by the South Pacific Regional Environment Programme (SPREP) assisted by UNDHA SPPO, United States Agency for International Development and Emergency Management Australia.

To date 12 Pacific nations have joined IDNDR and arrangements are being made to form a regional IDNDR committee.

The Australian IDNDR Coordination Committee has been privileged to work in partnership with Pacific island nations. Together, we can ensure that the outcomes for the Decade are positive, and that there will be a significant reduction in the loss of life and property damage from natural disasters as a result of our combined efforts.

Brigadier Alan Hodges
Chairman
Australian IDNDR Coordination Committee

NATURAL DISASTER REDUCTION IN PACIFIC ISLAND COUNTRIES

ABSTRACT

The South Pacific Report to the World Conference on Natural Disaster Reduction represents the voice of 14 Pacific Island Developing Countries. It describes the region, its natural hazards and vulnerabilities and outlines a common strategy and the means necessary to implement this strategy. The region is characterised by small land masses dispersed over the world's largest ocean. A wide range of natural disasters occur in the region, with tropical cyclones as the most common and damaging natural hazard. The small island developing states of the Pacific are extremely vulnerable to these hazards, and consequences to individual countries often reach severe proportions.

The report describes the main issues that have shaped the way in which disaster management has developed and which form the constraints and opportunities for disaster reduction during the remainder of the IDNDR. The overriding issue is that disasters frequently and intensively disrupt the development of countries in the region. Other issues are the scale and orientation of economies, population growth and concentration and limited human resources. An issue of considerable concern is climate change and sea level rise, which may have a profound impact on the region.

The common strategy for disaster reduction outlined in the report comprises four key areas: human resource and institutional development; hazard and risk assessment; disaster warning and community preparedness; and disaster mitigation for sustainable development. For these key areas the report outlines approaches and priorities. The means of implementation outlined in the report puts the primary responsibility within the countries but concludes that their efforts will need to be supplemented by regional and international organizations and other donors. The report emphasises the need for effective cooperation and collaboration at national and regional level.

IDNDR has had only limited impact in the South Pacific region to date and only a small part of the disaster programmes in the region is linked to the Decade. It would be beneficial to the region if the IDNDR infrastructure is used to strengthen the implementation of the common strategy for disaster reduction. The opportunities identified in the report include contribution to raising awareness within the region, improved access to scientific and technological information and increased appreciation of the characteristics and vulnerabilities of Pacific island states, leading to further cooperation.

The report urges the World Conference and the IDNDR Secretariat to give special recognition to small island developing states. Towards an action programme for the second half of the decade, the document recommends the following:

1. The focus of the second half of the decade be on the implementation of disaster mitigation projects at national and regional levels.
2. The High Level Council and the Scientific and Technical Committee be tasked to actively support fund-raising for identified disaster mitigation projects.
3. Action be taken to support and facilitate the setting up of a South Pacific Regional IDNDR Committee for the exchange of ideas, information and strategies for disaster reduction in the region.
4. Action be taken to appoint a representative, nominated by the South Pacific Regional IDNDR Committee, of Pacific Island Developing Countries for the Scientific and Technical Committee.
5. The IDNDR Secretariat intensify efforts to facilitate exchange and cooperation between regions.

INTRODUCTION

This report represents the voices of 14 Pacific Island Developing Countries. It outlines the problems and opportunities we see to address the issue of disaster reduction in our region. The countries represented in this report are: Cook Islands, Federated States of Micronesia, Fiji, Kiribati, Marshall Islands, Niue, Palau, Papua New Guinea, Solomon Islands, Tokelau, Tonga, Tuvalu, Vanuatu and Western Samoa. In international disaster management circles, the South Pacific is sometimes seen as an annex to the Asia region. One of the aims of this report is to increase the international community's understanding and appreciation of the unique character of our societies, along with the vulnerability and the hazards we face.

