

Case Study D

COMMUNITY RISK MANAGEMENT FOR PACIFIC ISLANDS

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INTRODUCTION

The management of community risk is a vast subject constituting a broad range of interrelated activities ranging from hazard assessments to analysis and evaluation so as to determine risk reduction measures. In the Pacific, the emerging focus is on comprehensive community risk management.

The overriding goal of community risk management is to increase personal safety and community resilience. This should be achievable through development and adoption of good risk management practices. In essence increasing community resilience hinges on understanding island vulnerabilities and managing its meager resources wisely to support sustainable development.

The last quarter century has seen greater concerted efforts by scientists and sociologists to understand and assess the many different hazards to which the Pacific community is exposed, as the Pacific region is now known to be one of the most vulnerable regions in the world. At the end of the last decade, the UN International Decade for Natural Disaster Reduction (IDNDR), Dr. Jack Rynn¹ compiled a report benchmarking the achievements in the region of the IDNDR goals.

Table 1 is from that report listing the various natural hazards to which Pacific island countries are vulnerable. The most frequently occurring are hydro-meteorological hazards of tropical cyclones, inland and coastal flooding, storm surges and drought and the geo-hazards of earthquakes, volcanoes and tsunamis.

Table 2 shows some of the current hazards and risks assessment projects with respect to the range of sources of island vulnerabilities. Shown do various institutions in the region undertake those that have some interaction with the Disaster Management Unit of SOPAC, which is mandated to coordinate disaster management programmes in the Pacific. This illustrates the growing awareness of island states in the importance to address all significant sources of risks arising from natural, environmental, man-made and technological hazards.

Events in the last 40 years have shown growing incidences of civil crisis and more recently economic crises. Reports² from climate change studies lists small island states of the Pacific as among the most threatened region where impacts have already destroyed unique cultural and conservation sites.

¹ Natural Disaster Reduction in Pacific Island Countries Final Report for International Decade for Natural Disaster Reduction 1990-2000; Dr Jack Rynn

² IPCC Geneva Meeting Report

Table 1. Pacific Island Countries Estimated Level Of Vulnerability To Specific Natural Hazards [“Final Report for International Decade For Natural Disaster Reduction” – Dr.Jack Rynn].

Country	Population	Land Area (km2)	Tropical Cyclone	Storm Surge	Coastal Flood	River Flood	Drought	Earthquake	Landslide	Tsunami	Volcanic Eruption
Cook Islands	19,500	240	H	H	M	M	H	L	L	M	-
Federated States of Micronesia	114,800	701	M	M	H		H	L	L	N	-
Fiji	752,700	18,272	H	H	H	H	H	H	H	H	L
Kiribati	76,000	725	L	M	H	-	H	L	L	H	-
Marshall Islands	50,000	181	H	H	H	-	H	L	L	H	-
Nauru			L	L	L	-	H	L	L	L	-
Niue	2,300	258	H	H	L	-	H	M	L	M	-
Palau	21,600	494	H	H	M	-	H	L	L	M	-
Papua New Guinea	4,056,000	462,243	H	H	H	H	H	H	H	H	H
Samoa	163,000	2,935	H	H	H	H	L	M	H	H	M
Solomon Islands	337,000	28,370	H	H	H	H	H	H	H	H	H
Tokelau	1,600	12	H	H	H	-	H	L	L	H	-
Tonga	97,400	720	H	H	H	M	H	H	L	H	H
Tuvalu	9,100	24	H	M	H	-	M	L	L	H	-
Vanuatu	156,500	12,200	H	H	H	H	H	H	H	H	H

Table 2. Exemplary Projects for Assessing a Range of Island Hazards and Vulnerabilities.

