



REPORT ON TROPICAL CYCLONE AMI



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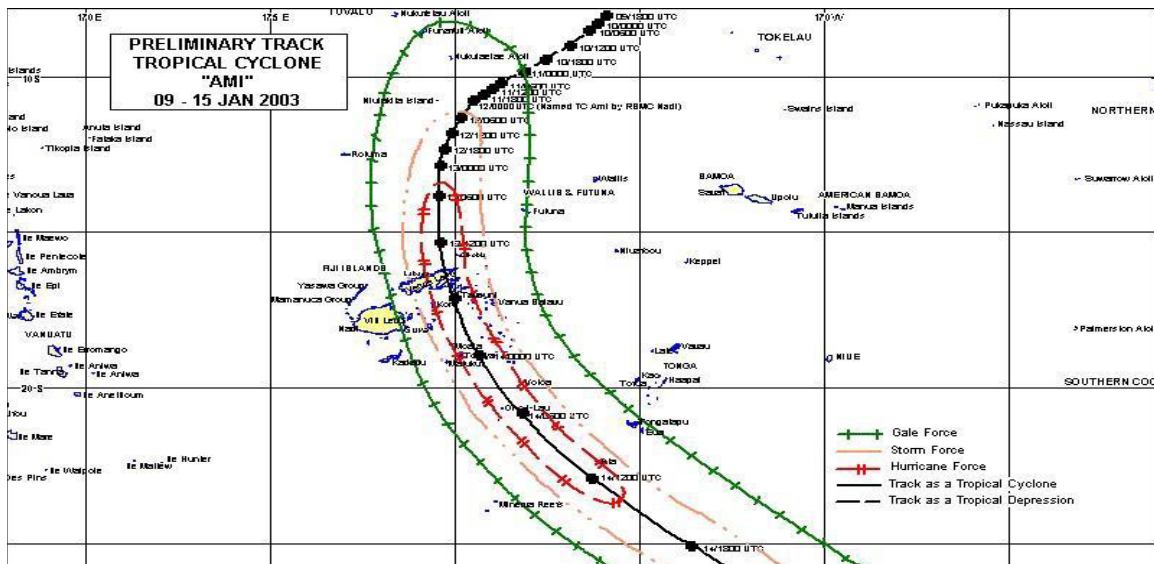
1.0 INTRODUCTION

This Report takes into account the emergency management arrangements that were put in place and operational activities executed immediately before, during and after Tropical Cyclone Ami struck the Northern and Eastern Division. These include: (i) weather forecasts, (ii) cyclone development and tracking, (iii) activation of cyclone response plan and the emergency management machinery, (iv) disaster declaration, (v) disaster impact, (vi) survey and assessment, (vii) relief and rehabilitation, (viii) local and international assistance and (ix) logistics and administrative support carried out by relevant agencies in response to the disaster.

The Report also covers the operation's debriefing that was held after the declared emergency period, which formulated some lessons learnt to be considered for implementation by Government and other relevant agencies to improve the emergency management system and arrangements to effectively deal with future disasters.

2.0 BACKGROUND

Tropical Cyclone Ami yet again brought to the fore the vulnerability and susceptibility of Fiji and its people to tropical cyclone and associated secondary hazards like flood and landslide. With an annual season from November to April, half of a calendar year is projected to an occurrence or more, which has become an annual event with an average of about three devastating events in a decade. Tropical cyclone impacts have become destructive phenomena causing major set back to development in Fiji.



Track Of Tropical Cyclone Ami

Courtesy: Fiji Met Services

2.1 Cyclone Development And Movement – Chronology Of Events

Ami was the third tropical cyclone to form in RSMC Nadi's area of responsibility during the 2002/2003 South Pacific Tropical Cyclone Season (Nov – Apr). The system originated as a tropical depression far east of Tuvalu on the 10th of January 2003 and developed into a tropical cyclone just east of Niulakita, the southern-most island of Tuvalu, on the 12th of January 2003.

The cyclone followed a southwest track initially but gradually turned southwards as it neared Rotuma. Once on a southerly track, Ami accelerated steadily as it approached Fiji on the 13th and moved right across Macuata and Cakaudrove Province in the Northern Division, intensifying to a "Hurricane " as it continued its passage through the Fiji Group. It subsequently speeded through the Lau group and curved southeast by the time it left the Fiji Group.

Ami was a relatively intense tropical cyclone with maximum (10 minute) average winds of about 80 knots and momentary gusts of 120 knots as its peak intensity. The cyclone caused destructive to very destructive storm to hurricane force winds over Fiji's Northern and central Divisions and damaging gale force winds over Tonga and Tuvalu. Damage in Fiji was extensive and severe due to high winds, heavy seas and torrential rainfall that led to the worst ever flooding in the northern town of Labasa.

At 8:40pm on 12 January, Ami was located at about 580 kilometers north-northeast of Labasa or 660 kilometres north-northwest of Vanuabalavu and moving south-southwest at about 15km/hr.

At 9:00am on 13 January, Ami had its centre located about 410 kilometres north-northeast of Labasa or 550 kilometers north-northwest of Vanuabalavu and was moving southwards at 13 km/hr. Vanua Levu, Taveuni and Northern Lau group were issued with gale warning.

As time progressed, Cikobia, Rabi, Kioa, Kia, Vanuabalavu, Naitauba, Tuvuca, Mago, Cicia, Nayau, Lakeba and nearby smaller islands were specifically mentioned in the *Gale Warning*, which indicated the expected occurrence of damaging winds to 85km/hr with momentary gusts 120km/hr over these islands.

The *Gale Warning* was stepped up to *Storm Warning* at 7:14pm. Ami, then accelerated south, towards Vanua Levu and intensified, the radius of gale and storm force winds increased. Also in the evening of 13 January, the Lomaiviti Group was issued with *Gale Warning*.

Northern islands in Vanua Levu and the Lau group were issued with *Hurricane Warning* at 1:51am on 14 January. Some of these places experienced very destructive hurricane force winds averaging 140km/hr and momentary gusts to 185 km/hr at maximum. At the same time Kia, Central Vanua Levu and Koro were placed under a *Storm Warning* indicating destructive winds of 110km/hr

with momentary gusts to 140km/hr to affect these places. A *Gale Warning* was also issued for Western Vanua Levu, Wakaya, Ovalau, Gau, Nairai, Moala, Totoya, Kabara, Matuku, Fulaga and nearby smaller islands in the Southern Lau and Lomaiviti Groups, with damaging winds of 75km/hr and momentary gusts to 100km/hr expected to affect these places. A *Tropical Cyclone Alert* was retained for the rest of the Fiji Group. Ami was then traveling south-southeast at 22 km/hr.

It subsequently speeded through the Lau Group and curved southeast by the time it left the Fiji Group. Ami's passage through the Fiji Group is shown on the map.



Flooding scar after water receded
Photo: Ministry of Information

2.2 Special Weather Bulletin

During Tropical Cyclone Ami, a total of seventeen (17) Special Weather Bulletins (SWBs) were issued for Fiji and Rotuma, i.e., two for Rotuma and fifteen for Fiji.

Rotuma's first SWB carried a *Gale Warning* issued around 3:54pm on Sunday 12 January 2003. Fiji was placed on a *Tropical Cyclone Alert* in its first SWB issued at 8:40pm on the day.

Subsequent *Tropical Cyclone Alerts* were issued every three to six hours thereafter until the first *Gale Warning* for Vanua Levu, Taveuni and Northern Lau Group was issued in SWB No. five at around 9:00am on the 13th. The rest of Fiji remained under *Tropical Cyclone Alert*.

At 7:14pm on 13 January, the first *Storm Warning* was issued in SWB No.7, which indicated that destructive winds with average speeds to 110 km/hr and momentary gusts to 160 km/hr would affect the islands early on 14 January. More areas were consequently placed under warning in subsequent SWBs.



House in ruins after the cyclone

At 1:51am on 14 January, the first *Hurricane Warning* was issued in SWB No. 10 for Cikobia, Eastern Vanua Levu, Rabi, Kioa, Taveuni, Qamea, Yacata, Kanacea, Vanuabalavu, Naitauba, Mago, Tuvuca, Cicia, Nayau, Lakeba, and nearby smaller islands.

Warnings for the Northern, Central and Eastern Division islands were progressively updated and later downgraded as the cyclone moved on a southeasterly direction and accelerated out of Fiji. The final SWB for Fiji was issued around 9:06pm on 14 January as Ami made its way out of the country while maintaining its hurricane intensity.

2.3 Preparedness Measures

The media, both the print and especially the radio stations play a pivotal role in community awareness since the beginning of the 2002/2003-cyclone season. Over the years the National Disaster Management Office (NDMO) through its education and awareness program has been working closely with the media particularly the various radio stations to ensure that the Fiji community is made aware of what to do before, during and after a disaster. This is vitally important especially for maritime communities due to their geographical isolation.

Currently there is an ongoing community awareness program with FBC that started in November 2002, which continuously reminded people of measures to take prior to the Ami event. These messages were aired more frequently as the cyclone continued to move towards the Fiji group.

NDMO through the Public Service Commission issued its annual Circular on Preparations for the 2002/2003 Cyclone season with instructions to Ministries and Departments to pay particular attention to the requirements of the National Disaster legislation and Plan and to take appropriate action.

3.0 ACTIVATION AND OPERATION OF THE DISMAC MACHINERY

3.1 Activation Of National Plans And Emergency Operation Centres

The NDMO reacted swiftly to the warning from the Nadi Meteorological Services and activated the National Cyclone Response Plan (NCRP) and the National Disaster Management Plan (NDMP).

The National Emergency Operations Center (NEOC) and all Divisional EOCs in the Northern, Central, Eastern and Western Divisions were activated simultaneously around 8.00am on Monday 13/1/03 to monitor the situation and effect actions in line with the NDMP.

3.2 Issuance Of Public Advisory

NDMO through the NEOC issued Public Advisories (PA), in all three languages, throughout Monday morning and afternoon, which continued into the night progressively warning people of the impending danger and to take precautionary measures to safeguard life and property. People were warned to seek shelter in more secure structures if they didn't feel safe in their own homes. They were also warned of secondary hazards like flood and landslide and to take appropriate measures such as relocation to safe places and move their animals to higher ground. Mariners were also warned not to go out to sea and to seek shelter in safe areas. The public was advised to contact their District Officers on information pertaining to Evacuation Centers and related issues.

