

AODRO

Registered by Australia Post. Publication No. NAW6161

Telephone: (02) 264 9544 (All hours)

International: 612 264 9544

Telex: AODRO AA73304

Cable: AODRO, Sydney

ISSN 0812 3039

2nd Floor
381 Pitt Street
Sydney NSW 2000
(P.O. Box K425
HAYMARKET NSW 2000
AUSTRALIA)

Vol.4 No.2
June 1986

EFFICIENT AUSTRALIAN RELIEF SYSTEM NEEDS PRE-DISASTER BACKING

There is no question that the Australian reaction to tropical cyclone "Namu" which hit the Solomon Islands on 18 May 1986 was swift, generous and efficient.

Now that there is a demonstratively sound system for providing post-disaster relief from Australia to neighbouring countries, attention must be directed to stepping up programmes of assistance in disaster prevention and preparedness.

Australia's machinery for launching overseas disaster relief operations and coordinating governmental and non-governmental efforts is simple and effective. The Australian Development Assistance Bureau (ADAB) is responsible for policy and finance, under the Minister for Foreign Affairs. Operations, other than the mere donation of cash, are then executed either by the Natural Disasters Organisation (NDO), if government resources are involved, or by AODRO, if the mobilisation of community efforts is considered best. NDO and AODRO then work closely together to coordinate execution into an economical, efficient and controlled national response. The contributions made to cyclone "Namu" relief by the community through AODRO, in the form of material aid and a medical team of Emergency Workers, are described separately in this issue of the NEWSLETTER.

An efficient relief system is, however, not enough. The progressive reduction of losses by disaster prevention measures and a growing capacity to respond internally are more important in the long term to the developing countries in the South Pacific. In its submission to the Sub-Committee on the South Pacific of the Joint Parliamentary Committee on Foreign Affairs and Defence, AODRO said, on pre-disaster aid: "Here is a clearly-defined and firmly-declared need for assistance in an area with potential for vital impact on development. The way is open for thorough, sympathetic intervention by friendly neighbours, such as Australia."

Cyclone "Namu" had a devastating impact on the Solomon Islands, as have a series of exceptionally destructive cyclones in Fiji, Vanuatu and Tonga stretching back to 1979 and beyond. Action to halt future losses of this magnitude is urgent. The technology is available to make an immediate impact if it can only be focussed on the problem. Australia, in collaboration with the countries concerned, other bilaterals and the multilateral aid groups can help to achieve this if it so resolves.

Members: Adventist Development and Relief Agency, Austcare, Australian Baptist World Aid and Relief Committee, Australian Catholic Relief, Australian Council of Churches, Australian Freedom from Hunger Campaign, Australian Institute of Radiography, Community Aid Abroad, Foundation for the Peoples of the South Pacific, Health Emergency Workers, Lutheran World Federation, Mr. A. Martin, Multiple District 201 Council of Lions Clubs International, National Council of YMCA of Australia, Royal Australia Planning Institute, Salvation Army, Save the Children Fund Australia, Major General R. J. Sharp, St. Vincent De Paul Society, World Vision of Australia, World Vision International (Aust.).

Neil R Britton

[Dr Britton is on the staff of AODRO. He has conducted natural hazard and disaster research since 1976 and has professional memberships in several national and international emergency management and disaster research associations. He is a member of the Centre for Disaster Studies at James Cook University (North Queensland) and is the author of over 50 publications relating to aspects of natural disaster impact and their management.]

INTRODUCTION

Within the space of five weeks, two tropical cyclone disasters occurred in the Pacific late in the 1985-85 cyclone "season".

