

# **NATIONAL DISASTER COUNCIL**



**Central Control Group**  
NATIONAL DISASTER MANAGEMENT OFFICE

**Honiara**

# **CYCLONE ZOË**

## **ASSESSMENT REPORT**

16 January 2003

SOLOMON ISLANDS

# CYCLONE ZOË ASSESSMENT REPORT

---

## SOLOMON ISLANDS

## CYCLONE ZOË

## ASSESSMENT REPORT

Paragraph	Contents	Page
	<b>MAP OF TIKOPIA</b>	<b>1</b>
	<b>EXECUTIVE SUMMARY</b>	<b>2</b>
	<b>Highest Priority Needs</b>	<b>2</b>
	<b>Second Priority Needs</b>	<b>3</b>
	<b>INTRODUCTION</b>	<b>4</b>
1	Cyclone Zoë	4
2	Team findings	4
3	Team recommendations	5
4	Underlying principles	5
5	Overall management of the response operation	5
	<b>ASSESSMENT METHODOLOGY &amp; ORGANISATION</b>	<b>6</b>
6	Team composition	6
7	Tasks	6
8	Timings	7
9	Team management	7
10	Sectors assessed	8
11	Method	8
	<b>GENERAL INFORMATION ABOUT TIKOPIA &amp; ANUTA</b>	<b>8</b>
12	Physical characteristics	8
13	Socio-economic characteristics	9
14	Access	9
15	Cultural considerations	10
16	Coping capacity	10
17	Population	11

# CYCLONE ZOË ASSESSMENT REPORT

---

	<b>SECTORAL REPORTS</b>	<b>12</b>
18	Manmade structures	12
19	The natural environment	14
20	Community productivity	16
21	Food / nutrition	19
22	Health	20
23	Water supply and sanitation	22
24	Communications	24
	<b>FINDINGS ON OTHER ISLANDS</b>	<b>25</b>
25	The situation on Vanikoro and Utupua	25
26	Assistance provided	26
	<b>ADDITIONAL RECOMMENDATIONS</b>	<b>26</b>
27	Debris clearance	26
28	Replacement of lost household items	26
29	Mosquito nets	27
30	Coordination support over the medium to longer term	27
31	Financial resources	28
32	Future cyclones	29
	<b>ANNEXES</b>	
<b>A</b>	<b>Estimated Population Distribution for Tikopia and Anuta</b>	<b>30</b>
<b>B</b>	<b>Provisional Estimate of Damage to Structures</b>	<b>31</b>
<b>C</b>	<b>Contributions and Offers of Assistance as at 10 Jan 03</b>	<b>33</b>
<b>D</b>	<b>Acronyms</b>	<b>36</b>

# CYCLONE ZOË ASSESSMENT REPORT

---



# CYCLONE ZOË ASSESSMENT REPORT

---

## Executive Summary

A comprehensive assessment of the impact of Tropical Cyclone Zoë on Tikopia and Anuta and other islands in Temotu Province, was carried out from 5 to 9 January 2003, after the seas had settled sufficiently to launch a mission. The assessment team's recommendations for further relief and support to the recovery process are summarised as follows:

### HIGHEST PRIORITY NEEDS

#### Short term (immediately)

- The Agriculture and Fisheries Division must conduct an assessment to determine the impact on these sectors, and to lay the groundwork for a full recovery plan.
- Nutritionally balanced food relief needs to be provided on a continuous basis, for at least 12 months and possibly up to 2 years on Tikopia, and for 3 to 6 months on Anuta. The food security situation should be monitored and quantities of food aid can be reduced as local production is restored.
- The NDMO must put together a comprehensive plan, with costs, to obtain and deliver sufficient bush building materials to rebuild 220 houses and repair 50. The most important item is sago palm, and this will cost approximately SBD 500,000.
- The NDMO should follow up on all the pledged contributions and less specific offers of assistance made domestically and from overseas, to fund the recovery.
- The NDMO should obtain donor funding for 2 chainsaws, ancillary/spares packs, and frames at a cost of SBD 18,000 each, for long-term loan to the islands.
- Solomon Islands Red Cross will supply a further 100 family packs to Tikopia, at a cost of approximately SBD 50,000.
- The entire population of both islands should be supplied with mosquito bed-nets.
- If further temporary shelter materials are provided as an interim solution to the shelter problem, they should be proper tarpaulins rather than plastic sheeting.

#### Medium term (up to 1 month)

- The existing water supply systems on Tikopia should be restored.
- Planting materials and gardening tools are needed, especially on Tikopia. Any taro delivered must be inspected for taro beetles first.
- The CCG should request FAO to conduct a quick assessment of food security on the islands and to design an agricultural and fishing recovery plan, in cooperation with the Agriculture and Fisheries Division, as soon as possible.
- The CCG and provincial government should encourage the population to repair essential community facilities, as a priority.
- The clinic and staff quarters on Tikopia should be rehabilitated and re-equipped.
- The Government should ensure that any funding commitments made through the National Disaster Council Trust Fund to commercial or other actors, are honoured.

#### Longer term (1 to 3 months)

- An adviser on the recovery of community productivity in small Pacific islands through the regeneration of agriculture and fisheries should be posted on Tikopia for up to a year.

## CYCLONE ZOË ASSESSMENT REPORT

---

- The islands need an integrated rural development plan, with an on-site coordinator (who could be the same person as the agriculture and fisheries adviser).
- The existing health worker on Anuta should receive more training and a registered nurse should be stationed on the island.
- Rebuilding of schools and re-establishment of primary education on two islands.
- Primary healthcare services such as immunisation, maternal and infant healthcare, routine disease surveillance, and regular re-supply should be re-established.
- A regular maintenance programme is needed for the clinics and their HF radios. Only sealed batteries should be supplied for the radios in future.

### **SECOND PRIORITY NEEDS**

#### **Short term (up to 1 month)**

- Suitable logs for building outrigger dugout canoes must be imported to the islands.

#### **Medium term (1 to 3 months)**

- The NDMO should request technical assistance in the form of an emergency response and recovery adviser, for a period of up to a year.
- The Division of Environment and Conservation should ask the South Pacific Regional Environment Programme to conduct a thorough impact assessment. In particular the problems with erosion and loss of topsoil need scrutiny.
- The Temotu Provincial Government should negotiate with the community on Anuta to permit the establishment of a proper clinic or a smaller health aid post.
- The SIBC relay station on Nendo Island should be completed as soon as possible.

#### **Longer term (beyond 3 months)**

- Food security should be reviewed at 6 monthly intervals for the next 2 years.
- The issue of what to do with the changes to Lake Te Roto, needs to be addressed by the Division of Environment and Conservation and the local community.
- Subject to developments with the lake, it may need to be restocked with fish.
- Limited restocking of livestock should be considered.
- The development of ventilated improved pit latrines should be considered.
- In future, the national patrol boats should visit these remote islands as often as possible, so that they can check on the HF radios and repair them if necessary.
- A more robust form of communication is needed with Tikopia and Anuta. If culturally acceptable to the communities, establishment of rural e-mail stations through the Solomon Islands People First Network should be considered.
- The NDMO's facilities should be gradually improved, and adequate budget provided to support minimal day-to-day operations, outside emergencies.
- The Bureau of Meteorology should be adequately funded to ensure that its central office and remote stations such as at Lata, have basic infrastructure.
- Technical Adviser to assist National Disaster Management Office in capacity building and facilitation of proposed National Emergency Operation Center.
- Extend capacity to the Provincial Disaster Committees prioritizing Temotu Provincial Disaster Council.
- The islands will need assistance with procuring bush-building materials for the routine replacement of sago palm wall panels and thatch, for years to come.

---

## **Solomon Islands – Tropical Cyclone ZOË 28-29 December 2002**

---

### **INTRODUCTION**

#### **1. Cyclone Zoë**

Cyclone Zoë was identified by the Tropical Cyclone Warning Centre at Nadi on Thu 26 Dec 02, when it was located at latitude 10.8 degrees south and longitude 174.5 degrees east, travelling in a westerly direction at 20 km/h, with a sustained wind speed of 95 km/h and momentary gusts up to 130 km/h. Zoë rapidly became a category 5 cyclone – the highest level – and reached its peak intensity on Sat 28 Dec, with extremely high seas, sustained winds of 245 km/h and gusts up to 340 km/h. At this time the eye of the storm was located only 50 km southeast of Anuta. Over the next 24 hours the weather system moved only 20 km further away from Anuta on its southwest heading, maintaining its intensity as it passed within 30 km of Tikopia. At only 890 hectopascals, the pressure of the system was so low that, when combined with the hurricane-force winds, it caused extremely strong storm surge to the islands. Tikopia sustained more damage because Zoë was almost stationary near the island for a period of 16 hours.