3.3 Closure Of Offices

The Permanent Secretary for Regional Development in his capacity as the National Disaster Controller (NDC) issued a radio message around 12.00 noon on Monday 13 January, advising all Permanent Secretaries and Heads of Departments to close their offices. It was to allow Civil Servants (non essential service only) to vacate their work places immediately and to make necessary preparations for their families in readiness for the impending disaster.

On Tuesday 14 January, the NDC also issued an advisory to the private sector to also consider securing and closing their operations in line with the advice given to civil servants earlier.

3.4 Emergency Committee Meeting

The Emergency Committee (EC) of the National Disaster Management Council (NDMC) met twice to discuss the state of preparedness of relevant agencies and formulated a plan of action for dealing with the prevailing emergency situation.

The Committee discussed initial reports received that Ami had wreaked havoc in the Northern and Eastern Divisions. Extensive flooding caused by heavy rainfall that accompanied the cyclone, further devastated Labasa and a major part of Macuata province. Storm surges also caused extensive damage in some coastal parts of Vanua Levu and smaller islands in the Lau Group. Extensive landslide in the Northern Division closed major sections of road networks in the division and was an impediment to land transportation and mobility in the division.

3.5 Declaration Of State Of Natural Disaster

Pursuant to section 17 of the Natural Disaster Management Act of 1998, the Prime Minister declared a state of natural disaster for the whole of Northern and Eastern Divisions on Tuesday 14 January 2003. A public broadcast by television and radio was announced on the same day and subsequently gazetted in accordance with the legislation.

It was decided to extend the emergency period in force in the two Divisions up to the maximum period of 30 days as required by legislation, to allow emergency relief work to proceed unhindered, and to ensure that all affected communities are assisted. The extension was also necessary to enable the completion of sanitation and general health care work that were being undertaken in several villages and settlements in the Northern Division.

The period of declaration of a state of natural disaster in the two divisions was terminated on 13 February 2003.

4.0 EMERGENCY OPERATIONS

During the emergency stage, the primary objective of Government was to protect life and property, restore essential services and provide immediate relief to victims of the disaster.

Emergency operations in the Northern and Eastern Divisions were undertaken under the overall direction and control of the National Disaster Controller; however, activities in the disaster areas were carried out under the command and control of the two Divisional Commissioners and the District Officers responsible.

Emergency operations in the Northern Division encountered a lot of constraints and were compounded by the fact that most of those involved in the operations had to be content with their own individual disaster as they themselves were victims of either the cyclone or flood, or in worst cases both. These officers deserve commendation for their selfless sacrifice and commitment in effectively dealing with the operations in the division. To make matters worse, the main radio transmitting station in the Northern Division at Delaikoro was out of service and for several days there was no means of contact with the outside world for the whole Northern Division and most parts of the Eastern Division.

4.1 Evacuation Centers

The following evacuation centers (16) were opened for occupancy immediately after Cyclone Ami struck, however, other victims were billeted and assisted by families and friends.

No.	Province	Evacuation Center	Population
1	Cakaudrove	Tukavesi	55
2		Kanacea	25
3		St Bedes College	12
4		Kioa Island Primary	60
5		Buca Govt School	60
6		Waimaqera Taveuni	NA
7		Kanacea	60
8		Rabi Islands School	6 families
9		Rabi-Tarisi	20
10		Druadrua Primary	12 families
1	Macuata	Holy Family	NA
2		Vunimoli	NA
3		Wasavula	NA
4		Fred Cairnes Residence	NA
5		Sukanaivalu Barrack	NA
6		Tawake Village Hall	NA

Figure 1 Evacuation Centers



A family in despair looking for shelter
Photo: Ministry of Information

4.2 Fatalities

The major cause of death was drowning, as was the case with the 14 deaths in the Northern Division. The lone Eastern Division drowning incident was caused by storm surge that flooded Nasaqalau village in Lakeba. The details are provided in Fig 2.

NO	PROVINCE	DISTRICT/ VILLAGE/ SETTLEMENT	NAME	CAUSE OF DEATH	MISSING	DEATH	REMARKS
	NORTHERN DIVISION						
1.	Macuata	Korotari	Ajesh Kumar Ajani Vikashni Shambhu Dutt Sandika Lata Pritika Anjali Subhag Wat Nandita N Dutt Sukh Raji Rajeshni Devi	Drowning " " " " " " "		9	Death: 8 year old male 26 year old female 43 year old male 14 year old female; 26 year old female 38 year old female 14 years old female 70 year old female 6 year old female
2.	Macuata	Naduna	Janif Khan	Drowning		1	Death: 1 x30 year old male
3.	Macuata	Wailevu	Tabresh Khan	Drowning	-	1	Death: 36 year old male
4.	Bua	Nasarawaqa	Ranjit Singh	Drowning	-	1	Death: 54 year old male
5.	Savusavu	Bagata	Sereima Kini	Drowning	-	1	Death: 1 year 8 months old female
6.	Bua	Wainunu	Louis Simpson	N/A	-	1	Death: 2 year old female
7.	Macuata	Korotari	Sandeep S Dutt Roshika Anjalin Maduri Lata		1 1 1	- - -	18 year old male missing during flood 14 year old female missing during flood 37 year old female missing during flood
7.	Macuata	Siberia	Mouala Lifula		1	-	37 year old male didn't return from fishing.
	EASTERN DIVISION						
10.	Lau	Nasaqalau	Semi Lacabuka	Drowning		1	Death: 1 elderly male
	TOTAL				4	15	

Figure 2 Summary - Dead and Missing

5.0 SURVEY AND ASSESSMENT

5.1 Aerial Assessment

The first aerial reconnaissance team left Nausori airport on board a RNZAF Orion on Wednesday morning, 15 January 2003. On board the aircraft were the Prime Minister, Minister for Regional Development, Minister for Lands and Mineral Resources and a Naval Officer.

The reconnaissance covered the province of Cakaudrove and Macuata in the Northern Division before the plane swept southeasterly and further South to cover the Lau group. Based on the flight path and assessment made, the team identified Cicia and Vanuavatu in the Lau group as the worst affected areas.

5.2 Eastern Division



The initial assessment and immediate response, in the division were based on the aerial reconnaissance. The Fiji Navy Vessel KULA was deployed to Vanuavatu and Cicia in the early hours of Thursday 16 January to determine the scope and nature of damage sustained by the two islands and also to provide urgent medical and relief assistance.

Ami's aftermath - A village in the Lau Group

Emergency supply of food, tarpaulin, water and medical supplies were also on board. A medical team and officials of DISMAC carried out the emergency operation.

This was followed by three Naval vessels carrying teams of Government officials assigned to the Lomaiviti and Lau Group to conduct field assessments.

Additionally, the Government vessel Tovuto left on 16/1/03 to carry out assessment in Cicia, Yacata, Vanuabalavu, Nayau and Lakeba for the Ministry of Education. The Government vessels Raiyawa and Natokalau were also deployed on January 16 and 17 to cover the remaining parts of the Lau Group and Lomaiviti Province, to ascertain the priority needs and level of assistance to be provided to those areas. Altogether, 8 teams of 7 officers per team were assigned to the Eastern Division.

5.3 Northern Division

Survey and assessment in the Division was constrained due to the extent and nature of the disaster in the area and logistical problems encountered. DISMAC officials at the Commissioner Northern Office and other civil servants involved in the relief operations were also victims of the cyclone and flooding. This dilemma was compounded by the complete cut-off of telecommunications for several days and inaccessibility of many areas and limited mobility due to debris blockages, damaged roads, broken bridges and other infrastructural damages. However this did not deter the Commissioner and his DISMAC teams with support from other agencies to carry out immediate restoration work and bring the situation under control. Survey teams were organized and deployed by the Divisional and District DISMAC to carry out assessment over the whole division.



Inaccessible road caused by landslide/debris blockage

Photo: Fiji Times Ltd

The lack of vessels available to transport assessment teams forced Government to divert the Government vessel Golea from its trip to Rotuma in order to take DISMAC officials to carry out assessment in areas and islands accessible only by sea. These include Mali, Druadrua, Namuka, Dogotuki, Udu and Cikobia. The survey took several days to complete before decisions were made on the types of assistance to be provided to the victims.



A survey team in Labasa on a private carrier

Photo: Fiji Times Ltd

6.0 SOCIO-ECONOMIC AND INFRASTRUCTURAL IMPACT

6.1 Social Sector

The social impact of TC Ami on both divisions was devastating. More than 8,000 dwelling houses were either partially damaged or destroyed. Refer Fig.3 for details. In some cases, victims were left with clothes on their bodies for days. Fifteen lives were lost largely through drowning with two reportedly missing and were presumed dead.

Damages were caused by the cyclone, flood, landslide and salt spray especially in the Lau Group.

An average of 60 – 80% damage was inflicted on subsistence crops, forcing Government to provide relief food to the affected communities. Water shortage due to damage sustained by the water supply system and infrastructure was also experienced and there was great demand for safe drinking water in affected areas. The water problem posed serious threat to the people and was a contributing factor to poor sanitation and adverse health conditions in some areas.



More than one hundred schools in both primary and secondary were either damaged or completely destroyed. Included in losses were stationeries and equipment. A primary school in Macuata had its entire classroom blocks and teachers' quarters blown away by the cyclone.

A classroom in complete mess

Photo: Ministry of Information

Twenty schools were forced to resume classes this year 1 – 2 weeks after schools officially opened for the 2003 academic year. Some schools after this period were still using makeshift shelters to enable classes to continue. Refer Fig.4-6 for details.

Disruption to power supplies in Labasa and Savusavu hospitals posed a major threat to patients and the health authorities. The situation was at its worse in Labasa where the mortuary could not accept any corpse resulting in the immediate burial of the dead without proper ceremonial rites. There were few outbreaks of water-borne and communicable diseases especially leptospirosis and dengue fever in some villages in Savusavu but were contained by the Ministry of Health officials. These officials were working around the clock and under resourced in terms of transport and equipment and supply of essential drugs, but they did their best despite the circumstance prevailing. Ministry of Health teams were supported by the Red Cross and RFMF medical teams.