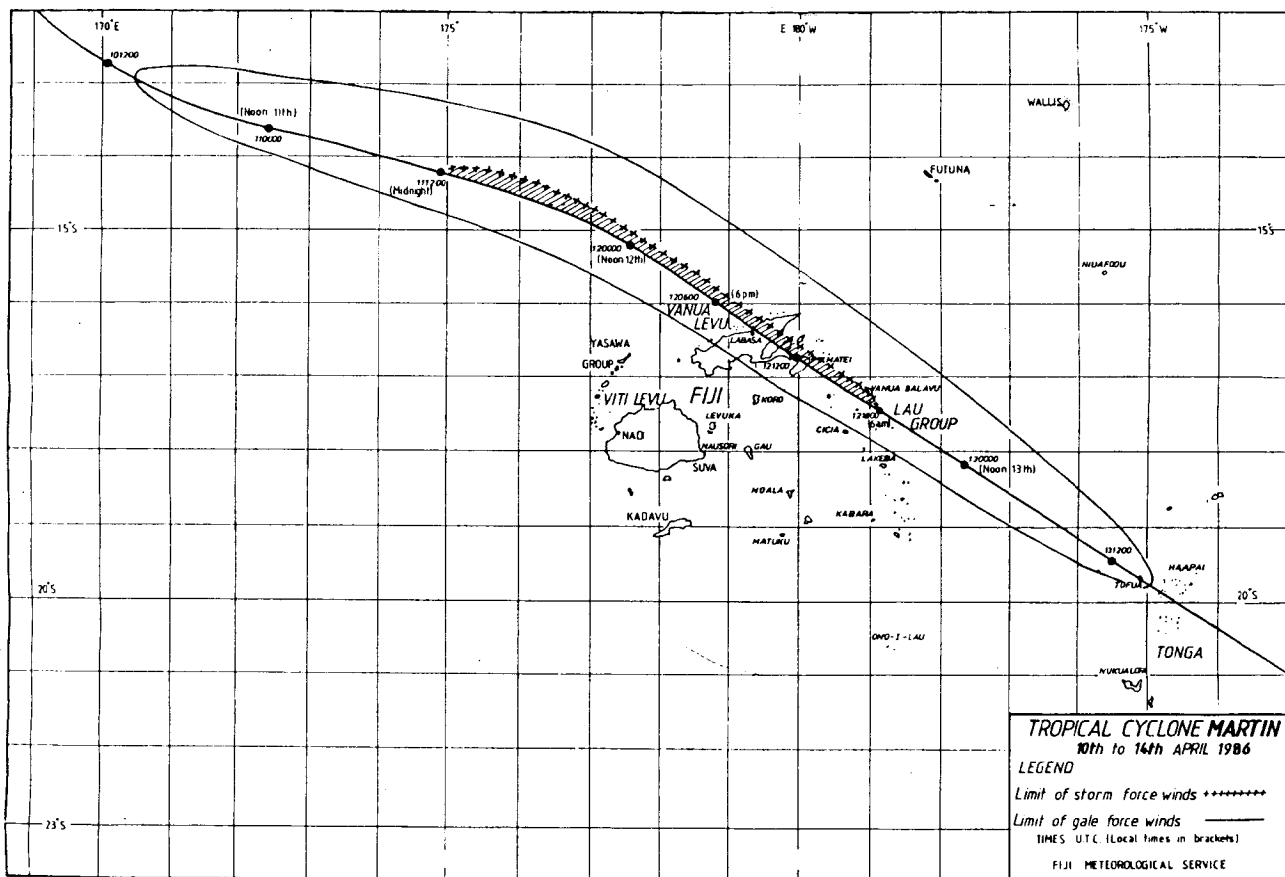
The first, TC "Martin", struck Fiji on the weekend of 12-13 April 1986. "Martin" differed from many of its recent predecessors by passing over parts of the Northern Division, notably Vanua Levu, causing widespread structural and economic dislocation to a part of Fiji that is normally spared the type of damage regularly

experienced on the main island of Viti Levu. "Martin" was not as intense as many other cyclones which have affected Fiji this decade have been (for example, "Arthur", January 1981; "Oscar", March 1983; "Eric" and "Nigel", January 1985). Nevertheless, the damage caused in the Northern Division was significant and the consequences, especially for the economy of the area, will be serious.

The second disaster commenced 18 May 1986. For seventy-two hours, TC "Namu" battered the Solomon Islands. It was, according to the Prime Minister, Sir Peter Kenilorea, the worst storm ever to hit the Solomons. Although the casualty figures were mercifully low, the impact of the cyclone on the social and economic structure was devastating. High wind, driving rain, flash-floods and landslides created havoc on the fragile economy.