The cyclone finally moved away to the south-southeast late on Sun 29 Dec, passing close to the main islands of Vanuatu. According to the Tropical Cyclone Warning Centre at Brisbane, Cyclone Zoë was the most intense cyclone to affect the Southwest Pacific Region, since reliable satellite data has been available.

#### **2. Team findings**

In spite of the lack of casualties, the overall impression of the assessment team is that the situation on Tikopia and Anuta is very serious. According to the Secretary of the Temotu Provincial Government and Chairman of the Provincial Disaster Committee (PDC), Zoë was by far the worst cyclone in living memory. The needs of the population are greater and will last longer than initially thought.



# CYCLONE ZOË ASSESSMENT REPORT

---

### **3. Team recommendations**

The assessment team's recommendations for further relief and support to the recovery process are summarised on the first page of this report.

Overall, the communities on Tikopia and Anuta need an integrated rural redevelopment plan that will bring together all the different sectoral inputs in a coherent manner. Once the emergency phase and the Central Control Group (CCG) have wound the immediate relief operation down, the Rural Development Division of the Ministry of Provincial Government and Rural Development could be empowered to provide such a service, perhaps through the Rural Development Volunteers Association (RDVA) supported by UNDP. An essential component of the recommended approach is the establishment of an on-site coordinator in Tikopia, with the capability of visiting Anuta on a regular basis, if possible.

### **4. Underlying principles**

Relief and recovery inputs have been prioritised purely on the basis of the greatest and most urgent needs of the affected communities on Tikopia and Anuta. Given the severity of the impact of Cyclone Zoë, the needs are not excessive. At all stages, the national and provincial managers of the relief and recovery operation will seek to avoid creating dependency on, or overly high expectations about the aid. Assistance will be delivered through normal channels and seek to reinforce local structures as much as possible, to avoid the possibility of rejection by the beneficiaries.

### **5. Overall management of the response operation**

A small and effective Central Control Group (CCG) was established in the immediate aftermath of the disaster. It is chaired by the acting Police Commissioner and has membership including the Adventist Disaster Relief Agency (ADRA), Oxfam, Solomon Islands Red Cross (SIRC), World Vision, the Ministry of Health, the Meteorological Service, the Marine Division, and the National Disaster Management Office (NDMO). The CCG reports to the National Disaster Council (NDC) and is the working-level body managing the operation from day-to-day. It has allocated

## CYCLONE ZOË ASSESSMENT REPORT

responsibilities for media liaison, donor liaison, local donations, NGO coordination, logistics, manning the operations room, and administrative support.

### ASSESSMENT ORGANISATION AND METHODOLOGY

#### 6. Team composition

(a) PB04 Auki – medical response team, assessment team, and relief team

<u>Name</u>	<u>Title</u>	<u>Representing</u>	<u>Role on team</u>
Herman Oberli	Doctor	Ministry of Health	i/c med. team
Segema Olita'a	Registered Nurse	World Vision	med. team
Selwyn Hou	Registered Nurse	Lata Hospital	med. team
Jack Kaota	Registered Nurse	Lata Hospital	med. team
Francis Tatapu	Registered Nurse	Lata Hospital	med. team
Philip Wakioasi	Pharmacy Assistant	Ministry of Health	med. team
Hon. Jeffrey Teava	MP	SI Government	
Stacey Greene	Second Secretary	Australian High Com.	general asses.
2 x	Agricultural Officers	Temotu Province	agriculture
George Siapu	Information Officer	PM's Department	info. mgt.
Alfren Inomae	Reporter	SI Broadcasting Corp.	
Selwyn Rotu	Superintendent	SI Police Service	i/c relief team
5 x	Police Officers	SI Police Service	relief team
2 x	Chainsaw operators	CPRF	clear debris

(b) MV Isabella – main assessment team

<u>Name</u>	<u>Title</u>	<u>Representing</u>	<u>Role on team</u>
Rex Tara	Disaster Officer	SI Red Cross	team leader
Nancy Jolo	Health Inspector	Honiara City Council	deputy TL
Linda Anderson-Berry	Zoë evaluation study	Bureau of Met.	storm impact
Allan Rangi	Met. Service Officer	Bureau of Met.	storm impact
Ian Aujare	NDC Volunteer	Zao (local NGO)	environment
Morris Kiukakea	Volunteer	World Vision	watsan
Ambrose Kirei	Civil Engineer	Honiara Tikopians	local liaison
Dominic Tua	Volunteer	SI Red Cross	logistics
30 x	Police Officers	SI Police Service	relief team

#### 7. Tasks

The medical team on PB04 Auki was responsible for providing medical assistance and for assessing the health sector.

## CYCLONE ZOË ASSESSMENT REPORT

The assessment team was deployed on both vessels: PB04 Auki and MV Isabella. This team was responsible for assessment in all other sectors, and for compiling an overall report on the situation.

A police disaster response corps of 36 officers and a number of volunteers under the command of Superintendent Selwyn Rotu also deployed on both vessels. Superintendent Rotu and 5 men travelled on Auki with the tarpaulins, clothing and water containers. Their tasks were to make contact with the local village councils and assist them to compile beneficiary lists and set up relief distribution networks on Tikopia and Anuta. The larger contingent travelled on Isabella with the bulk of the relief supplies, and they were tasked with conducting the distribution and assisting the communities in debris clearance and initial repairs.

### 8. Timings

<u>Date</u>	<u>Time</u>	<u>PB04 Auki</u>	<u>MV Isabella</u>
Thu 2 Jan 03	2000 hrs	Depart Honiara	
Fri 3 Jan 03	1200 hrs	En route to Lata	Depart Honiara
Sat 4 Jan 03		Collect nurses, chainsaw ops & agriculturalists / deliver medical supplies	En route to Lata
Sun 5 Jan 03	0530 hrs	Arrive Tikopia	Pass Lata
	2359 hrs	Assessment on Tikopia	Arrive Tikopia
Mon 6 Jan 03	0920 hrs	Overall team meeting at Tikopia	
	2359 hrs	Sub-team sails to Anuta	Main team inputs data
Tue 7 Jan 03	0545 hrs	Arrive Anuta	Assessment on Tikopia
	2359 hrs	Sub-team sails to Tikopia	Main team inputs data
Wed 8 Jan 03	0600 hrs	Arrive Tikopia	Assessment on Tikopia
	1200 hrs		Depart Tikopia
Thu 9 Jan 03	0600 hrs	Arrive Vanikoro	Arrive Lata
	1330 hrs	Arrive Utupua	Depart Lata
Fri 10 Jan 03	0400 hrs	Arrive Lata	En route to Honiara
	1430 hrs	Depart Lata	Arrive Honiara
Sat 11 Jan 03	1430 hrs	En route to Honiara	Team debrief
Sun 12 Jan 03	1430 hrs	Arrive Honiara	
Mon 13 Jan 03	1100 hrs	Team debrief	

### 9. Team management

The CCG nominated Rex Tara, Disaster Relief Officer for SIRC and FACT member, as team leader. The deputy leader was Nancy Jolo, Health Inspector for Honiara City Council and an UNDAC member. Terms of Reference were developed

## CYCLONE ZOË ASSESSMENT REPORT

---

jointly by the CCG and the team before their departure. En route the team allocated tasks and sectoral responsibilities based on individual team members' expertise, and it planned the methodology it would use. On return the team was thoroughly debriefed on both the substantive information they had collected, and the assessment process itself.

### 10. Sectors assessed

The team employed an assessment form that utilised a number of sectors. The team allocated responsibilities for collecting information across these sectors as follows:

(1) General information and population details	[Ambrose Kirei]
(2) Damage to structures	[Ambrose Kirei & Ian Aujare]
(3) Damage to the environment	[Ian Aujare]
(4) Damage to community productivity	[Provincial agricultural officers]
(5) Food / nutrition	[Nancy Jolo]
(6) Health	[Dr. Herman Oberli]
(7) Water supply and sanitation	[Morris Kiukakea & Nancy Jolo]
(8) Communications	[Dr. Linda Anderson-Berry]

### 11. Method

The assessment team attempted to spend as long as possible on the ground on each island, making observations and taking notes, photographs and video footage. They sought out the leaders in each community such as the village elders, the teacher and nurse, if there was one. They also consulted the women and youths separately from the men. The leaders usually assigned locals to the team to assist them with the assessment. The team members generally stayed together and carried out their multi-sectoral assessment using pre-designed forms supplied by the NDMO. Most interviews with the local population were conducted in Melanesian Pidgin.