Natural disasters are one of the specific threats to which our small island developing states are exposed. It will be a major challenge to reduce the impact of natural disasters in our countries, especially in view of increasing vulnerabilities and potential impacts of climate change and sea level rise. We see regional cooperation and a common strategy in addressing this challenge as a viable way to optimize our efforts in meeting the objectives of the International Decade for Natural Disaster Reduction. It is hoped that the IDNDR initiative and the World Conference for Natural Disaster Reduction can contribute to this shift from disaster response towards pre-disaster planning and disaster reduction.

The report is prepared as a contribution to the World Conference on Natural Disaster Reduction, held within the framework of the International Decade for Natural Disaster Reduction in Yokohama, Japan, in May 1994. We outline a common approach for the South Pacific, presenting six strategic measures to reduce disasters in our region, including the means and actions that we consider necessary to implement these strategies. It is hoped that the International Decade for Natural Disaster Reduction will serve as a catalyst for the implementation of our disaster reduction strategy, and similar efforts around the world.

This contribution to the World Conference is based upon reports prepared by national IDNDR committees in the region, consultations with all regional countries in January - February 1994 and the following recent meetings and workshops:

- South Pacific Regional Meeting of IDNDR Committee Representatives, Port Vila, Vanuatu, 25-26 August 1993.
- South Pacific Workshop, United Nations Disaster Management Training Programme, Apia, Western Samoa, 29 November to 4 December 1993.
- Regional INSARAG meeting, Apia, Western Samoa, 6-7 December 1993.
- Regional Technical Meeting for the Pacific and Indian Ocean, in preparation of the World Conference on Sustainable Development of Small Island Developing States in Barbados in 1994, Port Vila, Vanuatu, 31 May to 4 June 1993.
- South Pacific Disaster Managers Workshop, Honiara, Solomon Islands, 11-14 May 1992.

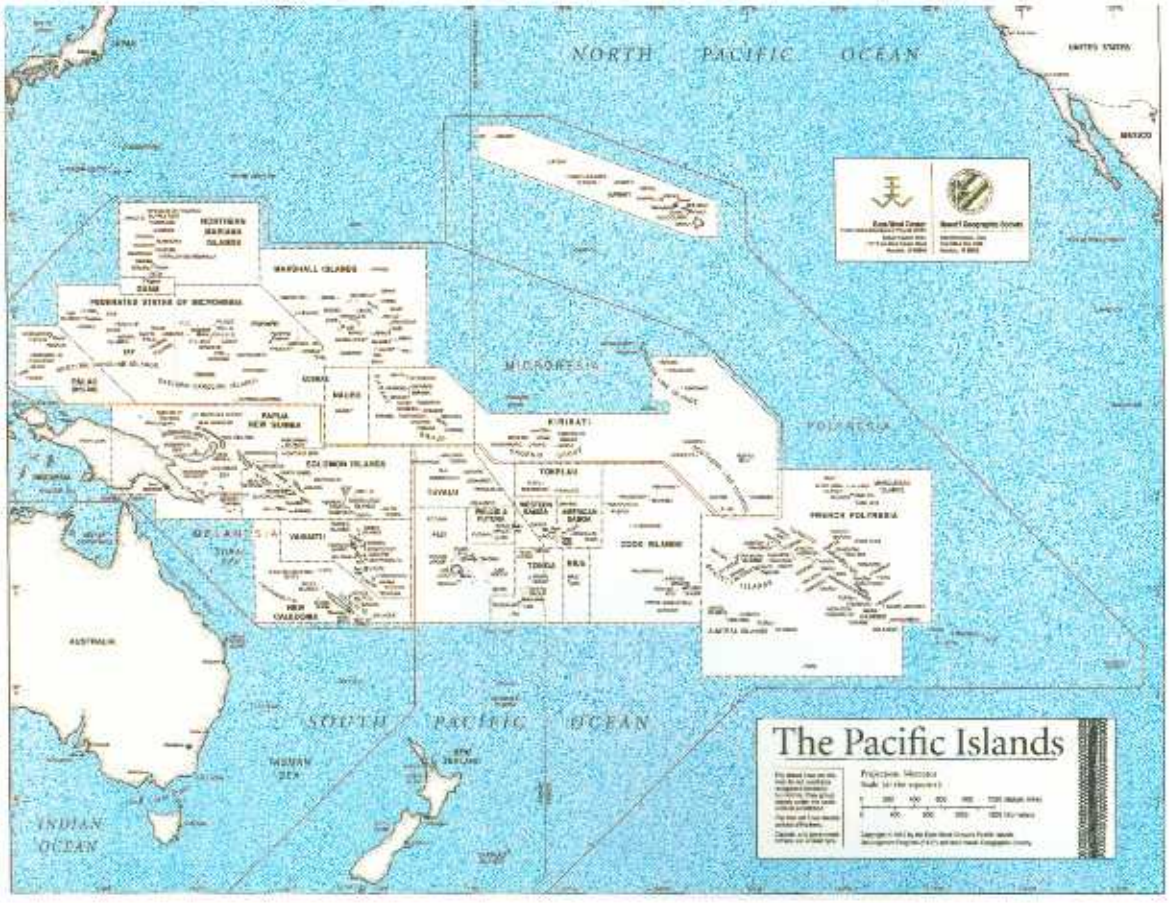
Chapter 1 of the report describes the context in which our disaster reduction efforts will take place. It describes the hazards, vulnerabilities and institutional arrangements that form the basis of our operations. Chapter 2 describes current and recent activities in disaster management at national, regional and international level. In Chapter 3, we outline what we see as the main issues in disaster reduction in the South Pacific region, while Chapter 4 formulates our common strategy to reduce disasters in our region. Chapter 5 identifies the means considered necessary to implement this strategy. Chapter 6 finally, describes how our efforts are linked to the International Decade, and suggests how IDNDR can further contribute to our disaster reduction efforts.