TROPICAL CYCLONE "MARTIN"

Prior to the development of TC "Martin", a number of locations in the Fiji Group were coping with localised flooding caused by two weeks of continuous heavy rain. The flooding problem was compounded following the cyclone's movement across parts of Fiji, and while winds from the system had no significant effect on Viti Levu, heavy rain



The track of tropical cyclone "Martin" as it approached and then crossed the Northern Division of the Fiji Group. "Martin" passed over the coast of Vanua Levu in the late evening of 12 April, 1986.

associated with "Martin" probably contributed to major landslips experienced in the Suva area (which resulted in property damage estimated at AUD 37.5 million).

"Martin" began as a shallow tropical depression north-east of the Vanuatu island of Espiritu Santo on Thursday, 10 April. During the next 24 hours the system intensified and began moving in a south-easterly direction (see Map 1). The system developed rapidly and by the early morning of 11 April (Fiji time) it had deepened into a tropical cyclone. The first Special Weather Bulletin (SWB) released by the Fiji Meteorological Service broadcast a gale warning for the entire Fiji Group. This warning message was upgraded to hurricane alert status mid-afternoon 11 April. By this time "Martin" had altered course, moving east-southeast and had picked up speed, although it slowed down again prior to its passage over Vanua Levu. Hurricane force winds were forecast for the whole of Vanua Levu and for several islands in the northern Lau Group during the evening of 12 April, with the rest of Fiji expecting gales, heavy rain and flooding.

By the evening of 12 April "Martin" was centred close to Labasa, and during the following four hours it crossed Vanua Levu. Winds estimated at 60 knots (110 k/h), with maximum gusts of 75 knots (140 k/h) were reported at Labasa and on Vanua Balavu, south east of Vanua Levu. Five deaths were reportedly attributable to the cyclone (difficulty to determine a precise figure for cyclone fatalities is due to the occurrence of several flood-related deaths before and after the cyclone's impact on Fiji). Thousands of people were left homeless, and over 1,800 houses destroyed or severely damaged. Heavy rain fell over most of Vanua Levu and the islands lying in the northern part of the Fiji Group. The cyclone's landfall over Vanua Levu coincided with a high tide, and the combination of storm surge and high tide caused minor flooding to some coastal areas. Early property and infrastructural damage estimates were put at AUD 7.5 million (FD 6m), mostly in the Northern Division.

The area reported to be the worst affected was Kia Island, off the north-west coast of Vanua Levu. Thirty-seven houses including a nursing station, two teachers quarters and a primary school building were either damaged or destroyed. Extensive damage to crops was reported.

On Vanua Levu, extensive damage to cane growing areas was reported. Sugarcane, regarded as the life-blood of Labasa, was flattened within a 40 kilometre radius of the town. Other crops, including rice, fruit trees and food crops were similarly affected. Estimates by the Fiji Sugar Corporation immediately following the impact of "Martin", suggested wind and water damage may have effected up to 300,000 tonnes of crop (almost a third of the expected harvest), with a monetary value as high as AUD 9 million (FD 7.5m). If this is so, the overall effect "Martin" could have on the Northern Division sugar industry may result in significant reductions of the normal harvest output. This will obviously have an adverse effect on total sugar production and consequently on the Fijian economy.

A statement by the Fiji Minister for Economic Development at a Fiji trade convention held in Sydney during April 1986, puts the impact this cyclone may have on the sugar industry in perspective. According to the Minister, a ten percent reduction in overall sugar production can result in a 2% decrease in the GDP for any given year. This knowledge, together with Campbell's (1985) discussion of the impact of cyclones on Fijian agriculture, and discussions by Britton (1985) and Lester (1985) on the cost of cyclone damage in Fiji (in excess of AUD 160 million over the past seven years), serves as sharp reminder of how vulnerable Fiji is to the tropical cyclone hazard. It illustrates the proneness of the South Pacific generally to natural disaster as well as to the special problems natural hazards pose from the point of view of economic development.

Labasa received a strong buffeting from "Martin" for about two hours, although sustained high winds were limited to about half an hour. At the height of the storm, part of the roof of Labasa Hospital blew away. Seventy percent of the town's electricity was disrupted when officials cut supply for safety reasons after power lines were severed. Several hundred people were evacuated to temporary shelters in Labasa and surrounding towns, many seeking refuge in school premises. In Vuo and Malau, on the coastal reaches of the island, villagers sought shelter in the Fiji Sugar Corporation's bulk store in Malau.