## GENERAL INFORMATION ABOUT TIKOPIA AND ANUTA

### 12. Physical characteristics

The eastern outer islands of the Santa Cruz Group – Tikopia, Anuta, and Fatutaka<sup>1</sup> – are extremely remote even by Pacific standards. Tikopia is an island of less than 6 km<sup>2</sup>, rising to 380 m at its highest point (Mt. Reani). It was thickly

---

<sup>1</sup> Fatutaka is uninhabited.

## CYCLONE ZOË ASSESSMENT REPORT

-----  
vegetated and volcanic in origin with the central and eastern part of the island a crater, breached to the south side at sea level. A narrow, low sand and gravel bar separates the slightly brackish crater-lake (Te Roto) from the ocean. The western end of the island where half of the population lives is flat, sandy plain only a few metres higher than the fringing reef. Anuta is 140 km to the northeast of Tikopia: a small single volcanic peak surrounded by a shallow narrow lagoon. It is less than 2 km<sup>2</sup> and rises to only 80 m. The lagoon is narrow and the reef affords limited protection, but the island is fertile and thickly vegetated.

### **13. Socio-economic characteristics**

The inhabitants of both islands are of Polynesian rather than Melanesian origin, with kinship ties to populations elsewhere in Temotu Province and in Makira and Rennell. They practise a very traditional communal lifestyle, particularly on Anuta, where land and many possessions are owned in common rather than by individuals or families. People have little formal education and few qualifications. There is one main village on Anuta, but on Tikopia the population lives in 16 small villages around the shoreline and the lake, and linked by small forest paths. There is little significant permanent infrastructure and relatively few manufactured items, and the population subsists on small-scale agriculture and in-shore fishing. The main source of income is from the occasional sale of marine products such as shark fins and bêche-de-mer as delicacies. Relatives of islanders with paid employment elsewhere (especially in Honiara) also contribute in a small but significant way to the local economy.

### **14. Access**

Both islands are extremely remote, being 500 km from Lata the capital of Temotu Province, and over 1,100 km from Honiara. They have no airstrips or helicopter landing sites, and the helicopter carrying the photojournalist Geoff Mackley from Santo Island in Vanuatu, was forced to land on a beach. The nearest airstrip is at Lata on Nendo Island, 500 km away, but this is too short even to take a C130 aircraft. A boat arrives only intermittently from Lata, and communications are tenuous.

## CYCLONE ZOË ASSESSMENT REPORT

---

The islands also have no roads, wharves or jetties. Although unloading from ship to shore is slightly easier at Tikopia because the reef does protect the shoreline more than at Anuta. At low tide the lagoon is so shallow that all goods must be carried by hand for quite a distance. Access to Anuta is very difficult as it lacks even a sheltered spot for landing small boats, and in fact one of the Auki's tenders was swamped in the high surf, soaking the outboard motor and 20 bags of rice (which were recovered).

The Tikopians and Anutans are even isolated from each other, since they possess only small outrigger canoes that cannot travel across the open ocean between the islands. A supply ship from Lata is supposed to visit every 6 weeks, but in reality shipping is infrequent and unreliable. During 2002 the longest interval between visits was 7 months. In effect, the islands are neglected by the provincial and national authorities.

### **15. Cultural considerations**

There are significant protocol requirements to be taken into account when providing assistance to these islands. They are ruled by powerful local chiefs who may refuse to accept help, even after an event as devastating as Cyclone Zoë, if the donors are deemed to be imposing their own terms on the transaction, and the chiefs perceive that the physical aid or relief works may impact negatively on their subjects in some way. However, the affected communities do have committees that are expected to liaise with the government representatives to coordinate the emergency assistance offered by donors. There are also two civil society organisations with which the NDMO, as the responsible government department, is expected to coordinate the national response: namely the Vattu Disaster Response Committee, and the Social and Economic Development Association of Tikopia.

### **16. Coping capacity**

The people are obviously very self-reliant and resilient to natural hazards, and have demonstrated well-developed traditional coping mechanisms for the extreme events themselves. Any assistance must take account of these practices and do all it can to reinforce them, rather than eroding them by encouraging dependency on the outside world. Nevertheless, the islands are very vulnerable in the aftermath of a

## CYCLONE ZOË ASSESSMENT REPORT

-----  
major disaster, as their capacity for food production can recover only as quickly as their environment regenerates.

Examples of these coping mechanisms include observing when the breadfruit trees have produced a large crop (which usually occurs in cyclone-years) and burying the surplus. After receiving the first warnings of the approaching cyclone on their transistor radios, people on Anuta then actively sought more information from other sources. They passed the warnings around the island and used the time available to secure their roofs and property, by weighing them down with banana palm trunks and covering them with vegetation. The schoolteacher was particularly active in disseminating the cyclone warnings. Finally, when the storm had destroyed their houses, the villagers on Tikopia sought shelter on higher ground under rock overhangs, and they wrapped everything they could salvage in plastic sheeting.

### **17. Population**

#### (a) Tikopia Island

Tikopia is divided into 2 districts: Ravenga covering the east through to the southwest half of the island, and Faea covering the west through to the northeast. Each district has 4 parishes or communities, and each parish comprises a few small villages. The population is 1,446: about 170 children are under 5 years and there are 12 teachers, 1 registered nurse and 1 nurse aid. Five women were pregnant at the time the team visited. The population density is 240 persons per km<sup>2</sup>: high by Pacific standards.

#### (b) Anuta Island

Anuta is divided into 2 parishes but most people live in the large central village: Fangaroto. The island has a total population of 232, living in 75 houses. The average family size is 7 persons, and less than 30 children are under 5 years old. The assessment team saw no pregnant women, and 4 people were reported to be disabled. The population density is 120 persons per km<sup>2</sup>. On the basis of population, approximately 17% of the total food relief provided in the initial deliveries, was delivered to Anuta.

## CYCLONE ZOË ASSESSMENT REPORT

---

### (c) Both islands

The estimated population distribution broken down by age and sex is at Annex A.

## SECTORAL REPORTS

### 18. Manmade structures

A provisional estimate of damage to structures on the islands is at Annex B.

#### (a) Situation and response on Tikopia

The team conducted a count by district, of all households on the island. 176 houses in Ravenga were completely destroyed by the waves or wind – nearly all the dwellings in the southern district. Those whose homes have been completely destroyed also require full sets of household possessions: clothes, bedding, cooking implements, lighting, and tools. Some families escaped with only the clothes on their backs – everything else was lost. These families are now living in rudimentary shelters built from debris and plastic sheeting. Unfortunately they are prone to tearing and also black, which absorbs the sun's rays and makes the shelters extremely hot, but they were the only suitable material available in Honiara on New Year's Day.

There were 153 houses in Faea and the majority of them suffered some damage. Over 200 houses across the whole island (about two-thirds of the total) require substantial repair or complete replacement. The earlier report that 70-80 houses were destroyed referred to just one village – Namo – built along the sand spit separating the lake from the ocean, that was swept away by the waves. The cyclone opened up 3 fresh graves in this area. Relatives have now re-interred the exposed remains.

Aside from homes, there were also meeting houses, schools, churches and other community buildings, built both of traditional materials and of sawn timber with corrugated iron roofs. The 4 churches and the 1 school in Ravenga were destroyed. The 1 trade store run as a village cooperative was also swept away and the other privately owned store and its stock were damaged. In Faea 1 of the churches and the school sustained major damage. The other 3 churches sustained minor damage. All educational materials in the Ravenga District school were lost. Those in the Faea



## CYCLONE ZOË ASSESSMENT REPORT

---

District school were damaged. World Vision has already despatched packs of educational materials on the third vessel, MV Hamakyo Maru.

### (b) Situation and response on Anuta

On Anuta 4 houses were badly damaged and another 24 suffered minor damage – out of a total of 75. Damaged houses have been patched up as far as materials availability permits, but more permanent repairs are still needed. The remaining buildings survived the cyclone intact, as the population was able to prepare by securing their roofs and household possessions before its full force struck them. The 3 m high seawall that protects the main village along the east coast mitigated severe damage from storm surge. The wall itself is made of unmortared coral blocks, but it withstood the waves well and was only damaged where trees fell on it. The wall is jointly maintained by the families that live behind it.

One of the 2 churches lost its roof, although this had already been re-thatched by the time the team arrived. The school was in a very poor state of repair and poorly resourced long before the cyclone. The school supply packs sent by World Vision will help, and it may be possible to interest other donors in refurbishing the school. In 2002 there were 70 students enrolled.