HAZARDS Assessment Projects	Primary Institution	Description
Animal Diseases and Fruit Fly	Secretariat for the Pacific Community	Incursion Response Plans in the Agriculture Sector
Pacific Cities Project	SOPAC	Geohazards mapping vis-à-vis RiskGIS of built features in Suva, Nukualofa, Port Villa, Honiara and Apia
PICCAP	SPREP and member countries	The region's response to the global issues for understanding and abating impacts of climate change and climate variability. Has established climate change adaptation task teams at national levels in all project countries.
ENSO	Pacific ENSO Application Center	Avails Early Warning information
Risk Management and Institutional Strengthening	SOPAC and member countries, also Palau	Strengthening national risk management capacities and development of specific natural and non-natural risk plans (cyclones, volcanoes, tsunamis, drought, oil spills, health). It is addressing national needs through programme coordination with the National Disaster Management Offices.
Disaster Preparedness and Mitigation Assessment	US Army Pacific	Providing GIS hazard and risk maps on request eg Cook Island, Niue and Vanuatu
ENSO Impact in the Health Center	Center of Excellence, Hawaii	Developing health sector profiles
Humanitarian Response to Man-made Crisis	FORUM Secretariat	Response and Preparedness Plans
Workshop on Civil Aviation Security	EMA with SOPAC DMU	

Many scientific models now exist for the purpose of developing scientific solutions that provide a knowledge base for effective hazard assessment. However this paper relates to the identified inadequacies in the existing disaster management approach as a significant factor that makes Pacific islands very vulnerable. It describes the new coordinated CHARM³ approach and describes how Fiji is to apply this new approach in assessing the hazards of drought and inadequacies in water supplies.

CONTEMPORARY APPROACHES TO ADDRESSING DISASTER MANAGEMENT

Past researches⁴ show that our very narrow based island economy is disrupted very adversely during disaster events. As Fairbairn noted "It is sobering, for example, that as the study shows, Fiji is subject to an average of around 10-15 tropical cyclones per decade – of which at least two are major cyclones – and that, in the case of Western Samoa, the damage caused by Cyclone Val (1991) was assessed at a cost equal to more than twice gross domestic product! The direct damage to a country's productive base and associated macroeconomic instability can deal a substantial blow to ongoing efforts by these countries to achieve longer-term sustainability and improvements in living standards". Consequently, island countries in the Pacific continually implement recovery and rehabilitation development projects to reduce risks to people and property, and strengthen national resilience to hazard impacts. Traditionally and consistently such projects have maintained a 'single sector' focus i.e. independently addressing risk reduction in each sector, such as housing, health or agriculture etc.

The commonness of disasters and impacts prompted Pacific leaders to take the initiative eight years ago in directing the development and implementation of a regional strategy for disaster management and programming activities. The last eight years have seen institutional strengthening and establishment of National Disaster Management Offices. Still the focus was on improving preparedness and the effective coordination of responses during national disasters and emergencies. Disaster management continues to

³ Comprehensive Hazard And Risk Management

⁴ The Economic Impact of Natural Disasters in the South Pacific with Special Reference to Fiji, Western Samoa, Niue and Papua New Guinea, Teo I.J. Fairbairn

have very little input into long-term development goals, which remain the domain of sectoral agencies, which was very much a global practice. Though such an approach maybe quite effective in an individual sector, it is not a sustainable model in island resource systems due to the small scale and fierceness in competition for the use of our very meager resources. This sectoral focus results in weakness of coordination between risk-reducing developments projects and has been one of the root causes that has seen poverty increasing with development. Social inequalities and adverse exploitation of resources are major contributing factors to the rapid reduction in the resilience of the developing Pacific island community. Hence our inability to cope with the ever-increasing disaster occurrences as evidenced by the greater number and severity of disasters in the last quarter of the century.

National leaders and disaster managers of the region believe that a comprehensive integration of and collaboration between risk reduction projects will bring greater cohesion and cost effectiveness, and reduce duplication of efforts directed to the same target or vulnerable community. Consequently leaders of the region tasked SOPAC to assist establish an all hazards, whole-of-country risk reduction programming approach within each Pacific island country.

The CHARM programming approach developed by SOPAC establishes a broader risk management framework to guide countries in the conduct of their hazard and risk identification, analysis, evaluation and treatment measures. The disaster managers believe that the application of the uniform approach through CHARM provides the missing link to bond firmer the coordination of the various multi-sourced development programmes delivered in a country.