Concern has been expressed about construction methods in the Northern Division. The inability of many private dwellings and public buildings to withstand

the cyclonic winds has caused some authorities to question current building practices on Vanua Levu. In the Labasa area for instance, nine schools were either destroyed or badly damaged. The possibility that school construction could be sub-optimal is of particular concern because of the disaster-relevant function these buildings have as evacuation centres during floods and cyclones. According to some, many people in the Labasa region have not heeded the call to upgrade dwellings to the standards outlined by the Fiji Building Standards Committee and the Fiji insurance industry (see AODRO Newsletter 3[4]). As a consequence, the quality of construction techniques for both private dwellings and public buildings in this area are considered inferior to those in either Suva or the Western Division.

NGO RESPONSE

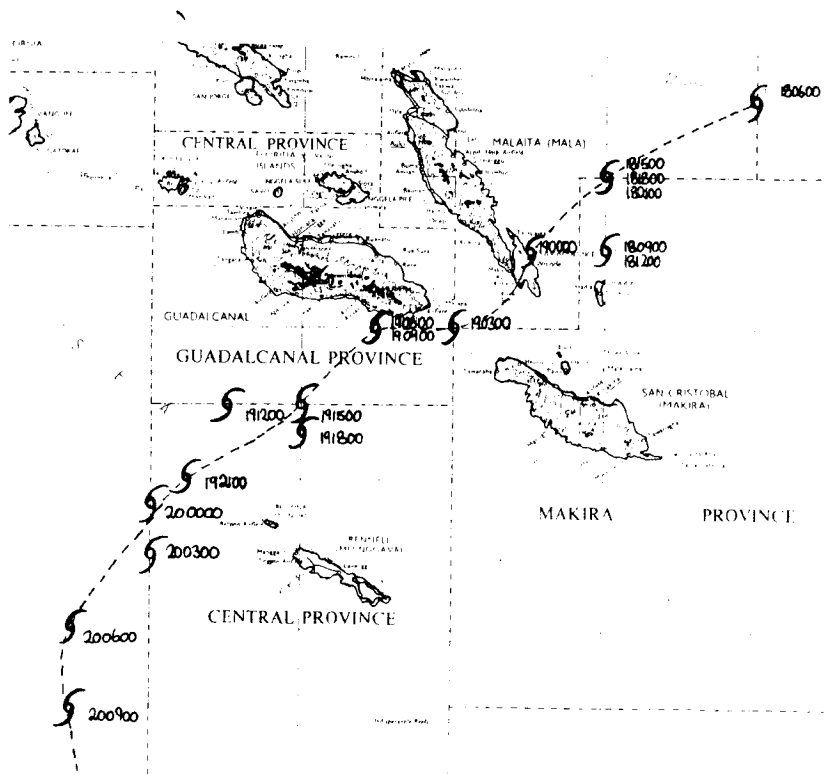
Because of ADRA's role in natural disaster relief in Fiji (see Truscott, 1986), many of the early requests received by AODRO for material aid were to ADRA. In turn, ADRA's South Pacific headquarters in Sydney forwarded several requests for clothing to its partner in Suva. These requests were for the cyclone victims in the Northern Division and the flood victims in the Western Division. It also arranged, through AODRO,

the delivery of 4.5 tonnes of clothing aid from Australia to the affected areas in Fiji. Similarly, World Vision South Pacific, another AODRO member, sent relief supplies.

TROPICAL CYCLONE "NAMU"

The effect of "Namu" on the Solomons will be longlasting. In terms of property damage and casualty figures, this cyclone was the most severe natural disaster to occur in this country in living memory. Had the cyclone struck the main island of Guadalcanal (where the majority of deaths occurred) at night, rather than daytime, the death toll undoubtedly would have been far greater.

Records of past cyclone events in the Solomon Islands are sketchy, especially prior to 1945, but at least fourteen cyclones have crossed the Solomon Islands since 1951. There are many similarities between "Namu" and some of the more recent events, and it is worth briefly reviewing two of these. Tropical cyclone "Bernie" (April 1982) caused damage in northern, western and central Solomons, including the capital of Honiara. While damage from "Bernie" was not extensive in Honiara, parts of western Guadalcanal and the islands of Santa Isabel, New Georgia and Russell



The path of tropical cyclone "Namu" through the eastern and southern provinces of the Solomon Islands. "Namu" developed northeast of Sikaina from atropical depression on 16 May, 1986.

