



**SOPAC Member Countries
National Capacity Assessments:
Tsunami Warning and Mitigation Systems**

Solomon Islands



Solomon Islands



SOPAC



SOPAC Member Countries National Capacity Assessments: Tsunami Warning and Mitigation Systems

SOLOMON ISLANDS

Honiara, 5 – 8 February 2008



Document Control

Approved for release:	Branch Head, Weather Services Branch, Australian Bureau of Meteorology	Date: 5 June 2009
Corrections & comments:	Cherie O'Brien Project Manager - SOPAC Member Countries Tsunami Capacity Assessments Australian Bureau of Meteorology GPO Box 1289 Melbourne VIC 3001 E-mail: c.o'brien@bom.gov.au Phone: +61 (3) 9669 4065 Fax: +61 (3) 9669 4695	
Distribution:	Australian Bureau of Meteorology, Australian Government Attorney- General's Department, AusAID, Solomon Islands Tsunami Capacity Assessment Workshop Participants, Pacific Disaster Risk Management Partnership Network	

Version	Date	Author	Comments
0.1	26 August 2008	C. O'Brien	Initial Draft
0.2	8 September 2008	C. O'Brien	Inclusion of Bryan Boase (Team Leader) review comments
0.3	9 October 2008	C. O'Brien	Inclusion of Assessment Team Comments (Shannon McNamara (AGD), Noud Leenders (SOPAC), Colin Schulz (Communications Contractor) plus minor edits and format changes).
0.4	6 February 2009	C. O'Brien	Country release
0.5	17 April 2009	C. O'Brien	Country release in new format
0.6	26 May 2009	C. O'Brien	Final version including review comments from Loti Yates (SINDMO) and editing for publishing.

For bibliographic purposes, this document should be cited as follows:

Australian Government Bureau of Meteorology 2009, *SOPAC Member Countries National Capacity Assessment: Tsunami Warning and Mitigation Systems, Solomon Islands, Honiara, 5-8 February 2008*, research report prepared by C. O'Brien, Australian Government Bureau of Meteorology, Melbourne.

Acknowledgements:

The Bureau of Meteorology wishes to acknowledge the contribution of all those who participated in the assessment workshop, particularly those who made their time available to help organise the workshop and to deliver presentations. The Bureau of Meteorology would also like to acknowledge the efforts of the visiting assessment team and continued support from partners Attorney-General's Department and Pacific Islands Applied Geoscience Commission and funding body AusAID. The Bureau would also like to acknowledge UNESCO/IOC, the WMO and ISDR for their input into the original questionnaire on which the project was based.

© Copyright Commonwealth of Australia 2009
Bureau of Meteorology (ABN 92 637 533 532)
700 Collins St Melbourne
Phone 03 9669 4000 • Fax 03 9669 4695

(Printed on paper of 50% post consumer waste and 50% FSC certified fibre)

Table of Contents

1. RESULTS OUTLINE.....	1
1.1. EXECUTIVE SUMMARY	1
1.2. RECOMMENDATIONS (INCLUDING PRIORITY AND RESOURCE INTENSITY).....	3
2. PROJECT BACKGROUND.....	11
2.1. ABOUT THE PROJECT	11
2.2. BROAD PROJECT AIM	11
2.3. KEY PROJECT OUTPUT.....	11
2.4. PROJECT METHODOLOGY	11
2.5. UNDERLYING POLICY OBJECTIVES OF THE AUSTRALIAN TSUNAMI WARNING SYSTEM PROJECT ..	12
2.6. TSUNAMI WARNINGS IN THE PACIFIC	12
2.7. INTERNATIONAL TSUNAMI FORUMS	12
3. COUNTRY BACKGROUND AND THE TSUNAMI THREAT	14
3.1. ABOUT THE SOLOMON ISLANDS	14
3.2. TSUNAMI THREAT SOURCES AND TSUNAMI HISTORY IN THE SOLOMON ISLANDS	16
4. THE SOLOMON ISLANDS TSUNAMI CAPACITY ASSESSMENT.....	18
4.1. DATE AND LOCATION	18
4.2. VISITING ASSESSMENT TEAM AND PARTICIPANTS.....	18
4.3. WORKSHOP SUMMARY	18
4.3.1. Day 1 (5 February 2008).....	18
4.3.2. Day 2 (6 February 2008).....	18
4.3.3. Day 3 (7 February 2008).....	19
4.3.4. Day 4 (8 February 2008) (Morning only).....	19
4.4. WORKSHOP PHOTOS (HONIARA FEBRUARY 2008).....	20
5. ASSESSMENT RESULTS.....	21
5.1. STATUS OF KEY SYSTEM COMPONENTS.....	21
5.2. CASE STUDY – 2 APRIL SOLOMON ISLANDS TSUNAMI	29
5.3. STRENGTHS, OPPORTUNITIES FOR IMPROVEMENT AND RECOMMENDATIONS TO PROGRESS THE TSUNAMI AGENDA IN THE SOLOMON ISLANDS	30
5.3.1. Governance and Coordination.....	30
5.3.2. Regional and International Coordination.....	32
5.3.3. Research Expertise.....	33
5.3.4. Tsunami Monitoring Infrastructure	34
5.3.5. Tsunami warnings	35
5.3.6. Communications.....	37
5.3.7. Tsunami Emergency Response (including evacuation)	38
5.3.8. Tsunami Hazard, Vulnerability, Risk and Mitigation.....	40
5.3.9. Public and Stakeholder Awareness and Education.....	41
5.4. ADDITIONAL WORKSHOP BENEFITS	43
5.5. NEXT STEPS	43
6. ANNEXURE.....	44
6.1. ANNEXURE 1: RECORD OF PARTICIPANTS.....	44
6.2. ANNEXURE 2 – THE VISITING ASSESSMENT TEAM.....	47
6.3. ANNEXURE 3 – AGENDA, SOLOMON ISLANDS TSUNAMI CAPACITY ASSESSMENT WORKSHOP	48
6.4. ANNEXURE 4 – SUPPORTING DOCUMENTS LOG.....	55
6.5. ANNEXURE 5 - FINDINGS OF THE SOLOMON ISLANDS APRIL 2ND 2007 TSUNAMI LESSONS LEARNED WORKSHOP.....	58
6.6. ANNEXURE 6 – DEFINITIONS	59
6.7. ANNEXURE 7 - REFERENCES.....	64
7. CD ATTACHMENT - SUPPORTING DOCUMENTS.....	65

Acronyms

AGD	Attorney – General's Department
AFTN	Aeronautical Fixed Telecommunications Network
AM	Amplitude Modulated
ATWS	Australian Tsunami Warning System
AusAID	Australian Agency for International Development
Bureau	Bureau of Meteorology
D	Document (e.g. Document 39 = D39) as listed in Annexure 4
DFAT	Australian Department of Foreign Affairs and Trade
EMA	Emergency Management Australia
EMWIN	Emergency Managers Weather Information Network
GA	Geoscience Australia
GTS	Global Telecommunications System
HF	High Frequency Radio
ISDR	International Strategy for Disaster Reduction
JMA	Japanese Meteorological Agency
MMERE	Ministry of Mines, Energy and Rural Electrification
NDC	National Disaster Council
NDMO	National Disaster Management Office
NEOC	National Emergency Operations Centre
NGOs	Non-Government Organisations
PGSP	Pacific Governance Support Program
PICs	Pacific Island Countries
PTWC	Pacific Tsunami Warning Centre
RAMSI	Regional Assistance Mission to the Solomon Islands
SIBC	Solomon Islands Broadcasting Commission
SIMS	Solomon Islands Meteorological Service
SIPF	Solomon Islands Police Force
SMS	Short Message Service
SOPAC	Pacific Islands Applied Geoscience Commission
SOPs	Standard Operations Procedures
UNESCO/IOC	Intergovernmental Oceanographic Commission, a division of the United Nations Educational, Scientific and Cultural Organisation
USGS	United States Geological Survey
UTC	Coordinated Universal Time
WMO	World Meteorological Organisation



1. Results Outline

1. Results Outline

1.1. Executive Summary

The National Capacity Assessment of Pacific Islands Applied Geoscience Commission (SOPAC) Member Countries: Tsunami Warning and Mitigation Systems project aims to work in collaboration with the member countries of SOPAC to assess their capacity to receive, communicate and respond effectively to tsunami warnings. The Tsunami Capacity Assessment of the ability of the Solomon Islands to receive, communicate and effectively respond to tsunami warnings took place in a workshop held from 5 – 8 February 2008 in Honiara, Solomon Islands.

The workshop was facilitated by a team of visiting experts and attended by some 27 Solomon Islands Government agency representatives, Non-Government Organisations (NGOs), international organisations and the private sector to discuss key areas of tsunami warning and mitigation in the Solomon Islands by completing a comprehensive questionnaire in session, presentations and site visits.

As well as outlining the Solomon Island's current status, strengths and opportunities for improvement with regard to tsunami warning and mitigation, a list of recommendations were formulated by the visiting assessment team in consultation with national participants. The aim of these recommendations is to guide further capacity development programs to target improvements in Solomon Island's tsunami warning and mitigation system.

The local tsunami threat sources for the Solomon Islands are the South Solomon and New Hebrides Trenches (Warne, 2008 p.1). The former runs east from Papua New Guinea (7°S, 147°E) south of New Britain to the western edge of the Western Province of the Solomon Islands (5°S, 153°E). It then runs south east along the eastern edge of the Solomon Islands to south of San Ana in the Makira Province (11°S, 163°E).

The New Hebrides Trench runs from the end of the South Solomon Trench east to the north western corner of the Temotu Province (10°S, 165°E) (Warne, 2008 p.1). The trench then runs along the western edge of the Solomon Islands and Vanuatu and ends east of New Caledonia (22°S, 174°E).

Warne (2008, p.1) states that there is limited threat from the Kermadec and Tonga trenches which run north from New Zealand to Samoa. Also posing limited threat is the distant tsunami sources off the coast of Chilli and the Kuril Islands. These distant sources are more than 10 hours away. It is not expected that these more remote source pose a significant threat to the Solomon Islands (Warne, 2008, p. 1).

Document 39 "Tsunamis in the Solomon Islands 1926 – 1982" by D. Tuni details the history of tsunami in the Solomon Islands between 1926 and 2007. The authors of the Solomon Islands April 2nd 2007 Tsunami – Lessons Learnt Workshop Report (D29) state that the Solomon Islands April 2nd 2007 tsunami impacted upon the Western and Choiseul Provinces. Fifty two lives were lost and significant damage was caused. The tsunami was triggered by a magnitude 8.1 earthquake which occurred at 7.39am local time, 1 April 2007 20:39:56 Coordinated Universal Time (UTC)) along the Solomon Islands subduction zone. Advice received by the Solomon Islands authorities, and the action taken as a result of this advice is outlined in the Case Study description on page 16 of this report.

Participants in the workshop stated a number of urgent priority areas that need to be addressed that included the need for:

- A robust early warning system;
- The development, implementation and exercising of an emergency response and recovery plan;
- Risk assessment and inundation mapping;
- Clearly defined roles and responsibilities for all stakeholders involved in emergency response to tsunami events;
- Focused training on all appropriate aspects of emergency response and recovery;
- Robust infrastructure standards. For example, adherence to the Building Code; and,
- Enhancement of community awareness.

The visiting team and workshop participants noted that the Solomon Island's National Disaster Committee (NDC) high level representation and reporting responsibility to Cabinet. It also noted that the National Disaster Management Office (NDMO) has close links with local communities in Honiara and the Provinces and those local disaster management officers have a strong involvement in community awareness programs. The existence of a substantial HF radio network throughout the Solomon Islands could be used on occasions to disseminate warnings. It is available at all major population centres and remote communities. All of the above provide a sound foundation for the enhancement of the tsunami warning and disaster management system.

The visiting team and workshop participants conclude that the highest priority and a significant first step, towards enhancing the tsunami warning and disaster management system, is the development of a Tsunami Response plan that clearly defines the roles, functions, authorities and responsibilities of all organisations and agencies (public and private sector) at the National and Provincial levels. It was acknowledged that this could only be successfully achieved through the urgent development and implementation of legislation and formalisation of the draft Solomon Islands Emergency Operations Centre, Standard Operations Procedures.

The visiting team also noted that the Solomon Islands should be congratulated on their proactive and committed approach to improving disaster management arrangements in the country through capitalising on lessons learned from the 2 April 2007 Solomon Islands event. Recently, two major initiatives have been developed in a relatively short timeframe which will move the country towards a more coordinated approach to managing disasters. These are outlined briefly below.

- ***Solomon Islands National Emergency Operations Centre and related Standard Operations Procedures:*** This centre will bring together officers from various government ministries and technical departments including the Solomon Islands Red Cross Society and other NGOs to formulate a more coordinated response during events.
- ***The development of Provincial Emergency Operations Centres and associated trained officers:*** Building on the role of the Provincial Disaster Committees (formed under National Disaster Council (NDC) Act 1989) by developing Provincial Emergency Operations Centres and associated trained officers to improve coordination at a provincial level, between provinces and nationally during events.

Solomon Island workshop participants are encouraged to use this National Tsunami Capacity Assessment report to guide both national projects and aid funded projects to achieve targeted improvements on the Solomon Island's tsunami warning and mitigation system. In turn, this will assist in improving systems for other natural hazards such as earthquakes and cyclones.

Contingent on the availability of human and financial resources, the Australian Bureau of Meteorology (Bureau) and project partners will aim to work with potential donors to bring the findings of this project to their attention on a country and regional scale. This will be done in the hope of further capacity development projects being undertaken.

1.2. Recommendations (including priority and resource intensity)

Table 2 outlines the priority and resource intensity for recommendations made to improve Solomon Island's tsunami warning and mitigation system. Both the priority and resource intensity are based on the consensus of the visiting Tsunami Capacity Assessment team after discussions held within the Tsunami Capacity Assessment Workshop. It is recognised that these rankings may not reflect the opinions of all individuals involved in the workshop as priorities vary depending on personal responsibilities and areas of interest. Each recommendation is important in its own right to achieve holistic improvements in Solomon Island's tsunami warning and mitigation system.

