



SIAM-2, C-4 Component
Environmental, Risk and
Resource Management

**Disaster Management Review
Workshop Summary**

July 2005

Prepared for
**Ministry of Natural Resources, Environment and
Meteorology**

by
BECA International Consultants Ltd.



▪ report

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By

Beca International Consultants Ltd

July 2005

Ministry of Resource Management, Environment and Meteorology
Private Bag
Apia
SAMOA

16 August 2005
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Management Review
Worshop Summary.DOC

Attention: Vitaua Peleiupu Fuatai

Dear Sir

Disaster Management Review Workshop Summary

Please find enclosed a summary of the Review Workshops for the Disaster Management workstream held on 20-21 June 2005. This report contains a summary of key points for each workshop and includes workshop attendance lists.

Yours faithfully
Graeme Roberts
Manager, Planning



on behalf of

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Revision History

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A	M Daly	Summary of Disaster Management Review Workshops held 20 th and 21 st June 2005.	28 July 2005

Document Acceptance

Action	Name	Signed	Date
Prepared by	Michele Daly, Kestrel Group Ltd		28 July 2005
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1 Introduction

1.1 Background

Three workshops were held over two days (20th and 21st June) and together comprised the Disaster Management Review Workshop held to initiate the Disaster Management component of the SIAM-2 project.

Workshop One focussed on:

- Proposed improvements to national disaster management structures
- Key features and best practice principles of generic disaster / emergency management legislation
- Options regarding the organisational and physical location of the NDMO.

Discussion documents on each of the above topics were circulated to participants in advance of the workshop.

The workshop was aimed at CEOs of various government departments.

Workshop Two focussed on:

- Key elements of agency response plans

A discussion document on the above topic was made available to participants at the meeting. It included an Agency Service Impact Questionnaire for agencies to take away and complete with key staff.

The workshop was aimed at senior representatives from key response and lifeline utility organisations.

Workshop Three focussed on:

- The collection of hazard information in a form suitable for disaster management planning.

Templates were made available at the meeting for agencies with knowledge of particular hazards to take away and complete.

This report contains a brief summary of each of the workshops. Attendance lists are included in Appendix A.

1.2 Definitions

The following definitions and abbreviations are used in this report:

CEO Chief Executive Officer

NDMO National Disaster Management Office (part of MNREM)

NGO	Non-Governmental Organisation (e.g. Red Cross)
MCDEM	Ministry of Civil Defence and Emergency Management (NZ)
MCIT	Ministry Communication and Information Technology
MNREM	Ministry of Natural Resources, Environment and Meteorology
MPMC	Ministry of Prime Minister and Cabinet
MWTI	Ministry of Works, Transport and Infrastructure
NDMP	National Disaster Management Plan
PUMA	Planning and Urban Management Agency (part of MWTI)
SIAM-2	Samoa Infrastructure Asset Management Project Phase 2
SOPAC	South Pacific Applied Geoscience Commission
UNDP	United Nations Development Programme

2 Workshop One: Disaster Management Structures

2.1 Participants

The workshop was attended by representatives from MNREM (DMO and Meteorology); MWTI; Police, Prisons & Fire; Foreign Affairs & Trade; Attorney General's Office; Ministry of Finance; MCIT; PM Dept; SOPAC; MCDEM and the Project Team. For a full list refer to Appendix A.

The purpose of the workshop was to introduce the project to government agencies and to obtain feedback on some preliminary recommendations concerning the National Disaster Management Plan, legislation and the function and location of the Disaster Management Office.

2.2 Inputs

Disaster Risk Reduction and Disaster Management: Building Resilience of Nations and Communities to Disasters: A Framework for Action 2005-2015 (SOPAC, Final DRAFT, June 2005)

Pacific Disaster Management Planning: Guideline for Pacific Small Island Developing States (SOPAC/MCDEM, June 2005)

Discussion Document 1: *Proposed Improvements to NDM Structures*

Discussion Document 2: *Options for the Organisational and Physical Location of the NDM Office*

Discussion Document 3: *Key Features of Best Practice Emergency Management Legislation*

2.3 Summary of Key Points

1. *NDM Structures*

There was a good discussion on the current and proposed disaster management structure. The following was noted:

- Some support for the Tonga model which has responsibility for risk reduction allocated to a specific Ministry (noting the significant role of private sector organisations in this).
- The above point takes account of the fact that reporting structures are different under risk reduction and preparedness to that under response.
- The Disaster Advisory Committee is important. It needs wide and senior representation on it (i.e. agencies that have a 'doing' role in risk reduction; but this should be kept at a strategic level).