WHAT IS CHARM

CHARM is defined as a comprehensive hazard and risk management tool and/or process within the context of an integrated national development planning process. As stated in the Guideline 5 CHARM is a “new way of doing business (that) moves the hazard and risk management approach away from just being response and relief toward a more holistic risk management containment strategy that is linked intrinsically to national development planning”.

It champions an all hazards, whole of country comprehensive approach to hazard and risk management, which requires that programmes and processes:

- Address all hazards including natural, human-induced, technological, biological and environmental;
- Adopt all appropriate risk treatment, including prevention / mitigation, preparedness, response and recovery;
- Integrate the efforts of all relevant regional and national organisations and agencies, public sector, NGOs, and community organizations;
- Link to national development planning and decision-making processes / systems;
- Seek to develop prepared communities with reduced vulnerability to risk and with increased resilience to the impact of hazards; and
- Seek to strengthen multi-sectoral collaboration and partnerships.

MAIN ELEMENTS OF CHARM

The CHARM approach is modeled around the AS/NZS 4360 Standard and has been adapted to suit the Pacific region requirements. It promotes a much broader integrated programming approach of all of a country’s sectoral programmes. While CHARM uses a top down approach aligned with national strategic development plans, it allows all stakeholder participation at every level in the decision-making processes. CHARM fosters achievement of sustainable development planning.

The immediate goal of the broader CHARM approach is to develop a national risk and treatment option matrix that has considered the activities of all agencies. CHARM then targets the programming gaps identified in the matrix. There are five major process steps associated with this goal consistent with the five main steps of the AUS/NZS 4360:1999 Standard:

(1) Establish the Context:

- Sensitise senior political and policy officials;
- Identify strategic and organisational issues that will apply to the CHARM process;
- Determine the CHARM management mechanisms and operational process;
- Identify national development priorities;
- Review existing policy related to development project appraisal processes;
- Implement training to mainstream mitigation into this process; and
- Develop the initial risk evaluation criteria.

(2) Identify Risks:

- Identify and assess primary and secondary hazards;
- Identify vulnerable sectors and determine geographic scope of potential impact; and
- Identify risks associated with primary and secondary hazards.

(3) Analyse Risks:

- Determine and assign levels of risk using indicators such as:
 - How often are the hazards likely to occur? and,
 - What are the potential consequences that may arise when the hazard impacts?
- Assign levels of risk.

(4) Evaluate Risks:

- Determine acceptable and unacceptable risks;
- Rank risks in order of priority for treatment.

(5) Treat Risks:

- Identify what activities are already being implemented;
- Evaluate and select appropriate treatments for dealing with unacceptable risks;
- Identify core business responsibilities and assess existing projects of agencies;
- Develop an implementation process for the identified program gaps;
- Link with Regional Partners and Programs;
- Close the programming gaps through new project proposals;
- Identify implementation support mechanisms; and
- Implement the new development program.

The CHARM process is underpinned by a continuous requirement for:

(a) Communication and Consultation: It is necessary to include all stakeholders in the process. If the process is going to be successful it requires commitment from all parties influenced by it.

(b) Monitoring and Review: It is necessary to ensure that the CHARM process remains valid by conducting regular reviews. It is necessary to monitor the implementation of selected mitigation treatments and to ensure that CHARM as a cyclic and continuous improvement process is integrated into broader development planning systems.

(c) Effective Documentation: It is necessary to document all the steps taken to demonstrate that the process is conducted correctly and to satisfy audit.

(d) Upgrading capability in use of Information Technological and Communication tools: all of the above require having good and easily displayable information systems as information collected during these steps will be progressively added to the matrix. A critical success factor to the CHARM programming approach will be to ensure that National Disaster Management Offices (NDMOs) are able to manage multi-disciplinary information resources. This will require them to utilize information that is currently available and to have working knowledge and skills in managing information infrastructures and technologies.