The priority ranking and resource intensity scale used as a basis for allocating a priority and resource intensity to each recommendation is explained in Table 1. The Very High priority recommendations should be seriously considered as requiring urgent completion. Low resource intensity recommendations are considered the 'low-hanging fruit' that are achievable with very few additional resources.

Table 1: Priority ranking and resource intensity scale

PRIORITY	RESOURCE INTENSITY
Very High	Low – Recommendation currently being progressed or could possibly be progressed within the capacity of existing in-country resources (funds and staff).
High	Medium – Recommendation could be progressed by existing staff or with a low to moderate number of additional staff and/or expertise and a moderate level of additional in-country funds. May or may not require external funding.
Medium	High – Recommendation would require a high level of additional staff and/or expertise and funds. External funding support is likely to be required.
Low	Very High – Recommendation would require a very high level of additional staff and funds. External funding support will be required.

Table 2: Priority and anticipated resource intensity for completion of recommendations made for improving Solomon Island's tsunami warning and mitigation system.

Priority	Recommendation	Resource Intensity	Topic	Multi-hazard or tsunami specific	Recommendation Number In Table 4
Very High	The Director SIMS and Deputy be provided with dedicated mobiles (with SMS capability) to receive SMS tsunami warnings from the PTWC.	Low	Tsunami warnings	Tsunami specific	12
Very High	That all SIMS, Ministry of Mines, Energy and Rural Electrification (MMERE) and NDMO tsunami SOPs include a requirement to confirm the receipt of advices and warnings disseminated to primary agencies. For example: maritime and aviation.	Low	Tsunami warnings	Tsunami specific	13
Very High	Continue to widely disseminate the traditional knowledge acquired via the Provincial Disaster Coordinator initiative and other tsunami awareness initiatives which focus on emergency response to tsunami warnings and natural tsunami warning signs.	Low	Public and Stakeholder Awareness and Education	Tsunami specific	26
Very High	Integrate an evaluation mechanism into community awareness and preparedness programs to ensure the continued improvement of these programs by focussing on successful methodologies.	Low	Public and Stakeholder Awareness and Education	Multi-hazard	29
Very High	Develop and implement appropriate community activities to assess the community understanding and response to tsunami warnings in an appropriate and timely manner.	Low	Public and Stakeholder Awareness and Education	Tsunami specific	32

Priority	Recommendation	Resource Intensity	Topic	Multi-hazard or tsunami specific	Recommendation Number In Table 4
Very High	Through the PCIDRR and ongoing work of the NDMO Provincial Disaster Coordinators, identify and advertise evacuation routes for communities.	PCIDRR (Low, funding already available) NDMO (High ongoing)	Tsunami Emergency Response (including evacuation)	Multi-hazard	17
Very High	To review the current process for the receipt of Tsunami Warnings by the SIMS, MMERE, and the NDMO to improve the timeliness of dissemination.	Medium	Tsunami warnings	Tsunami specific	8
Very High	The tsunami Standard Operating Procedures (SOPs) of SIMS, MMERE and NDMO should be developed, exchanged and coordinated. The viability of SOPs should also be tested when they are developed or changed via a practical exercise prior to their operational adoption.	Medium	Tsunami warnings	Tsunami specific	9
Very High	Formally review the resource requirements of the Solomon Islands Meteorological Service (SIMS) that would enable it to maintain a 24x7 multi-hazard watch and warning service. For example: detection and communication equipment; appropriately trained staff.	Medium	Tsunami warnings	Multi-hazard	11
Very High	Use the tsunami hazard studies that have been completed for the Southwest Pacific Nations to date, and any historical tsunami records, to identify low-lying communities which may be potentially prone to tsunami impacts from all likely tsunami sources and develop and include hazard maps in the disaster response plan and associated evacuation plans.	Medium	Tsunami Hazard, Vulnerability, Risk and Mitigation	Tsunami specific	21

Priority	Recommendation	Resource Intensity	Topic	Multi-hazard or tsunami specific	Recommendation Number In Table 4
Very High	Formally review and develop strategies to implement an alternative means of providing multi-hazard warnings from that of SIBC broadcasts. For example, alternative technologies such as 'wake-up' AM radio and the Chatty Beetle.	High	Communications	Multi-hazard	15
Very High	Identify critical infrastructure and lifeline support facilities and develop plans to ensure the availability of minimal government services after a destructive tsunami, or other natural disasters.	High	Tsunami Emergency Response (including evacuation)	Multi-hazard	20
Very High	Maintain and where possible enhance the current momentum to integrate the disaster awareness initiative throughout all levels of the education curriculum.	High	Public and Stakeholder Awareness and Education	Multi-hazard	27
Very High	Maintain and enhance the current multi-hazard community awareness media campaigns.	High	Public and Stakeholder Awareness and Education	Multi-hazard	30
Very High	That consideration is given to providing a set of common dedicated HF frequencies that would only be used during times of disaster.	High	Communications	Multi-hazard	14
Very High	The highest priority is given to the development of a Tsunami Response plan that clearly defines the roles, functions, authorities and responsibilities of all organisations and agencies (public and private sector) at the National and Provincial levels. At the completion of this plan, develop agency or organisational specific response plans to ensure coordinated response and continuity of essential services.	High (technical assistance required)	Tsunami Emergency Response (including evacuation)	Tsunami specific	16

Priority	Recommendation	Resource Intensity	Topic	Multi-hazard or tsunami specific	Recommendation Number In Table 4
Very High	<p>To clearly define the authority, roles and responsibilities for all stakeholders involved in emergency response to tsunami events through the urgent development and implementation of legislation and formalisation of the draft Solomon Islands National Emergency Operations Centre (NEOC), Standard Operations Procedures (SOPs). Including consideration of:</p> <ul style="list-style-type: none"> a. Clearly defining the roles of NDC members and outlining coordination between the Disaster Controller, NDMO Director and Provincial Coordinators. b. Developing strategies to integrate the private sector into the draft Solomon Islands NEOC Standard Operations Procedures (SOPs). <p>Update May 2009 – Currently underway and funded.</p>	High (Update May 2009 – Funded)	Governance and Coordination	Multi-hazard	1
Very High	Acquire the necessary baseline data (high resolution topography and bathymetry) for populated coastlines as part of a multi-hazard mapping activity to assist in assessment of the tsunami risk in the Solomon Islands.	Very High	Tsunami Hazard, Vulnerability, Risk and Mitigation	Tsunami specific	22
High	Integrate tsunami considerations into the multi-hazard committees under the NDC to ensure liaison and further development to effectively meeting the tsunami threat.	Low	Governance and Coordination	Tsunami specific	2
High	That the Australian Bureau sea-frame tide-gauge and planned new stations real-time data link to SIMS HQ to be restored.	Medium	Tsunami Monitoring Infrastructure	Multi-hazard	6

Priority	Recommendation	Resource Intensity	Topic	Multi-hazard or tsunami specific	Recommendation Number In Table 4
High	The Solomon Islands progress towards joining the IOC.	Low	Regional and International Coordination	Multi-hazard	3
High	Formally review the resource requirements of the MMERE that would enable it to maintain a 24x7 tsunami watch and advice service. For example: detection and communication equipment; appropriately trained staff.	Low	Tsunami warnings	Tsunami specific	10
High	Develop mechanisms to ensure that international bodies are aware of existing arrangements to coordinate assessments undertaken post a natural disaster (MMERE focal point for technical assessments and SOPAC regional focal point) and that results, including full reports, are provided and archived locally.	Low	Tsunami Emergency Response (including evacuation)	Multi-hazard	18
High	Through NDC and committees ensure comprehensive formal event reviews are undertaken for each tsunami event (and other emergencies/disasters) that occurs. Ensure the results of these reviews are acted upon and that reviews are archived.	Low	Tsunami Emergency Response (including evacuation)	Multi-hazard	19
High	For urban centres - develop a strategy for the recognition and adherence to the current Building Code combined with a risk management strategy in terms of disaster threat for new developments. For villages – develop a village carpenters manual including building placement considerations with regard to natural hazards (especially important for public buildings that become evacuation centres).	Medium	Tsunami Hazard, Vulnerability, Risk and Mitigation	Multi-hazard	23

Priority	Recommendation	Resource Intensity	Topic	Multi-hazard or tsunami specific	Recommendation Number In Table 4
High	NDMO and Ministry of Education liaise to develop a training program for teaching staff conducting tsunami (and multi-hazard) awareness classes as well as developing teaching tools.	High	Public and Stakeholder Awareness and Education	Multi-hazard	28
High	Develop a media awareness program to raise the community awareness of the importance and need for the respect of early warning equipment. For example, Solar panels on sea-level instrumentation. .	Medium	Public and Stakeholder Awareness and Education	Multi-hazard	31
High	Introduce a competency-based training approach to the development of skills and knowledge in the field of disaster management, including scientific knowledge regarding tsunami science and warnings (SIMS and MMERE), to further enhance skills	High	Public and Stakeholder Awareness and Education	Multi-hazard	33
Medium	Locate and archive bathymetry data from previous studies undertaken of Honiara, Gizo, Noro, Marovo and Savo Island.	Low	Tsunami Hazard, Vulnerability, Risk and Mitigation	Multi-hazard	25
Medium	Capitalise on partnerships offered by regional and international bodies to undertake scientific research in the Solomon Islands into seismology and tsunami science.	Medium	Research Expertise	Multi-hazard	5

Priority	Recommendation	Resource Intensity	Topic	Multi-hazard or tsunami specific	Recommendation Number In Table 4
Medium	<p>Investigate the feasibility of receiving real-time sea-level and seismic data from neighbouring countries, regionally or internationally, via the World Meteorological Organisation (WMO) Global Telecommunications System (GTS). Then:</p> <ul style="list-style-type: none"> a. Ensure relevant legislation is in place to allow MMERE and other relevant agencies have the authority to use this data b. Integrate use of this data into Standard Operating Procedures for tsunami. 	High	Tsunami Monitoring Infrastructure	Tsunami specific	7
High	Investigate the feasibility of and options for conducting a modelling study to calculate inundation from tsunami at identified locations throughout the Solomon Islands.	Very High	Tsunami Hazard, Vulnerability, Risk and Mitigation	Tsunami specific	24
High	A protocol is developed to ensure that reports from all assessments are provided back to the Solomon Islands and that they are formally archived for easy retrieval and reference.	Low	Research Expertise	Multi-hazard	4



2. Project Background

2. Project Background

2.1. About the Project

The National Capacity Assessment of SOPAC Member Countries: Tsunami Warning and Mitigation Systems project aims to work in collaboration with the member countries of SOPAC to assess their capacity to receive, communicate and respond effectively to tsunami warnings. The Australian Bureau is the lead implementing agency, in partnership with the Australian Attorney-General's Department (AGD), (formerly Emergency Management Australia [EMA]), SOPAC, and with the assistance of the Intergovernmental Oceanographic Commission (IOC) a division of the United Nations Educational, Scientific and Cultural Organization (UNESCO). The project is funded by the Australian Agency for International Development (AusAID) under the Pacific Governance Support Programme (PGSP). It is implemented under an agreement (Schedule 5 to the Record of Understanding 14304, June 2006) between AusAID and the Australian Bureau). The fourteen SOPAC member countries participating in the project are the Cook Islands, the Federated States of Micronesia, Fiji, Kiribati, the Marshall Islands, Nauru, Niue, Palau, Papua New Guinea, Samoa, the Solomon Islands, Tonga, Tuvalu and Vanuatu.

2.2. Broad Project Aim

By undertaking an assessment of the capacity of individual nations to manage tsunami events, the project aims to better guide donor funding towards achieving targeted improvements in the tsunami warning and mitigation systems in the respective countries.

2.3. Key Project Output

The key deliverable of the project is a comprehensive set of reports, including one national report specific to each country, detailing the strengths and opportunities for improvement of the country with regard to tsunami warning and mitigation. The national report for each country also includes recommendations to address priority issues. These reports will then feed into a consolidated Regional report that will aim to identify common issues across the Region with regard to tsunami warnings and mitigation.

2.4. Project Methodology

National assessments in each SOPAC member country are conducted by visiting teams including experts in the fields of tsunami warnings, emergency management, disaster risk reduction and data and warning communications. The visiting team meets with in-country experts during four-day workshop involving government agencies, the private sector, NGOs and international organisations involved in tsunami and natural disaster management.

The workshop aims to complete a questionnaire covering all aspects of tsunami warning and mitigation and gather information to support questionnaire responses. This information then feeds

into the national report. Consultation with individual countries before completion of the report is an integral part of the report writing process.

The questionnaire for the Pacific Island Countries (PICs) is a modified version of that used for the Indian Ocean equivalent project. The Indian Ocean questionnaire was jointly developed by UNESCO/IOC, SOPAC, WMO and the International Strategy for Disaster Reduction (ISDR). Details of the Indian Ocean equivalent project can be found at <http://ioc3.unesco.org/indotsunami/nationalassessments.htm>

2.5. Underlying Policy Objectives of the Australian Tsunami Warning System Project

The Bureau in partnership with Geoscience Australia (GA) and AGD, is currently undertaking a four-year project to establish the Australian Tsunami Warning System (ATWS). One of the three policy objectives of the ATWS project is “To contribute to the facilitation of tsunami warnings for the South West Pacific” (DFAT, 2006). The Tsunami Capacity Assessment project and this report, contributes to the achievement of this policy objective. Also, as part of the implementation of the ATWS, Australia will contribute to the facilitation of more effective tsunami advisory bulletins to Pacific Island nations through the provision of seismic and sea level observations to the Pacific Tsunami Warning Centre (PTWC) in Hawaii.