6.2 Economic Sector

TC Ami also brought economic woes to the business sector especially in the Northern Division. Many shops in Labasa, Savusavu and Taveuni were flooded resulting in damages to assets and commodities. The tourist industry was also affected with damages inflicted on several hotels in Savusavu and Taveuni as summarized in Fig. 11. The impact in the Eastern Division was not as significant due to concentration on subsistence-oriented farming and small entrepreneurs like retail stores, copra, etc. in the division.

The Ministry of Agriculture lost about \$39 million in terms of damage to commercial crops and loss of export earnings. The Sugar Industry suffered damage to sugar cane crop and FSC facilities, however there was indication that most cane crop would recover.

6.3 Infrastructural Sector

Damage to infrastructure in Macuata and Cakaudrove province was significant. Many roads were washed away and left inaccessible due to debris blockages, fallen trees, landslides and broken bridges. A number of public buildings were also damaged. Movement between Savusavu and Labasa was crippled for several days as a result of damage sustained by Vunivesi bridge [major link between the two areas].

FEA and Telecom facilities and equipment sustained extensive damage resulting in power blackout that left the Northern Division and parts of the Eastern Division without any contact with the outside world for several days. FEA efforts to restore some form of power supply were drastically affected by flooding of FEA equipment. The TFL main telecommunication dish at the Delaikoro Transmitting station was blown down. Both utilities were rendered ineffective and out of service due to damage sustained, which effectively curtailed any form of communication with the National DISMAC in Suva and other centers around the country. Damage to FEA and Telecom facilities and equipment was another cause of delay to Government efforts to help victims and was an impediment to the overall emergency relief operations.

7.0 DAMAGE COST - BY SECTOR

Summarized below are the cost of damage sustained by the various sectors.

7.1 Social Sector

7.1.1 Housing

Damage sustained by dwelling houses in the Eastern and Northern Division was estimated at \$22,089,200 as shown in Fig. 3.



The remains of a damaged building
Photo: Fiji Times Ltd

No	Province	Destroyed	Partially damaged	Damage Cost (F\$)
1	Bua	30	100	288,000
2	Cakaudrove	1,257	2,200	9,679,200
3	Macuata	1,000	3,000	9,200,000
4	Lau	375	590	2,808,000
5	Lomaiviti	Nil	95	114,000
	Total	2,662	5985	22,089,200

Figure 3 Houses Damaged And Destroyed In Eastern & Northern Divisions – Summary Of Costs

7.1.2 Agriculture (food security)

Damage to subsistence crop was estimated at \$921,000. These were mostly subsistence crops in villages and settlements. This figure is treated separately from other commercial crops as tabulated in Fig. 15 below.

7.1.3 Education

A total of **138 schools** were either partially damaged or completely destroyed in both divisions. Most of these schools were either committee based or church managed institutions. The disaster led to the deferment of the opening of the 2003 academic year by a week.

Figures 4, 5 and 6 provide a list of damaged primary schools in both divisions.

Fig. 7 is a summary of secondary schools in both divisions.



Classroom rooftop blown off

Photo: Ministry of Information

Lists of damaged primary schools in Macuata, Lau and Cakaudrove are shown below:

	Primary school		Primary school
1	Dogotuki District	27	Nasasa District
2	Nubu Primary	28	Daku Bhartiya
3	Namuka District	29	Udu District
4	Korotari Arya	30	Duavata District

	Primary school		Primary school
5	Naduri District	31	Wavuwavu-Indian Primary
6	Kia District	32	Vuo Bhartiya Primary
7	Seaqaqa Muslim	33	Tabia Sanatan
8	Labasa Sangam	34	Lagalaga Indian
9	Draladamu Primary	35	Holy Family Primary
10	Buobale Indian	36	Naduna Arya Primary
11	Vunicuicui Sanatan	37	Nagigi Indian
12	Vunimoli Islamia	38	St Mary's Primary
13	Coqeloa Sangam	39	Guru Nanak Primary
14	Naleba Bhartiya	40	Bethel Primary
15	Waidamudamu Primary	41	Bulavou District
16	Wairiki District	42	Labasa Handicapped
17	Nasekula District	43	St Mary's Primary
18	Nabekavu Primary	44	Guru Nanak Primary
19	Uluibau District	45	Bethel Primary
20	Cadranasiga District	46	Bulavou District
21	Vunimanuca Primary	47	Labasa Handicapped
22	Cikobia District	48	St Mary's Primary
23	Batinikama Bhartiya	49	Guru Nanak Primary
24	Seaqaqa District	50	Bethel Primary
25	Korowiri/Tovata Primary	51	Bulavou District
26	Naikelikoso Primary	52	Labasa Handicapped

Figure 4 Summary Of Damaged Primary Schools In Macuata Province.

	Primary school		Primary school
1	Nayau District	15	Kabara District
2	Vanuavatu District	16	Ratu Alifereti Finau
3	Tuvuca Village	17	Uluiqalau District
4	Natokalau Primary	18	Naikeleyaga Village
5	Tabutoga Primary	19	Vunigigia Village
6	Mabula District	20	Namuka District
7	Cicia District School	21	Vulaga District
8	Cikobia District School	22	Matuatabu Village
9	Mualevu District School	23	Vatoa District
10	Avea Primary	24	Onolevu District
11	Susui Village School	25	Doi Village School
12	Dalconi Village	26	Onolevu District
13	Adi Maopa Primary	27	Doi Village School
14	Mavana District	28	Ketei District

Figure 5 Summary Of Damaged Primary Schools In Lau Province

	Primary school		Primary school
1	Yacata Village School	22	St Andrews Primary
2	Nasinu District	23	Vuanisaiki Primary
3	Viani Primary	24	Batibalavu District
4	Qalitu District	25	Vunilagi Primary
5	Tacilevu Village School	26	Wailevu Primary
6	Yasawa District	27	Kama District
7	Nukubolu Primary	28	Nawi Catholic primary
8	Nabua Primary	29	Vatuvonu SDA
9	Muanivatu District	30	Tunuloa Catholic
10	Drekeniwai District	31	Kioa Island
11	Vundawa Primary	32	Nasavusavu District
12	Kasavu Primary	33	Wailevu East Primary
13	Naganivatu Primary	34	Vunisalusalu Central
14	Naweni District	35	Natadra District
15	Navonu Primary	36	Dawa Primary
16	Volivoli Primary		
17	Banaban Primary		
18	Buokanikai Primary		
19	Tabiang Primary		
20	Nagigi SDA		
21	Tawake District		

Figure 6 Summary Of Damaged Primary Schools In Cakaudrove Province.

Twenty-two (22) secondary schools were damaged in the two divisions as summarized in Fig. 7

Northern division	Eastern division
1. Navatu Junior Secondary	1. Adi Maopa Junior
2. St Bede's College	2. Ratu mara College
3. Savusavu Secondary	3. Ratu Finau Secondary
4. Rabi High School	
5. Saqani Junior	
6. Naleba College	
7. Batinikama Junior	
8. Vunimoli Secondary	
9. Tabia College	
10. Labasa Sangam	
11. Labasa Arya Secondary	
12. Duavata Secondary	
13. Labasa College	
14. Holy Family	
15. Guru Nanak	

Northern division	Eastern division
16. All Saints Secondary	
17. Nadogo Secondary	
18. Napuka Junior	
19. Vaturova Junior	

Figure 7 List Of Damaged Secondary Schools

7.1.4 Health

The Ministry of Health encountered various challenges in the aftermath of Ami. Vector control in the Northern Division was implemented through spraying of major areas in the districts of Labasa and Savusavu. Vector control in the Eastern Division was implemented in Lakeba, Vanuavatu, Cicia, Fulaga, Kabara and Ono-I-Lau. Leptospirosis surveillance and sampling were conducted in many villages in Cakaudrove and Savusavu. Korosi village in Savusavu had to be relocated due to the adverse health situation in the village.

Additional drugs were requested for Labasa and Savusavu hospitals.

Certification of food condemnation was made on tinned meat and sardines given as aid-in-kind by the Government of French Polynesia. Damage and contamination was mainly due to deck-load handling, long voyage and the extreme hot and humid condition prevailing in Fiji upon arrival of consignment.

A number of Ministry of Health institutional buildings were also damaged in both divisions including Labasa and Savusavu hospitals, Qarani and Visoqo health centers and nursing stations in Yacata, Vanuavatu, Ogea, Vatoa and Ono-I-lau.

Damage to the health sector is estimated at \$857,000 however other intangible costs for human loss and suffering cannot be quantified. Summary of cost to the health sector is provided below.

No.	Item	Cost
1	Drugs	450,000
2	Insecticide	25,000
3	Spraying machines	28,000
4	Staff Expenses	10,000
5	Leptospirosis	8,000
6	Hospitals, health, centers and nursing buildings	336,000
	Total	857,000

Figure 8 Summary Of Health Cost For Both Divisions

7.2 Economic Sector

7.2.1 Business Community



Damage sustained by the Labasa Chamber of Commerce was estimated at \$12.11 million. The cost of damage to the Taveuni business community was assessed at \$113,550 as provided in Fig. 9

Labasa Main Street after floodwater has receded

Photo: Ministry of Information

Name of Property	Location	Nature of Damage	Estimated Cost	Remarks
Pacific Transport	Naqara	Roof structure blown off and wall collapsed	\$38,000.00	Complete damage
Taveuni Hardware	Naqara	Roof structure collapsed inside damaging wall	\$30,000.00	Complete damage
Vitson Store	Naqara	Carpenter's house, garage and shop front partially blown	\$2,050.00	Partially repaired in use
Krishna Store	Naqara	Down pipe / Guttering and iron to roof blown	\$10,000.00	Complete damage
Krishna Store	Naqara	Cargo boat damaged	\$15,000.00	Complete damage
Garden State Price Point	Naqara	Waste lines broken	\$4,500.00	Repaired in use
Karl's Supermarket	Naqara	Tin roof partially damaged	\$7,000.00	Repaired in use
Boy Store	Matei	Tin roof completely blown	\$7,000.00	Repaired in use
Total			\$113,550	

Figure 9 Taveuni Business Sector - Summary Of Damage

7.2.2 Sugar Industry

FSC had assessed damages to the sugar industry in terms of crop and assets damaged as summarized in Fig. 10

No.	Particular	Cost (F\$)	Remarks
1	Crops	7,600,000	Estimates
2	Assets	6,000,000	Estimates
	Total	13,600,000	

Figure 10 Estimated Cost Of Damage To FSC.