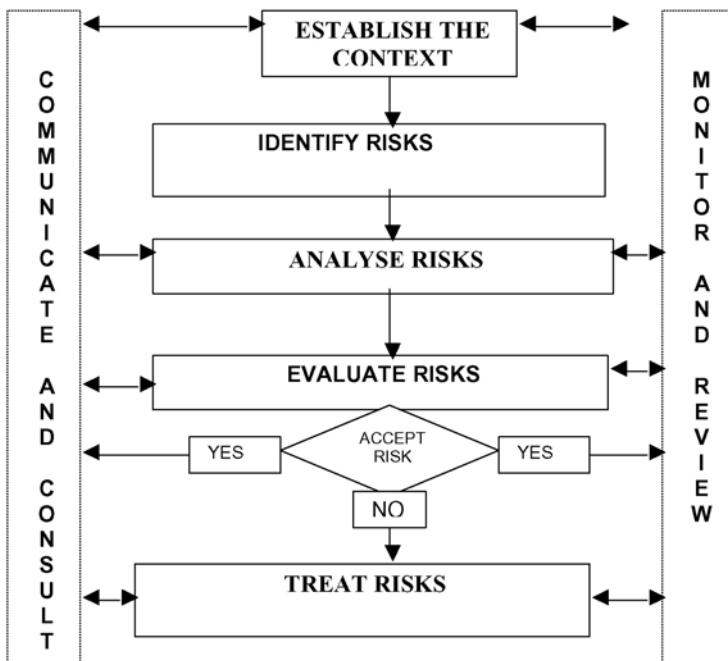


Figure 1. Process Overview

CHARM DEVELOPMENT ISSUES

Risk management programs that are linked to hazards and their impact on development programs and communities are cross cutting and require the support and cooperation of all government, NGO and in many cases the private sector to be successfully implemented.

CHARM is a tool to integrate the many risk management programmes of government line ministries and departments, together with regional organisations, that are undertaking in isolation with very little information sharing or collaborating partnerships being established. Duplication of effort is often present.

In order for national planning officials to identify programming gaps, they must first have a bigger picture of all the hazards and the significant risks they pose, together with an overview of what projects are being undertaken or proposed. It is only the national planning offices that would have this type of information, however our experience has been that there is not usually a matrix that identifies all the projects and their linkages.

Hence both regional and national strategies have been established to develop CHARM

(a) Regional CHARM Development Strategy

The development of CHARM needs the proactive support of the region's traditional donors and the aim is to develop strategic collaboration with Australia, NZ and USA. The primary target is getting their agreement on a uniform approach and then for these donor countries to facilitate concurrent coverage of island countries under an agreed program.

- SOPAC has signed an MOU with the Queensland Department of Emergency Services (QDES) – Counter Disaster and Rescue Services (CDRS) Division as the major CHARM development partner in the Pacific. As well as providing assistance in the production of the CHARM Regional Guideline, QDES is assisting in its implementation and in training attachments of disaster managers.
- Negotiations are continuing with the appropriate institutions in USA and NZ to determine where their expertise can be channelled to help in the country development of CHARM
- CHARM is being consolidated in four target countries – Fiji, Tonga, Palau and Vanuatu. As it is new, a High Level Advocacy Team has been appointed that will visit these countries to advocate to the respective national governments to adopt policies and programmes that recognise that risk management:

1. Is an integral part of achieving sustainable development at all levels;
2. Allows for improved decision making in the development of mitigation and response strategies;
3. Requires the integration of comprehensive whole of country hazard and risk reduction practices with national development planning;
4. Needs to be supported by on-going institutional strengthening and human resources development (particularly use of IT tools); and
5. Needs the co-operation and collaboration of all stakeholders.