2.6. Tsunami warnings in the Pacific

Tsunami messages for the Pacific Ocean are issued by the PTWC in Hawaii as the United States of America (USA) contribution to the Pacific Tsunami Warning and Mitigation System (PTWS). Individual countries are then responsible for using this advice to distribute national tsunami warnings to their communities. PTWC messages can be Tsunami Warnings, Tsunami Watches, Tsunami Advisories and Tsunami Information Bulletin/Statement. For the purpose of this report, products from the PTWC will be referred to generically as ‘tsunami messages’. A full definition of each PTWC product products can be found at http://www.prh.noaa.gov/ptwc/about_messages.php

2.7. International Tsunami Forums

Under the auspices of the IOC, the Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System was first convened in 1968 (ICG/PTWS, formerly known as ICG for the Tsunami Warning System in the Pacific (ITSU)) (IOC, 2009). This is an international cooperative effort involving many IOC Member States of the Pacific Region. The ICG/PTWS meets regularly to review progress and coordinate activities resulting in improvements of the service (IOC, 2009).

The Working Group on Tsunami Warning and Mitigation in the Southwest Pacific Ocean was formed at the ICG/PTWS-XXI meeting in Melbourne in early May 2006 with the aim of enhancing tsunami warning and mitigation in the Southwest Pacific Ocean. The membership of the working group is composed of representatives from IOC Member States and other countries in the region (as members and observers). SOPAC provides secretariat support. The Working Group is currently chaired by a representative of New Zealand, with vice-chairs from Fiji and Samoa.

The Working Group has a number of Terms of Reference and this project is directly relevant to the following Terms of Reference:

- To evaluate capabilities of countries in the Southwest Pacific Region for providing end-to-end tsunami warning and mitigation services;
- To ascertain requirements from countries in the Southwest Pacific Region for the tsunami warning and mitigation services;
- To facilitate capacity building and the sharing of tsunami information in the region;
- To support the further development of the virtual centre of expertise in a multi-hazards context within SOPAC in line with the Regional Early Warning Strategy; and
- To facilitate the inclusion of tsunami hazard and response information into curricula, and development and dissemination of education materials.



3. Country Background and the Tsunami Threat

3. Country Background and the Tsunami Threat

3.1. About the Solomon Islands

The Solomon Islands is an archipelagic state situated in the South West Pacific Ocean. Its land mass of 28,400 square kilometres extends over nearly one thousand islands comprising nine main island groups. The capital, Honiara, is located on Guadalcanal, which is the largest island (DFAT, 2008).

The population of Solomon Islands, estimated to be around 510,000, is predominantly Melanesian (about 95%) although there are also smaller Polynesian, Micronesian, Chinese and European communities. There are 63 distinct languages in the country, with numerous local dialects. English is the official language of Solomon Islands but Solomons Pijin is the language used by the majority of people (DFAT, 2008).

At independence on 7 July 1978, Solomon Islands joined the Commonwealth with Queen Elizabeth II as its Head of State, represented by a Governor General. The unicameral National Parliament comprises fifty members, elected for a four-year term under a "first past the post" voting system. The Prime Minister is elected by a simple majority of Members of Parliament. Party structures in Solomon Islands are fluid. In addition to the national government, there are nine provincial assemblies, each led by a premier (DFAT, 2008).

According to the Australian Department of Foreign Affairs and Trade (DFAT, 2008) the Solomon Islands economy recorded growth rates of 8 per cent in 2004, 5 per cent in 2005 and 6.2 per cent in 2006. The economy grew at 10 per cent for 2007; one of the highest rates of growth in the region, although it is expected to ease back to 6 per cent growth in 2008. The recovery can be attributed to the return of business investment and an increase in export receipts (from rapidly expanded exports of timber and more favourable terms of trade for other export commodities), supported by the arrival of the Regional Assistance Mission to Solomon Islands (RAMSI), which has dramatically improved the outlook for the economy. Fiscal policy has delivered consistent budget surpluses from 2003–2006 due to higher government revenues and better expenditure management. Challenges for the economy include a subsistence/cash crop agriculture (meaning many people are not in paid work) commodity based exports and unsustainable logging practices.

As in many other PICs, a large proportion of the population in the Solomon Islands is concentrated in coastal areas. Further, much of the infrastructure and economic resources are also located in the coastal zone. These factors greatly increase the vulnerability and risk to the community and the economy from tsunami events. Such events would worsen poverty, especially in the rural communities affected.



Figure 1: The Solomon Islands (Source: Google Earth)

3.2. Tsunami Threat Sources and Tsunami History in the Solomon Islands

An overview of potential tsunami threat sources and tsunami history in Solomon Islands is outlined below. This information should be treated as general background and does not attempt to provide a comprehensive picture of tsunami hazard and vulnerability and associated risk for Solomon Islands. Such a study is outside the scope of this project.

The local tsunami threat sources for the Solomon Islands are the South Solomon and New Hebrides Trenches (Warne, 2008 p.1). The former runs east from Papua New Guinea (7°S, 147°E) south of New Britain to the western edge of the Western Province of the Solomon Islands (5°S, 153°E). It then runs south east along the eastern edge of the Solomon Islands to south of San Ana in the Makira Province (11°S, 163°E).

The New Hebrides Trench runs from the end of the South Solomon Trench east to the north western corner of the Temotu Province (10°S, 165°E) (Warne, 2008 p.1). The trench then runs along the western edge of the Solomon Islands and Vanuatu and ends east of New Caledonia (22°S, 174°E).

Warne (2008) states that there is limited threat from the Kermadec and Tonga trenches which run north from New Zealand to Samoa. Also posing limited threat is the distant tsunami sources off the coast of Chilli and the Kuril Islands. These distant sources are more than 10 hours away. It is not expected that these more remote source pose a significant threat to the Solomon Islands (Warne, 2008, p. 1).

Document 39 “Tsunamis in the Solomon Islands 1926 – 1982” by D. Tuni (D39) details the history of tsunami in the Solomon Islands between 1926 and 2007. The authors of the Solomon Islands April 2nd 2007 Tsunami – Lessons Learnt Workshop Report (D29) state that the Solomon Islands April 2nd 2007 tsunami impacted upon the Western and Choiseul Provinces. Fifty two lives were lost and significant damage was caused. The tsunami was triggered by a magnitude 8.1 earthquake which occurred at 7.39am local time (1 April 2007 20:39:56 Coordinated Universal Time (UTC)) along the Solomon Islands subduction zone (40 km (25 miles) SSE of Gizo, New Georgia Islands and about 345 km (215 miles) WNW of HONIARA, Guadalcanal) as a result of under-thrusting of the Australia/Woodlark/Solomon Sea plate beneath the Pacific plate, as part of the broader northeast-directed subduction process (United States Geological Survey (USGS), 2008).

The first tsunami warning (PTWC Bulletin No. 1) for the Solomon Islands was issued by PTWC on 2 April 2007 at 7.55am local time. The tsunami warning for the Solomon Islands was cancelled at 3.05pm local time on the same day (in PTWC Bulletin No. 8). Detailed information on PTWC tsunami messages for this event can be found on the PTWC website www.prh.noaa.gov/ptwc. Advice received by the Solomon Islands authorities, and the action taken as a result of this advice is outlined in the Case Study description on page 16 of this report.



Figure 2a: The subduction zones (in orange) of the Pacific Ocean



Figure 2b: The location of the Solomon Islands and other Pacific Island Countries in relation to regional and local subduction zones (in orange)



4. The Solomon Islands Tsunami Capacity Assessment

4. The Solomon Islands Tsunami Capacity Assessment

4.1. Date and Location

The tsunami capacity assessment of the ability of the Solomon Islands to receive, communicate and effectively respond to tsunami warnings took place from 5 – 8 February 2008 at the King Solomon Hotel, Honiara.

4.2. Visiting Assessment Team and Participants

The visiting assessment team was made up of those outlined in Annexure 2. The focal points in the Solomon Islands for the completion of this project was Mr Loti Yates, Director, NDMO and Mr Chanel Iroi, Director, SIMS. A full list of workshop participants can be found in Annexure 1.

4.3. Workshop Summary

For a copy of the full agenda for the workshop see Annexure 3.

4.3.1. *Day 1 (5 February 2008)*

The opening ceremony was conducted by Mr Loti Yates, Director of the NDMO. An opening prayer was provided by the Reverend Philemon Riti. Mr Chanel Iroi, Director of SIMS welcomed participants. The Guest of Honour, the Minister for Environment, Conservation and Meteorology, the Honourable Gordon Darcy Lilo delivered an opening address and officially opened the workshop. Mr Bryan Boase, the Team Leader of the visiting assessment team, responded to the Minister and provided participants with a broad outline of the workshop ahead. Reverend Philemon Riti then concluded with a closing dedication and prayer of refreshments.

Presentations were given after refreshments by the visiting assessment team covering topics including a review of the tsunami threat and threat sources for the Solomon Islands, the Solomon Islands tsunami 2 April 2007 and an overview of the national capacity assessment project.

After lunch presentations were given by Solomon Islands in-country experts, outlining the tsunami warning and mitigation capacity of their country. These presentations included one each from SIMS (Mr Chanel Iroi) and NDMO (Mr Loti Yates).

In the late afternoon the workshop participants commenced discussing and recording answers to the questionnaire (refer to Attachment 1a).

4.3.2. *Day 2 (6 February 2008)*

The workshop participants continued to discuss and record answers to the questionnaire (refer to Attachment 1a).

4.3.3. Day 3 (7 February 2008)

In the morning of the 3rd day the workshop participants continued to discuss and record answers to the questionnaire (refer to Attachment 1a). In the afternoon site visits were conducted by the visiting team, accompanied by relevant Solomon Islands participants. Visits were made to:

- The Solomon Islands NDMO
- SIMS

4.3.4. Day 4 (8 February 2008) (Morning only)

A presentation of preliminary findings from the visiting assessment team was made by Mr Bryan Boase. Solomon Islands participants then had the opportunity to provide feedback on these preliminary findings and the project methodology in general.

4.4. Workshop Photos (Honiara February 2008)



Tsunami Capacity Workshop participants



Visiting the Solomon Islands Meteorological Service (Honiara)



Visiting the National Disaster Management Office Bryan Boase and Loti Yates



Noud Leenders (SOPAC) making a presentation at the workshop



Workshop participants Ian Aujare (NDMO), Rex Tara (Oxfam) and Festus Akihau (SIMS)



5. Assessment Results

5. Assessment Results

5.1. Status of Key System Components

The Tsunami Capacity Assessment Workshop results are summarised below in Table 3 in which the status of key components of the Solomon Islands tsunami warning and mitigation system are outlined (as at the date the Tsunami Capacity Assessment Workshop was held in February 2008, updates between then and the publication of this report are as marked).

Table 3: Summary of current status of key components of the Solomon Islands tsunami warning and mitigation system as at February 2008.

Rating

Yes - fully realised
Partially realised
No - not realised

Key Component	Rating	Discussion
Authority, Coordination and NGO Role		
Legislation in place for tsunami warnings and response	Partially	<p>Currently the Minister for the Ministry of Home Affairs is responsible for management of disasters and emergencies as stipulated by the NDC Act 1989. The Police Act and associated legislation exists. The legislative mandate for issuing of tsunami warnings and coordination of National and Provincial responsibilities requires improvement.</p> <p>Update May 2009 – A consultant is currently assisting the Solomon Islands to review disaster risk reduction and disaster management legislation. Updated legislation is expected to be before Parliament by November 2009.</p>
Tsunami coordination committee or effort at a National and local level	Partially	<p>The NDC have the authority to coordinate the appropriate emergency response as per the NDC Act 1989 (Act currently being revised). NDC, of which the NDMO is the secretariat, has the “operational practical implementation authority” whereas the Cabinet has legislative authority to authorise the NDC to take action. The Solomon Islands National Emergency Operations Centre (to be renamed the NDOCs) has Standard Operations Procedures (SOPs). The NDOC activates the Provincial Disaster Operation Centres (PDOCs).</p> <p>Update May 2009 - A consultant is currently assisting the Solomon Islands to review the NDC structure. It is planned that four sub-committees will exist (Risk Reduction, Hazards, Disaster Management Arrangements and Recovery) headed by the key accountable agency. Workshops will be held with all stakeholders to develop Terms of Reference for these sub-committees agency specific SOPs. This process is AusAID funded.</p>

Key Component	Rating	Discussion
Authority, Coordination and NGO Role (Continued)		
Agency responsibilities clearly defined	Partially	<p>Agency responsibilities are defined within the draft Solomon Islands NEOC, Standard Operations Procedures (SOPs) under the headings of response and recovery. For tsunami, the lead technical agency is listed as the Ministry of Mines and Energy (MMERE).</p> <p>Update May 2009 – Agency responsibilities and accountability will be further enhanced by the review of legislation, Disaster Risk Management Plan and Disaster Risk Management National Action Planning process.</p>
NGOs have a defined role in tsunami warning dissemination, preparedness and awareness and emergency response	Yes	NGOs play a role in community awareness and preparedness and, most importantly, emergency response.
Regional and International Cooperation		
Country represented at an international and regional level to aid cooperation in tsunami warning and mitigation efforts	Yes	The Solomon Islands is involved in the PTWS and Southwest Pacific Tsunami Working Group. The Solomon Islands is yet to become a member of the IOC.
Priorities		
Priorities established for implementation of tsunami warning and mitigation system at a National level	Partially	<p>Lessons Learned from 2 April 2007 Solomon Islands tsunami have helped to focus efforts. Opportunity for further strategic development in an all hazards framework exists.</p> <p>Solomon Island's priorities in enhancing their tsunami warning and mitigation system are outlined in this report. The following priorities were identified by the participants in the Tsunami Capacity Assessment Workshop:</p> <ul style="list-style-type: none"> • Early warning • Risk assessment and inundation mapping • Defined roles and responsibilities • Training and exercising • Emergency response and recovery plan • Infrastructure standards • Community awareness