FSC in Labasa after impact
Photo: Fiji Times Ltd

7.2.3 Agricultural Economic Commodities

Based on surveys, commercial crops like dalo, yaqona, copra, etc. were badly affected.

Damaged commercial crops and loss of export earnings was estimated at **\$39,309,948** for both Northern and Eastern Divisions.

7.2.4 Tourism

The tourism industry sustained damages to hotels in Savusavu and Taveuni at a cost of \$144,000 as shown.

No.	Hotels	Damaged facilities	Est. Cost F (\$)
1	Taveuni Is. Resort	7 bures partly damaged	10,000
2	Coconut Grove	5 bures partly damaged	30,000
3	Garden Island Resort	30 rooms partly damaged	30,000
4	First Light Inn	20 rooms partly damaged	2,000
5	Maravu Resort	12 bures partly damaged	20,000
6	Tovutovu Resort	6 bures partly damaged	12,000
7	Tuvununu Inn	2 rooms partly damaged	10,000
8	Matagi Is. Resort	12 bures partly damaged	20,000
9	Nanukulevu Is. Resort	4 rooms damaged	10,000
	Total		\$144,000

Figure 11 Damaged Hotels – Summary Of Cost

7.2.5 Total Cost To Economic Sector

No.	Sector	Cost	Total Cost
1.	Tourism	\$144,000	
2.	Agriculture Commercial Crop	\$39,309,948	
3.	Sugar (FSC)	\$13,600,000	
4.	Labasa Chamber of Commerce	\$12,110,000	
5.	Taveuni Chamber of Commerce	\$113,500	
	Total	\$65,277,448	\$65,277,448

7.3 Infrastructure And Utility Sector

7.3.1 Infrastructure

The cyclone, flooding and landslide caused extensive damage to infrastructures in both Northern and Eastern Divisions with the former suffering the most damage due to the level of infrastructural development in the division. Damage in the Eastern Division largely involved roads and jetties. In the Northern Division the major infrastructures suffered heavily. This included water supply system, roads and bridges, regional and rural water supply, sewerage system and public buildings. All in all this involved five capital programmes within the Ministry of Works for 2003. Together with FEA and TFL costs on damaged utilities, the summary of overall costs to the sector is provided in Fig. 15.



Broken Vunivesi bridge in Savusavu

Programme	Budget	Damage Cost	Remarks
Maintenance of roads and bridges	\$8,000,000	\$2,725,000	
Regional water supply	\$35,000,1000	\$1,179,500	
Rural Water Supply	2,500,000	\$927,758	
Regional Sewerage	5,400,00	\$522,223	
Public buildings PWD		\$101,954	
Total	\$51,000,000	5,456,435	

Figure 12 Damage To Infrastructure – Summary Of Cost

7.3.2 Telecommunications

Tropical Cyclone Ami caused severe damage to TFL's telecommunications infrastructure in the Northern and Eastern Divisions. The Delaikoro Transmitting Station in Vanua Levu sustained serious damage with four [4] dishes blown down. The Lomaiviti and Uluvuya links to Delaikoro went down isolating the North and the Lau Group. Service was restored to Viti Levu via the alternate Lomaiviti link at 9.20pm on 15/01/03. Service to Labasa, Savusavu, Waiyevo, Seaqaqa, Vodafone and DDN was restored by around 11pm on the same day.



Inaccessible road and broken bridge forced people to use other alternative mode of transport
Photo: Fiji Times Ltd

Service to Vanuabalavu was restored on 17/01/03 and Lakeba on 04/02/03 by providing a new direct link from Vanuabalavu to Lakeba. The Nayau and Cicia services were restored by 04/02/03. Restoration work was carried out in island stations in the Eastern Division from 16 - 21/01/03. Most of the HF services operated as normal with only 3 islands without any telecommunication service. Repeater stations suffered the most damage, as they were located on higher ground making them vulnerable to strong winds. Also severe damage was sustained by access roads to the stations caused by fallen trees, landslides and debris rendering them inaccessible. The cost of damage to telecommunications is in the tune of \$1.185 million as summarized below.

Network Element	Cost
Customer access	\$260,000.00
Power	\$7,500.00
Switching	\$12,500.00
Transmission	\$725,400.00
Customer premises equipment	\$180,000.00
Total	\$1,185,400.00

Figure 13 Cost Of Damage To TFL Infrastructure

7.3.3 Fiji Electricity Authority

The total cost of damage to installations, equipment and facilities was assessed at \$3.395 million as shown.

Region or Equipment	Nature	Costs
Northern	Network	\$625,000
Western	"	\$10,000
Central	"	\$65,000
Wainiqueu Hydro Project	Reinstatement	\$2,500,000
Delaikoro, Repeater Station	"	\$15,000
Northern – Meters	Replacement	\$180,000
Total		\$3,395,000

Figure 14 Summary - Cost Of Damage To FEA Facilities And Equipment



Heavy machinery clearing road and utility blockages at Vunivesi
Photo: Fiji Times Ltd

7.4 Summary Of Damage - By Sector

The estimated cost of damage inflicted by Cyclone Ami on the country as summarized in Fig. 15 totaled **\$104,387,789** with Government accounting for **\$73,839,889**.

No.	Sector	Cost	Total cost
1	<i>Social</i> Housing Health Agriculture Education	22,089,200 857,000 1,020,671 4,770,635	28,737,506
2	<i>Economic</i> Taveuni Chamber of Commerce Labasa Chamber of Commerce Tourism Sugar industry Agriculture Commercial Crop	113,500 12,110,000 144,000 13,600,000 39,309,948	\$65,277,448
3	<i>Infrastructure</i> Roads and bridges Regional water supply Rural water supply Sewerage Public buildings	2,725,000 1,179,500 927,758 522,223 437,954	5,792,435
4	<i>Utilities</i> Telecommunications Power supply [FEA]	1,185,400 3,395,000	4,580,400
	Total	\$104,387,789	\$104,387,789

Figure 15 Estimated Cost Of Damage To All Sectors

8.0 RELIEF OPERATIONS

The Government relief efforts were primarily geared towards the restoration of essential services and provision of food ration, safe drinking water and temporary shelter.

8.1 Food Ration

Supplies provided by the Fiji Red Cross began immediately a day after the cyclone. Government initial response was for the emergency run by FNV KULA to Cicia and Vanuavatu in the Lau group on 16/1/03. Emergency food ration was gradually distributed during the first week of the event. Other relief assistance was also provided after the cyclone based on initial surveys conducted to ascertain the level of damage sustained and assistance required. The provision of ration was projected to last three months in worst affected areas however this

would be subject to monthly review based on the agricultural reassessment to determine further need. The ration formula is prescribed below.

8.2 Ration Formula

Food ration provided to the victims was based on the ration provided by Government to 'refugees' during the 2000 political crisis. For the purpose of distribution, the formula also equated an adult as equivalent to two children. A standard week supply for an adult is as follows:

8.2.1 Standard Supply Per Adult Per Week

- 2 kg rice
- 1 kg flour
- ¼ kg sugar
- 2 tinned fish
- ½ kg dhal
- ¼ kg milk (for children)
- ¼ (1ltr) bottle oil

8.3 Food Ration Distribution

It took the NDMO and all agencies involved almost six weeks to supply and distribute food rations to all victims in cyclone-affected areas in the Northern Division. The delay was caused by variables that were beyond the officials' control. The work of assessment teams in the Divisions and districts were constrained by inaccessible and poor road condition especially in the Northern Division where most of the roads were damaged. The scattered distribution of population in the Northern Division with 78.5% living in rural areas compounded the problem.

The scenario in the Lau Group was totally different as survey and distribution of food ration was facilitated by greater mobility and availability of Government and commercial vessels.

The first phase of the food relief programme entailed the provision of four (4) weeks supply to the affected people. In the Northern Division the first round was in the form of one-week supply because of the huge population to be served and the urgency of distributing food to the victims in good time. Only Macuata and Cakaudrove province were assisted. Bua did not qualify for food assistance as the province was left almost unscathed.

In Lau province, some islands received four weeks supply during round one, but majority received two weeks supply in two rounds. Moala, Matuku and Totoya did not qualify for food assistance according to Ministry of Agriculture assessment, as damage to crops on these islands was insignificant.

8.4 Emergency Shelter

Apart from tarpaulins donated by donor governments, Government supplied tarpaulins to victims in the Northern Division at the earlier stage of the emergency relief operation. The cost of tarpaulins amounted to \$231,068.00

8.5 Operational Cost

A number of agencies were involved in the relief operations ranging from managing the Emergency Operation Centres to transportation and distribution of relief supplies. Details are shown in Fig 16 & 17. This substantial operational cost was attributed to the huge population in the Northern Division and the vast geographical land mass interspersed with villages and settlements including urban and peri-urban areas.

Agency	Cost	Percent	Cum	Remarks
Government Supplies	\$27,780.00	5.00	5.00	Labour cost
RFMF	\$124,771.50	22.00	27.00	Meals and transport
Commissioner Eastern	\$48,866.15	9.00	36.00	Boat hire and administration
Commissioner Northern	\$271,563.84	47.00	83.00	Equipment, transport hire, meals for Ops team & Admin.
NDMO	\$100,000.00	17.00	100.00	Boat hire, purchase of equipment, meals for NEOC staff and Admin.
Total	\$572,981.49	100.00		

Figure 16 Summary Of Operational Cost

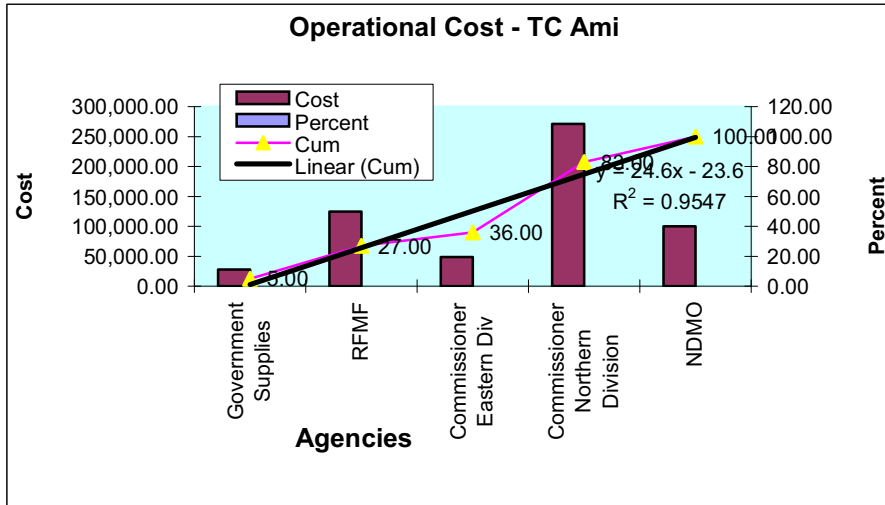


Figure 17 Operational Cost By Agencies

8.6 Cost Of Food Ration, Tarpaulin And Relief Operations

The total cost of four weeks supply of food rations supplied to the Northern and Eastern Divisions amounted to **\$4,436,500.51** involving a total population of 115,487. The cost of tarpaulins supplied to the victims was **\$231,068.46**. The operational cost incurred by agencies involved in the relief operation amounted to **\$572,981.49**. Total cost expended by Government on food ration, tarpaulin and logistics amounted to **\$5,240,550.46** at the time of compiling this report. This is bound to increase as the food relief programme continues into the next phase. Refer Fig 18 for breakdown of costs.