CHAPTER 1

THE SETTING

1.1 THE REGION AND ENVIRONMENT

The South Pacific is unique, not only because our geographical, biological, sociological and economic characteristics are found nowhere else in the world, but also particularly because of the combination of these characteristics in our region. The combined Exclusive Economic Zones (EEZ) of the countries occupy 30 million square kilometres, but the land area is only 1.8 percent of that total. The area has an estimated population of 5.8 million, of which 4 million are in Papua New Guinea. The island countries vary greatly in their physical and economic characteristics and their resource endowments.



The South Pacific covers a vast area, with small land masses dispersed over part of the world's largest ocean. Even within countries, distances can be vast. The region's economic and cultural base is highly dependent upon the natural environment and is vulnerable to a wide range of natural hazards. The cultures and languages, traditional practices and customs of the region are very diverse. Land tenure systems vary throughout the region, but are commonly based on communal land ownership patterns, in which a large degree of communal control is retained over land use and the exploitation of natural resources.

The Melanesian countries of Fiji, Papua New Guinea, Solomon Islands and Vanuatu are extensions or parts of undersea mountain ranges. They comprise large, rugged, mainly volcanic islands which are generally rich in natural resources. They have relatively fertile land, mineral wealth and abundant living marine and terrestrial resources.

Micronesia and Polynesia are made up of countries comprising small island groups. The Cook Islands, the Federated States of Micronesia (FSM), Tonga and Western Samoa have some volcanic islands with rich soil. Most of the islands are however small, isolated atolls with poor soils. Among these are Kiribati, Marshall Islands, Tokelau and Tuvalu, where the highest elevation does not exceed five meters and is commonly between one and two meters. The seas of Polynesia and Micronesia are generally rich in living resources and reported to have significant prospects for exploitable non-living resources, but apart from these, the natural resources of these islands are severely limited.

Upolu, Western Samoa

Global concerns about the inter-relation between natural disasters and the environment, and their combined impacts on society, are of particular relevance to the South Pacific. First because natural disasters cause extensive disruption of the development process in small island states, and second because of the high degree of dependency on the natural environment.