Islands suffered considerable flooding and severe damage to natural vegetation and food gardens. In addition, more than 1,000 people from eleven villages on the east coast of Guadalcanal had to be evacuated following "Bernie". An earlier cyclone, "Kerry" (1979) following a path similar to "Namu", affected parts of eastern Solomon Islands. "Kerry" killed two people, caused several serious injuries and rendered 6,000 homeless.

In many ways, "Namu"s behaviour was typical of cyclones affecting the Solomons. Fisher (1985) has stated that most cyclones which influence the Solomon Islands occur during the beginning or the end of the season (usually November through to April), rather than mid-season. "Namu" swept through the Solomons 18-20 May 1986, thereby maintaining this tendency. Furthermore, if the interval 1948-67 is used as a criteria for cyclone behaviour, Fisher advises the usual location for cyclones to form is the area Sikaiana to Ulawa. "Namu" developed northeast of Sikaiana from a tropical depression on 16 May, 1986. Cyclones that originate in the Sikaiana area usually affect Malaita and Guadalcanal. As Map 2 shows, "Namu" went close to Sikaiana, Malaita, Small Malaita, eastern Guadalcanal, Rennell, Bellona and San Cristobal, causing considerable damage to all these areas. The only possible landfall by "Namu" in the Solomons may have been the tip of Small Malaita. Fisher also

states that central pressures for cyclones within this period are usually in the order of 940-980 millibars. Namu's lowest central pressure was recorded at 986 mb, with a maximum wind gust of 63 knots (117 k/h). However, the worst hit areas around the island of Ulawa, in Makira Province, reported windspeeds peaking at 100 knots (185 k/h). It is likely that the central pressure may have fallen as low as 955 mb after it passed the Solomon Islands. From these preliminary findings, "Namu" can be described as a "severe" to "very severe" cyclone, and weather observers have suggested it is about 3.5 on the Saffir-Simpson scale of tropical cyclone intensity (see Table 1).

It is too early yet for a complete assessment of the damage to be compiled, but with nearly one-third of the Solomon Islands population of approximately 254,000 people (1983 estimate) being affected in some way, the overall cost, to individuals and to the nation as a whole, will be significant. Current estimates place the likely total cost of cyclone damage to be in excess of AUD 100 million. Roads, bridges, schools, hospitals, transmission and telephone lines, and in some cases complete villages have been wiped out. It will be several years before the agricultural industry fully recovers. Preliminary reports place the final death toll at 102 with 32 still missing presumed dead. Ninety thousand

TABLE 1
INTENSITY SCALE OF TROPICAL CYCLONES

Magnitude	Saffir Simpson Scale	Central Pressure (mb)	Maximum Wind Gust		Maximum Storm Surge (m)
			(knots)	m/s	
Mild	1	>990	40-60	20-30	0-1
Moderate	2	970-985	70-90	35-45	1.5-2.5
Severe	3	950-965	100-120	50-60	3-4
Very Severe	4	930-945	130-150	65-75	4.5-5.5
Catastrophic	5	<925	160-180	80-90	6-7

Table 1 illustrates a classificatory system of tropical cyclones based on the Saffir-Simpson intensity scale. Terminology describing cyclones is shown. It must be emphasised that the relationship between central pressure, maximum wind speed and maximum storm surge height are only approximate and that many cyclones do not fit this pattern.

people were made homeless, at least 3,400 dwellings were destroyed and over 4,000 were badly damaged. The National Disaster Council has estimated 30,000 people on Guadalcanal, about 90 percent of the Central Province's total population, were adversely affected and an estimated 6,000 people were left homeless in Malaita Province.

The most profound effect of the cyclone will probably be witnessed on the country's agriculture. The Solomon Islands is heavily dependent upon the export of a few commodities: fish, timber, palm oil, copra and kernels. Fears are being expressed that cyclone damage to these export staples might cripple the economy for the next few years. Prior to "Namu", the Solomons was experiencing a deteriorating economy and the effect of this cyclone will further reduce the country's ability to trade itself out of its current difficulties.