### (c) General concerns

Almost all houses and the majority of other structures on both islands are built in traditional style out of bush materials: sago palm thatched roofs and walls covering timber frames. The main fastenings are twine made of natural vines or nylon, and nails. The normal lifespan of sago palm roof thatch is only 2 years, and all the surviving structures will need new roofs within 12 to 18 months. Sago palm leaves were already in short supply on Tikopia before the cyclone. Due to the environmental damage, the islands' own sources of building materials were destroyed for the foreseeable future. It will take 8 to 12 years for sago palm to regenerate, and longer for structural timber. The lack of local building materials constitutes a real secondary threat to the wellbeing of the population. For this period the islands will therefore remain dependent on external sources of building materials.

## CYCLONE ZOË ASSESSMENT REPORT

---

### (d) Recommendations

The current shelters for the population of Ravenga District are unsatisfactory. If future temporary materials are sent they should be proper tarpaulins rather than plastic sheeting. As nearly half the population of Tikopia and Anuta are in need of building materials for house reconstruction or repairs, the only option is to purchase and deliver large quantities of sago palm leaves as soon as possible. There are significant Tikopian communities elsewhere in Temotu, which might have been willing to help, but the Vanikoro Island chief has already confirmed that his community did not have any surplus sago palm resources. Tikopians living in Lata have already supplied about 1,000 prefabricated woven leaf panels, but this is sufficient to build only 2 or 3 houses. Enough sago palm to make some 100,000 such panels will be needed over the next couple of months.

The NDMO will therefore need to look further afield to the country's larger islands, and donors must be prepared to support their purchase and delivery of bundles of unprocessed sago. Each house would need about 20 bundles at a cost of roughly SBD 100 each. Completely rebuilding 220 such buildings and repairing a further 50 would require in the order of SBD 500,000, excluding delivery.

It is recommended that the populations prioritise essential community facilities such as the 3 schools and the clinic, for early repair or reconstruction, as appropriate. It is up to the on-site representatives of the CCG and Temotu Provincial Government to encourage them to do this.

### **19. The natural environment**

#### (a) Situation and response on Tikopia

The cyclone has wrought enormous changes to Tikopia's environment especially the south coast. All the vegetation has been torn apart and not a shred of greenery remains. Many of the larger trees, including coconut palms, were snapped in half or uprooted. Access on the small tracks around the island is curtailed and a possible secondary hazard is fire, with all the broken wood littering the island, although at the moment the ground and debris are still very wet. In some places the ground was scoured down to bare rock by the rain and storm surge, and small

## CYCLONE ZOË ASSESSMENT REPORT

---

landslides are visible on the steeper slopes. With the humus layer and shade cover gone, it will take much longer for the vegetation to recover than would normally be expected.

Te Roto, the central lake in Ravenga formerly contained slightly brackish freshwater. It has now been filled with mud, sand, and saltwater, up to 30 m into the lake on the seaward side. Depending on rainfall, it will take at least a year for the water to become fresh again. Another problem is erosion of the sand spit that separates the lake from the sea. This was formerly 2 m higher and also narrower. It is now breached in one place, where dirty green water flows out to the sea. The level of the lake has fallen and the sea will now be able to enter the lake much more easily, either by passing through the breach or by washing over the lowered sandbar. Some form of protective works may be required to prevent further erosion, and to allow freshwater to accumulate in the lake again. A culvert may also be needed, if the level of the sandbar is raised significantly, to prevent the lake flooding the surrounding villages.

The island's fringing coral reef may also have been damaged, but probably this is less significant because the sea level during the storm was much higher than normal, and the waves swept over the reef. The fish stocks on the reef should still be intact, but this has not been investigated. Many beaches show signs of damage and erosion.

Overall, the wind, sea-spray, and wave action have largely destroyed Tikopia's land and coastal environments. The condition of its marine environment is unknown. Obviously the flora has suffered greatly, but it is hard to measure the effects, because there are no recent ecological studies of the island before the cyclone. The most significant fauna is birds, flying foxes and bats, and insects. Whilst some species of insect have increased following the destruction, the flying foxes and fruit-eating birds will suffer greatly, reducing their populations and ultimately also their ability to help the recovery of plants through the dispersal of seeds.

### (b) Situation and response on Anuta

## CYCLONE ZOË ASSESSMENT REPORT

---

Superficially Anuta looks better than Tikopia, but its environment has still been seriously damaged by the cyclone. Many large trees have been uprooted, vegetation in coastal areas has been covered in sand, and there is evidence of erosion, especially on exposed slopes. Vegetation has not been stripped completely bare as on Tikopia, but all fruit trees are denuded and, depending on the species, they will not bear fruit again for 1 to 2 years.

### (c) Recommendations

The most significant problems are the loss of topsoil and the corresponding ability of the earth to retain nutrients and moisture. Substantial recovery of the ecosystem will take at least 10 to 15 years, provided there are no other major upsets but, on some heavily eroded slopes, it may never happen. Tropical cyclones do form near this area and the island experiences a minor cyclone every few years. However, in the past a storm of Zoë's magnitude has occurred only once every 30 to 50 years.

It is recommended that the Division of Environment and Conservation ask the South Pacific Regional Environment Programme (SPREP) to conduct a thorough impact assessment. This would put accurate figures on the time period needed for partial and complete recovery of the environment, and make recommendations to accelerate the process. The findings and recommendations will be valuable for the whole of the Solomon Islands, which suffers from major cyclones every few years.

This team should particularly examine the state of the soil on Tikopia, since this will be critical for the island's recovery. Another specific issue is Te Roto Lake in Ravenga, now that its retaining barrier is eroded and breached. Should it be dredged and the sandbar rebuilt as high as before, perhaps incorporating a culvert to prevent flooding, or should it be left alone ?

## **20. Community productivity**

### (a) Situation and response on Tikopia

Agricultural productivity on the island has been completely wiped out. Gardens on the hillsides were destroyed by the high intensity winds, and the swamp taro patches on low-lying land were flooded with seawater and covered with sand.

## CYCLONE ZOË ASSESSMENT REPORT

---

Assuming that there are other suitable areas for planting, taro will still need about 12 months to reach maturity. The fastest growing vegetable is cassava, which takes 3 to 4 months from planting to harvest. Papaya and banana will take 6 months and, the new coconut palms that must be planted will not start producing for 6 to 8 years. These times are for good growing conditions, but conditions on Tikopia are now far from ideal. The topsoil layer has been seriously eroded, there is no shade to protect young plants from the sun, and by April the region will have entered the dry season again.

Although they may survive the saltwater inundation of the lake, the 4 species of freshwater fish living there have ceased to be a viable food source because of the silt and debris that now choke it. Even if the lake becomes fresh again over the next 12 months, it will need to be restocked with fish from other islands, and these stocks will need time to grow before they can be utilised at a sustainable rate.

The ability to catch fish has been seriously impacted by the loss of equipment; 95% of people in Ravenga having lost their outrigger dugout canoes. In Faea, most people saved theirs, by pulling them inland. New canoes can be built in 2 to 8 weeks depending on the size, and the availability of manpower and simple tools (axes and adzes), but suitable logs must first be imported from other parts of the Solomons.

### (b) Situation and response on Anuta

Most of the swamp taro has been damaged by saltwater inundation and up to 70% of crops have been destroyed, mainly by flying debris, flooding and soil erosion. Most gardens have been damaged to some extent and need to be cleared of debris and replanted as soon as possible. The breadfruit has all fallen and 80% of coconut palms are damaged. After the current crop of nuts is consumed there is concern that the trees may not recover.

A week after the passage of the cyclone some banana palms already showed signs of recovery, but this first crop is likely to be spoiled. The next crop will be ready in 6 months time. The soil on Anuta was always more fertile and it has not suffered from the same erosion as Tikopia. In addition, the inhabitants practised an effective crop rotation system thanks to their communal management approach.

## CYCLONE ZOË ASSESSMENT REPORT

-----  
Although the vegetation is stripped of leaves and all shade is gone, the humus layer is still intact, and agricultural productivity should recover within the next 12 months.

Since the passage of the cyclone no fishing had been conducted on Anuta, either because the sea was still too rough after the passage of the cyclone or for cultural reasons. Only a few canoes were lost, and it is likely that the reef resources survived the cyclone, although this has not been assessed.