The way in which Pacific island countries may be affected by climate change is not yet clearly established. However, there is widespread concern about the potential impact that may be inflicted on the vulnerable natural and human environment of the region. Part of this concern is that potential global warming may induce an increase in the severity and frequency of meteorological and hydrological hazards in the region.

Increasing frequency and intensity of tropical cyclones, increased rainfall, heavier floods and higher storm surge levels are all hazardous phenomena that may be associated with climatic change. Some sources indicate that an increase in intensity and frequency of natural hazard impacts may well be one of the first climate change effects on populations. These sources continue to conclude that "the obvious path for development planning, sensitive to the threat of global warming and to losses from natural disaster, is firstly to improve the ability to manage current hazards".

Better management of current hazards also includes increasing efforts to reduce the vulnerability of communities and natural environments to these hazards. This will require increasing efforts of countries, communities and individuals. This is of particular importance in the Pacific region in view of the frequency of natural disasters caused by cyclones, floods and droughts, and the vulnerability of human and natural environments.

1.2 HAZARDS OF THE REGION

The Pacific is often exposed to extremely damaging natural hazards, primarily in the form of catastrophic cyclones, volcanic eruptions and earthquakes. Some islands are also susceptible to landslides, extended droughts and extensive floods. A table showing regional nations' vulnerability to these hazards appears on page 9. For those affected by these natural hazards, the economic, social and environmental consequences can be severe and long-lasting. As a result of climate change, disaster events, such as cyclones, droughts and floods are forecast to occur in increasing frequency and intensity, and Pacific island developing countries increasingly recognize the need and challenges to addressing these issues.

Aftermath of Cyclone Val - Savaii, Western Samoa, 1991

Of the natural hazards that affect the South Pacific region, tropical cyclones are the most frequent and have the most damaging effect. For example, the Republic of Vanuatu is one of the most cyclone prone of the Pacific island nations with 29 cyclones between 1970 and 1985. A recent study concluded that in any 20-year period since 1940, any given location in Vanuatu would be affected by around 10 cyclones. Similar figures exist for a number of other countries in the region. The countries most at risk from tropical cyclones include Vanuatu, Fiji, Solomon Islands, Tonga, Niue, Cook Islands, Western Samoa, Palau, FSM and Marshall Islands.

Tropical cyclones are relatively rare in Kiribati, Tuvalu, PNG and Tokelau, but even in these countries, damaging cyclones do occur. Tokelau for example had only recorded three such storms since 1846, until the last five years, when the country experienced two cyclones (Tusi and Ofa). Ofa was so severe that waves completely covered the islets of the atoll, washing away topsoil. Residual salt prevented crop growth for some months and salt contaminated the freshwater lens making it too brackish for drinking purposes. Papua New Guinea was affected by cyclones as recently as May 1993 and January 1994.

Cyclone Namu flood damage - Solomon Islands, 1986

Tropical cyclones in many cases trigger other hazards, in particular storm surge, flash-floods and landslides. In fact the most serious impact of a tropical cyclone, in many cases is caused by the coastal and riverine floods that often follow. Wave impact associated with cyclones can be particularly severe on atolls, where sometimes the landscape is drastically altered after cyclones. In Tuvalu for example, tropical Cyclone Bebe hit Funafuti in October 1972, and formed a huge rubble rampart of 18 km. long, which is still visible today. One of the major disruptions in Fiji after Cyclone Kina in 1993 was that three major bridges were washed away by flood waters.

Landslides can cause major disasters, in particular in the Melanesian countries. They often happen as a secondary disaster to cyclones or earthquakes. Research has shown that landslides in Fiji are in most cases triggered by heavy rainfall, often associated with tropical cyclones. The most extensive landslides were recorded after Cyclone Wally in 1980, when Fiji's main road between Navua and Yarawa was blocked by 45 huge landslides.

Droughts are slow-onset disasters, and their impact tends to be underestimated. But especially on atoll islands, droughts can impose considerable hardship. For example during the 1950s a considerable number of i-Kiribati* were resettled to the Solomon Islands. Kiribati, now an independent country, needs to develop its capabilities to deal with such a situation, because if a similar event were to occur again, it would have to solve the problem within its own borders.