(b) National Development Strategy

CHARM is a strategic planning tool aimed to integrate risk management activities within mainstream development planning. It involves creating a participatory inter-agency approach amongst government and non-government agencies. National planners would perhaps be comfortable with it but other stakeholders understandably may not so easily assimilate it. To ease this, CHARM development in the country is linked with an advocacy strategy, starting with the sensitising workshop and is followed by two working Workshops that determine the direction for charm and identify the priority programmes in country. For effective implementation strategies include:

- Training Courses – Whole of country comprehensive risk management is a new concept that requires training and the upgrading of skills of the national development planners and disaster managers. SOPAC is collaborating with selected training institutions in the development of training courses in public safety and risk management that embodies the concepts of CHARM.
- Training Attachments – the development of CHARM will require time and the collaborative effort of all major stakeholders to complete. Added to this that CHARM programming has to harmonize with development planning and vice-versa. The capacity is yet to be developed and strengthened in both NDMOs and National Planning Offices to drive this process in country. Some professional development is needed for senior officers who “champion” the in-country development of CHARM. SOPAC has developed partnerships with the Queensland Department of Emergency Services – Counter Disaster and Rescue Services Division
- Information Technological and Communication Strengthening – A critical success factor to the CHARM programming approach will be to ensure that NDMOs are able to manage multi-disciplinary information resources. This will require them to utilise information that is currently available and to have working knowledge and skills in managing information infrastructures and technologies. SOPAC has started upgrading computer capacity and skills of NDMOs and has just received further funding from Emergency Management Australia to improve communication systems.

NATIONAL DEVELOPMENT PROCESSES

There are nine major steps designed to assist national officers in initiating actions towards the development of country support programs.

1. Introducing the new CHARM concepts in working session.
2. Sensitising key government ministries and NGOs.
3. Developing an action plan.
4. Conducting an all agency workshop.
5. Designing the draft support program.
6. Designing the CHARM Policy Document.
7. Conducting a follow-up country meeting.
8. Preparing an annual task activity statement.
9. Establishing monitoring, review and reporting mechanisms.

THE BENEFITS OF CHARM

The rationale for CHARM is to integrate recognised risk management practices within the development planning processes of countries. Other attributes being:

- It is linked to sustainable national development planning (social, economic and infrastructure), maintaining a focus away from the siloed approach to an integrated risk management programming approach
- It is an easy to follow structured and systematic decision making process that assists in establishing non-acceptable risks, their rating and prioritisation within development activities
- It is instrumental in identifying direct and consequential risks and in targeting the management of both existing and future risks
- It is linked to existing national and regional institutional mechanisms
- It involves national and regional partners in collaborative partnerships and provides a mechanism for establishing and strengthening formal linkages between all stakeholders
- It creates a programming environment that maximises the use of available resources and minimises duplication.
- It offers across the region an uniform and credible approach being adapted from an internationally recognised standard
- The CHARM process is in itself a useful professional development mechanism – (see Table 3)
- It results in useful national risk and treatment matrices that consider all hazards through the activities of all agencies.
- It creates an environment for enhanced collaboration at national and regional levels

CHARM shows that the hazards and risks facing PICs can be managed, and the effective management of these risks will underpin greater sustainability in development planning, strengthen disaster response capacity and reduce severity of disasters.

Table:3 attempts to further demonstrate the alignment between normal management, risk management, disaster risk management practices and CHARM.