S/NO	LOCATION	TRANSPORT		COST	REMARKS
FOOD RATION – FIRST ROUND DISTRIBUTION (WITH EFFECT FROM 23/1/03)					
(a) NORTHERN DIVISION					
1	DISMAC LABASA	-	MV	\$227,634.00	
2	DISMAC LABASA	-	MV	\$168,557.07	
3	AIRLIFT LABASA	-	MV	\$15,674.07	
4	DO SAVUSAVU	-	MV	\$94,605.87	
5	DO SAVUSAVU	-	MV	\$89,297.52	
6	DO TAVEUNI	-	MV	\$32,567.69	
				\$628,336.22	
ROUND 2: THREE WEEKS DISTRIBUTION WEF 22/02/03					

1	NORTHERN DIVISION	-	MV	\$3,032,108.32
2	BOARDING SCHOOL	-	MV	\$126,484.24
3	DISMAC RATION	-	MV	\$655.46
4	Balance 1 month ration for Yacata Qamea & Savusavu	-	MV	\$11,463.93
				<u>\$3,170,711.95</u>
	Total			<u>\$3,799,048.17</u>
	(b) EASTERN DIVISION			
1	Lau Group (Phase 1)	-	MV	\$499,730.34
2	Lau Group (Phase 2)	-	MV	\$137,722.00
				<u>\$637,452.34</u>
	<u>TOTAL FOR FOOD RATION FOR A MONTHS SUPPLY</u>			<u>\$4,436,500.51</u>
	OTHER RELIEF ITEMS			
	NORTHERN			
	Commissioner Northern Division	-		\$95,323.00
	DO TAVEUNI	-		\$10,908.73
	DO SAVUSAVU	-		\$70,218.04
	DO BUA	-		\$1,151.62
	DO MACUATA	-		\$3,173.08
				<u>\$180,774.47</u>
	(b) Boat Vessels (Fuel/Hire)			
	Commissioner Northern Division	-		\$9,712.92
	DO TAVEUNI	-		\$4,900.63
	DO SAVUSAVU	-		\$8,082.46
	DO BUA	-		\$610.00
	DO MACUATA	-		\$0.00
				<u>\$23,306.01</u>
	© Travel/Accommodation			
	Commissioner Northern Division	-		\$149.00
	DO TAVEUNI	-		\$0.80
	DO SAVUSAVU	-		\$0.00
	DO BUA	-		\$340.00
	DO MACUATA	-		\$0.00
				<u>\$489.80</u>
	(d) Administration/Office Cost			
	Commissioner Northern Division & DO Macuata	-		\$18,748.78
	DO TAVEUNI	-		\$22,706.48
	DO SAVUSAVU	-		\$12,152.96

	DO BUA	-	\$200.00
			<u>\$53,808.22</u>
(e)	<i>Additional charge imposed by Consort</i>	-	\$13,185.34
	<i>Shipping to NDMO/Government for holding vessel in Labasa</i>		
(f)	<i>Commissioners Northern Division</i>		
	<i>Commitment and Expenditure</i>		
	Meals	-	\$938.33
	Ret/Ration	-	\$6,777.47
	Stationery	-	\$1,261.00
	Fuel	-	\$1,261.32
	Passage & Cartage	-	\$37,277.65
	Hire of Vehicle & Outboard Motor	-	\$1,350.38
			<u>\$48,866.15</u>
	TOTAL COST		<u>\$650,243.02</u>
(A)	<u>COST OF FOOD RATION</u>		
	Northern Division	-	\$3,799,048.17
	Eastern Division	-	\$637,452.34
	TOTAL		<u>\$4,436,500.50</u>
(B)	<u>OPERATIONAL COST</u>		
	National DISMAC	-	\$100,000
	Government Supplies	-	\$27,780.00
	RFMF	-	\$124,771.50
	Commissioner Northern Division	-	\$271,563.84
	Commissioner Eastern Division	-	\$48,866.15
	TOTAL		<u>\$572,981.49</u>
	SUMMARY OF COSTS		
	COST OF FOOD RATION		\$4,436,500.51
	OPERATIONAL COST		\$572,981.49
	COST OF TARPULINS		\$231,068.46
	GRAND TOTAL		<u>\$5,240,550.46</u>

Figure 18 Summary: Cost Of Food Ration, Tarpaulin And Logistics

PROV/DIST	Round 1	Round 2	Actual Population	% Of H/Holds in Div	No H/Hold	4 of weeks ration	Monthly Cost (\$)
Macuata (Round 1)	54,321						
(Round 2)		64,128	80,207	57.49	10080.78		
Cost Per Person Per Day						1.73	2,635,222.62
Taveuni (Round 1)	10,375						
(Round 2)		14,877					
Cost Per Person Per Day						1.73	611,343.05
Savusavu (Round 1)	27,854						
(Round 2)		28,957	44,321	31.77	5570.46		
Cost/Person/Day						1.73	1,189,934.84
BUA			14,988	10.74	1883.76		
TOTAL		107,962	139,516	100			4,436,500.51
Average Size of H/Hold (Province)				7.96			
No of H/Hold (Northern Div.)					17535		
Eastern Division							
LAU	6,111		12,211	2.68			499,730.34
		1,684					137,722.00
Cost/Person/ Day						2.73	
Average Size of H/Hold (Province)				4.84	2523.44		
TOTAL		7795					\$637,452.34
No of H/Hold (Central/Eastern)					94,210		
TOTAL			151,727				

Figure 19 Food Distribution: By Area/Location

8.7 The first round of food rations supply started on 21 January 2003, based on the result of the initial surveys. A population of 54,321 people received assistance in Macuata Province, 10,375 in Taveuni and 27,854 in Savusavu. The total population of Macuata Province represents 57.5% of the total population in the Northern Division and Cakaudrove (Taveuni and Savusavu) comprises 31.8%.

In the Eastern Division, the Lau Group with a population of 7,795 affected and provided with food rations, 78.40% of these people were assisted during the first round. The other 21.60% were assisted during the second round of distribution. Total cost of food ration for the Eastern Division amounted to \$637,452.34.

AREA/ PROVINCE	No of H/HOLD	FIJIAN	INDIAN	OTHERS	TOTAL	FLOUR	RICE	SUGAR	MILK	T/FISH	C/OIL	DHAL
						Bags	Bags	Bags	Bags	Ctns	Ctns	Bags
Macuata (Round 1)	13,268	16,348	37,642	331	54,321	2,303	3,313	903	1,011	1,398	1,186	3,430
(Round 2)	16,042	23,968	39,242	918	64,128	6,537	8,114	2,617.5	1,573.67	3,315	1,945	9,409
TOTAL						4,234	4,801	1,715	563	1,917	759	5,979
VARIANCE	2,774	7,620	1,600	587	9,807	8,840	11,427	3,521	2,585	4,713	3,131	12,839
Taveuni (Round 1)	575	2,876	7,366	133	10,375	613	1,153	218	139	519	25	459
AREA/ PROVINCE	No of H/HOLD	FIJIAN	INDIAN	OTHERS	TOTAL	FLOUR	RICE	SUGAR	MILK	T/FISH	C/OIL	DHAL
(Round 2)	1252	6,262	8,674	691	14,877	488	653	158	21c	861	166	194
						-125	-500	-60		342	141	-265
VARIANCE	677	3,386	1,308	558	4,502	1,101	1,806	376	139 & 21C	1,380	191	653
Savusavu (Round 1)	7,762	20,246	3,300	4,308	27,854	860	2,204	2,333	863	1,095	808	2,723
(Round 2)	2,503	10,164	12,426	6,367	28,957	873	1,316	303	520	621	407	1,804
						13	-888	-2,030	-343	-474	-401	-919
VARIANCE	-5,259	-10,082	9,126	2,059	1,103	1,733	3,520	2,636	1,383	1,716	1,215	4,527

Figure 20 Distribution Of Food Ration, Northern Division, First & Second Round

8.8 At the end of the second round, 64,128 people in Macuata representing 77.95% of the total population of the province were assisted, whilst Cakaudrove had 43,834 people affected (Savusavu – 28,957 and Taveuni – 14,877). Therefore, a total population of **107,962** were affected by the cyclone and provided with four weeks food ration in the Northern Division at a total cost of **\$3,799,048.17**.

8.9 Assistance - Other Ethnic Groups

Apart from Fijians and Indians other ethnic groups were provided with food ration in Macuata and Cakaudrove Province contributing to the increase in the number assisted between round 1 and 2 by 3,204. Total cost expended on food ration amounted to \$272,902 involving 7,736 people.