Although earthquakes and volcanic eruptions do not frequently cause large scale disasters, they pose considerable threats to some of the South Pacific countries, in particular Vanuatu, Fiji, Tonga, Solomon Islands and Papua New Guinea. The recent earthquakes in Papua New Guinea caused 41 deaths and forced the evacuation of over 7000 people, mainly because of landslide hazards. *(see opposite page)*

Manam Volcano - Papua New Guinea

Tsunamis have not frequently caused disasters in recent times, although their generation is considered one of the potentially serious consequences of earthquakes for most of the region.

Global warming and sea level rise are the most serious long term disaster threat. Pacific island countries are particularly vulnerable because they include many hundreds of low-lying islands and atolls, house most of their populations in coastal zones, and depend on extremely scarce supplies of potable ground water.

**People of Kiribati.*

In October 1993, a magnitude 7.2 R earthquake struck the Finisterre Range in the Madang and Morobe Provinces of Papua New Guinea. It caused huge landslides over a large but sparsely populated area, resulting in 41 deaths and more than 7000 people being evacuated to four care centres. A few weeks later, earth-dams created by the landslides, were breached, destroying major bridges over the Gusap River.

1.3 LEVELS OF VULNERABILITY

A number of studies have indicated that small island states have high levels of vulnerability to natural hazards. The South Pacific region is no exception, and natural hazards tend to have considerable impact on the economies of Pacific island countries. The consequences for individual countries often reach severe proportions due to the following factors:

1.3.1 Proportionately Very High Disaster Impact - Pacific island countries, in terms of physical size and their economies, are usually dependent on a narrow range of commodities, mainly from the agricultural, fisheries, and forestry sectors. The disaster impact is often proportionately very high, paralysing a whole country and causing damage that may be equivalent to annual GNP and resulting in very long recovery period. This places considerable stress on small island economies, destabilising other development processes.

1.3.2 Fragile Island Environments - The narrow resource base and the limited carrying capacity of the environments of countries in the South Pacific make them vulnerable to long term damage by natural and man-made disasters. Atoll communities and settlers of coastal plains are vulnerable to tropical cyclones, storm surges and coastal floods due to the characteristics of their environments, in which houses, agriculture and water sources are easily damaged or destroyed by natural hazards.

1.3.3 Scattered and Isolated Island Communities - Pacific island countries are characterised by their scattered and isolated communities of small size, with limited resources. This means it is both difficult and expensive to keep such communities aware and prepared, and to provide emergency assistance. Transportation and communication become extremely important in these circumstances, and their limitations and cost make it difficult to reduce the impact of disaster.

1.3.4 Urbanization and Population Pressure - The vulnerability of populations in both rural and urban areas to natural disasters is increasing because of growth rates and urbanization. Increasingly, hazard-prone urban fringe areas are settled. Newcomers in these urban areas often do not have the resources or knowledge to take adequate precautions against natural hazards. Urbanization tendencies give rise to high population densities and increase the vulnerability of communities. Loss of agricultural land and degradation of forests, lagoons and reefs, following urbanization, further increase the natural disaster risks.

1.3.5 Degradation of Traditional Coping Mechanisms - Traditionally, Pacific island communities had developed numerous measures to help them withstand the impacts of natural hazards, although often not without considerable hardship. These measures included food preservation, planting of 'disaster crops' and systems of social support between individuals and communities. However, economic and social change, as well as urbanization are factors that have reduced the efficacy, or the incentive to maintain many of the traditional measures. This results in an increased dependency on governments and external donors, and a decline in self-reliance.

These vulnerabilities follow from the characteristics of our societies and present day development processes. Our major challenge in disaster reduction is to formulate and implement strategies to reduce the vulnerability of Pacific island communities within this context.