Key Component	Rating	Discussion
Multi-hazard Approach		
Tsunami warning capabilities are being established within a multi-hazard framework	Yes	<p>The draft Solomon Islands NEOC, Standard Operations Procedures (SOPs) provide a multi-hazard framework for Solomon Islands Government agencies and their disaster management partners before, during and after a disaster event. National and Provincial Disaster Committees and Offices are exist in a multi-hazards context.</p> <p>Update May 2009 – The multi-hazard approach will be further enhanced by the review of legislation, Disaster Management Plans, SOPs and the Disaster Risk Management National Action Planning process.</p>
Research Expertise		
Active research is being undertaken within the country for seismology and tsunami to strengthen the tsunami warning and mitigation system	No	No formal research was identified specific to tsunami. A few projects proposed but under resourced. The Solomon Islands are generally reliant on the efforts of international and regional technical agencies as well as educational institutions such as the University of Papua New Guinea.
Tsunami monitoring infrastructure		
Existence of seismograph stations and integration of real time data from these stations into the tsunami warning process	Partially	There is one location where two digital seismic stations are co-located. The data is available in real-time to the international community that has provided the equipment and to the Solomon's MMERE but the MMERE do not have the capacity or authority to communicate it to the community during a real time event.
Existence of sea-level stations and integration of real time data from these stations into the tsunami warning process	Partially	One 3 rd party owned sea-level station exists. Real time data for this station is accessible via a web interface but not currently used in warnings.
Sharing of seismic and sea-level data internationally to facilitate improvement of PTWC tsunami messages for the region	Yes	<p>Seismic data is shared internationally.</p> <p>Sea level data (3rd party site) is shared internationally and fed into PTWC tsunami messages.</p>

Key Component	Rating	Discussion
Warnings		
Nation receives PTWC messages	Yes	<p>The NDMO receives tsunami messages from PTWC via Short Message Service (SMS) to the Director or Deputy's mobile telephone and via e-mail. NDMO then uses the internet to confirm the tsunami advice. Once confirmed the NDMO officer will advise the duty SIMS officer at the airport meteorological office or conversely, the on duty SIMS Officer will advise the NDMO depending on who gets the advice first. SIMS receives the PTWC messages via the Aeronautical Fixed Telecommunications Network (AFTN) and/or a phone call (there is currently no set protocol) and from NDMO via a landline phone call at the airport meteorological office. SIMS has a number of data communication systems through which they can receive the PTWC messages but primarily it is through the AFTN and the Emergency Managers Weather Information Network (EMWIM). The WorldSpace system is due to be installed in the near future.</p> <p>The reliability of the message receipt systems on which SIMS received the PTWC message is questionable at times due to difficulties in maintaining the equipment. EMWIN (which is alarmed) is likely to be the most reliable option for SIMS to receive the PTWC message if it was operational.</p> <p>MMERE currently has no formal role in tsunami message receipt from PTWC, or subsequent analysis and dissemination of tsunami warnings for the Solomon Islands.</p> <p>Update May 2009 – SIMS has recently had a substantial input of resources for telephone, facsimile and power generators etc.</p>
24x7 operational staff at warning receipt and dissemination location	Yes	<p>The SIMS forecasting office is only staffed from 5am to 6pm daily as opposed to the airport meteorological office that is staffed 24x7 therefore PTWC tsunami messages are received by the airport office (Note – the forecasting office will receive notification of tsunami messages from the airport office).</p> <p>The Solomon Islands Police Force (SIPF) operate 24x7 and act as a back up to NDMO Duty Officer but are most likely to receive tsunami messages from NDMO. The SIPF disseminate it through their 24x7 hour HF radio network to their local stations (also staffed 24x7) and use loud speakers etc. to warn the community.</p>
Disseminate national tsunami warnings as guided by a Standard Operating Procedure	No	<p>Standard Operating Procedures do not exist for tsunami warnings post PTWC message receipt in the Solomon Islands.</p> <p>Update May 2009 – Enhancement of this aspect of the system is planned in the framework of the enhanced Act, committee structure and National, Provincial and agency emergency plans.</p>

Key Component	Rating	Discussion
Warnings (Continued)		
System redundancies in place for receipt of PTWC messages and dissemination of National warnings	Partially	<p>NDMO and SIMS provide back up to each other with regard to receipt of tsunami messages from PTWC. However, as NDMO is not 24x7 (they are on a call in roster), this back up arrangement is largely reliant on the Director and Duty Officer receiving SMS messages. When a message is received from PTWC (or the NDMO) by SIMS, the tropical cyclone standard operating procedures are activated to disseminate tsunami warnings for the Solomon Islands. SIMS sends tsunami warnings to the media and to the Provincial Meteorological Offices and Provincial Government Offices by fax. The NDMO can also take on the warning dissemination role by issuing advice to Solomon Island Police Force (SIPF) and the Solomon Islands Broadcasting Commission (SIBC).</p> <p>Update May 2009 – NDMO is currently the agency most actively pursuing issuing of tsunami advice to the community based on PTWC messages.</p>
Redundant 24x7 methods available for dissemination of warnings to community (e.g. public radio, sirens etc.)	No	<p>SIMS currently issues tsunami warnings to the population with due consideration to its role in issuing tropical cyclone warnings. This is by fax to the media, Provincial Meteorological Offices and Provincial Government Offices.</p> <p>The warning dissemination role is sometimes filled by the NDMO under an informal agreement at the time of the event with SIMS. NDMO pass the warning onto the SIBC (the Amplitude Modulated (AM) frequency national broadcaster) for dissemination nationally. SIBC operates 6am to 11pm daily (main means of dissemination but is not 24x7). Although there is no formal agreement in the case of an emergency, operating hours can be extended but this can create a longer lead time for warning dissemination.</p> <p>The Provincial Government Offices then disseminate the warning as best they can to the community utilising the HF radio network and word of mouth. Media is then contacted to ensure the message has been received and will be transmitted immediately. Dissemination of messages is somewhat inefficient outside of office hours.</p> <p>The warning is also passed onto the SIPF who disseminate it through their HF radio network to their local stations and use loud speakers etc. to warn the community. The Ministry of Health and Medical Services Information Network is also a viable communication channel that connects with every village across the country. Both the Police and the Ministry of Health and Medical Services HF radio networks currently have dedicated frequencies. No agreement has been made which allows these dedicated frequencies to be used for tsunami warnings.</p> <p>Update May 2009 – The Solomon Islands People First Network (http://www.peoplefirst.net.sb) exists but is not operated 24x7. A World Bank initiative is currently working towards implementing low-cost broadband. New 'wake-up' AM radio technologies and other technologies such as the Chatty Beale are being investigated. NDMO, through an EU funded project, has installed HF radios in Provincial Meteorological and Disaster offices. These use the same radio frequency.</p>

Key Component	Rating	Discussion
Warnings (Continued)		
Effective warning dissemination to remote communities	Partially	AM station is main means of dissemination but is not 24x7. Scope for improvement by use of dedicated HF frequencies (such as those used by the SIPP) and development of out of hours 'wake-up' technologies.
Communications coverage of whole country that is effectively utilised for the dissemination of tsunami warning messages	Partially	Adequate communications coverage via AM radio and HF systems. Scope for improvement by use of dedicated HF frequencies (such as those used by the SIPP) and development of out of hours 'wake-up' technologies.
Issue of marine tsunami warnings and guidance for vessels, harbours and ports	Partially	There is no marine tsunami warning product as such. The Search and Rescue Unit of the Ministry of Fisheries and Marine Resources operate 24x7 HF/VHF radio watch and pass on marine safety messages and tsunami warnings when received.
Emergency Response and Evacuation		
Disaster preparedness and emergency response system has been reviewed and opportunities for improvement and training identified	Partially	For tsunami this was done as a lessons learned workshop and resulting report from the 2 April 2007 event. Update May 2009 – The disaster preparedness and emergency response system is currently being reviewed through the review of the Act, committee structure and National, Provincial and agency response plans. The Solomon Islands will also in 2010 undertake the Disaster Risk Management National Action Planning process.
Tsunami emergency response, evacuation and recovery plan exists	Partially	Refer above to answers to "Legislation in place for tsunami warnings and response" and "Tsunami coordination committee or effort at a National and local level". Update May 2009 – The Solomon Islands Tsunami Response Plan is one third complete but needs technical input to be completed.
The designated agency for evacuation is identified and have authority by law	Yes	In areas where Police operate (Honiara and Urban Centres) the Ministry of Police, under the Police Act, are the key evacuation agency. Villages have their own arrangements.
Plans have been made for safe evacuation of population centres including aspects such as maps, routes and signage	No	There is currently no evacuation plan for tsunami. Evacuation planning will be undertaken by the new Provincial Disaster Coordinators and is in fact, written into their duty statements. Update May 2009 – Templates for evacuation plans will be developed and rolled out as part of the PCIDRR project (refer below under "Public and stakeholder awareness and education").
Procedures are tested and exercised to improve the response through better planning and preparedness	Partially	The Police exercise their procedures. No exercise program exists for other agencies involved in tsunami warning and response. The Solomon Islands participated in Exercise Pacific Wave 2006 (refer to D42). Update May 2009 – The Solomon Islands participated in Pacific Wave 2008 and would like to include a regular exercise regime in their Tsunami Response Plan.

Key Component	Rating	Discussion
Emergency Response and Evacuation (Continued)		
Land use policies and building codes are in place to mitigate against the tsunami hazard	Partially	The building code applies only in Honiara and urban centres has been in draft for almost 20 years and is now ready for cabinet approval. Once approved, enforcement needs to be considered to ensure that this code is an effective tool. Developments on the coastal verge in Honiara have been approved without consideration of risk. This is a problem.
Tsunami hazard, vulnerability and risk		
Completion of studies to assess the tsunami hazard in the country or Region	Partially	Preliminary and Probabilistic Tsunami Hazard Assessment of the South West Pacific completed by SOPAC and GA. No national studies exist at present.
Local risk assessments have been completed for at risk communities	No	This has not been completed for tsunami.
Adequate data exists and local inundation modelling has been completed for population centres	Partially	Some accurate bathymetry exists at some locations, however these studies were undertaken by the Japanese and the data is not currently available in-country. Satellite topography data for the entire Solomon Islands is available (with 40meter contours for the country and 5meter contours for Honiara). Available data is outlined in the report "Inventory of Geospatial Data and Options for Tsunami Inundation& Risk Modelling" (SOPAC 2008). Update May 2009 – Inundation studies of the areas affected by the Gizo tsunami of April 2007 have been completed.
Public and stakeholder awareness and education		
Measures have been taken to ensure the public understand and take action in the event of a tsunami warning being issued	No	This is incorporated into a multi-hazard approach. Could be improved once Tsunami Response Plan is in place.

Key Component	Rating	Discussion
Community level education and preparedness programs exist tsunami	Partially	<p>Education and preparedness efforts are generally multi-hazard. Efforts have been made to incorporate Disaster Risk Management into education curriculum (all hazards through the National Adaptation Plan of Action), radio and television programs. Community education coverage is quite good with the joint efforts of the Red Cross, Solomon Islands Development Trust (STDT) and NDMO. Travel to remote islands is expensive and can hinder community awareness and preparedness efforts.</p> <p>Update May 2009 –</p> <ul style="list-style-type: none"> • AusAID funding has been used for multi-hazard wall calendars and posters for schools and Government departments. • The Solomon Islands is included in the Pacific Community Focused Integrated Disaster Risk Reduction (PCIDRR) project managed by the National Council of Churches Australia and funded by AusAID. Under this project the Solomon Islands have two NDMO trained field officers who will be accompanied by Provincial Disaster Officers to run village workshops. These workshops will focus on education and awareness and non-structural DRR such as evacuation planning, risk assessments and development of disaster committees and plans. The project is three years duration with the field officers visiting two villages per month. • At a Tertiary level, introduction to disaster management has been integrated into the third year nursing curriculum. • NDMO's budget spent on education through the media.
Training programs for the National media exist for natural hazard and tsunami	Yes	Tsunami training programmes are provided for the media by NDMO and partners.

5.2. Case Study – 2 April Solomon Islands Tsunami

On at 7.39am on 2 April 2007 local time (1 April 2007 20:39:56 UTC) a magnitude 8.1 earthquake occurred along the Solomon Islands subduction zone. This earthquake generated a tsunami which impacted upon the Western and Choiseul Provinces of the Solomon Islands, killing fifty two (52) people and causing significant damage. This event was used as a case study throughout the tsunami capacity assessment process in the Solomon Islands. The aim of this case study was to gain an understanding of the operation of the system in a real time event. The findings of this case study are outlined below.

The Solomon Islands MMERE has two (2) digital seismic stations co-located. The MMERE system detected and evaluated the earthquake, establishing its location, direction and magnitude. The processes took approximately ten (10) to fifteen (15) minutes. This information was not provided to the community as the MMERE does not have the communication capability to undertake this task.

In terms of detecting and measuring sea-level changes, the Honiara sea level gauge was unserviceable at the time of the 2 April 2007 event in terms of communication capabilities due to damage being caused to the equipment as a result of an incident that happened on the Honiara wharf. However, data stored on the data logger was used post the event for analysis purposes.

For this event the Solomon Islands received the international tsunami message from the PTWC about fifteen (15) minutes after the initial earthquake (approximately 8.10am local time). A message from the Japanese Meteorological Agency (JMA) was also received approximately five (5) minutes after the PTWC message. In reaction to receipt of the PTWC message the message was faxed to SIBC to warn the areas that were going to be affected. Receipt of the message by SIBC was verified through a phone call. This message was then broadcast. The visiting tsunami capacity assessment team was advised that because the event was generated locally, both the PTWC and JMA messages, and resulting warning action taken in-country, was too late to activate any effective community response.

The Solomon Islands did not have a national tsunami response plan in place at the time of this event. In general, conflicting messages were communicated throughout the community and community response to the event was confused. However, in some communities, lives were saved because of traditional knowledge of the natural warning signs of a tsunami being the receding sea. The workshop noted that the Solomon Islands community tends to be “response orientated” rather than preparedness focused. Sharing of traditional tsunami knowledge sometimes does not occur or is not taken seriously.