- Structures must reflect the reality that the Prime Minister will direct response.
- It needs to be clear that the proposed Director Disaster Management is the implementer of the directions from the PM and the National Disaster Council; this is achieved by co-ordinating the physical actions of others.
- In response, the role of the NDMO is to support the person in charge (i.e. support the PM by directly assisting the Director Disaster Management).
- The proposed roles of Director Disaster Management and Recovery Coordinator would be roles assigned to current positions (not newly created ones).

2. *NDMO Function*

- Need to determine the functions of the NDMO before deciding on an organisational location.
- *Preparedness* is what the NDMO spends most of its time on, i.e.
 - Maintenance of NDM Plan and standard operating procedures; including the development of contingency plans
 - Agency and Community education and awareness programmes
 - Physical preparedness of the National Emergency Operations Centre
 - Training and simulations (programme development and implementation)

3. *NDMO Organisational Location*

- Successful Pacific models feature the Director (or CEO) of Disaster Management reporting directly to a Minister. This Director should ideally be technically strong in Disaster Management and have influence with a range of key organisations.
- The NDMO ideally needs its own identity (or be part of a prominent Ministry) in order to be able to deliver the function.
- Future arrangements must reflect the considerable progress to date in Samoa in evolving the NDMO towards being a more independent agency (possibly ultimately an 'authority'?)
- Part of this process involves building up the NDMO's resource levels.
- Recommendations need to consider short-term arrangements (practicalities) and long-term options (optimum).

4. *NDMO Physical Location*

- Recommendations must follow on from further analysis of predominant NDMO activities (i.e. preparedness), organisational structure and organisational location.
- Recommendations must take into account the available resourcing.
- The NDMO must be able to deliver support to the person in charge 'on the day' of a major event.
- There is a range of workable choices short and long-term.

5. *Legislation*

- *Emergency vs Disaster*
 - ‘Emergency’ has a wider scope than ‘Disaster’ – defining the scope will be very important for the legislation.
 - Balancing the desire to take an all-hazards approach with the practical scope and capability of the NDMO.
 - Participants open to moving towards ‘Emergency’.
 - ‘Emergency’ and ‘Disaster’ have the same translation in Samoan.
- *Prescriptive vs Enabling* for agencies and the community
 - Caution about prescriptive requirements where there is no resource capability.
 - Legislation most likely to have elements of both.

2.4 **Next Steps**

- Workshop report summary (by end July)
- Undertake further analysis as noted above
- Ministerial briefing (August)
- Meetings of Disaster Advisory Committee to discuss the project in preparation for the first simulation (August)
- First simulation (August)

3 Workshop Two: Agencies with a Role in Disasters

3.1 Participants

The workshop was attended by representatives from MNREM, Samoa Airport Authority, Electric Power Corporation, Samoa Water Authority, Ministry of Police, Prisons and Fire Service, MWTI, Telecom Samoa Cellular, Samoa Hotel Association, Samoa Broadcasting Corporation, Samoa Ports Authority, Samoa Polytechnic, UNDP, SOPAC, MCDDEM (NZ), as well as members of the Project Team. For a full list refer to Appendix A.

The purpose of the workshop was to provide guidance to response agencies on how to plan for disaster, and how they link to the national disaster management structures.

3.2 Inputs

Discussion Document 4: *Key Elements of Agency Response Plans*

3.3 Summary of Key Points

- Agencies acknowledged the need to plan for disasters, and that current levels of planning could be improved. Some agencies would need more resources to be able to improve their planning. Government department planning may not be to the standard of private corporations planning.
- Agencies need to plan for both service continuity and response activities.
- There is a need for more agency education on what should be in disaster plans.
- Agencies need to understand how they link with the national disaster management structures.
- There is potential for sharing resources if agencies communicate better and understand each others roles, priorities and plans for disaster.