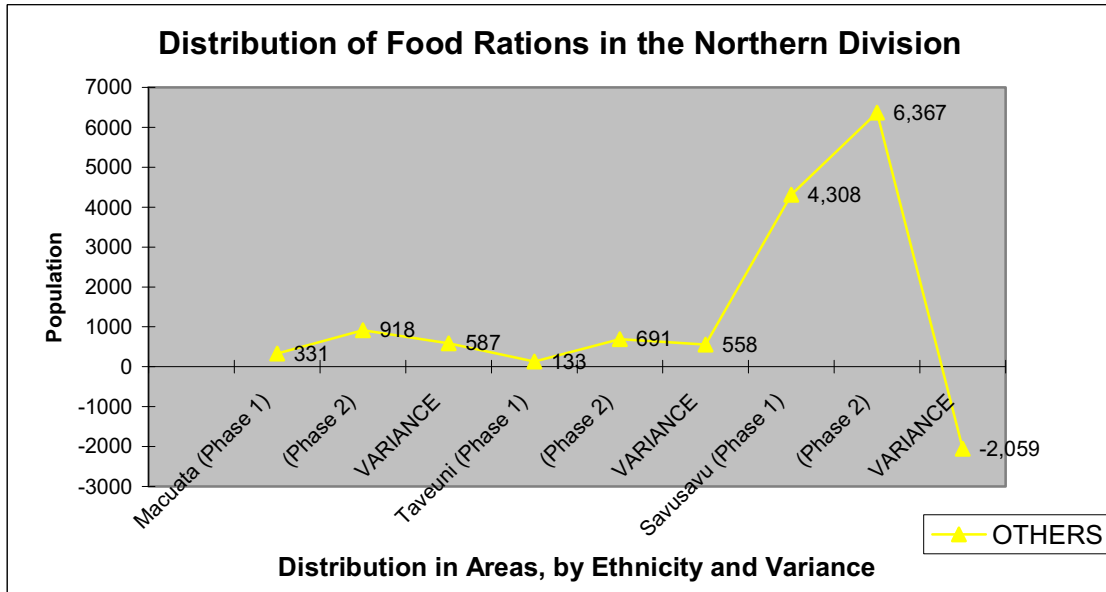


Figure 21 Distribution Of Food Ration To Other Ethnic Groups

8.10 Assistance - Fijians

The decline in the number of Fijians that received food rations in the second round was recorded in Savusavu district while Macuata and Taveuni registered increases.

Fig. 22 below shows an increase in Fijian population provided with food ration in Macuata from 16,348 to 23,968 during the two rounds of distribution. This represented an increase of 68.2% or variance of 7,620 people.

in Taveuni, the number of Fijians assisted increased from 2,876 to 6,262 during the two rounds accounting for a variance of 3,386. However, in Savusavu the number declined by 10,082 or 50.2%.

In summary a total of 4,977 Fijian families with a population of 39,614 were assisted in the Northern Division at a cost of **\$1,397,462.00**.

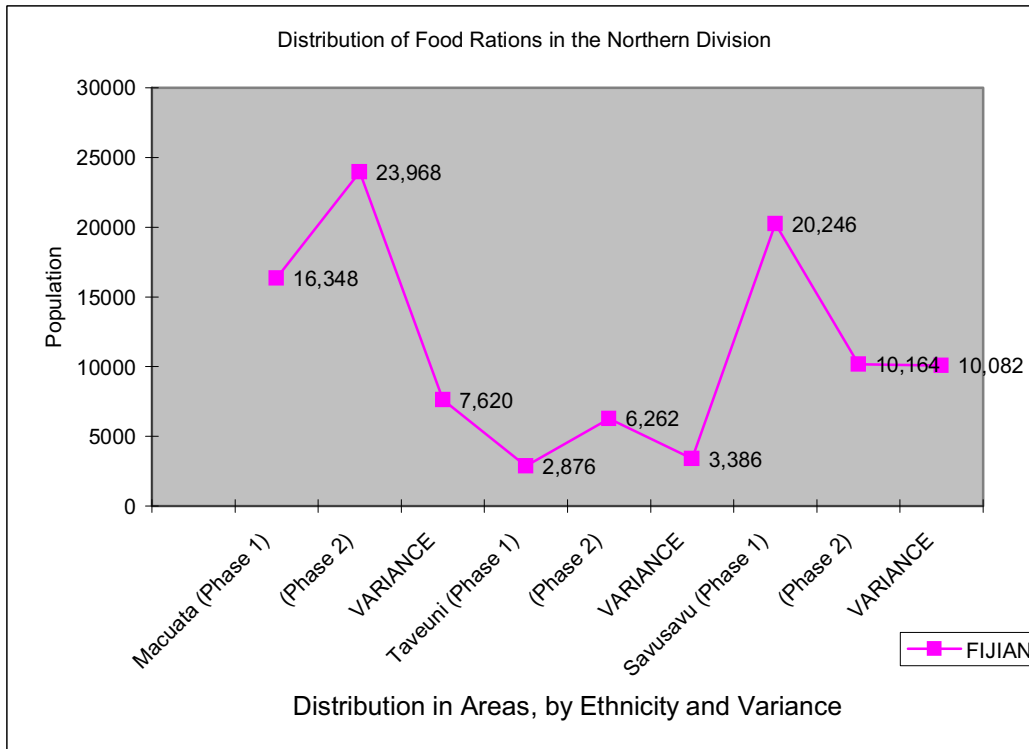


Figure 22 Distribution Of Food Ration To Fijians In Northern Division

8.11 Assistance - Indians

Figure 23 depicts the number of Indians assisted in Macuata Province stood at 37,842 in Round 1 and gradually increased to 39,242 in Round 2 with a variance of 1,400 or 3.6%.

A total of 4930 Indian families were assisted in Macuata, an increase of 3.57% from round 1. A sum of \$475,252.00 was spent on these families in a week in terms of food rations, an increase of \$16,966.50 from Round 1.

In Taveuni, the number of Indians provided with food ratio increased from 7,366 to 8,674 with a variance of 15%. In Savusavu however a variance of 73.44% was recorded as the number assisted increased by 9,126.

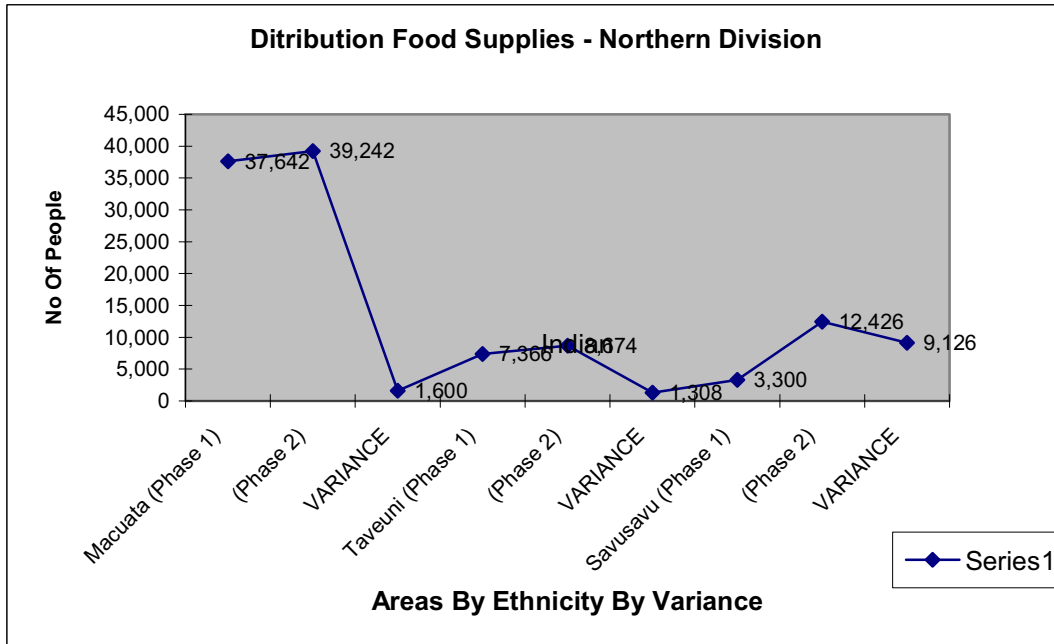


Figure 23 Distribution Of Rations To Indians In Northern Division.

A total of 1,561 Indian families were provided with relief assistance at a cost of \$89,206.33 in round 1, which increased to \$105,046.93 in round 2. A similar scenario was recorded in Savusavu where 162 Indian families were provided food ration at a cost of \$15,616.80 in round 1 but increased considerably to 1,561 families in round 2 at a cost of \$150,480.40.

In summary a total of 7,580 Indian families with a population of **60,342** were assisted in the Northern Division at a cost of **\$2,128,683.32**.

8.12 Phase 2 (second month) Supply Of Food Ration

The second phase of the food relief programme would be determined by the agricultural reassessment and progress of the agricultural rehabilitation program. In some areas this could be the last round of rationing however the overall food distribution is expected to last for three months in worst hit areas.

9.0 TYPES OF ASSISTANCE

9.1 Local Assistance

Many local organizations provided assistance to victims of Cyclone Ami. Some are listed in Figure 24 whilst others worked quietly behind the scene and wished to remain anonymous. The Fiji Red Cross Society worked closely with Government in attending to the needs of those affected and made significant

contributions towards the national relief efforts. Relief work was coordinated on the ground by District Officers together with teams of Government officials.

No	Organization	Assistance	Centre	Transportation	Dates	Areas covered
1	Fiji Red Cross	Food packs, tarpaulins, clothes, food, water containers, cooking utensils	Suva Red Cross Center and Northern centers.	Red Cross	18 th – 23 rd January	Cakaudrove and Macuata affected areas.
2	Arya Sabha Fiji	Clothes and Food	Vanua Levu Sabha	Sabha	19 th January	Korotari and other flooded areas
3	Assemblies of God	Cash donation, clothes	Direct to church members	Individual	January	Vanua Levu and Lau group
4	Methodist Church of Fiji	Cash and food donation	Direct to members	Individual	January	Northern and Eastern
5	Western Union Money transfer	Food donation	NDMO	Government vessel	24 th January	Northern and Eastern
6	Fiji Muslim League	Clothes, cash, household items	Labasa branch	Individual	28 th January	Northern division
7	Seventh day Adventist Church	Clothes, utensils, soap, powder	NDMO	Government vessel	20 th January	Vanuavatu, Nayau, Tuvuca, Cikobia, Yacata Vanuabalavu,
8	Ministry of Labour staff	Food, clothes	Government supplies	Government vessel	25 th January	Northern and eastern
9	Fiji Sevash Ram Saga Group	Food and water containers	DO Labasa	Individual	28 th January	Naqai, Korociri, Bucalevu, Coqeloa
10	Valebasoga Tropic Board	Bottled Water	VTB	VTB	28 th January	Naodamu and parts of Labasa
11	PM's Cyclone Relief Trust	Funds	PMs Office	Regional Development	28 th January	Northern and eastern division.
12	Communications Fiji Ltd	Cash	Save the Children's Fund	SCF	30 th January	Children at eastern and northern division

Figure 24 Summary Of Local Donors

9.2 Fiji Red Cross Society

The Fiji Red Cross Society (FRCS) quickly activated its Emergency Plan, mobilized its resources and quickly responded to the needs of the affected populace. Relief assistance was provided through its branch network supported by Red Cross volunteers. Savusavu and Labasa, the normally quiet branches of the Fiji Red Cross Society were the focus of the large-scale relief operation during the emergency period.