A formal lessons learned process was undertaken after the event. Annexure 6 of this report summarises the findings of this lessons learned workshop and the full workshop report can be found in Attachment 1b (D29) to this report.

5.3. Strengths, Opportunities for Improvement and Recommendations to Progress the Tsunami Agenda in the Solomon Islands

Based on the discussions during the workshop with in-country participants and the supporting documentation collected during the visit, the visiting team, in consultation with Tsunami Capacity Assessment workshop participants formulated the following strengths, opportunities for improvement and recommendations under key topics which they believe will progress the tsunami agenda in the Solomon Islands. These are outlined in Table 4.

Table 4 – Strengths, opportunities for improvement and recommendations under key topics

5.3.1. Governance and Coordination	
Strengths:	Opportunities for Improvement:
<ul style="list-style-type: none"> • NDC exists with high level representation and reporting responsibility to Cabinet. • Staffed NDMO exists which has close links with local communities, local disaster management officers and strong involvement in community awareness programs. Nine trained Provincial Disaster Management Officers provide community links. • Provincial Disaster Committees exist and are linked to the NDC with reasonable across the board relationships. • NGOs play a role in community awareness and preparedness and, most importantly, emergency response. This is demonstrated by the written plans and actions of the Solomon Islands Red Cross Society and Oxfam Solomon Islands Field Office. • The strong relationship between the NDMO and SIBC. • The lessons learned process undertaken post the 2 April 2007 event. • The capacity building of local communities. 	<ul style="list-style-type: none"> • Legislative mandate for issuing of tsunami warnings requires improvement. SIMS currently issues tsunami warnings to the Solomon Islands population with due consideration to its role in issuing tropical cyclone warnings but with no legislative backing. NDMO sometimes also issue tsunami warnings. • Legislation governing the role of the NDC at the provincial level requires clarification; ensuring policy developed by the Provincial Disaster Committees is aligned with national policy and consistent nation wide. • National strategy for guiding disaster risk reduction in general requires enhancement. The Solomon Islands has no current strategy, although NDMO is active in progressing dialog on this issue. • Improvement in planning processes and the capabilities of leading agencies. • Enhanced training and associated resources. • Clear roles and responsibilities including a national focal point for communities during a disaster. • Enhanced community links through the Provincial Disaster Coordinators and community education. • Heighten political interest and cooperation between agencies.

<i>Governance and Coordination (Continued)</i>	
Strengths:	Opportunities for Improvement:
<ul style="list-style-type: none"> (Refer above) 	<ul style="list-style-type: none"> Update May 2009 – <ul style="list-style-type: none"> Consideration is being given to Meteorological and MMERE Staff to be located together under the Environment Ministry to share resources and knowledge. A consultant is currently assisting the Solomon Islands to review disaster risk reduction and disaster management legislation. Updated legislation is expected to be before Parliament by November 2009. The NDC structure is also being reviewed. It is planned that four sub-committees will exist (Risk Reduction, Hazards, Disaster Management Arrangements and Recovery) headed by the key accountable agency. Workshops will be held with all stakeholders to develop Terms of Reference for these sub-committees and agency specific SOPs. This process is AusAID funded.
Recommendations:	
<ol style="list-style-type: none"> To clearly define the authority, roles and responsibilities for all stakeholders involved in emergency response to tsunami events through the urgent development and implementation of legislation and formalisation of the draft Solomon Islands NEOC, Standard Operations Procedures (SOPs). Including consideration of: <ol style="list-style-type: none"> Clearly defining the roles of NDC members and outlining coordination between the Disaster Controller, NDMO Director and Provincial Coordinators. Developing strategies to integrate the private sector into the draft Solomon Islands NEOC, Standard Operations Procedures (SOPs). Integrate tsunami considerations into the multi-hazard committees under the NDC to ensure liaison and further development to effectively meeting the tsunami threat. 	

5.3.2. Regional and International Coordination

Strengths:	Opportunities for Improvement:
<ul style="list-style-type: none"> Discussions are progressing regarding obtaining support from neighbouring countries (particularly to support NDMO's) during extreme events. The Solomon Islands is well connected with international and regional bodies and forums that can assist in Disaster Risk Management in an all-hazards framework. The Solomon Islands has designated Tsunami National Contacts and Tsunami Warning Focal Points for receiving information on regional tsunami mitigation activities and tsunami messages from the PTWC, JMA, and WC/ATWC that serve as the international tsunami warning centres for the PTWS. The Solomon Islands is involved in the PTWS and Southwest Pacific Tsunami Working Group. 	<ul style="list-style-type: none"> The Solomon Islands is yet to become a member of the IOC. Enhanced cooperation with regional and international organisations regarding scientific research (refer to Research Expertise). Enhanced coordination of post-disaster assessments (refer to Tsunami Emergency Response (including evacuation)).
Recommendations:	
3. The Solomon Islands progress towards joining the IOC.	

5.3.3. Research Expertise

Strengths:	Opportunities for Improvement:
<ul style="list-style-type: none"> • A number of post-tsunami impact assessments and other studies have been undertaken in the Solomon Islands post 1 April 2007 event. These studies were completed by both national and international organisations with a number of the resulting reports provided to the Solomon Islands. • The Solomon Islands have a reasonable historical record of tsunami and are currently undertaking a project to obtain the oral history of past tsunami. 	<ul style="list-style-type: none"> • To ensure data, results and reports from visiting assessments and projects are fed back to the Solomon Islands post completion. • There is no active research, including government sponsored research into seismology and tsunami science in the Solomon Islands. The Solomon Islands are generally reliant on the efforts of international and regional technical agencies as well as educational institutions such as the University of Papua New Guinea.
Recommendations:	
<ol style="list-style-type: none"> 4. A protocol is developed to ensure that reports from all assessments are provided back to the Solomon Islands and that they are formally archived for easy retrieval and reference. 5. Capitalised on partnerships offered by regional and international bodies to undertake scientific research in the Solomon Islands into seismology and tsunami science. 	

5.3.4. Tsunami Monitoring Infrastructure

Strengths:	Opportunities for Improvement:
<ul style="list-style-type: none"> • One sea-level gauge exists in the Solomon Islands on the Honiara wharf. • There is one location where two digital seismic stations are co-located. • MMERE have access to national seismic data in real time and this data is provided to the international community in real time. 	<ul style="list-style-type: none"> • Access to real time data is an opportunity for improvement. The Solomon Islands no longer has access to real-time data from the Honiara tide gauge (access is available in PDF format from the Australian Bureau Registered User Website). • Although MMERE have access to national seismic data in real time they are unable to communicate it to the community and under the current legislation do not have the authority to do so. • Obtain new technologies for tsunami and earthquake monitoring
Recommendations:	
<ol style="list-style-type: none"> 6. That the Australian Bureau sea-frame tide-gauge and planned new stations real-time data link to SIMSHQ to be restored. 7. Investigate the feasibility of receiving real-time sea-level and seismic data from neighbouring countries, regionally or internationally, via the WMO GTS. Then: <ol style="list-style-type: none"> a. Ensure relevant legislation is in place to allow MMERE and other relevant agencies have the authority to use this data b. Integrate use of this data into Standard Operating Procedures for tsunami. 	

5.3.5. Tsunami warnings

Strengths:	Opportunities for Improvement:
<ul style="list-style-type: none"> • It is estimates that approximately 80% of people in the rural population can receive tsunami warnings by SIBC. • SIMS and NDMO receive tsunami messages from PTWC via AFTN and SMS. • Refer to further strengths listed under the Topic: Communications. 	<ul style="list-style-type: none"> • The improvement of defined roles and coordination between key agencies during a tsunami event. In particular the improvement of communication between MMERE and SIMS in the operational context. • There is a lack of understanding of roles and developed SOPs across the organisations involved that detail actions taken in response to a tsunami message received from PTWC. SIMS currently uses their cyclone SOPs and NDMO have limited instructions on felt earthquakes. • Enhancement of the MMERE that has the expertise but lacks the resources and funding to detect and evaluate seismic events. They are currently not a 24/7 operation and have one location with two digital seismometer stations co-located. The staff can evaluate events above 5MW quickly if they are on site at the time but they have no ability to raise the alarm. The lack of triangulation of seismic stations is a recognised problem. • Although a number of agencies receive the PTWC message via various different means – there is no formal procedure or back up arrangement for receiving this message and disseminating a national tsunami warning message to the community. . • Cover the overnight gap by development of a 24/7 system • Update May 2009 – <ul style="list-style-type: none"> ○ SIMS has recently had a substantial input of resources for telephone, facsimile and power generators etc. ○ Enhancement of this aspect of the system is planned in the framework of the enhanced Act, committee structure and National, Provincial and agency emergency plans. ○ NDMO is currently the agency most actively pursuing issuing of tsunami advice to the community based on PTWC messages.

*Tsunami Warnings (Continued)***Recommendations:**

8. To review the current process for the receipt of Tsunami Warnings by SIMS, MMERE and the NDMO to improve the timeliness of dissemination.
9. The tsunami Standard Operating Procedures (SOPs) of SIMS, MMERE and NDMO should be developed, exchanged and coordinated. The viability of SOPs should also be tested when they are developed or changed via a practical exercise prior to their operational adoption.
10. Formally review the resource requirements of the MMERE that would enable it to maintain a 24x7 tsunami watch and advice service. For example: detection and communication equipment; appropriately trained staff.
11. Formally review the resource requirements of SIMS that would enable it to maintain a 24x7 multi-hazard watch and warning service. For example: detection and communication equipment; appropriately trained staff.
12. The Director SIMS and Deputy be provided with dedicated mobiles (with SMS capability) to receive SMS tsunami warnings from the PTWC.
13. That all SIMS, MMERE and NDMO tsunami SOPs include a requirement to confirm the receipt of advices and warnings disseminated to primary agencies. For example: maritime and aviation.

5.3.6. Communications

Strengths:	Opportunities for Improvement:
<ul style="list-style-type: none"> • The People First Network provides a rural radio / emailing system that is available as part of distance education that utilises digital HF radios as well as some VSAT terminals. • There is a substantial HF radio system throughout the Solomon Islands that could be, and is, used on occasion to disseminate warnings. It is available at all major population centres and remote communities. Note - Through the Police HF radio (digital voice and text), it is protected so no one can interrupt. NDMO and the Ministry of Health and Medical Services both have digital voice capable HF. • Police are relatively well set-up communications wise and this is set to improve (HF radio and WorldSpace systems). • Mobile and SMS coverage of Honiara, Gizo, Auki, Tulagi, Munda, Noro, Gold Ridge, Savo Island (half the Island). • The Search and Rescue Unit of the Ministry of Fisheries and Marine Resources operate a 24x7 HF/VHF radio watch and pass on tsunami warnings when received. These messages are received by SIMS. • Update May 2009 – <ul style="list-style-type: none"> ○ NDMO, through an EU funded project, has installed HF radios in Provincial Meteorological and Disaster offices. These use the same radio frequency. ○ SIMS has been successfully chosen to be involved in the first pilot deployment of the RANET Chatty Beetle, a 'wake-up' communications technology for communities. New 'wake-up' AM radio technologies are also being considered. ○ A World Bank initiative is currently working towards implementing low-cost broadband. 	<ul style="list-style-type: none"> • Although access to HF radio is very good around the country there is no control over this service. Transmissions can be regularly interrupted by HF users who have no formal licensing. Previously there were regulations through the Government, organising when people spoke, however these regulations do not exist now. An up to date list of HF users does not currently exist. • Satellite access is available through the Iridium Network but is not currently utilised due to a lack of technical expertise, funds and equipment. • Equipment and comprehensive training is required for all facets of the provision of a tsunami warning service from the communication perspective (including technical and operational). • Satellite phones exist in the Solomon Islands (NDMO, Red Cross, Tourist Operators, and Oxfam) but are not used 24/7 to receive warnings. They are normally used for emergency coordination when people are alerted to activate them. NDMO has a list of numbers. • SMS (from PTWC) to individuals phones was the only system on which the 1 April 2007 tsunami message was received in spite of EMWIN and AFTN systems existing (GTS is not currently operating but will be restored soon).
Recommendations:	
<p>14. That consideration is given to providing a set of common dedicated HF frequencies that would only be used during times of disaster.</p> <p>15. Formally review and develop strategies to implement an alternative means of providing multi-hazard warnings from that of SIBC broadcasts. For example, alternative technologies such as 'wake-up' AM radio and the Chatty Beetle.</p>	

5.3.7. Tsunami Emergency Response (including evacuation)

Strengths:	Opportunities for Improvement:
<ul style="list-style-type: none"> • Draft Solomon Islands NEOC, SOPs January 2008 exist. Benefits include: • Definition of responsibilities of the Provincial Emergency Operations Centres and the NEOC. • Defines disasters and organisations responsible (during the response and recovery phase). • Provides templates for use during the disasters such as a template for a "Situation Progress Report" and "Damage Assessment Summary" log. • The SIPF have authority by law (the Police Act) to evacuate the public (supported by Fire Brigade and NDMO). In areas where Police operate (Honiara and Urban Centres) the Ministry of Police are the key evacuation agency. Villages have their own arrangements. • As a result of 2 April event and a lessons learned exercise, there is currently an initiative for the development of nine Provincial Disaster Coordinators underway. There is two months left before their training is complete. • As a result of 2 April event and a lessons learned exercise, the SIPF have revisited their SOPs and are making appropriate changes. • SIPF have an "Operations Centre Manual – S.O.P" for flood, storm and tsunami. • SIPF procedures are regularly tested and exercised. • Lessons learned and reports from various agencies and organisations are utilised to review current plans and identify gaps and needs. • Procedures to access National funds for disaster response through cabinet exist. 	<ul style="list-style-type: none"> • No tsunami specific emergency response plan exists. It is the intention that this plan would form an annexure to the Response to Disasters and Organisational Responsibilities. • No tsunami evacuation plan exists. No evacuation maps, routes, assembly points, shelters or signage for tsunami evacuation exists for the Solomon Islands. • NDMO procedures are not tested or exercised. • NDMO is not staffed 24/7. Currently a duty officer arrangement is in place that means NDMO staff are available on a call-out basis via mobile phone. The Police act as a back up if the NDMO duty officer can't be located. • Update May 2009 – <ul style="list-style-type: none"> ○ The Solomon Islands Tsunami Response Plan is one third complete but needs technical input to be completed. ○ Templates for evacuation plans will be developed and rolled out as part of the PCIDRR project (refer below under "Public and stakeholder awareness and education"). ○ The Solomon Islands participated in Pacific Wave 2008 and would like to include a regular exercise regime in their Tsunami Response Plan. ○ The disaster preparedness and emergency response system is currently being reviewed through the review of the Act, committee structure and National, Provincial and agency response plans. The Solomon Islands will also in 2010 undertake the Disaster Risk Management National Action Planning process.