### (c) Recommendations

The loss of productivity is the most critical issue facing the people of Tikopia and, to a slightly lesser extent, of Anuta, since it will cut their food supplies drastically and ultimately threaten their wellbeing. It is therefore recommended that the Government immediately despatches an experienced and responsible team from the Agriculture and Fisheries Divisions of the Ministry of Agriculture, to determine the impact on these sectors, and to lay the groundwork for a full recovery plan<sup>2</sup>.

Tools, planting materials (beans, tomatoes, and others), and logs for outrigger canoes will be needed over the short to medium term, and these must be brought from other islands. All imported taro must be inspected to prevent the import of taro beetles to Tikopia and Anuta. Limited restocking of livestock should be considered later. At present there is a risk that they will compete for food with the human population and possibly damage new gardens as they are established.

In the medium to longer term, an adviser on the recovery of community productivity should be posted on Tikopia for up to 1 year. They should be an expert on agriculture and fisheries in small Pacific island environments, and particularly about issues such as topsoil regeneration and irrigation. They will also have to understand the strong cultural context and, for this reason and because of the isolation, it is suggested that a suitable national is recruited for the post. The expert could be recruited through the 'Kastom Gaden Association'<sup>3</sup> since it already runs similar projects across the country.

---

<sup>2</sup> A team will be despatched on the 4<sup>th</sup> vessel, MV Kopuria, which is scheduled to sail on Sat 18 Jan.

<sup>3</sup> Run by Tony Jansen in Honiara.

## CYCLONE ZOË ASSESSMENT REPORT

---

### 21. Food / nutrition

#### (a) Situation and response on Tikopia

The main dietary staples are cassava, taro, yam, coconuts and fruit: breadfruit, banana, and papaya. Protein comes mainly from fish – telapia from the freshwater lagoon in the centre of Ravenga District and from the fringing reef – and chickens, ducks and pigs. Except for the fringing reef, all local food sources have been destroyed and there are almost no stocks remaining. The islanders will need seedlings as well as seeds, and 174 households in Ravenga also lost their gardening tools.

The population was running out of food by the time the first relief arrived; almost all undamaged fruit and vegetables and some of the livestock had been consumed, leaving only spoiled taro. Sufficient rice has been delivered for the next 6 weeks, but this does not constitute a balanced diet and nutrition is therefore an immediate and growing problem. Without continuing substantial external assistance, Tikopia will have zero food security for the next 12 to 24 months. A nutritionally balanced package of food relief must be provided for this length of time, with the quantity gradually being reduced as local production picks up again. This will only commence if a recovery plan for agriculture and fishing is put in place, based on a comprehensive evaluation of food security over the short, medium, and longer term.

#### (b) Situation and response on Anuta

As on Tikopia, the main staple foods are cassava, swamp taro, yam, and coconuts, with fish and shellfish collected from the reef, plus occasional meat from the chickens and ducks. However, unlike Tikopia, most cooking is done in one central communal kitchen. Imported foods such as rice are cooked in individual kitchen outhouses.

On Anuta the taro did not all spoil immediately and, before the arrival of the relief mission arrived, people were living off the tubers still in the ground and fallen fruit. These could last another 2 weeks but after this stock is exhausted it will take many months before the taro patches can be restored to productivity. Food aid will be required for 3 to 6 months until local productivity is restored, provided that all gardens can be cleared of debris quickly.

## CYCLONE ZOË ASSESSMENT REPORT

---

### (c) Recommendations

Ensuring sufficient and balanced nutrition for the next 2 years is the most critical challenge facing the islanders, the government, and the donors that have pledged to support the Solomon Islands. Tikopia will need significant and continuous food relief for 12 to 24 months, and Anuta for 3 to 6 months, with the quantities being reduced progressively as local production picks up. If the majority of the relief is to be in the form of rice, then vitamin supplements must also be provided. In both islands the nutritional situation needs to be closely monitored throughout these periods and thereafter, in case crops do not regenerate as fast as anticipated.

It is recommended that the CCG request the Food and Agriculture Organisation (FAO) to evaluate food security and design an agricultural and fishing production recovery plan, as soon as possible. Ideally the study should be done in conjunction with the environmental impact assessment, and also draw on local expertise, such as the 'Kastom Gaden Project' and the AusAID-funded regional 'Tarogen Project'. The food security situation on both islands should then be reviewed again at intervals of 6 months, for the next 2 years.

## 22. Health

### (a) Situation and response on Tikopia

Miraculously Cyclone Zoë caused no fatalities. The nurse had already treated minor injuries. The only serious injuries were a fractured forearm and one badly infected leg-wound which Doctor Oberli treated with intra-venous antibiotics, but there was no noticeable increase in attendance at the clinic following the cyclone. Those whose homes were washed into the lake or out to sea by the three large waves that came from the southeast, survived by sheltering in large groups (of 50 or more) under overhanging rocks on higher ground. These were not caves, and they became increasingly exposed as the wind stripped the surrounding vegetation cover.

During their 4 day visit the medical response team examined and treated 93 patients, 41 of them children. They presented cases of Acute Respiratory Infections (ARI), skin infections, abscesses, pneumonia (2 cases in children), and conjunctivitis



## CYCLONE ZOË ASSESSMENT REPORT

---

(1 case). There was no diarrhoea. One case of malaria was seen, but this patient had recently returned from Honiara. In general the population seemed very healthy and in good spirits, including the children, in spite of their highly stressful experience.

Medical facilities on the island consist of a single clinic already in poor condition and a staff house abandoned 10 years ago and now derelict. After the cyclone the main structures were still intact, but the roof of the clinic leaks and this needs urgent attention or the newly supplied drugs may be wasted. The High Frequency (HF) radio had been out of order since November, and 5 discharged batteries and 6 solar panels were found inside, only one of the latter working. Much of the medical equipment was also inoperative, so the medical team prepared a complete list of all requirements, for re-supply by Lata Hospital.

### (b) Situation and response on Anuta

Again, no casualties were sustained during the cyclone, although one man had sprained an ankle when he fell from a coconut tree. Currently the mosquito problem on Anuta is even worse than on Tikopia. There are no cases of malaria, but the absence of the anopheles mosquito should be verified. Some of the women reported a rising incidence of diarrhoea in young children during the rainy season, but only one case was presented to the medical team.

However, there are significant problems with primary healthcare on the island. Traditional beliefs led the island's chiefs to close the clinic in 1995, as they feared that its presence could increase rather than reduce the incidence of disease. The one community health worker has to work out of his own home. He needs more training and was himself suffering from a severely abscessed tooth when the medical team arrived. A nursing aid is currently in training on Malaita, and he should return to the island within 6 months.

On its one-day visit the medical team established a temporary clinic in the school, and examined and treated 42 patients in total, 22 of them children. The other main complaints were ARI, skin infections, abscesses, and a single case of diarrhoea. The registered nurse, Segema Olita'a, also took advantage of the team's visit to give some instruction in midwifery to 3 local women.

## CYCLONE ZOË ASSESSMENT REPORT

---

### (c) General concerns

Since the cyclone the incidence of skin problems has been increasing. These are related to poor personal hygiene caused by the now restricted freshwater supply and lack of shelter from the elements. There has been a marked increase in the population of flies and mosquitoes, but malaria is not endemic on the islands. Underlying chronic health concerns are tuberculosis and diabetes. Smoking home-grown tobacco and chewing betelnut are also prevalent. Essential medical supplies were exhausted on both islands, and so the team left 3 months of stocks with the health workers.

### (d) Recommendations

It is recommended that donors already engaged in developing and strengthening the health sector provide support to improve the quality of healthcare on the islands. This can be achieved if the Temotu Provincial Government addresses 4 main areas:

- The re-establishment of primary healthcare services such as immunisation, maternal and infant healthcare, routine disease surveillance, and regular re-supply of medicines and vaccines;
- The rehabilitation and re-equipping of the clinic and the staff quarters on Tikopia;
- The provision of training for the existing health worker on Anuta and ensuring that a registered nurse is posted there when trained;
- Negotiating with the community on Anuta to permit the establishment of a proper clinic or a smaller health aid post on the island.

## **23. Water supply and sanitation**

### (a) Situation and response on Tikopia

Of the 2 gravity-fed water supply systems on Tikopia; the one supplying about 400 people in Ravenga District is virtually destroyed (the Vai Ata source), and the one for Faea is damaged (Te Puta). The Ravenga system suffered damage to its dam and its 9,000 litre tank on the main hill about 300 m above sea level, and complete loss of all pipe-work and standpipes. Faea's intake works and reservoir were blocked

## CYCLONE ZOË ASSESSMENT REPORT

---

by debris but they have now been cleared and are already in use again. However the water reticulation system is damaged and requires some new pipes and fittings.