Relief efforts carried out by FRCS provided tremendous support to Government efforts and the Society worked in close partnership with the DISMAC system. The pre-positioned relief containers located in strategic locations around the country provided immediate relief to the disaster victims.



A pre-positioned Container

The containers in Labasa and Savusavu were the first of the relief supplies to reach the affected communities within the first few hours following the disaster.

Seven disaster preparedness containers in Viti Levu were used to support the national relief efforts. This involved the four containers located in Togalevu, and one each in Navua, Sigatoka and Nadi centres.

The Fiji Red Cross Society supplied victims with their pre-packed humanitarian emergency family packs containing clothes, blankets, towels, soap, antiseptic cream, first aid supplies, mosquito coils, all wrapped in black polythene sheeting. FRCS was also involved in distributing water containers, cooking sets/ utensils, buckets, tarpaulins, oral re-hydration salts and water purification tablets to the affected people.

The total expenditure incurred by the Society in the AMI emergency relief operations was approximately around **\$400,000.00**.

9.3 International Assistance

A summary of assistance provided by donor governments, aid agencies and regional organizations is outlined in Figure 25.

No.	Country/ Organization	Type of assistance	Value (F\$)
1	Australia	Hire of helicopter for assessments and relief deliveries. Hire of water purification units for Eastern Division. Hire of office equipment for NEOC. Provision of 1000 water purification tablets. Aircraft with 5,000 water containers 1,000 tarpaulins Aircraft with 3,200 light blankets and 2,000 tarpaulins Relief assistance through Fiji Red Cross Contribution to local radio appeal	\$30,000 not costed not costed not costed not costed not costed not costed
2	France	Aircraft with 300 tarpaulins, 50 blankets, 50 water containers, 5,000 puritabs 7 2 flights to Labasa. Naval patrol vessel for delivery run to Cicia island in Lau. 100 tarps and food relief locally purchased.	Not costed Not costed \$20,000
3	Japan	To provide education and health mid-term rehab	TBC
4	New Zealand	Provision for Orion aircraft for aerial reconnaissance. Contribution to PM's appeal. Aircraft with 1000 containers and 600 tarpaulins. Additional relief and logistic support. Purchase of 55 x 5,000 litre water tanks and logistics	Not costed \$37,000 Not costed \$31,000 \$120,000
5	Norway via (OCHA)	Relief assistance	\$30,000
6	Italian Govt	Purchase of 110 x 5000ltrs water tanks. Purchase of food ration and logistics	\$410,000
7	UNOCHA	596 tarpaulins/30km rope & hire of helicopter for ration delivery in remote areas.	\$30,000
8	United Kingdom	Assistance through Fiji Red Cross. Contribution to PM's appeal	\$10,000 \$5,000
9	United States of America	Cash to Fiji Red Cross for water purification equipment	\$100,000

No.	Country/ Organization	Type of assistance	Value (F\$)
10	WHO	Technical/financial assistance to Health	TBC
11	FAO	Assistance in Agriculture rehabilitation program related to commercial crops.	
12	Cook islands	Assist relief programmes	\$10,000
13	French Polynesia	Vessel Tahiti Nui brought 94 tons of rice, 8 tons of sugar, 23 tons of milk, 22,800 tins of sardines, 2,328 bottles of oil, 70 tons of flour, 66,864 tinned corned beef and 60,500 bottled water for Vanua Levu and Cicia.	\$1,700,000
14	Forum Secretariat	Relief assistance from emergency grant	\$20,000
15	Rotary Club-Mt Coo-tha, Brisbane, Aust	Hospital beds, wheel chairs, medical equipment, clothing, school library books	
16	SOPAC	Conducted technical assessment in Northern division	Not costed

Figure 25 Summary Of International Assistance

10.0 REHABILITATION

At its meeting held on 28th January Cabinet agreed that the various sectors would be responsible for implementation of their respective rehabilitation programs and to source funds from within their own existing capital budget. Government Ministries directly involved with the national rehabilitation program include: Ministry of Agriculture, Ministry of Regional Development, Ministry of Education, Ministry of Health and Ministry of Works.

The National rehabilitation effort would focus on the following areas:

- a) Rehabilitation of subsistence farming, provision of seeds and planting materials and cash crops;
- b) Rehabilitation of rural housing, provision of building plans, cyclone resistant building materials for risk reduction, and carpenters;
- c) Reconstruction of public and committee run schools, teachers quarters, dining halls and hostels;
- d) Restoration of health service, health promotion and disease prevention activities, infrastructure establishment and trauma counselling; and
- e) Rehabilitation of infrastructure like roads, bridges, government buildings, sewerage system, and water supply (rural and urban) systems.

The rehabilitation periods would differ from one sector to another however all programs are due for completion within a twelve-month period from the time the cyclone struck the country.

The overall coordination of the rehabilitation program would be undertaken by the National Disaster Management Office as prescribed under the Natural Disaster Management Act, 1998. NDMO would be responsible for undertaking a review of

all rehabilitation programmes within a six-month period. Quarterly reporting to Cabinet would provide progress and updates of the national rehabilitation programme.

Total cost of the national rehabilitation programme to Government by sector amounted to \$24.492 million as summarized in Figure 26 below.

No.	Sector	Rehabilitation Type	Cost	Total Cost
1	Agriculture	Crops (food security) Drainage, river engineering and dredging Animal health and production Research	\$550,457 \$288,427 \$97,112 \$84,676	\$1,020,672
2	Regional Development	Rural housing Damaged: Lau/Lomaiviti 202 Damaged: Bua, Cakaudrove, Macuata 2,594 Destroyed: Lau – 243 Destroyed: Bua, Cakaudrove, Macuata – 1,349	\$242,400 \$3,112,800 \$1,360,800 \$7,554,400	\$12,270,400
3	Education	Priority schools Other schools and related structures	\$1,084,800 \$3,685,835	\$4,770,635
4	Health	Infrastructure development Public buildings repair Drugs and medicine supplies Supplies and equipment Disease prevention: spraying Disease prevention: water treat	\$500,000 \$336,000 \$100,000 \$18,000 \$10,000 \$10,000	\$974,000
5	Public Works	Roads and Bridges Public buildings Regional water supply Rural water supply Regional Sewerage	\$2,725,000 \$101,954 \$1,179,500 \$927,758 \$522,223	\$5,456,435
	TOTAL			\$24,492,142

Figure 26 Cost Of Rehabilitation To Government

11.0 DEBRIEF

Two debriefs were conducted at the end of the 30 days stand down period for the declaration of a state of disaster. The first was held on 14 February for Agencies that served in the National Emergency Operations and followed by the second (main debrief) held at the Government Training Center on 17 February 2003. Issues raised in the two debriefs that would require further Government intervention are summarized below:

11.1 Communication

The communication problem that gripped the Northern Division during the first few days of the operation underlined the need to develop a Loss Communication Procedure (LCP) to facilitate early restoration of communications. NDMO should have information on all communication media available in remote areas. DISMAC should have backup communications to support emergency relief efforts. Government to examine other alternative form of communication that can operate under any kind of situation, like satellite phones.

11.2 Interpretation Of Aerial Photography

The appropriate technical officer should have accompanied the RNZAF assessment flight immediately after AMI struck, as the officer should be able to give a better interpretation of aerial photos that were taken during the flight.

11.3 On Site Operations Center (OSOC)

The setting up of OSOCs to support field operations in certain parts of the Northern Division was considered a viable option that would ensure quick response to the needs of the affected people and overall operational efficiency.

11.4 Air Support

The need to reach those affected in inaccessible areas in good time reflects the importance for Government to consider having its own air support capability instead of relying on Pacific Crown Aviation, the only helicopter company in the country. At the time of the disaster PCA was operating only one chopper.

11.5 Contingency Plan

Government should have a Contingency Plan that will allow quick deployment of personnel on the ground dealing with assessments and distribution of relief supplies. The current government bureaucracy however does not allow this to happen; this needs streamlining. The Plan should also provide for Loss Communication Procedure. The Navy offered their assistance in this area.

11.6 Weather Reports

Special Weather bulletins should be clear and concise and provide full details in layman's term that is easily interpreted by the people. It should also enable the community to use the Cyclone tracking map and other associated aid. Radio announcers should undergo training to ensure consistency in terminology used and general weather reporting.

11.7 Simulation Exercise

Simulation exercise on all hazards that affect the country should be conducted on a regular basis at all levels, in particular the schools and community, to ensure they understand the characteristics and nature of those hazards and put in place the necessary preparedness measures. This would enhance the public state of readiness before the real event occurs.

11.8 Training

Agencies expressed keen interest in sending their officials to attend relevant training such as EOC Management and Damage Assessment. Training and regular exercises for response agencies was considered a critical factor in ensuring effective response to disaster. NDMO to undertake training on the two core courses identified at all levels.

11.9 Review Of Ration Scale

The Ration Scale should be reviewed in light of the need for food with highly nutritious value and also to develop two different scales, a Standard and Supplementary Scale dealing with babies, children, lactating mothers, elderly and handicapped.

11.10 Dedicated Budget

Emergency response agencies to have a dedicated budget for emergencies and disasters to avoid late response and other operational deficiencies those agencies would normally experience given the current state of affairs. There is too much expectation on response agencies in dealing with disasters but they don't have the financial commitment to carry out their functions effectively.