PACIFIC ISLAND COUNTRIES
ESTIMATED LEVEL OF VULNERABILITY TO SPECIFIC NATURAL HAZARDS

Country	Population	Land Area (km2)	Cyclone	Coastal Flood	River Flood	Drought	Earthquake	Landslide	Tsunami	Volcanic Eruption
Cook Islands	19,500	240	M	M	L	H	L	L	M	-
Federated States of Micronesia	114,800	701	M	H	L	H	L	L	H	-
Fiji	752,700	18,272	H	H	H	M	M	H	H	-
Kiribati	76,000	725	L	H	-	H	L	L	H	-
Marshall Islands	50,000	181	M	H	-	H	L	L	H	-
Niue	2,300	258	M	L	-	M	L	L	M	-
Palau	21,600	494	M	M	-	M	L	L	M	-
Papua New Guinea	4,056,000	462,243	L	H	H	M	H	H	H	H
Solomon Islands	337,000	28,370	H	H	H	L	H	H	H	H
Tokelau	1,600	12	M	H	-	H	L	L	H	-
Tonga	97,400	720	H	H	M	M	H	L	H	H
Tuvalu	9,100	24	L	H	-	M	L	L	H	-
Vanuatu	156,500	12,200	H	H	H	L	H	H	H	H
Western Samoa	163,000	2,935	M	H	H	L	M	H	H	L

H = HIGH M = MEDIUM L = LOW

1.4 NATIONAL DISASTER INSTITUTIONS

Most countries in the region have some institutional mechanism in place to cope with natural disasters. In general however, responsible organizations are oriented towards emergency response and disaster relief, with some limited disaster preparedness responsibilities. Institutional arrangements vary considerably between countries, but two typical models can be distinguished:

1.4.1 The first model often has a relatively strong disaster organization, with responsibilities that are limited to the management of the immediate emergency. These organizations are usually linked to police forces. This type of disaster organization operates in the Cook Islands and Vanuatu. One problem is that the emergency management organization misses the link with development and reconstruction aspects of natural disasters. Responsibility for the preparation of rehabilitation programmes tends to be unclear in situations where the formal disaster management organization is only charged with disaster preparedness and emergency response. This often leads to a lack of emphasis and lower priority for disaster mitigation activities. Efforts to include disaster considerations in development planning are often limited by inadequate linkage between disaster managers and development planners. The Cook Islands government is currently working to expand the roles of its disaster organization to address these issues.

1.4.2 The second model is one in which a government agency or team has a broad range of responsibilities in disaster management. This includes disaster mitigation, preparedness, emergency response, relief and rehabilitation. These organizations are often responsible for a host of other activities, eg in Papua New Guinea, fire, police-emergencies, civil strife and search and rescue are included in the portfolio of the disaster manager. Fiji and Palau are other examples of such organizational structures. Although this type of organization enables a broad approach to disaster management, they tend to be weak, due to a lack of support from other government departments and lack of government commitment. Disaster managers often operate in isolation without adequate backing.

National level organizations are the key organizations for effective disaster management in our region and further strengthening of these organizations is a precondition for disaster reduction. Efforts to strengthen disaster management will need to take into account the differences between countries in terms of their organization models and will need to improve the weak points in each of the models. This will include linking of rehabilitation and development to disaster management in the first model, and strengthening of the operational capabilities and arrangements in the second model. For both models to be effective, considerable political will is needed.

The status, applicability and quality of national disaster plans varies widely over the region. Some countries do not have approved disaster plans, others are outdated or are rigidly based on models followed in other countries without adequately taking into account specific local circumstances. Strengthening of national disaster management organizations will need to be combined with a review and revision of national disaster plans, as part of improving the basis of disaster-related activities.

While their work is often not formally recognized, non-government organizations [NGOs], especially women's and church groups, play an important role in post-disaster response, especially in the provision and/or distribution of relief. These groups have considerable untapped potential to contribute to the reduction of community disaster vulnerability through preparedness and mitigation activities as well as through their roles in public awareness building and education. Efforts to reduce the impact of disasters in the region should encompass institutional strengthening for NGOs so they can better carry out their roles. NGOs also need to be recognized by governments as partners in disaster reduction.