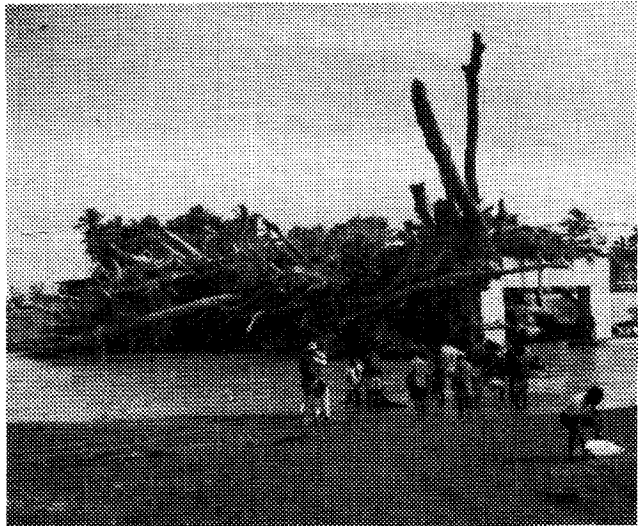
Wind, water, mud and debris damage to private food gardens, which are the mainstay of the islands subsistence agriculture, is substantial. The Natural Disaster Council estimates that nearly 90,000 people will be dependent on relief supplies for at least six months before they will be fully able to work their gardens again. Material damage to large commercial agricultural areas is also very serious. Damage to Solomon Islands Plantations (a Commonwealth Development Corporation oil palm plantation) on Guadalcanal, for instance, is estimated by insurance underwriters to be in the region of AUD 7m. Sol Rice, the country's sole rice producer and importer, also sustained very severe property and crop



The future use of land adjacent to river courses scoured by debris-laden floodwaters, together with the problems now facing authorities after millions of tonnes of silt have been deposited onto agricultural land are some of the many problems confronting the Solomons.

damage, with some rice growing areas buried beneath a metre of mud. Copra plantations on Guadalcanal and Malaita have been seriously affected by both water and wind damage.

Local industries in Honiara have also suffered a major setback. Timber milling operations are likely to be out for one or two months because of flood damage to machinery. This could create a temporary shortage of milled timber required for reconstruction works. While there is no shortage of timber for temporary construction and firewood (an estimated 20,000 tonnes of trees brought down by floods and landslides now litter the Guadalcanal coast), the effect of this loss on the timber industry over the longer term has yet to be assessed. There is some suggestion that indiscriminate logging in the highland area may have aggravated conditions resulting in the subsequent landslips and floods.



Large trees and other debris dislodged by the passage of "Namu" brought down bridges, swept away roads and disrupted other transport and communications facilities, hampering the rescue effort and adding to the huge damages bill.

On Sikaiana, in the early stages of the cyclone's development, food gardens and housing suffered badly. All but ten houses on the atoll were reported destroyed. One of the more serious effects was saltwater and debris contamination of the water supply. Freshwater on Sikaiana has always been a problem and the cyclone compounded this difficulty. In an effort to overcome this, the Solomon Islands Government organized delivery of desalinization plants and well pumps.

Damage to property on the coastal areas of Malaita and Small Malaita was caused mainly

by high winds and rough seas. Further inland, heavy rainfall contributed to further the damage, this time by landslip. Most of the damage occurred on the north-east coasts of central and southern Malaita, around Small Malaita, and up the south-west coasts of Are'Are and Kwaio. Widespread destruction to dwellings, classrooms, clinics, police stations, wharves, and the hospital on Malaita has been reported.

On Guadalcanal, damage to buildings was widespread from Honiara east to Marau and along the weather coast. Most of the destruction was caused by extensive flooding, flash floods, debris inundation and mud deposition, particularly in the plains area east of the island. Rivers broke their banks in numerous places depositing mud and debris over the country's prime agricultural basin. Floodwaters brought down huge trees from the highlands, creating secondary hazards and causing severe structural damage to buildings, roads and bridges. Whole villages were smothered with mud and had to be abandoned. Most of the 102 deaths caused by "Namu" occurred in the eastern plains of Guadalcanal, the majority by drowning or burial by landslips.

In the capital, Honiara, damage was relatively light. Water supplies, electricity and communications were affected for a few days following the cyclone, and the town was isolated from the remainder of Guadalcanal by road blockages and bridge washouts. Houses overlooking the town were wind damaged, with several dwellings being destroyed. About 1,000 people were affected by flooding. On the coastal fringe, saltwater penetration occurred, while to the west and east of Honiara many hamlets were blown down and flooded.