The following suggestions were made about how the disaster management project could assist workshop participants to develop their own response and service continuity plans:

- Develop a template for agencies to use to develop service continuity plans.
- Develop a checklist for agencies who already have plans to check they cover everything they need to cover.
- Hold more workshops for agencies to understand the roles of each other and how they link with each other during a disaster.
- Write a section into the NDMP that says the roles of each agency and how they link into national disaster management structures.
- Develop minimum standards that agencies should meet to prepare for disasters.
- Develop the role of the DMO so they can support agencies to develop plans.
- Keep agencies up to date with progress on other parts of the disaster management project.

3.4 Next Steps

- Agencies were provided with a questionnaire to be filled out and brought back for the next workshop.
- Agencies will be invited to participate in national disaster management simulations scheduled for August (some agencies) and November.
- The project team will follow up and support agencies to develop or revise plans during each visit to Samoa.
- The next agency workshop is scheduled for October 2005.

4 Workshop Three: Hazards

4.1 Participants

The workshop was attended by representatives from MNREM (Meteorology Division and NDMO), Samoa Airport Authority, Samoa Red Cross, Ministry of Health, Electric Power Corporation, MWTI, PUMA, Samoa Polytechnic, UNDP, SOPAC, MCDEM (NZ), as well as members of the Project Team. For a full list refer to Appendix A.

The purpose of the workshop was to discuss what hazard information was available and to enlist the assistance of agencies in compiling the hazard information into a format suitable for emergency management planning.

4.2 Inputs

Draft List of Hazards for Consideration – 21 June 2005 (Appendix B)

Samoa Hazards and Risk Summary – Template (Appendix C)

4.3 Summary of Key Points

1. *Draft list of hazards (Appendix B)*

- Tornados aren't really of concern and they don't occur. The occasional waterspout has been sighted. It was suggested that this hazard be removed from the list.
- Prefer the term "forest fire" than "rural fires."
- Terrorism and war/conflict should be added to the list.

2. *NDMP*

- The NDMP needs to be practical and reflect the reality in terms of what Ministries are capable of doing (with limited resources).

3. *Comments in relation to specific hazards and risks*

- *Infrastructure*: for roads there is an asset management database (age; replacement etc); there is specific vulnerability information from the CIM Plans already completed; there is a building code (AusAid project) – buildings 2 storeys or higher need an engineers report; bridges and buildings must be designed for a specified return period event, however the criteria need to be re-examined given changing weather patterns.
- *Flooding*: there is a UNDP project about to start on flood warnings.
- *Cyclones*: frequency is increasing and they are getting more severe.

- *Rainfall Intensity*: this is increasing. There are more than 30 rain gauges on the islands and 10 years of information on volume.
 - *Forest Fires*: El Nino weather pattern is most likely to produce conditions which increase the risk of Forest Fires (1982, 1997).
 - Agriculture is at risk from changing weather patterns.
 - A major vulnerability is the loss of key resources. Very dependent on the outside world for assistance.
 - *Maritime incident*: oil spills; Port Authority has an oil spill kit.
 - *Utility failure – electricity*: fire can cause electrical outages; tree falls. Power is about 50% hydro; remainder from fuel which is imported.
 - *Dam failure*: there are villages in the path of water if the hydro dams were to fail. There are plans to enlarge one of the dams.
 - *Avian influenza*: there is a high chance that it will arrive in Samoa at some stage (illegal entries); border controls need to be tightened. If it arrives there is no vaccine or medication available. In a worst case scenario, approximately 25% of the population would be affected (children and elderly)
 - *Hazard maps*: exist (or are being developed) for flooding, storm surge and landslide.
 - *Geological hazards*: there is understood to be relatively good information on geological hazards (earthquakes, volcanic activity)
4. *Hazards/risks requiring follow-up (no-one present at workshop able to comment)*
- Water, telecommunications, pesticides (MNREM), urban fires (incl. licencing process), asbestos (1 high risk building?), gas (Origin), terrorism, plant and animal pests (Min. Agriculture)

4.4 Next Steps

- Agencies to complete hazard templates and provide to the NDMO (end July).
- Information to be collated and an assessment made of what additional information is required (August).
- A process to acquire any additional information will be determined (August).
- Hazards and risks prioritised for the NDMP (September/October).

