SOPAC Member Countries National Capacity Assessments:

Tsunami Warning and Mitigation Systems

Solomon Islands

Solomon Islands

AUSTRALIA

SOPAC

Section 1

1. Results Outline

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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 Chile 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.

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	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: **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). **Update May 2009 –** Currently underway and funded.	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	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: **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