On the islands of Rennell and Bellona houses and food gardens were affected from seawater encroachment, high winds and heavy rain. Bellona had 160 houses flattened and in West Rennell 20 dwellings were destroyed, with both the school and airstrip damaged.

AUSTRALIAN RESPONSE

In response to the destruction of the Solomon Islands by TC "Namu", a massive rescue and relief effort was mounted by Australian non-government organizations (see accompanying article) and the Australian Government. Non-cash aid provided by NGOs up to 4 June 1986 totalled 59,830 kg with an

estimated value of AUD 220,350.

In addition to material aid, two medical teams, a combined 7-person medical team from the Australian Foundation for the South Pacific and Save the Children Fund Australia, and a 6-person AODRO Emergency Worker medical team (see accompanying article) were sent to augment Solomon Islands health professionals.

The Australian Government responded quickly, providing food, medical supplies and other emergency equipment valued between AUD 1.5 - 2 million. Australia's defence forces were mobilised to carry essential stores (including material donated by NGOs), relief workers and damage-repair experts to the Solomons. The Natural Disasters Organisation in Canberra constantly monitored the situation and provided timely situation reports for both government and NGO officials. Airline companies, including Air Pacific, provided free transport space to the Solomons after Henderson Airfield was opened for commercial flights on 26 May.

CONCLUSION

In the midst of death and destruction it is easy to overlook the fact that there are positive aspects to disasters. The most precious asset to come from human tragedy on the scale experienced by the peoples of Fiji and the Solomon Islands is knowledge gained by the disaster experience. This knowledge, if used wisely, can be employed to prevent similar disaster effects occurring in the future. Many lessons will be learned from the impact of "Martin" and "Namu". Valuable insights have already been gained by disaster managers in both these countries. As the post-impact situation unfolds, more experience, greater understanding and further awareness will be generated.

There are many valuable lessons for overseas disaster relief organizations as well. Now is the time for all of us, whether we are victims or helpers, to think and act on the experience and knowledge gained while the tragedy in the Pacific is still fresh in our minds.

ACKNOWLEDGEMENTS

I would like to thank the following people for providing information to assist in the preparation of this report: Mr R Krishna, Director of the Fiji Meteorological Service, Nadi (Fiji); Mr G Crane, Supervising Meteorologist, Brisbane Tropical Cyclone

Warning Centre; Mr R Jackson, General Manager, Queensland Insurance, Suva (Fiji); Mr J Laidlaw, Regional Manager - Pacific, QBE Insurance (International) Ltd, Sydney; Mr D Carroll, Manager, QBE Insurance (International) Ltd, Port Vila (Vanuatu). Responsibility for the interpretation of this information however, rests with the author.

REFERENCES CITED

Britton N R (1985), The nature and effect of tropical cyclones in the Pacific. **AODRO Newsletter**, 3(3), September 1985. pp 2-5.

Campbell J R (1985), Impact of tropical storms and cyclones upon economic activity in Fiji. **AODRO Newsletter**, 3(4), December 1985. pp 6-9.

Fisher N K (1985), Cyclone hazards in the Solomon Islands. Paper presented to the **Disaster Preparedness Workshop for Non-Government Organisations**. Honiara. 28 October - 1 November 1985. Sponsored by ARCS./AODRO.

Lester L R (1985), Small economies, big disaster bills. **AODRO Newsletter**, 3(4), December 1985. pp 3-5.

Truscott W P (1986), ADRA's involvement in Fiji tropical cyclone relief. **AODRO Newsletter**, 4(1), March 1986. pp 2-3.

They found all the village housing and the clinic under almost a metre of mud and deserted except for one male nurse who had remained. In twelve days of hard work the Team treated 500 patients at Mbinu or on patrols to over forty villages in the surrounding area. Meanwhile, the Health Surveyor and the Stores Officer cleaned up the village and restored water and power, the latter with welcome help from members of an Australian APEX work party. Excerpts from the report made by Dr Bill George, the Team Leader, are printed below.

The speed with which this medical team was mobilised, their administrative and technical self-sufficiency and the effective work the various professionals in it were able to do attest to the quality of the people on stand-by as AODRO Emergency Workers and the thoroughness of the planning which has gone into building this volunteer scheme.