- Appendix A

Workshop Attendance Lists

Workshop One

Name	Organisation	Email
Mulipola A Titimaea	MNREM - Meteorology	aussie@meteorology.gov.ws
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Workshop Three

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- Appendix B

**Draft List of Hazards for
Consideration – 21 June
2005**

Samoa NDM Plan Draft List of Hazards for Consideration

21 June 2005

<i>Group</i>	<i>Hazard</i>	<i>Remarks</i>
Natural	1. Flood	
	2. Cyclone	
	3. Stormsurge	Including tidal and coastal erosion hazards
	4. Drought	Urban or rural implications
	5. Tornado	
	6. Earthquake	Distant or local; includes liquefaction
	7. Volcano	
	8. Tsunami	Local or teletsunami
	9. Fires - rural	Also called wildfire or bushfire
	10. Landslip	Including serious erosion, subsidence, instability, land loss due to sea level rise
Non-Natural (Technological, Anthropogenic, Biological, Sociological etc)	1. Lifeline Utility Failure - electricity	
	2. Lifeline Utility Failure - water and wastewater	
	3. Lifeline utility Failure - telecommunications	
	4. Major infrastructure failure	e.g. bridge, dam, building structural failure
	5. Hazchem incident	During production, transport, storage - spillage, leakage, fire, explosion
	6. Major transport accident - air	
	7. Major transport accident - sea	
	8. Environmental pollution	Significant in scale - e.g. oil spill
	9. Agricultural/ horticultural emergency	Animal or plant disease/ epidemic/ insect pests/ crop failure
	10. Public health crisis	Pandemic, community quarantine

- Appendix C

Samoa Hazards and Risk Summary - Template

Samoa Hazards and Risk Summary

Please provide as much information as possible using the attached template.

Additional copies (including electronic) are available from the NDMO:

Contact Filomena Nelson, Principal DM Officer, ph 32742, email:

Filomena.Nelson@mnre.govt.nz

Please return completed forms to Filomena as soon as possible (by end July 2005)

The summary table is structured to provide the following outline information:

- **Risk context** – background to the potential hazards and risks as they relate to Samoa.
- **Likelihood** – indication of historical incidence and future expected occurrence (where such information exists).

This is most commonly expressed as a return period (e.g. an earthquake of Mercalli Intensity 6 has a return period of 90 years), or preferably expressed as a probability (e.g. an earthquake of Mercalli Intensity 6 (MMI 6) has a 43% probability of occurring over a 50 year time period).

Note any sources of information (e.g. technical publications; internal documents).

- **Consequences** – an overview of the consequences in terms of:
 - a. Human impact (numbers of dead; injured; displaced)
 - b. Economic cost (total \$ costs for all categories, including long term recovery; direct and indirect costs)
 - c. Social impact (disruption to normal social function)
 - d. Infrastructural impact (buildings, structures, utilities)
 - e. Environmental impact (topography, landform, natural resources)

Where possible, consequences are categorised in terms of *short-*, *medium-* or *long- term*.

- **Manageability** – an overview of how the hazard is currently being managed in terms of:
 - a. Risk reduction (e.g. planning controls)
 - b. Preparedness (e.g. planning to respond and recover; warnings; education; simulations)
- **Gaps** – Identify where gaps in information or procedures exist (e.g. areas prone to liquefaction (earthquake) have not been identified; no volcano-seismic monitoring network in place; etc)
- **Maximum Credible Event (worst case scenario):** Where sufficient information exists, describe a Maximum Credible Event (MCE) to assist in the later risk evaluation, and for consideration of the effectiveness of risk controls and review of response functions.

Include the event's *Likelihood* and a brief description of *Consequence*.

Note that the maximum credible event can be based on an actual historical event.

Hazard	Risk Context	Likelihood	Consequences	Manageability
			<p>Human Impact:</p> <p>Social Impact:</p> <p>Economic Cost:</p> <p>Infrastructure Impact:</p> <p>Environmental Impact:</p>	<p>Gaps</p>
	<p>Maximum Credible Event (MCE):</p>			

Hazard	Risk Context	Likelihood	Consequences	Manageability
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EXAMPLE (FICTIONAL)