Normal Management	Risk Management (AS/NZS 4360:1999)	Disaster Risk Management (Qld)	CHARM
Problem Definition	<p>Establish the Context:</p> <ul style="list-style-type: none"> Establish strategic, organisational and risk management contexts Develop risk evaluation criteria Define the structure 	<p>Establish the Context:</p> <ul style="list-style-type: none"> Identify issues and establish risk management framework Develop risk evaluation criteria 	<p>Establish the Context:</p> <ul style="list-style-type: none"> Sensitise senior political and policy officials Identify strategic issues Identify existing frameworks for management of CHARM Identify national development priorities Review project appraisal criteria Develop Training support program Develop risk evaluation criteria
Research	<p>Identify Risks</p> <ul style="list-style-type: none"> Identify what can happen Identify how and why it can happen 	<p>Identify Risks:</p> <ul style="list-style-type: none"> Identify and describe hazards, community and environment Scope and analyse vulnerability Establish risks 	<p>Identifying Risks</p> <ul style="list-style-type: none"> Identify & assess hazards Identify & assess vulnerability in key sectors Identify risks
Analysis	<p>Analyse Risks:</p> <ul style="list-style-type: none"> Determine existing controls Determine likelihood and consequence Estimate level of risk 	<p>Analyse Risks:</p> <ul style="list-style-type: none"> Determine Likelihood Determine Consequence Estimate level of risk 	<p>Analyse Risks</p> <ul style="list-style-type: none"> Determine Likelihood Determine Consequence Assign level of risk
Decision Making	<p>Evaluate Risks:</p> <ul style="list-style-type: none"> Compare against criteria Set risk priorities <p>Accept risk or not</p>	<p>Evaluate Risks:</p> <ul style="list-style-type: none"> Compare against criteria Set risk priorities 	<p>Evaluate Risks</p> <ul style="list-style-type: none"> Decide on risk acceptability Set risk priorities
	<p>Treat Risks:</p> <ul style="list-style-type: none"> Identify treatment options Evaluate treatment options Select treatment options 	<p>Treat Risks:</p> <ul style="list-style-type: none"> Identify mitigation, preparedness, response and recovery options Evaluate options Select options 	<p>Treat Risks:</p> <p>Managing Existing Risk:</p> <ul style="list-style-type: none"> Evaluate treatment options Select and prioritise treatment options Allocate responsibilities against core business functions of agencies Develop an implementation plan based on gaps Link with regional partners Close the programming gap through new project proposals Implement the plan <p>Managing Future Risk</p> <ul style="list-style-type: none"> Identify options for project design changes Liaise with national authorities and development partners Incorporate changes.
Implementation	<ul style="list-style-type: none"> Prepare treatment plans Implement plans 	<ul style="list-style-type: none"> Plan and Implement Treatments 	<ul style="list-style-type: none"> Coordinate and monitor implementation
Monitor and Review	<ul style="list-style-type: none"> Monitor and review 	<ul style="list-style-type: none"> Monitor and review 	<ul style="list-style-type: none"> Undertake formal program reviews

PART 2: FIJI CASE STUDIES: APPLICATION OF RISK MANAGEMENT PROCESSES TO DEVELOP DROUGHT MITIGATION STRATEGIES

BACKGROUND

The establishment of Fiji's National Disaster Management Office in the early nineties was timely in terms of the need to develop response plans and mitigation strategies following the series of major disasters, natural and man-made, that hit Fiji in the last decade. The 1993 Tropical Cyclone Kina and the 1997/98 ENSO related drought were the major events in terms of economic losses but the Fiji Air crash of 1997 in terms of lives lost. All left disastrous social consequences on the victims and related vulnerable communities. The armed civil coup of 2000 stood out as the one that had the most devastating eco-socio-political impacts on the nation. After each event Government was tasked with developing mitigation strategies. A new Ministry was created to bring about national reconciliation following the 2000 coup.

The 1997-98 El Niño event was very competently forecasted, monitored and assessed by the Fiji Met but unfortunately most of the actions taken by Government were limited only to responding after adverse impacts were assessed, as there was no built capacity for effective short-term mitigation measures.

Several inter-linking studies were undertaken both at national and regional levels. These all contributed to a more comprehensive assessment of the impacts of the 1997/98 El Niño drought, providing better analysis of its longer-term effects. These were to enable government to identify measures to deal with problems caused by the drought, and prepare strategies to reduce the medium and long-term negative impacts on development. Two workshops were held in Fiji that brought together climate scientists, disaster managers and water-user agencies for a collaborative development of strategies.

This case study is a short account of the major issues that concerned participants in the Fiji national El Nino workshop in the hope that it provides an informed background of the planners and water users' perception to the scientific community. To date the government is still to develop work programmes from these findings. In the meantime, it is hoped that this presentation will prompt more discussions so as to identify programming gaps and assist Fiji develop a framework for stakeholder implementation of sustainable water development strategies.