11.11 Pre-positioning Of Relief Supplies

Relief supplies to be pre-positioned in strategic locations around the country to facilitate emergency relief operations, however a thorough assessment should be undertaken initially to look at the issue of storage facilities, accounting, handling, distribution and other associated issues.

11.12 NEOC Teams

Ministry of Education and PSC teams were the only two Ministries that were consistently represented at the NEOC during the entire operation. Concern was expressed at the non-involvement of many Ministries and Departments. NEOC teams should as far as possible represent all Ministries since it is a national crisis and that the work should be equally shared by all agencies.

Team Leaders serving in the NEOC should have discretionary powers to make decisions without reference to higher authority to enable quick decisions and swift response to the needs in the affected areas.

11.13 Evacuation Center

Information concerning Evacuation Centres should be made known to the public before the onset of the cyclone season and that they should be made aware of the various aspects of evacuation center management, in particular their role and responsibilities.

11.14 Preliminary Assessment

The initial survey teams should include all relevant organizations to ensure that assessment is undertaken in an integrated and coordinated approach and that a comprehensive assessment is provided on the situation.

People in the assessment teams should be qualified to do the job so that assessment results are realistic and accurate. Training of civil servants based in remote areas and community leaders in assessment work to be given priority. This would enable early determination of the scope and nature of damage and needs of the affected communities whereby swift action could be taken by Government and other response agencies.

The existing assessment forms used by all sectors should be reviewed and standard assessment forms developed and adopted for future use.

11.15 Declaration Of A State Of Emergency

The declaration of a State Of Emergency should be area specific and not broadly described as was in the recent disaster to ensure that resources and assistance are targeted at specific groups and locations for economy of organization and effort.

11.16 Decentralization Of Powers

It was evident that decision - making was top down and driven from national level that did not allow Divisional DISMAC and Commissioners of the two divisions concerned the liberty to operate with total independence.

This was considered an impediment to the operations and a contributing factor to delay in the decision making process and eventual response.

11.17 Donor Assistance

To examine procedures and arrangements dealing with donor assistance to ensure that such assistance is secured at an early stage that would allow effective response and that critical needs are met.

11.18 Disaster Service Liaison Officers (DSLO)

It appears that the involvement of DSLOs lacked proper organization; therefore there is a need to review arrangements and procedures for DSLO mobilization and engagement in times of disasters. Better organization of DSLOs should result in prompt response from agencies and provision of timely assistance to the affected communities, and streamlining of operations for the overall efficiency of emergency operations.

11.19 Baseline Information

The operation highlighted the importance of baseline information to facilitate assessment and relief operation. In the absence of baseline data there was delay in responding to the needs of the affected communities. The development of proper baseline information should be carried out as a matter of urgency. The need to revisit earlier work carried out by the Ministry of Fijian Affairs in relation to Village Profile was considered a good benchmark for this project.

11.20 EOC Operations - Standardization

All EOCs should use standard reporting format, assessment forms, situation report etc, to ensure uniformity and to facilitate decision-making.

11.21 Daily Briefing On The Situation

NEOC staff to provide daily briefings and updates on the situation to Director NDMO, DSRD and PSRD to keep them abreast of progress and to facilitate the decision making process.

11.22 Upgrading Of EOCs

EOCs lack proper organization because of the absence of essential resources and limited operational capability. They need proper resourcing in terms of communications equipment, computers, fax machines, state boards, maps, etc; and trained staff to man them.

11.23 EOC Management

Staff should be exposed to EOC Management training in order to improve organization in the EOC and management of the overall operation. Information flow was a critical factor in the recent operation that needs significant improvement.

11.24 Information Management

Information Management is a critical component of EOC management that was lacking in the recent operation. The Information Management System to be reviewed in light of deficiencies identified in the AMI operations and proper training undertaken.

11.25 Standard Operation Procedures (SOP)

The NEOC SOP was not completed at the time TC AMI struck, which affected the management of the NEOC and the overall operation. The SOP should be completed as a matter of urgency.

12.0 LESSONS LEARNT

12.1 Telecommunication Capability

The fact that the whole of the Northern Division had no form of communication with the outside world for a few days is a serious point to consider. It had an adverse effect on Government efforts to deal with the situation. The situation underlined the importance of strengthening the telecommunication capability in the Northern and Eastern Division. There is a need to consider other forms of communication such as satellite phones - that can operate under any situation.

12.2 Pre-position Emergency Supplies

A major difficulty faced by the national response efforts is the very widespread nature of this disaster, seriously affecting some 70-80,000 people on two large and dozens of tiny islands dispersed across 300,000 square km of open ocean. Lau has the least developed infrastructure in Fiji and together with the damage to communications system; this has hampered preliminary assessment and emergency response efforts particularly in the provision of emergency relief

supplies. The need to pre-position emergency relief supplies in strategic locations around the country therefore needs serious examination.

12.3 Salt Water Desalination Need

In addition to the pre-positioning of relief supplies it is necessary to consider the installation of salt-water desalination equipment either in Government vessels or in strategic locations in the island groups in particular. The availability of water continues to be a problem and the presence of desalination equipment will be invaluable.

12.4 Air Support Need

It is evident from the current operation that the availability of air support is critical for quick deployment of assistance to the affected areas. The current emergency relief work is constrained by the fact that only one helicopter from the only company in the country is available to support damage assessment and attend to other urgent tasks including medical evacuation (MEDEVAC). The availability of Government owned air support would provide the impetus for operational efficiency and ensure timely response.

12.5 Training

Training of key individuals in isolated small islands on important disaster response activity like damage assessment would ensure early receipt of assessment report and quick deployment of relief supplies. This should be an integral part of a community capacity building and partnership program.

12.6 Public Education And Awareness

Poor public response to warning reflects the need to constantly carry out public education and awareness campaign. The public will be encouraged to participate in simulation exercise on cyclone warning and response to continuously raise awareness and strengthen general state of readiness. Lack of public awareness and poor response to warnings was a major contributing factor to the current death toll and missing fishermen. The 2003 Budget provides only \$10,000 for disaster awareness.

12.7 DISMAC Resource

In its present form the National Disaster Management Office (NDMO) is ill equipped to deal with a major disaster. It needs proper resources, a purpose built center, with state-of-the art facilities to effectively deal with disasters. Similar reorganization/upgrading is required for the various Emergency Operations Centers in the country.

12.8 Dedicated Budget

The absence of a contingency fund to deal with such emergencies will continue to be an impediment to effective response. The redeployment of funds from Ministries' budget to meet relief and rehabilitation programs would adversely affect both operating and capital works planned for the year. This would negate the very essence of key development initiatives as espoused under the Blueprint and other affirmative action initiatives and would draw huge public outcry. A yearly-dedicated budget is required to cater for NDMO normal operations and also for relief, rehabilitation and recovery after a natural disaster.

12.9 The foregoing lessons learnt from Cyclone Ami emergency operations were earlier drawn to the attention of Cabinet. Cabinet had decided that the Ministry of Regional Development put together a detailed paper on the key lessons learnt and resubmit to Cabinet for its further consideration.

13.0 CONCLUSION

This Report is a reflection of contributions made by government, NGOs, donor communities, private sector and the victims themselves in response to the disaster situation caused by TC Ami. Figures and data provided are based on information provided by field officers at the sectoral level. Most of the figures provided are contemporary, and are bound to change as more data are received during the relief and rehabilitation period.

The food relief program is expected to last three months in worst affected areas subject to monthly review. Sectoral rehabilitation program would take time, however, a maximum period of twelve months is projected before its completion.

Government has taken decisive action and demonstrated total commitment in responding to the disaster situation and attending to the needs of the affected people, with the limited resources at its disposal. This national effort has been greatly facilitated with the assistance provided by allies within the region and also internationally, and has helped to carry the burden which otherwise would be borne by the country alone.

A final report will be produced later in the year to highlight the total relief and rehabilitation program and costs to Government, and in particular to look at the socio-economic impact of cyclone AMI on the country.

14.0 ACKNOWLEDGEMENT

The impact of Tropical cyclone Ami was not only challenging but a very daunting task to the Government of Fiji, International and Local Donors, Non-Government Organizations and members of the public who contributed in various ways.

The Minister for Regional Development (Chairman of the National Disaster Management Council), the Permanent Secretary for Regional Development (National Disaster Controller) and DISMAC personnel at the various levels would like to acknowledge the assistance and support provided by the following:

14.1 Government Departments And Corporate Entities

Prime Minister's Office and Cabinet
Public Service Commission
Ministry of Agriculture
Ministry of Commerce
Ministry of Education
Ministry of Foreign Affairs
Ministry of Health
Ministry of Home Affairs
Fiji Military Forces and Naval Division
Fiji Police Force
Ministry of Fijian Affairs
Ministry of Finance
Government Supplies Department
Ministry of Information
Ministry of Works
Ministry of Lands
Ministry of Fisheries and Forests
Ministry of Youth and Sports
Ministry of Women
Auditor General's Office
Fiji Marine Services
Fiji Meteorological Services
Telecommunications Fiji Ltd
Fiji Electricity Authority
Fiji National Provident Fund
Fiji Broadcasting Commission
Fiji Sugar Corporations
National Fire Authority
Fiji Custom Services

14.2 Donor Governments And International Agencies

Australian High Commission and AusAID
British High Commission
New Zealand High Commission
Papua New Guinea High Commission
French Embassy
Japanese Embassy
People of the Republic of China Embassy
Taiwan
American Embassy
Government of Cook Islands
Government of Tuvalu
Government of French Polynesia
Government of Italy
UNDP
UN Office of Coordination and Humanitarian Affairs (UNOCHA)
European Union
UNICEF
FAO

14.3 Regional Organizations

SOPAC
Forum Secretariat
South Pacific Community

14.4 Local Agencies

Fiji Red Cross and Crescent Society
Fiji Council of Social Services and individual organizations
Communications Fiji Ltd
Fiji Times Ltd
Daily Post Ltd
Fiji Sun Ltd
Save The Children's Fund
Consort Shipping Line Ltd
Patterson Brothers Shipping Ltd
Tunatuki Shipping Ltd
Beachcomber Cruises Ltd
Punjas Fiji Ltd
Flour Mills of Fiji
Morris Hedstrom Ltd
Rewa Dairy

14.5 Others

Including other agencies, donors, and individuals who may have provided assistance that are not mentioned in this report.