Earthquake	<p>Earthquake risk in the PARADISE ISLANDS is considered moderate. No active faults have been mapped within 200 km of the PARADISE ISLANDS, and the islands have been generally regarded as tectonically stable.</p>	<p>Mean return period of 500 years for MM VI.</p>	<p>Human-Social: While there is only a small earthquake hazard in PARADISE ISLANDS, there is still a risk of injury and loss of life. Loose items in homes, work places and shops will cause most casualties. Earthquake induced landslides could isolate some communities for a period.</p>	<p>Buildings greater than 2 storeys high require a building permit.</p> <p>An earthquake contingency plan exists however this hasn't been updated in 6 years.</p>
	<p>However, earthquakes are recorded from time to time and there is a proven risk of small to medium sized earthquakes. There was some minor damage in December 1963 from 2 earthquakes of magnitudes 4.8 and 4.9 near NORTH TOWN and SANDY HARBOUR. One school building had to be demolished. More recently earthquakes have been recorded near the outlying islands of BLUE ISLANDS (magnitude 4.3, May 1995) and near PINEAPPLE VALLEY (magnitude 3.9, May 1978).</p>	<p>Mean return period of 1200 years for MM VII.</p>	<p>Economic-Infrastructural: An MM VII event will cause furniture to move and some damage to tiles, water tanks, walls and some older buildings. Buildings and infrastructure on poorly consolidated materials could experience a greater degree of damage. Many buildings traditionally used as evacuation shelters (churches and schools) are constructed of unreinforced masonry and could be unsafe.</p>	<p>Gaps</p>
	<p>Earthquake intensities (Modified Mercalli (MM) scale) of MM VI and above have the potential to cause some damage, though the felt effects will vary according to the underlying geology. Earthquake waves can be amplified on areas of thick unconsolidated material, including alluvium and man-made fill. This includes the thick lacustrine, swamp and alluvium at SPRINGS FLAT and the thick alluvium and fill found between central NORTH TOWN and the port.</p>		<p>Environmental: Large earthquakes have the potential to permanently alter the landscape: surface ruptures, landslides, etc). However, the risk of this occurring in the PARADISE ISLANDS is low.</p>	<p>Seismic microzoning would characterise the probable shaking response of materials such as those found in the SPRINGS FLAT and NORTH TOWN areas.</p> <p>Presently there is no correlation between Building Act Standards and MM Intensity scale.</p>

Hazard	Risk Context	Likelihood	Consequences	Manageability
	<p>Maximum Credible Event (MCE): MM VII earthquake located in or near the NORTH TOWN area, causing some structural damage to older buildings and clean up of stock/goods/personal effects dislodged from shelves. No deaths and 2 minor injuries. One small public building had to be demolished. Insurance claims totalled \$130,000.</p>			

Hazard	Risk Context	Likelihood	Consequences	Manageability
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EXAMPLE (FICTIONAL)

Infrastructure Failure – Electricity	<p>Communities, utilities, businesses and industry are reliant on a continuous electricity supply. However, many key service providers have limited generator backup.</p> <p>Loss of power could be due to a major transformer failure, lines network failure, drought resulting in high power demand, or a hydro-electric dam (canal) failure. These could be caused by a natural event (e.g. earthquake, high winds, flooding), demand in excess of capacity, accident or deliberate action.</p> <p>Issues affecting vulnerability include:</p> <ul style="list-style-type: none"> - There is a relatively high level of security and maintenance around key sites – but many sites/structures remain vulnerable. - Local areas of networks are not easily isolated for repair. - There is an increasing number of substations within private buildings. - Just-in-time sourcing of parts has repair recovery implications. 	<p>No reasoned Likelihood estimates available.</p>	<p>Human-Social: General disruption (typically short-term); hospital service disruption. Food storage/contamination has public health and economic consequences.</p> <p>Economic-Infrastructural: Sewage and, in some cases, water pumping/treatment disrupted to homes and businesses. Short to medium term disruption to businesses and economic activity in general.</p> <p>Telecommunication disrupted if power outage is more than a few hours (arguable how many hours). Critical services, industry and business increasingly exposed to risk.</p> <p>Liquid fuel supply dependent on electricity in some cases.</p> <p>Environmental: Loss of system control leading potentially to hazardous materials handling and spill issues.</p>	<p>A number of key facilities: * airport * hospital have backup generators.</p> <p style="text-align: center;">Gaps</p> <p>Specific vulnerabilities (e.g. sites and degree of vulnerability to specific hazards) not known.</p>
	<p>Maximum Credible Event (MCE):</p> <p>Electricity out to NORTH TOWN for more than 48 hours. 50 people in need of assistance. Effects on electronic commerce and industry/business in general has significant economic consequences.</p> <p>Note: Significant increase in consequences if outage extends to one week.</p>			