*Tsunami Emergency Response (including evacuation) (Continued)***Recommendations:**

16. The highest priority is given to the development of a Tsunami Response plan that clearly defines the roles, functions, authorities and responsibilities of all organisations and agencies (public and private sector) at the National and Provincial levels.
17. Through the PCIDRR and ongoing work of the NDMO Provincial Disaster Coordinators, identify and advertise evacuation routes for communities.
18. Develop mechanisms to ensure that international bodies are aware of existing arrangements to coordinate assessments undertaken post a natural disaster (MMERE focal point for technical assessments and SIOAC regional focal point) and that results, including full reports, are provided and archived locally.
19. Through NDC and committees ensure comprehensive formal event reviews are undertaken for each tsunami event (and other emergencies/disasters) that occurs. Ensure the results of these reviews are acted upon and that reviews are archived.
20. Identify critical infrastructure and lifeline support facilities and develop plans to ensure the availability of minimal government services after a destructive tsunami, or other natural disasters.

5.3.8. Tsunami Hazard, Vulnerability, Risk and Mitigation

Strengths:	Opportunities for Improvement:
<ul style="list-style-type: none"> A draft building code exists. Update May 2009 – Inundation studies of the areas affected by the Gizo tsunami of April 2007 have been completed. 	<ul style="list-style-type: none"> The building code has been in draft for almost 20 years and is now ready for cabinet. Aus/NZ standards are used. The building code will be difficult to enforce and will be used in an all hazards context. There is currently little regard for land use restrictions and building in disaster prone areas is common practice. Improvements in land use will only occur through the enforcement of the building code and other regulations pertaining to land use etc. The building code applies only in Honiara and urban centres. Alternative options for rural communities need to be developed. MMERE are tasked to undertake tsunami specific hazard mapping but currently have no budget to complete this work. A proposal is being prepared to receive support from SOPAC on completion of this task. No tsunami modelling, including inundation studies, have been completed for the Solomon Islands (MMERE plans to do this in the future). Some accurate bathymetry exists at some locations, however these studies were undertaken by the Japanese and the data is not currently available in-country. Satellite topography data for the entire Solomon Islands is available (with 40meter contours for the country and 5meter contours for Honiara). Available data is outlined in the report “Inventory of Geospatial Data and Options for Tsunami Inundation& Risk Modelling” (SOPAC 2008).
Recommendations:	
<ol style="list-style-type: none"> 21. Use the tsunami hazard studies that have been completed for the Southwest Pacific Nations to date, and any historical tsunami records, to identify low-lying communities which may be potentially prone to tsunami impacts from all likely tsunami sources and develop and include hazard maps in the disaster response plan and associated evacuation plans. 22. Acquire the necessary baseline data (high resolution topography and bathymetry) for populated coastlines as part of a multi-hazard mapping activity to assist in assessment of the tsunami risk in the Solomon Islands. 23. For urban centres - develop a strategy for the recognition and adherence to the current Building Code combined with a risk management strategy in terms of disaster threat for new developments. For villages – develop a village carpenters manual including building placement considerations with regard to natural hazards (especially important for public buildings that become evacuation centres). 24. Investigate the feasibility and options for conducting a modelling study to calculate inundation from tsunami at identified locations throughout the Solomon Islands. 25. Locate and archive bathymetry data from previous studies undertaken of Honiara, Gizo, Noro, Marovo and Savo Island. 	

5.3.9. Public and Stakeholder Awareness and Education

Strengths:	Opportunities for Improvement:
<ul style="list-style-type: none"> • The ancestral heritage “run to high ground after an earthquake” passed onto younger generations by survivors of small, historic tsunamis triggered an immediate spontaneous self evacuation in some communities during the 2 April 2007 Solomon Islands tsunami. • There is currently a curriculum education and awareness program being developed (through cooperation between the Ministry of Education, NDMO and MMERE) and trialled across all levels of the education system as well as weekly one hour radio sessions and information stalls. Further private sector funding is required. Feedback on the effectiveness of the various approaches would improve future education programs. • There are currently no tsunami memorials or museums in the Solomon Islands but the Western Province is planning to have an annual “Day of Remembrance” applicable to the 2007 event. • Tsunami training programmes are provided for the media by NDMO and partners. • Community education coverage is quite good with the joint efforts of the Red Cross, Solomon Islands Development Trust (STDT) and NDMO. 	<ul style="list-style-type: none"> • This ancestral heritage could be more widely disseminated to assist in community awareness for tsunami events in the future. • Further private sector funding is required for the curriculum education and awareness program. Travel to remote islands is expensive and can hinder community awareness and preparedness efforts. • An assessment of public awareness has not been completed for tsunami in the Solomon Islands. • Strengthening the traditional warning systems. • Update May 2009 – <ul style="list-style-type: none"> ○ AusAID funding has been used for multi-hazard wall calendars and posters for schools and Government departments. ○ The Solomon Islands is included in the Pacific Community Focused Integrated Disaster Risk Reduction (PCIDRR) project managed by the National Council of Churches Australia and funded by AusAID. Under this project the Solomon Islands have two NDMO trained field officers who will be accompanied by Provincial Disaster Officers to run village workshops. These workshops will focus on education and awareness and non-structural DRR such as evacuation planning, risk assessments and development of disaster committees and plans. The project is three years duration with the field officers visiting two villages per month. ○ At a Tertiary level, introduction to disaster management has been integrated into the third year nursing curriculum. ○ NDMO’s budget spent on education through the media.

*Public and Stakeholder Awareness and Education (Continued)***Recommendations:**

26. Continue to widely disseminate the traditional knowledge acquired via the Provincial Disaster Coordinator initiative and other tsunami awareness initiatives which focus on emergency response to tsunami warnings and natural tsunami warning signs.
27. Maintain and where possible enhance the current momentum to integrate the disaster awareness initiative throughout all levels of the education curriculum.
28. NDMO and Ministry of Education liaise to develop a training program for teaching staff conducting tsunami (and multi-hazard) awareness classes as well as developing teaching tools.
29. Integrate an evaluation mechanism into community awareness and preparedness programs to ensure the continued improvement of these programs by focusing on successful methodologies.
30. Maintain and enhance the current multi-hazard community awareness media campaigns.
31. Develop a media awareness program to raise the community awareness of the importance and need for the respect of early warning equipment. For example, Solar panels on sea-level instrumentation. .
32. Develop and implement appropriate community activities to assess the community understanding and response to tsunami warnings in an appropriate and timely manner.
33. Introduce a competency-based training approach to the development of skills and knowledge in the field of disaster management, including scientific knowledge regarding tsunami science and warnings (SIMS and MMERE), to further enhance skills.

5.4. Additional Workshop Benefits

In addition to this report, additional benefits of the Tsunami Capacity Assessment Workshop in Solomon Islands were:

- Facilitation of working relationships between agencies and organisations involved in tsunami warning and mitigation within the Solomon Islands;
- Exchange of information on National activities and capabilities within the Solomon Islands;
- Enhanced working relationships between the Solomon Island participants, the Australian Bureau, EMA and SOPAC; and
- Enhanced understanding and appreciation by the assessment team and Project of the challenges faced by the Solomon Island communities.

5.5. Next Steps

The Solomon Islands will receive three key material outcomes from the Tsunami Capacity Assessment project:

1. The completed questionnaire in electronic format with scanned copies of all supporting documentation collected in-country;
2. A comprehensive National Report in a standard format which aims to summaries information collected from the visits and is consumable for non-technically minded recipients (this document); and
3. A copy of the final Regional Report which will outline common themes across the region.

At the agreement of the country project results will be posted on websites such as the Australian Bureau, SOPAC and Pacific Disaster Net.

Once approved by the country the Bureau will facilitate dissemination of reports to regional and international donors and other stakeholders to ensure maximum exposure of results. Contingent on the availability of human and financial resources, the Bureau and project partners will aim to work with potential donors to bring the findings of this project to their attention on a country and regional scale. This will be done to facilitate further capacity development projects being undertaken based on the results of this project. .

Solomon Islands workshop participants are encouraged to use this National Tsunami Capacity Assessment report to guide both national projects and aid funded projects to achieve targeted improvements of the Solomon Islands tsunami warning and mitigation system. In turn, this will assist in improving systems for other natural hazards.



6. Annexure

6. Annexure

6.1. Annexure 1: Record of Participants

Organisation	Position	Title	First Name	Last Name	Postal Address	Telephone	Fax	Mobile	E-mail
Solomon Islands Meteorology Service	Weather Forecaster	Mr	Michael	Siau	PO Box 21 Honiara	27658	23029	77985	forecast@met.gov.sb
Solomon Islands Christian Association (SICA)	General Secretary	Rev	Philemon	Riti	PO Box 1335 Honiara	(677) 23350		97344	gastica@solomon.com.sb sicacom@solomon.com.sb
Ministry of Infrastructure Development	Chief Civil Engineer	Mr	Jimmy	Nuake	PO Box 1213 Honiara	21201	28705	91564	nuakej@hotmail.com
Ministry of Mines and Rural Electrification	Principal Vulcanologist	Mr	Thomas	Toba	PO Box G37 Honiara	(677) 21522	(677) 25811	92940	t_toba@mines.gov.sb
National Disaster Management Office	Provincial Disaster Coordinator	Mr	Chris	Neo	PO Box G11 Honiara	27936			Neo_chris007@yahoo.com
Oxfam	Disaster Management Program Office	Mr	Rex	Tara	PO Box 1377 Honiara	22004	23134		rext@oxfam.org.au
Solomon Islands Development Trust	SIDT Disaster Program Officer	Mr	Joseph	Major	PO Box 147 Honiara	23409	21131	79316	jmajor_sidt@yahoo.com.au

SOLOMON ISLANDS TSUNAMI CAPACITY ASSESSMENT REPORT

Organisation	Position	Title	First Name	Last Name	Postal Address	Telephone	Fax	Mobile	E-mail
Ministry of Mines and Rural Electrification	Principal Seismology Observer	Mr	Alison	Papabatu	GPO Box G37	21521/21522	(677) 25811	86132	Papabatu@mines.gov.sb
National Disaster Management Office	Provincial Disaster Coordinator	Mr	Bahenua	Sauhonu	PO Box G-11	27937	(677) 24293		bahenua@yahoo.com
Ministry of Home Affairs (MHA) – NDMO	Provincial Disaster Coordinator	Mr	Silas	Arukwai	PO Box 611 Honiara SI	27937			Arukawi_silas@yahoo.com
MHA NDMO	Provincial Disaster Coordinator	Mr	Oliver	Hiromana	PO Box G11 Honiara	27937			olivenagadi@yahoo.com.au
MHA NDMO	Provincial Disaster Coordinator	Mr	Frank	Menola	PO Box G11 Honiara	27937		79430	
Solomon Island Police Force	Director National Traffic Centre	Superintendent	Albert	Samani	Police Headquarters PO Box G 3 Honiara	25567			
Ministry of Lands, Housing and Survey	Senior GIS Cartographer	Mr	Dalton	Hone	PO Box G38 Honiara SI	23365			billyhone@hotmail.com
Solomon Island Police Force	Director Emergency Management & Special Events Planning		George	Paikai	SIPF Box G3 Honiara	23048	20616	88960	
Solomon Island Police Force	Staff Officer to Commissioner	Superintendent	Nathanial	Moses	PHQ PO Box G3 Honiara	23431	20616	98473	Rsipp@solomon.com.sb
NDMO	Provincial Disaster Coordinator	Mr	Herrick	Savusi	PO Box G17 Honiara	27937	24293		hilceschava@yahoo.com

SOLOMON ISLANDS TSUNAMI CAPACITY ASSESSMENT REPORT

Organisation	Position	Title	First Name	Last Name	Postal Address	Telephone	Fax	Mobile	E-mail
NDMO	Chief Administration Officer	Mrs	Janet	Prakash	PO Box G11 NDMO Ministry of Home Affairs	27937/ 27936	24293	79480	cheifadminndc@solomon.com.sb directorndc@solomon.com.sb
NDMO	Director	Mr	Loti	Yates	PO Box G11 NDMO Ministry of Home Affairs	27937/ 27936	24293	(677) 95895	directorndc@solomon.com.sb
NDMO	Provincial Disaster Coordinator	Mr	Brain	Tom	PO Box G11 NDMO Ministry of Home Affairs	27937/ 27936	24293		Willie2brandc@yahoo.com
NDMO	Provincial Disaster Coordinator	Ms	Alice	Saefooa	PO Box G11 NDMO Ministry of Home Affairs	27937/ 27936	24293	81584	Alicesaefooa@gmail.com
NDMO	Provincial Disaster Coordinator	Mr	Nelson	Anaia	PO Box G11 NDMO Ministry of Home Affairs	27937/ 27936	24293		
NDMO	Provincial Disaster Coordinator	Mr	Pearson	Simi	PO Box G11 NDMO Ministry of Home Affairs	27937/ 27936	24293	81232	Ura_piason@yahoo.com
NDMO	Programs Officer – Training and Awareness	Mr	Julian	Makaa	PO Box G11 NDMO Ministry of Home Affairs	27937/ 27936	24293		programsndc@solomon.com.sb
Solomon Islands Meteorological Services	Director	Mr	Chanel	Iroi	PO Box 21 Honiara ARA	27658	23029	79653	c.iroi@met.gov.sb
Solomon Islands Red Cross	Dissemination Officer	Mr	Niniu	Oligao	PO Box 187 Honiara	22682			Dissem_sirc@solomon.com.sb
Ministry of Lands, Housing and Survey	Senior GIS Cartographer	Mr	Dalton	Hone	PO Box G38 Honiara SI	23365			billyhone@hotmail.com