The water tanks, pipes and fittings supplied on MV Hamakyo Maru should be sufficient to repair the Faea District system and make a start with the Ravenga system. Whilst on Tikopia the plumber who is making these repairs will quantify what else is needed for Ravenga. In the meantime families in Faea are using a good quality source on the northwest beach, but this is only accessible at low tide. The main problem is with water distribution, which reduces water availability for hygiene and will increase the incidence of diarrhoea and skin diseases, especially amongst children. This has been partially addressed in the short term by the provision of water containers.

### (b) Situation and response on Anuta

The water supply system to the main village is a gravity-fed system from a spring source on a nearby hill, feeding a 9,000 litre tank. The small concrete dam of the intake works suffered some damage. Villagers had already cleared debris and effected temporary repairs of the intake works and piping, so sufficient drinking water of good quality is still available. The water reticulation system on Anuta consists of 10 shared standpipes; 2 of them were damaged by falling trees and require replacement. The materials necessary to repair the Anuta water supply system were despatched on MV Hamakyo Maru.

### (c) Recommendations

Although untreated, the water supply in the islands is quite good by national standards, so after the cyclone it is a question of restoring the systems rather than developing anything new. Currently the quantity of fresh water supplied is adequate for both drinking and basic hygiene purposes, although its quality has not been scientifically tested. It is recommended that all repairs to the water supply systems in Tikopia be effected as quickly as possible and, in the medium term, this is an opportunity to overhaul the water supply systems on both islands.

Sanitation is extremely basic: people use the sea, the beach below the high water mark, or the bush around their homes. Given current conditions, this practise may pose a risk to health, especially of children. The development of ventilated

## CYCLONE ZOË ASSESSMENT REPORT

-----  
improved pit (VIP) latrines for all communities should be considered, if culturally acceptable.

World Vision Solomon Islands has indicated that it can take the lead in this sector, and is currently quantifying its overall resource requirements.

### **24. Communications**

#### (a) Situation on Tikopia and Anuta

The only means of communication with the outside world for both islands is a two-way HF radio provided by the Ministry of Health, and located in the clinic on Tikopia and Tematai Primary School on Anuta. Neither radio had been functioning for some time – on Tikopia this was due to a faulty microphone since November and on Anuta it had not been working for a number of years. The lack of communications with the outside world for the week after the cyclone was the cause of much anxiety, especially in Australian and western media, given the intensity of the storm.

In terms of receiving information from the outside world; about two-thirds of households on Tikopia and one-third on Anuta have their own short-wave battery-operated transistor radios. These receive Solomon Islands Broadcasting Corporation (SIBC) transmissions in the early morning or the evening, but not at other times. They tune in to Radio Vanuatu because it has the best reception and they can understand Bislama. They seldom listen to the BBC, ABC, or Radio New Zealand. They did receive the cyclone warnings through the SIBC broadcasts, and the messages were passed around the islands by word of mouth. The passage of information works better on Anuta than Tikopia, because the community is smaller and, since fewer families have a radio, those that do have one make more effort to pass the news on to those that do not.

#### (b) Response on Tikopia and Anuta

The technician in the crew of PB04 Auki repaired the faults and replaced the antenna and the solar panel that powers the radio on both islands. However, the opportunities for regular maintenance are few, the radio operators have no training or

## CYCLONE ZOË ASSESSMENT REPORT

-----  
spares, and hence the communications links with these outer islands will remain very tenuous.

### (c) Recommendations

In future the national patrol boats should visit these remote islands and others like them as often as possible, since the simple radio repairs made by the technician on board were vital to ensuring communication with the islands. A regular maintenance programme is needed for the clinics and their radios. This will require an ongoing commitment of resources from Government. Only maintenance-free (sealed) 12 V batteries should be provided for use with HF radios.

In the medium to longer term, better and more robust communications to these remote islands are a definite need. One possible option, if acceptable to the communities and their traditional leaders, is the extension of the 'People First Network' (PFnet), the Solomons' own rural e-mail network, to Tikopia and Anuta. This system seeks to improve connectivity and drastically lower the cost to the user. Although like the Ministry of Health it relies on HF radios, the system is more sustainable, since the project team in Honiara provides a fully managed support service, with training and allowances for the operators, a regular maintenance schedule, parts and repair back-up, and ongoing improvements to the network. This solution to the communications problem has been effective elsewhere in Solomon Islands, but it must be culturally acceptable to succeed, especially in such very isolated and poorly serviced islands. The cost of establishing a standard PFnet Rural E-mail Station is approximately SBD 60,000 but this could increase by 50% to reduce the system's vulnerability to future cyclones. The cost would therefore be SBD 120-180,000 for both islands.

## FINDINGS ON OTHER ISLANDS

### 25. The situation on Vanikoro and Utupua

The assessment and medical response team visited the islands of Vanikoro and Utupua in Temotu Province, to verify that they did not require any assistance. Vanikoro experienced storm surge from Cyclone Zoë, which washed away 1 kitchen

## CYCLONE ZOË ASSESSMENT REPORT

outhouse and damaged some gardens. There was no damage on Utupua, and there is no need for any external assistance to either island.

### **26. Assistance provided**

As on Tikopia and Anuta, the HF radios in the clinics were not functioning before the cyclone, often for very simple reasons. On Vanikoro the technician on board PB04 Auki repaired the antenna and replaced the solar panel, and on Utupua he supplied a new 12 V battery, donated by World Vision, to replace one only 4 months old that had been allowed to dry out. Other than this the clinic on Utupua was in the best state of repair of the 4 visited: the building was clean and evidently maintained, and all equipment except the radio, was working. On Vanikoro a list of non-functional equipment was compiled. The team left 3 months of medical supplies on both islands.

## **ADDITIONAL RECOMMENDATIONS**

### **27. Debris clearance**

Large trees need to be cleared from the environment generally and in particular the access tracks around the islands and the gardens, so that they can be replanted as soon as possible. This timber could be cut and used for reconstruction. Some of the largest logs may be suitable for dugout canoes, many of which were lost on Tikopia. The Community Peace Restoration Fund (CPRF) deployed 2 chainsaws and operators to the islands for a short period, but the scale of the task means that such equipment would be required on each island for a few months. It is recommended that NDMO be given sufficient funds to purchase 2 chainsaws, plus ancillaries/spares and frames for cutting planks. Each chainsaw package would cost approximately SBD 18,000.

### **28. Replacement of lost household items**

SIRC provided 100 family packs containing bedding, clothing, cooking implements, hand-tools, nails, soap, seeds, and basic fishing equipment that were delivered to Tikopia on MV Hamakyo Maru. These were to replace some of the household items lost at Namo when the village was swept into the lake. In fact there

## CYCLONE ZOË ASSESSMENT REPORT

-----  
were 176 houses completely destroyed across Ravenga District, and another 28 were destroyed or seriously damaged on Anuta. Most of these households can be assumed to have lost many of their possessions. It is therefore recommended that a second consignment of 100 family packs should be provided, at a cost of approximately SBD 50,000.

### **29. Mosquito nets**

Although there is no malaria on the islands, the mosquito and fly populations, especially on Anuta, have increased enormously. 300 nets (200 family-size and 100 single) were despatched on MV Hamakyo Maru. It is recommended that the entire population of both islands be supplied with nets: a further 1,200 people.

### **30. Coordination support over the medium to longer term**

#### (a) In the islands

The assessment and relief delivery operation in the islands was handicapped by the absence of any single on-site coordinator, with sufficient authority to control the activities of all external teams. Ideally the provincial government would assume this role and also prepare a plan for both the emergency response and the longer term recovery, but due to lack of capacity and the distances involved, they could not.

Although the on-site coordination function is vital, it is proposed that rather than establishing a separate position; the agriculture and fisheries adviser to be posted in Tikopia should carry out the role. The adviser should report both to the Ministry of Agriculture and the NDMO or the Ministry of Provincial Government and Rural Development, if it assumes the role of coordinating the recovery. If possible they should be equipped with a satellite telephone, spare battery and a flexible solar panel for charging, and also with a budget or other means of conducting occasional visits to Anuta. They need to be self-reliant and resourceful, since they will be very isolated.

#### (b) In Honiara

The institutional constraints and lack of capacity in central government slowed the initial response but was partially compensated for by the goodwill of the aid community in Honiara – particularly the Red Cross and NGOs – that pooled their

## CYCLONE ZOË ASSESSMENT REPORT

---

resources and placed them at the disposal of the CCG. The NDMO also received technical support from Emergency Management Australia (EMA) and the Office for the Coordination of Humanitarian Affairs (OCHA) during the emergency phase.