OUTLINE OF DROUGHT WORKSHOP ISSUES

Following is a listing of the drought vulnerability issues of concern to the multi-disciplinary workshop participants who represented both government and non-government agencies. Under each issues is listed more specific concerns to give a broader picture of the scope of concerns.

1. Better demonstration of the nature of drought hazards:

- Defining Types of Drought and the Critical Threshold:
 - **Hydrological drought** (dry streams and watering holes)
 - **Agricultural drought** (no production)
 - **Meteorological drought** (below average rainfall)
- Can there be a drought indicator, a drought severity index – a drought-sensitive crop, for instance, which can predict the onset of a drought? Can sugarcane be an indicator crop?

2. Greater number of information providers and information resources

- Identification and strengths of sources of information
- Reliability and Sensitivity of the information
- Intention of the information providers
- Timelines of information release
- How best to use the information by recipients of the information
- How can we improve and enrich information on drought
- Recognising regional cooperation and institutional linkages

- Timetable of information releases and intensity of warning contained in it, eg 6, 3, or 1-month notices/warnings?
- Link an alert procedures system to the warning system for drought

3. Clarity and understanding of methodology for undertaking comprehensive long-terms drought impact assessments and analysis

- Surveys – types of surveys, comprehensiveness of surveys, what enumerators to use?
- Options between Steering Committee method and use of a Consultant?
- Classes of data – time series and how long; cross-sectoral data
- Place for rigorous statistical analysis? For correlation statistical analysis? For simple association analysis?
- Is long-term consideration more significant than short-term consideration?

4. Mitigation of drought risks

- Short term vs long term measures?
- How much should be made into government policies?
- How much should be made into a manual as guidance?
- Sectoral breakdown of measures and practicality of measures
- Technicality and specificity of measures; scale of measures – small, moderate or large
- Routine-ness of measures and cost effectiveness of measures
- Who are the target groups? Gender consideration
- Level of implementation of measures
- Public education programmes and awareness exercises

5. Need to prepare relevant agencies for drought hazards management

- Relevant training - Who to train? Who are the trainers?
- Attitudinal orientation is important, eg to take measures now for a threat that is yet to strike
- What agencies to involve and coordination of agencies
- Networking and communication line
- How much can be imposed?
- How much can rely on persuasion?
- How much can be legislated

(6) Enable the government to consolidate developing further mitigation measures

- Ensure clarity in defining the measures
- Ensure practicality, relevance and implementality of measures
- Specify sectors to which measures relate and ensure proper priority of measures
- Identify what already exist and what is to be supplemental
- Identify economic and social measures

CONCLUSION

The concerns of the workshop clearly pointed to a need for improvement in the translation, packaging and dissemination of scientific, technical and management information and in the process to involve greater participation of all stakeholders. It also pointed to the need to strengthen government leading role to effectively coordinate stakeholder expectation and participation.

These required expanding the role of the NDMO from the traditional “responding to events” to a more proactive, broad based risk management coordinating function which capacity Fiji NDMO did not have then to drive drought risk management plan.

In 2001, Fiji reorganised the NDMO and this year obtained Cabinet approval to adopt the risk management approach in development planning. NDMO is now using the CHARM tool to develop a national drought support plan as well as to articulate sectoral strategies under the national plan. In a first step, at the CHARM workshop of early this year, water supply was identified as a national hazard and a national “risk – treatment” matrix produced that addressed the significant potential impacts so identified. This is attached as Annex 1.

Building Up “Owning-Community” Capacity in Water Resources Planning and Management

The consultative processes exercised in Fiji was driven from the strong belief that stakeholder participation is essential in all stages of development planning and that not enough of such consultation was undertaken in the past. With the development of the CHARM tool, Fiji can now progress further in forging linkages between the community decision-making processes and the government’s mainstream development planning processes.

Accepting that community participation is essential in the decision making processes of water resources development, then it has to be recognised that a serious effort has to be made to build up community capacity and information base. The following lists key areas that need to be incorporated in any strategic development planning for water resources management in Fiji.