6.2. Annexure 2 – The visiting assessment team

Team Position	Name	Position within Organisation	Organisation	Contact Details
Natural Hazard Warning Expert and Team Leader	Bryan Boase	National Manager, Weather Services Quality	Australian Bureau of Meteorology	B.Boase@bom.gov.au Ph. +61 3 9669 4719 Fax. +61 3 9669 4803 Mob. +61 4 0984 7998
Emergency Management Expert	Shannon McNamara	Manager Tsunami Capability Development	Emergency Management Australia	shannon.mcnamara@ema.gov.au Ph. +61 2 6256-4680 Fax. +61 2 6256-4653 Mob. +61 41-729-2183
Data Communications Expert	Colin Schulz	Telecommunications Engineer	For the Australian Bureau of Meteorology	cschulz@squirrel.com.au Ph. +61 7 5441 1381
Regional Expert	Noud Leenders	Community Risk Management Adviser	South Pacific Applied Geoscience Commission	Noud@sopac.org agleenders@gmail.com Ph. +679 (338) 1377 Fax. +679 (337) 0040 Mob. +679 9999388

6.3. Annexure 3 – Agenda, Solomon Islands Tsunami Capacity Assessment Workshop

DAY 1: Tuesday 5 February 2008				
SESSION 1: OPENING CEREMONY AND INTRODUCTORY PRESENTATIONS				
LOCATION: King Solomon Hotel				
CHAIR: Mr Bryan Boase, National Manager, Weather Services Quality, Australian Bureau of Meteorology				
Time	Item	Questionnaire Reference	Duration	Participation
9.30 – 11.00am	Opening Ceremony	NA	1.5hrs	All
11.00 – 11.30am	Official Opening Morning Tea	NA	0.5hrs	All
11.30 – 12.30pm	Presentations			
11.30am	<i>Tsunami science and components of a tsunami early warning system</i> Presenter: Bryan Boase	NA	15mins	All
11.45am	<i>Solomon Islands tsunami hazard</i> Presenter: Noud Leenders, Community Risk Management Adviser, SOPAC	NA	15mins	All
12.00pm	<i>Regional policy and forums for progressing disaster risk reduction, disaster management and early warning systems (including tsunami)</i> Presenter: Noud Leenders	NA	15mins	All

Time	Item	Questionnaire Reference	Duration	Participation
12.15pm	<i>National Tsunami Capacity Assessment Project</i> Presenter: Bryan Boase	NA	15mins	All
12.30 – 1.30pm	Lunch	NA	1hr	All
1.30 – 2.30pm	Presentations			
1.30pm	<i>Tsunami warnings in the Solomon Islands</i> Presenter: Chanel Iroi, Director, Solomon Islands Meteorological Service	NA	0.5hrs	All
2.00pm	<i>Tsunami Disaster Risk Reduction and Disaster Management in the Solomon Islands</i> Presenter: Loti Yates, Director, National Disaster Management Office	NA	0.5hrs	All

SESSION 2: ORGANISATIONS, COMMITTEES, LEGISLATION, STRATEGY AND COOPERATION				
LOCATION: King Solomon Hotel				
CHAIR: Mr Bryan Boase				
Time	Item	Questionnaire Reference	Duration	Participation
2.30pm – 2.45pm	Discussion of workshop method and agenda	NA	15mins	All
2.45 – 3.30pm	Capacity Assessment – Organisations, Committees and Legislation			
2.45pm	<i>Organisations involved in tsunami warning and mitigation in the Solomon Islands</i>	<i>Section 2, Part A</i>	<i>15mins</i>	<i>All</i>
3.00pm	<i>Tsunami warning and mitigation coordination committees at National, Provincial and community level in the Solomon Islands</i>	<i>Section 2, Part B</i>	<i>15mins</i>	<i>All</i>
3.15pm	<i>Legislation relevant to tsunami warnings and emergency response</i>	<i>Section 2, Part C</i>	<i>15mins</i>	<i>All</i>
3.30pm – 4.00pm	Afternoon tea	NA	0.5hrs	All
4.00pm – 5pm	Capacity Assessment – Strategy, International and Regional Cooperation, All Hazards Approach			
4.00pm	<i>Disaster risk reduction strategy in the Solomon Islands</i>	<i>Section 2, Part D</i>	<i>15mins</i>	<i>All</i>
4.15pm	<i>International and Regional cooperation for tsunami warning and mitigation in the Solomon Islands</i>	<i>Section 2, Part E & F</i>	<i>15mins</i>	<i>All</i>
4.30pm	<i>All-hazards approach</i>	<i>Section 3</i>	<i>15mins</i>	<i>All</i>
4.45pm	<i>CONCLUSION – Solomon Islands priorities for implementing an effective tsunami warning and mitigation system</i>	<i>Section 4</i>	<i>15mins</i>	<i>All</i>
5.00pm	CLOSE			

DAY 2: Wednesday 6 February 2008**SESSION 3: RESEARCH, MONITORING, WARNING AND EMERGENCY RESPONSE****LOCATION:** King Solomon Hotel**CHAIR:** Mr Bryan Boase

9.00 – 11.00am		Capacity Assessment – Research, Monitoring, Warning and Emergency Response		
<i>9.00am</i>	<i>Research and development expertise</i>	<i>Section 5</i>	<i>15mins</i>	<i>All</i>
<i>9.15am</i>	<i>Tsunami monitoring including:</i> <ul style="list-style-type: none"> <i>Tsunami monitoring infrastructure (seismic network, sea-level network and utilisation of satellites for data communication)</i> <i>Case Study – Use of this monitoring infrastructure for the 1 April 2007 Solomon Islands tsunami</i> 	<i>Section 6, Part A, B, C & Case Study – Monitoring Systems</i>	<i>15mins</i>	<i>All</i>
10.00 – 10.30am	Morning Tea	NA	0.5hrs	All
<i>10.30 – 12.30pm</i>	<i>Tsunami warning system in the Solomon Islands including:</i> <ul style="list-style-type: none"> <i>International communication cooperation</i> <i>National tsunami warning centre</i> <i>Receipt of advisories from PTWS</i> <i>Procedures for dissemination of tsunami warnings Nationally, once received from PTWS</i> <i>Issuing warnings for marine vessels, harbours and ports</i> <i>Case Study – Receipt of international advisories and dissemination of warnings nationally for the 1 April 2007 Solomon Islands tsunami.</i> <i>CONCLUSION – Strengths and weaknesses of tsunami warnings</i> 	<i>Section 7, Part A, B, C, D, E, F, G, Case Study – Tsunami Advisory Messages and Warnings & Part H</i>	<i>2hrs</i>	<i>All</i>

Time	Item	Questionnaire Reference	Duration	Participation
12.30 – 1.30pm	Lunch	NA	1hr	All
1.30 – 3.00pm	<p><i>Emergency response to tsunami in the Solomon Islands including:</i></p> <ul style="list-style-type: none"> • <i>Assessing the capacity of the disaster management system in the Solomon and identifying training needs</i> • <i>Emergency response and recovery plans</i> • <i>Evacuation (including evacuation legislation)</i> 	Section 8, Part A, B & C	1.5hrs	All
3.00 – 3.30pm	Afternoon Tea	NA	0.5hrs	All
3.30 – 5.00pm	<p><i>Emergency response to tsunami in the Solomon Islands continued including:</i></p> <ul style="list-style-type: none"> • <i>GIS use for emergency response</i> • <i>Testing and exercising</i> • <i>Consideration of critical infrastructure</i> • <i>Tsunami mitigation efforts</i> • <i>The role of Non-Government organisations in tsunami warning and mitigation</i> • <i>Case Study – Preparedness and response for the 1 April 2007 Solomon Islands tsunami.</i> 	Section 8, Part D, E, F, G, H & Case Study – Preparedness and Response	1.5hrs	All
5.00pm	CLOSE			

DAY 3: Thursday 7 February 2008**SESSION 4: TSUNAMI HAZARD, VULNERABILITY AND RISK AND COMMUNITY AWARENESS****LOCATION:** King Solomon Hotel**CHAIR:** Mr Bryan Boase

Time	Item	Questionnaire Reference	Duration	Participation
9.00 – 11.00am	Capacity Assessment – Hazard, Vulnerability and Risk Studies and Community Awareness			
9.00am	Presentation – Community awareness and preparedness and capacity building in Australia Presenter: Shannon McNamara (EMA)	NA	15mins	All
9.00am	<i>Tsunami hazard, vulnerability and risk studies in the Solomon Islands including:</i> <ul style="list-style-type: none"> • Post tsunami surveys • Tsunami hazard, vulnerability and numerical modelling studies • Community participation in assessing the tsunami risk 	Section 9, Part A, B, C, D, E, F	1hr	All
10.00am	<i>Public and stakeholder awareness and education regarding tsunami in the Solomon Islands including:</i> <ul style="list-style-type: none"> • Assessment of public awareness • The role of public awareness in understanding warnings and taking action • Public awareness and education programs • Tsunami memorials and museums 	Section 10, Part A, B, C, D	1hr	All
11.00 – 11.30am	Morning Tea	NA	0.5hrs	All

Time	Item	Questionnaire Reference	Duration	Participation
SESSION 5: SITE TOURS				
LOCATION: Various				
CHAIR: NA				
11.30 – 5pm	Visiting assessment team tours of sites and facilities important to tsunami warning and mitigation within the Solomon Islands including the offices of: SIMS, NDMO and MMRE	NA	5.5hrs	All
5.00pm	CLOSE			
DAY 4: Friday 8 February 2008				
SESSION 6: PRESENTATION OF PRELIMINARY ASSESSMENT FINDINGS				
LOCATION: King Solomon Hotel				
CHAIR: Mr Bryan Boase				
9.00 – 10.00am	Preliminary summary presentation from the visiting assessment team – Solomon Islands strengths, needs, preliminary recommendations and next steps	NA	1hr	All
10.00 – 11.00am	Feedback of preliminary summary presentation by Solomon Island participants	NA	1hr	All
11.00 – 11.15am	Acknowledgements and Close	NA	15mins	All
11.30 – 12.00pm	Morning Tea	NA	0.5hrs	All

6.4. Annexure 4 – Supporting Documents Log

Ref.	Document Name	Copy Obtained (Y/N)	Format (H = Hard Copy) (E = Electronic)
D1	A Rapid Response to the 1 April 2007 MS~8.0 earthquake in the Solomon Islands to Conduct Crustal Motion Measurements using GPS and Coral Geodesy, Frederick W. Taylor	Y	H & E
D2	After the earthquake: An assessment of the impact of the earthquake and tsunami on fisheries-related livelihoods in coastal communities of Western Province, Solomon islands – WorldFish Centre	Y	H & E
D3	“Ancestral heritage saves tribes during 1 April 2007 Solomon islands tsunami” – Geophysical Research Letters, Vol, 35, L01607, doi:10.1029/2007GL031654,2008	Y	H & E
D4	Australian Bureau of Meteorology SitesDB Station: Solomon Islands. NTC AWS 200859 printout.	Y	H & E
D5	Brief Preliminary Report on Field Survey of Solomon Islands Earthquake Tsunami in April 2007, May 2007, Tsunami Research Centre Port and Airport Research Institute	Y	H & E
D6	Constitution of Solomon Islands Red Cross Society	Y	H & E
D7	Draft for Discussion: Subject to SIG Cabinet Approval – Recovery Action Plan, Western and Choiseul Provinces Earthquake and Tsunami Solomon Islands 2007	Y	H & E
D8	Earthquake and Tsunami Disaster in Solomon Islands, 2 April 2007 – PowerPoint presentation by JAEE Tsunami Survey Team	Y	H & E
D9	End User Licence Agreement for the Supply of Digital Data for Non-Commercial Purposes – MMERE	Y	H & E
D10	Geological Survey of the 2 April 2007 Solomon Islands Earthquake and Tsunami: Brian G. McAdoo Department of Earth Science and Geography, Vassar College Poughkeepsie, USA; Jens C. Krüger Pacific Islands Applied Geoscience Commission SOPAC Secretariat, Fiji; Kelly L. Jackson Rosenstiel School of Marine and Atmospheric Science Miami, USA; Andrew L. Moore Department of Geosciences, Earlham College Richmond, USA; Wilson B. Rafiau Department of Mines and Energy, Solomon Islands; Braddley Tiano Dive GizoGizo, Solomon Islands;	Y	H & E
D11	Geologic Survey of the 2 April 2007 Solomon Islands Earthquake and Tsunami. McAdoo, Jackson, Kruger & Bonte-Graptin, Moore, Rafiau & Billy and Tiano	Y	H & E
D12	Hazards Vs Org.xls spreadsheet	Y	H & E