The same weaknesses will hinder the recovery process unless coordination in Honiara is strengthened. It is recommended that an emergency response and recovery coordination adviser is placed in the NDMO for a period of 6 to 12 months to support the CCG in its ongoing response to this and other disasters. They could also provide training and other capacity building to staff of the NDMO, key national response agencies, and provincial disaster officials.

### **31. Financial resources**

#### **(a) Offers of assistance**

The NDMO has compiled a table of all contributions and offers of assistance made domestically and from overseas. If the Government, the Red Cross and NGOs in Honiara are to be able to support the recovery process on Tikopia and Anuta, it is essential that the uncommitted contributions and the unspecified offers of assistance from potential donors are followed up. The funds or goods proposed will not materialise without proactive efforts by the members of the CCG. And when the emergency phase is concluded, letters of thanks and brief reports should be sent to each domestic and overseas donor.

The table of contributions and offers of assistance to date is at Annex C.

#### **(b) Strengthening the credibility of the National Disaster Council**

The Solomon Islands National Disaster Act of 1989 enacted that there must be a National Disaster Plan and a number of committees must be established to implement the plan. As one of these committees, the CCG was granted the authority to take whatever steps it deemed necessary to facilitate the operational response to a disaster, including the power to requisition relief supplies and transport assets, without immediate funding to hand, if necessary. However, sufficient funding is essential to the success of the Cyclone Zoë operation, and future operations. The



## CYCLONE ZOË ASSESSMENT REPORT

-----  
Government must ensure that the National Disaster Council Fund is refunded for the financial commitments it has made, or future response operations will be jeopardised.

### (c) Building the capacity of the National Disaster Management Office

The NDMO's lack of facilities, equipment, and any operating budget must also be addressed. This should be addressed through the regional disaster management programme, implemented by the South Pacific Applied Geoscience Commission (SOPAC). Ultimately however, although donors may provide support to develop the disaster management infrastructure, the corollary of this is a genuine commitment by the Government to ensure that the office is sustained with a basic operating budget.

## 32. Future cyclones

### (a) Support to the Bureau of Meteorology

The remote meteorological station in Lata requires proper office facilities, including an HF radio transceiver in order to communicate with the central office of Bureau of Meteorology in Honiara. Like the NDMO, this office also needs infrastructure support and a limited but assured operating budget.

### (b) Support to the Solomon Islands Broadcasting Corporation

The AusAID funded project to improve SIBC coverage needs to be accelerated; specifically the relay station on Nendo Island should be completed as soon as possible, to enhance the reception of SIBC broadcasts across Temotu Province.

### (c) Support from international radio stations

International stations such as Radio Australia, Radio New Zealand, and local stations in Vanuatu, can provide back up to SIBC when it is off-air. However, the former stations should be encouraged to broadcast their warnings in Pidgin as well as English.

*Central Control Group  
Honiara, 16 January 2003*

## CYCLONE ZOË ASSESSMENT REPORT

Annex A

### ESTIMATED POPULATION DISTRIBUTION FOR TIKOPIA AND ANUTA

AGE GROUP	TIKOPIA			ANUTA			TOTAL NOS
	Female	Male	<i>Subtotal</i>	Female	Male	<i>Subtotal</i>	
0 – 1 yr	16	22	<b>38</b>	3	3	<b>6</b>	<b>44</b>
1 – 4 yrs	66	63	<b>129</b>	11	10	<b>21</b>	<b>150</b>
5 – 9 yrs	84	87	<b>171</b>	13	14	<b>27</b>	<b>198</b>
10 – 14 yrs	79	97	<b>176</b>	13	16	<b>29</b>	<b>205</b>
15 – 19 yrs	72	60	<b>132</b>	11	9	<b>20</b>	<b>152</b>
20 – 30 yrs	155	65	<b>220</b>	25	10	<b>35</b>	<b>255</b>
30 – 40 yrs	92	60	<b>152</b>	15	10	<b>25</b>	<b>177</b>
40 – 50 yrs	61	47	<b>108</b>	10	8	<b>18</b>	<b>126</b>
50 – 60 yrs	65	43	<b>108</b>	10	7	<b>17</b>	<b>125</b>
60 – 70 yrs	57	80	<b>137</b>	9	13	<b>22</b>	<b>159</b>
70 – 80 yrs	29	31	<b>60</b>	5	5	<b>10</b>	<b>70</b>
80 yrs +	7	8	<b>15</b>	1	1	<b>2</b>	<b>17</b>
<b>TOTALS:</b>	<b>783</b>	<b>663</b>	<b>1,446</b>	<b>126</b>	<b>106</b>	<b>232</b>	<b>1,678</b>

Note:

*The figures above have been calculated on the basis of the total population of Tikopia and Anuta at the time of the cyclone: 1,446 and 232, respectively. The breakdown between age groups and the sexes has been extrapolated from the results of the 1999 national census, the latest available statistics.*

## CYCLONE ZOË ASSESSMENT REPORT

### Annex B

### PROVISIONAL ESTIMATE OF DAMAGE TO STRUCTURES

Type of Building:		Houses					Schools					Clinics					Churches					
PARISH or COMMUNITY	VILLAGES	POPULATION																				
			Pre-TC Zoë No.	Minor damage (usable)	Major damage (unusable)	No. Totally destroyed	% unusable or lost	Pre-TC Zoë No.	Minor damage (usable)	Major damage (unusable)	No. Totally destroyed	% unusable or lost	Pre-TC Zoë No.	Minor damage (usable)	Major damage (unusable)	No. Totally destroyed	% unusable or lost	Pre-TC Zoë No.	Minor damage (usable)	Major damage (unusable)	No. Totally destroyed	% unusable or lost
1. St. Paul's Parish	Namo, Teroro	201	45			45	100										1			1	100	
2. St. Mark's Parish	Asanga, Nuku, Sa Fangarere	200	45			45	100	1			1	100					1			1	100	
3. All Saints' Parish	Sa Kafika, Faretapu (part)	180	36			36	100										1			1	100	
4. St. John's Parish	Faretapu (part), Tai	188	50	2		48	96										1			1	100	
<i>Ravenga District</i>	<i>Subtotals:</i>	<i>769</i>	<i>176</i>	<i>2</i>	<i>0</i>	<i>174</i>	<i>99</i>	<i>1</i>	<i>0</i>	<i>0</i>	<i>1</i>	<i>100</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>4</i>	<i>0</i>	<i>0</i>	<i>4</i>	<i>100</i>	
5. St. Luke's Parish	Tereva (part), Tukutaunga	135	33	5	4	4	24						1	1			0		1	1	100	
6. St. Mary's Parish	Matautu	266	55	8	9	9	33	1		1		100					1	1			0	
7. St. Michael's Parish	Korokoro, Rarupe	136	32	5	2	2	13										1	1			0	
8. St. Barnabas' Parish	Sau Tapu, Fareata, Raropuka	140	33	6	5	5	30										1				0	
<i>Faea District</i>	<i>Subtotals:</i>	<i>677</i>	<i>153</i>	<i>24</i>	<i>20</i>	<i>20</i>	<i>26</i>	<i>1</i>	<i>0</i>	<i>1</i>	<i>0</i>	<i>100</i>	<i>1</i>	<i>1</i>	<i>0</i>	<i>0</i>	<i>4</i>	<i>2</i>	<i>1</i>	<i>0</i>	<i>25</i>	
<i>Tikopia Island</i>	<i>Totals:</i>	<i>1446</i>	<i>329</i>	<i>26</i>	<i>20</i>	<i>194</i>	<i>65</i>	<i>2</i>	<i>0</i>	<i>1</i>	<i>1</i>	<i>100</i>	<i>1</i>	<i>1</i>	<i>0</i>	<i>0</i>	<i>8</i>	<i>2</i>	<i>1</i>	<i>4</i>	<i>63</i>	