(a) Development Planning

- Climate variability impacts on water resources to be comprehensively assessed and disseminated through district development forums from whence to establish base inventory of needs.
- Water development strategies need to be identified and linkages with knowledge sources strengthened.
- Mechanism to be established to monitor stakeholder participation in development strategies

(b) Drought Mitigation Measures

- On-going consultation and coordination with stakeholders on past drought impacts and cost effective reduction measures to be strengthened at district development committee levels.
- Strengthen response strategies and take it down to village level through training.
- Develop island level response systems to receive, disseminate and respond to early warning forecasts.

ANNEX 1
WATER SUPPLY HAZARD/RISK IDENTIFICATION

HAZARDS		VULNERABILITY		LIKELIHOOD	CONSEQUENCE	SECTOR	RISK STATEMENT
		ELEMENT	LOCATION				
Water Supply	Interrupted Supply	Community Industry Tourists Economy	Urban & Peri-urban	Very High	Production irritant Loss,	PWD Utilities Economy	There is a high degree of risk that interrupted water supply would lead to low production in all sectors of the economy
	Contamination	Community	Above plus rural	H	Diseases / Loss of lives – infants	Health	There is a risk that contaminated water supply could pose a serious health problem particularly for infants
	Lack of supply	Community	All	M--> H	Loss of development opportunities	Economy Health	There is a high risk that the lack of water supply would result in cancellation of major hotel investment projects

WATER SUPPLY RISK ASSESSMENT/ANALYSIS

RISK STATEMENT	RATING	EXISTING RISKS	POTENTIAL RISKS	NATIONAL PRIORITY	RISK REDUCTION MEASURES	CONSEQUENTIAL RISKS	EVALUATION
There is high degree of risk that interruptions to water supply would lead to reduction in all sectors of the economy	(3)	Common in urban areas – Lautoka – Nadi corridor Lami – Suva – Nausori	That it could become even more frequent and serious	H	Development of Masterplans to upgrade supplies Improve infrastructures Conservation & Education Boreholes	Need human and capital resources. Availability of large amount of capital funding that could impact other areas.	(3) – maybe cannot eliminate all interruptions but aim for 50% reduction in 2-3 years
There is a risk that continued water supply interruptions could pose a serious health problem particularly to infants	(1)	Exists but exacerbated during intermittent / no supply and floods	Can be life threatening	E (extreme)	Awareness and education Improving supply Treatment	Benefits only	(1)
There is a high level of risk that lack of water supply would result in cancellation of major investment projects eg Hotels	(2)	Particularly to do with tourism and other investments	Lots of major investment opportunities	H – M	National development strategy for water utility development Prioritisation of projects Funding	Mostly benefits but see above	(2)

WATER SUPPLY RISK TREATMENT

EXISTING RISKS at national level for Water Supply

RISK TREATMENT OPTIONS	IMPLEMENTING AGENCY	SUPPORTING AGENCIES	FUNDING SOURCE	NATIONAL DEVELOPMENT PROGRAM	SECTORIAL DEVELOPMENT PROGRAM	EXISTING MEASURES	GAPS	PRIORITY
National Water Strategy Plan	Ministry of National Planning	Works Energy Regional FAB, Health, MRD, NLTB, Lands, Agriculture	Budget & Donor	National development program	Need to develop water resource sector, multi sectorally	none	Strategy and legislation	(1)
Development of regional and local maps and plans	Ministry of Works	Finance, Town Planning, Donors, Reg Dev & others	Same as supporting agencies	National development plan / strategy	utilities and infrastructures	In existence	Prioritise for implementation	(2)
Infrastructure Upgrading	Ministry of Works	Finance Donors Public Planning	Same as Supporting Agencies	As above		In existence	Strengthen & prioritise funding aid	(2)
Public awareness	Works	Education NDMO, NGO, Health	Donors Education Finance	As above	Multi-sectoral approach	None or limited		(1)

NOTES