Ref.	Document Name	Copy Obtained (Y/N)	Format (H = Hard Copy) (E = Electronic)
D13	HF Radio Survey – list of HF users	N	-
D14	Manual for Development of Risk Management Strategies	Y	H & E
D15	“Moving Beyond the Quagmire – DRM Legislation and Plan review – Where we are and where to go”	Y	H & E
D16	National Disaster Council Act 1989	Y	H & E
D17	NDMO – National Capacity Assessment – Tsunami Warning & Mitigation Systems Workshop – Presentation by DNDMO	Y	H & E
D18	Oxfam – Solomon Islands Field Office – Humanitarian Contingency Plan	Y	H & E
D19	People First Network web site: http://www.peoplefirst.net.sb/	Y	H & E
D20	Preliminary assessment of Solomon Island Legislation in light of Disaster Risk Management	Y	H & E
D21	Preliminary Report for Tsunami Field Survey for the Solomon Islands Earthquake of April 1, 2007, Tanioka, Nishimura, Nakamura (Hokaido University), Tsuji (University of Tokyo, Namegaya (AIST), Murata (ADRC), Woodward (Kent State University)	Y	H & E
D22	Preliminary Report regarding Coral Reef and GPS Measurements of Crustal Deformation Associated with the 2 April 2007 Gizo Great earthquake	Y	H & E
D23	Solomon Islands Provincial Government Act	N	H & E
D24	RANET web site: http://www.ranetproject.net/	Y	H & E
D25	Recovery Action Plan – Western and Choiseul Provinces Earthquake and Tsunami – Draft for Discussion Subject to SIG Cabinet Approval	Y	H & E
D26	Section 8 Emergency Response, Part D: GIS use for Emergency Response	Y	H & E
D27	SIPF Operations Centre Manual – S.O.P.: Flood, Storm, Tsunami	Y	H & E
D28	SIPF Template for Provincial Post – Critical Incident Plan	Y	H & E
D29	Solomon Islands April 2 nd 2007 Tsunami – Lessons Learnt Workshop Report	Y	H & E
D30	Solomon Islands Emergency Assistance Project – Western Province 16 – 22 May 2007 – Post April 2007 event	Y	H & E
D31	Solomon Islands Emergency Operations Centre – Standard Operations Procedures January 2008	Y	H & E
D32	Solomon Islands Red Cross Society Disaster Preparedness and Response Plan	Y	H & E
D33	Solomon Islands Red Cross Society Act 1983 No 4 of 1983	Y	H & E
D34	Solomon Islands Police Force Act	N	H & E
D35	Solomon Islands Meteorological Act 1985	Y	H & E
D36	Standard Operating Procedures for SIMS	N	-
D37	SI Emergency Operations Centres – Inventory of EOC Forms	Y	H & E

Ref.	Document Name	Copy Obtained (Y/N)	Format (H = Hard Copy) (E = Electronic)
D38	Summary International Team Visits Post April 2007 Event	Y	H & E
D39	Tsunamis in the Solomon Islands 1926 – 1982 by D.Tuni	Y	H & E
D40	Western Province, Works Division, Assessment Report, Gizo Roads & Bridges	Y	H & E
D41	WMO GTS Documentation located at: http://www.wmo.int/pages/prog/www/documents.html#WDM	Y	H & E
D42	Solomon Islands – Preliminary Feedback for Participants of Exercise Pacific Wave 06	Y	H & E
D43	Solomon Star Coverage of Solomon Islands Tsunami Capacity Assessment Workshop	Y	H & E
D44	Inventory of Geospatial Data and Options for Tsunami Inundation& Risk Modelling” (SOPAC 2008)	Y	E

6.5. Annexure 5 - Findings of the Solomon Islands April 2nd 2007 Tsunami Lessons Learned Workshop

1. Update of the National Disaster Management Plan (1987) and development of Provincial Disaster Management Plans (by the Provincial Disaster Committees).
2. National Disaster Management Act (1989) revised by Government to strongly support the National Disaster Management Plan.
3. SI Government urged to support the NCD and the NDMO by providing further training to disaster officials, additional tools such as satellite communications, logistical support, expert advice and authority to act decisively in the initial phase of response without recourse to higher authorities.
4. Call for strengthening of the functions and mandate of the Provincial Disaster Committees (PDC) so they are provided with the skills and tools to assist their communities. Including provincial level training in specific functions in disaster management.
5. New approaches at the village and community levels be undertaken by disaster officials by providing village/community planning processes to strengthen the resilience and coping mechanisms of the people in the immediate aftermath of a disaster and before the arrival of national and international assistance.
6. SI Government and national disaster bodies urged to provide mechanisms and structures so that they are able to make more effective use of the assets and technical assistance of international community and bi-lateral donors at the time of crisis.
7. Disaster authorities were urged to strengthen the coordination between the Churches and NGOs by giving them more prominence in the immediate response and engage with them as partners in providing much needed relief supplies.
8. Disaster authorities and development partners were urged to put in place standardised assessment formats and methodologies, as well as processes for the recording of receipt, delivery, distribution and tracking of beneficiaries for better accountability and transparency in the provision of relief items, recovery and rehabilitation activities.
9. The need for awareness and information programs that can reach the communities was emphasised (including information on hazards and vulnerabilities and use of all media and public information systems to deliver the necessary messages).

6.6. Annexure 6 – Definitions

Used in reports for SOPAC Member Countries National Capacity Assessment: Tsunami Warning and Mitigation Systems

Source: United Nations, International Strategy for Disaster Reduction, 2009

Capacity

A combination of all the strengths and resources available within a community, society or organization that can reduce the level of risk, or the effects of a disaster.

Capacity may include physical, institutional, social or economic means as well as skilled personal or collective attributes such as leadership and management. Capacity may also be described as capability.

Capacity building

Efforts aimed to develop human skills or societal infrastructures within a community or organization needed to reduce the level of risk.

In extended understanding, capacity building also includes development of institutional, financial, political and other resources, such as technology at different levels and sectors of the society.

Disaster

A serious disruption of the functioning of a community or a society causing widespread human, material, economic or environmental losses which exceed the ability of the affected community or society to cope using its own resources. *A disaster is a function of the risk process. It results from the combination of hazards, conditions of vulnerability and insufficient capacity or measures to reduce the potential negative consequences of risk.*

Disaster risk management

The systematic process of using administrative decisions, organization, operational skills and capacities to implement policies, strategies and coping capacities of the society and communities to lessen the impacts of natural hazards and related environmental and technological disasters. This comprises all forms of activities, including structural and non-structural measures to avoid (prevention) or to limit (mitigation and preparedness) adverse effects of hazards.

Disaster risk reduction (disaster reduction)

The reduction of disaster risks and adverse impacts of natural hazards, through systematic efforts to analyse and manage the causes of disasters, including through avoidance of hazards, reduced social and economic vulnerability to hazards, and improved preparedness for adverse events

Early warning

The provision of timely and effective information, through identified institutions, that allow individuals exposed to a hazard, to take action to avoid or reduce their risk and prepare for effective response.

Early warning systems include of three primary elements: (i) forecasting of impending events; (ii) processing and dissemination of warnings to political authorities and population; and (iii) undertaking appropriate and timely actions.

Emergency management

The organization and management of resources and responsibilities for dealing with all aspects of emergencies, in particularly preparedness, response and rehabilitation. *Emergency management involves plans, structures and arrangements established to engage the normal endeavours of government, voluntary and private agencies in a comprehensive and coordinated way to respond to the whole spectrum of emergency needs. This is also known as disaster management.*

Geographic information systems (GIS)

Analysis that combine relational databases with spatial interpretation and outputs often in form of maps. A more elaborate definition is that of computer programmes for capturing, storing, checking, integrating, analysing and displaying data about the earth that is spatially referenced.

Geographical information systems are increasingly being utilised for hazard and vulnerability mapping and analysis, as well as for the application of disaster risk management measures.

Hazard

A potentially damaging physical event, phenomenon and/or human activity, which may cause the loss of life or injury, property damage, social and economic disruption or environmental degradation.

Hazards can include latent conditions that may represent future threats and can have different origins: natural (geological, hydrometeorological and biological) and/or induced by human processes (environmental degradation and technological hazards). Hazards can be single, sequential or combined in their origin and effects. Each hazard is characterised by its location, intensity, frequency and probability.

Land-use planning

Branch of physical and socio-economic planning that determines the means and assesses the values or limitations of various options in which land is to be utilized, with the corresponding effects on different segments of the population or interests of a community taken into account in resulting decisions.

Land-use planning involves studies and mapping, analysis of environmental and hazard data, formulation of alternative land-use decisions and design of a long-range plan for different geographical and administrative scales.

Land-use planning can help to mitigate disasters and reduce risks by discouraging high-density settlements and construction of key installations in hazard-prone areas,

control of population density and expansion, and in the siting of service routes for transport, power, water, sewage and other critical facilities.

Mitigation

Structural and non-structural measures undertaken to limit the adverse impact of natural hazards, environmental degradation and technological hazards.

Natural hazards

Natural processes or phenomena occurring in the biosphere that may constitute a damaging event.

Natural hazards can be classified by origin namely: geological, hydrometeorological or biological. Hazardous events can vary in magnitude or intensity, frequency, duration, area of extent, speed of onset, spatial dispersion and temporal spacing.

Preparedness

Activities and measures taken in advance to ensure effective response to the impact of hazards, including the issuance of timely and effective early warnings and the temporary removal of people and property from a threatened location.

Prevention

Activities to provide outright avoidance of the adverse impact of hazards and means to minimize related environmental, technological and biological disasters.

Depending on social and technical feasibility and cost/benefit considerations, investing in preventive measures is justified in areas frequently affected by disasters. In the context of public awareness and education, related to disaster risk reduction changing attitudes and behaviour contribute to promoting a "culture of prevention".

Public awareness

The processes of informing the general population, increasing levels of consciousness about risks and how people can act to reduce their exposure to hazards. This is particularly important for public officials in fulfilling their responsibilities to save lives and property in the event of a disaster.

Public awareness activities support changes in behaviour leading towards a culture of prevention. This involves public information, dissemination, education, radio or television broadcasts and the use of printed media, as well as, the establishment of information centres and networks and community and participation actions.

Recovery

Decisions and actions taken after a disaster with a view to restoring or improving the pre-disaster living conditions of the stricken community, while encouraging and facilitating necessary adjustments to reduce disaster risk.

Recovery (rehabilitation and reconstruction) affords an opportunity to develop and apply disaster risk reduction measures.

Relief / response

The provision of assistance or intervention during or immediately after a disaster to meet the life preservation and basic subsistence needs of those people affected. It can be of an immediate, short-term, or protracted duration.

Resilience / resilient

The capacity of a system, community or society potentially exposed to hazards to adapt, by resisting or changing in order to reach and maintain an acceptable level of functioning and structure. This is determined by the degree to which the social system is capable of organizing itself to increase its capacity for learning from past disasters for better future protection and to improve risk reduction measures.

Risk

The probability of harmful consequences, or expected losses (deaths, injuries, property, livelihoods, economic activity disrupted or environment damaged) resulting from interactions between natural or human induced hazards and vulnerable conditions.

Conventionally risk is expressed by the notation

Risk = Hazards x Vulnerability

Some disciplines also include the concept of exposure to refer particularly to the physical aspects of vulnerability.

Beyond expressing a possibility of physical harm, it is crucial to recognize that risks are inherent or can be created or exist within social systems. It is important to consider the social contexts in which risks occur and that people therefore do not necessarily share the same perceptions of risk and their underlying causes.

Risk assessment/analysis

A methodology to determine the nature and extent of risk by analysing potential hazards and evaluating existing conditions of vulnerability that could pose a potential threat or harm to people, property, livelihoods and the environment on which they depend.

The process of conducting a risk assessment is based on a review of both the technical features of hazards such as their location, intensity, frequency and probability; and also the analysis of the physical, social, economic and environmental dimensions of vulnerability and exposure, while taking particular account of the coping capabilities pertinent to the risk scenarios.

Structural / non-structural measures

Structural measures refer to any physical construction to reduce or avoid possible impacts of hazards, which include engineering measures and construction of hazard-resistant and protective structures and infrastructure.

Non-structural measures refer to policies, awareness, knowledge development, public commitment, and methods and operating practices, including participatory mechanisms and the provision of information, which can reduce risk and related impacts.

Vulnerability

A set of conditions and processes resulting from physical, social, economic, and environmental factors, which increase the susceptibility of a community to the impact of hazards.

6.7. Annexure 7 - References

- Australian Agency for International Development (AusAID) and Australian Bureau of Meteorology 2006, *Schedule 5 to the Record of Understanding 14304 in relation to cooperation between the Australian Bureau of Meteorology and AusAID for SOPAC Member Countries National Capacity Assessment: Tsunami Warning and Mitigation Systems*, AusAID, Canberra.
- Intergovernmental Oceanographic Commission, a division of the United Nations Educational, Scientific and Cultural Organisation, *Assessment of Capacity Building Requirements for an Effective and Durable Tsunami Warning and Mitigation System in the Indian Ocean, Consolidated Report for Countries Affected by the 26 December 2004 Tsunami*, viewed 2008, <<http://ioc3.unesco.org/indotsunami/nationalassessments.htm>>
- IOC's Tsunami Program, Intergovernmental Coordination Group for the Pacific Tsunami Warning System (ICG/PTWS), International Tsunami Information Centre October, viewed January 2009, <<http://ioc3.unesco.org/itic/contents.php?id=179>>
- Pacific Tsunami Warning Centre 2008, National Oceanographic and Atmospheric Administration (NOAA), U.S.A, viewed January, 2009, <<http://www.prh.noaa.gov/ptwc>>
- Thomas, C. and Burbidge, D. 2009. A Probabilistic Tsunami Hazard Assessment of the Southwest Pacific Nations. *Geoscience Australia Professional Opinion No. 2009/02*.
- Thomas, C., Burbidge, D., Cummings, P., 2007. *A Preliminary study into the Tsunami Hazard faced by Southwest Pacific Nations*. Risk and Impact Analysis Group, Geoscience Australia.
- Terminology: Basic terms of disaster risk reduction March 2004, United Nations, International Strategy for Disaster Reduction, viewed January, 2007, <<http://www.unisdr.org/eng/library/lib-terminology-eng%20home.htm>>



7. CD Attachment

7. CD Attachment - Supporting Documents

- a. Assessment Questionnaire
- b. Supporting Documents
- c. Presentations