## CYCLONE ZOË ASSESSMENT REPORT

---

Type of Building:		Houses					Schools					Clinics				Churches						
PARISH or COMMUNITY	VILLAGES	POPULATION																				
			Pre-TC Zoë No.	Minor damage (usable)	Major damage (unusable)	No. Totally destroyed	% unusable or lost	Pre-TC Zoë No.	Minor damage (usable)	Major damage (unusable)	No. Totally destroyed	% unusable or lost	Pre-TC Zoë No.	Minor damage (usable)	Major damage (unusable)	No. Totally destroyed	% unusable or lost	Pre-TC Zoë No.	Minor damage (usable)	Major damage (unusable)	No. Totally destroyed	% unusable or lost
1. St. James' Parish	Fangaroto, Vasiana	189	61	20	4		7	1	1									1		1		100
2. St. John's Parish	Rotoapi	43	14	4			0											1				0
<i>Anuta Island</i>	<i>Totals:</i>	<b>232</b>	<b>75</b>	<b>24</b>	<b>4</b>	<b>0</b>	<b>5</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>
<b>GRAND TOTALS:</b>		<b>1678</b>	<b>404</b>	<b>50</b>	<b>24</b>	<b>194</b>	<b>54</b>	<b>3</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>67</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>10</b>	<b>2</b>	<b>2</b>	<b>4</b>	<b>60</b>

## CYCLONE ZOË ASSESSMENT REPORT

---

Annex C

### CONTRIBUTIONS AND OFFERS OF ASSISTANCE AS AT 10 JAN 03

(all sums in Solomon Islands Dollars)

NAME	NATURE OF SUPPORT	VALUE	COMMITTED	CONTACTS	REMARKS
<b>Support Received From Solomon Islands Government</b>					
Ministry of Finance	Cash for logistics	\$100,000	\$100,000		Rations, hire, fuel, stationery
Ministry of Health	Medical supplies	Not specified	\$50,000		
	300 mosquito nets	\$2,500	\$2,500		
	2 base station HF radios	\$22,000	\$22,000	Health Sector Trust	
	Water supply materials	Not specified	\$6,566.65	Rural Water Supply	
<b>Totals:</b>		<b>\$124,500</b>	<b>\$181,067</b>		
<b>Support Received from Donor Governments and UN Agencies</b>					
Australia	Aerial photography mission	Not specified	Yes	EMA (S. Banks)	Conducted on 01/01/03
	Technical assistance to NDMO	Not specified	Yes	EMA (S. Banks)	From 04-14/01/03
	Patrol boat fuel	\$60,000	\$60,000	AusAID (G. Miller)	PB04 Auki
	36 MT rice / laptop for NDMO	\$200,000	\$200,000	AusAID (G. Miller)	Rice on Isabella & Hamakyo
	Hamakyo Maru charter & fuel	\$200,000	\$200,000	AusAID (G. Miller)	Departed on 08/01/03
Japan	Tents, w/containers / freight	\$350,000	\$350,000	Isamu Nakamura	Arrived Honiara on 14/01/03
New Zealand	Charter of MV Isabella & fuel	\$200,000	\$200,000	John Mataira	Departed on 05/01/03
ROC	Cheque	\$72,000	\$20,000	ROC Embassy	Deposited in NDC A/C
OCHA (UN)	Cheque	\$72,000	\$0	Charlie Higgins	Transferred to UNDP Suva
<b>Totals:</b>		<b>\$1,094,000</b>	<b>\$970,000</b>		

## CYCLONE ZOË ASSESSMENT REPORT

NAME	NATURE OF SUPPORT	VALUE	COMMITTED	CONTACTS	REMARKS
<b>Support Received from Red Cross, NGOs and Other Aid Agencies</b>					
ADRA	Water containers & piping	\$44,500	\$44,500	David Cram	Sent on Isabella
APSD (Int. NGO)	10 MT of 2nd hand clothing	Not specified	Yes		Arrived Honiara 10/01/03
CPRF	Tools	\$28,000	\$28,000	Judy Paterson	Sent on Isabella
Red Cross (SI)	Blankets, fuel, OBM, generator	\$96,200	\$96,200	Agnes Wale	Sent on Auki and Isabella
Red Cross (SI)	200 household packs	\$100,000	\$100,000	Agnes Wale	Sent on Isabella
Oxfam (Australia)	Tarpaulins, cloth, seeds	\$60,000	\$60,000	Val Stanley	Sent on Auki and Isabella
Soroptomists Int.	250 health message calendars	Not specified	Yes		Sent on Hamakyo Maru
World Vision (ANZ)	Tarpaulins, w/containers, medical supplies, rope, 3 school kits, plumber & tools	\$70,000	\$70,000	Jennifer Poole	Sent on Auki and Isabella
Geoff Mackley	Reconnaissance flight to Tikopia	Not specified	Yes		Conducted on 01/01/03
<b>Totals:</b>		<b>\$398,700</b>	<b>\$398,700</b>		
<b>Support from Local Business Houses, Organisations, and Individuals</b>					
BPI (fibreglass) Ltd.	Guttering	Not specified	Sent on Isabella		Received 06/01/03
Hocking Ltd.	8 school blackboards	Not specified	Sent on Hamakyo	Peter Hocking	
Nazarine Church	Kitchen utensils	Not specified	Sent on Hamakyo		Received 04/01/03
XJ6 (shop)	8 bales of 2nd hand clothing	Not specified	Sent on Hamakyo		
Hon. Basil Manelegua MP	Cheque	\$5,000	\$0	Basil Manelegua	Cheque received 05/01/03
Solomon Islands Mutual Insurance	Cash	\$10,000	\$0		Received 06/01/03
Workers Mutual Group (PNG)	Cash	\$10,000	\$0		Received 06/01/03
<b>Totals:</b>		<b>\$25,000</b>	<b>\$0</b>		

## CYCLONE ZOË ASSESSMENT REPORT

---

NAME	NATURE OF OFFER	VALUE	STATUS	CONTACTS	REMARKS
<b>Offers from Governments, UN Agencies, and NGOs</b>					
Germany	Unspecified assistance	TBC	Need assessment	Gerald Stenzel	Through German Consulate
PNG	Unspecified assistance	TBC			
UK	Unspecified assistance	TBC	Need assessment	DFID	Through British High Com.
USA	Cash	\$180,000	\$0	Kethie Saunders	To Oxfam (Australia)
Vanuatu	Vessel (barge)	TBC			
SI Consulate in NZ	Cash donations	\$180,000	\$0	Doreen Preeble	Deposit in NDC A/C
EU	Unspecified assistance	TBC	Need assessment		Through EU Delegation
UNDP	Unspecified assistance	TBC	Need assessment		Through UNDP Suva office
UNFPA	Unspecified assistance	TBC	Need assessment		Through UNDP Suva office
WHO	Unspecified assistance	TBC	Need assessment		Through WHO Suva office
SWIM	Unspecified assistance	TBC	Need assessment		
ASIFA	Unspecified assistance	TBC			
SITG	Unspecified funds	TBC		Mather Matzke	
<b>Totals:</b>		<b>\$360,000</b>	<b>\$0</b>		
<b>Offers from Local Business Houses, Organisations, and Individuals</b>					
OP Shop	1 container 2nd hand clothing	Not specified		George	
Seaways	Free use of MV Baruku				
<b>Totals:</b>		<b>\$0</b>	<b>\$0</b>		

# CYCLONE ZOË ASSESSMENT REPORT

## Annex D

### ACRONYMS

ABC	Australian Broadcasting Corporation
ADRA	Adventist Development and Relief Agency
ARI	Acute Respiratory Infections
ASIFA	Australian Solomon Islands Friendship Association
AusAID	Australian Agency for International Development
BBC	British Broadcasting Corporation
CCG	Central Control Group
CPRF	Community Peace Restoration Fund
EMA	Emergency Management Australia
EU	European Union
FACT	Field Assessment and Coordination Team (of IFRC)
FAO	Food and Agriculture Organization
HF	High Frequency
IFRC	International Federation of Red Cross & Red Crescent Societies
MP	Member of Parliament
MT	Metric Tonne
MV	Marine Vessel
NDC	National Disaster Council
NDMO	National Disaster Management Office
NGO	Non-Governmental Organisation
NZ	New Zealand
OCHA	(UN) Office for the Coordination of Humanitarian Affairs
PB	Patrol Boat
PDC	Provincial Disaster Committee
PFnet	People First Network
PM	Prime Minister
PNG	Papua New Guinea
RDVA	Rural Development Volunteers Association
ROC	Republic of China
SBD	Solomon Islands Dollars
SI	Solomon Islands
SIBC	Solomon Islands Broadcasting Corporation
SIRC	Solomon Islands Red Cross Society
SITG	Solomon Islands (Bible) Translation Group
SOP	Standard Operating Procedure
SOPAC	South Pacific Applied Geoscience Commission
SPREP	South Pacific Regional Environment Programme
UK	United Kingdom
UNDAC	United Nations Disaster Assessment and Coordination (team)
UNDP	United Nations Development Programme
UNFPA	United Nations Fund for Population Activities
USA	United States of America
USD	United States Dollar
VIP	Ventilated Improved Pit (latrine)