Building community resiliency to natural hazards in Pacific Island Nations using traditional and modern technologies and methods

Resiliency in Pacific Islands Workshop

University of South Pacific, Suva, Fiji
19-20 June, 2008

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Contents

Acknowledgements

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Background to the Workshop

While Pacific island nations are vulnerable to many kinds of natural disasters, they are particularly vulnerable to weather related events, such as cyclones and droughts. Their close association with a highly dynamic ocean-atmosphere interface and their high ratio of shoreline to land area mean that the impacts of storms can be especially severe. Most models of global warming predict an increased risk of more extreme weather events, including more persistent droughts, and higher intensity wind storms. As the destructive power of wind storms is very sensitive to the peak wind velocity, the effects on Pacific Island Nations are likely to become more and more severe as global warming takes effect.

Typically, Pacific Island Nations are resource poor, have narrow economic bases that depend on primary production, and are sensitive to global markets for attracting foreign exchange. The nations typically have tenuous central control, poor communications and limited infrastructure. As a result of their particular vulnerabilities, Pacific Island Nations have sometimes suffered losses of more than 100% of their GDP due to natural disasters – far more significant than losses suffered by Western nations, or even by mainland developing countries.

The *Pacific Regional Framework for Action for Building the Resilience of Nations and Communities to Disasters 2005-2015*; the *Pacific Islands Framework for Action on Climate Change 2006–2015*; and the *Hyogo Framework for Action 2005-2015*, call for action to build resilience and reduce vulnerability to hazards due to climate change. They recommend 'consultation' with local people on how to go about the process. However, it is uncertain how communities can contribute to the planning process in a meaningful way.

The overall vision that stimulated the convening of this workshop was to elicit traditional knowledge from local communities on resource use in sustaining livelihoods in the context of the physical and economic environment, as a basis for developing resilience of communities through education, negotiation, and improved decision making. This builds on the results of the UNDP (United Nations Development Programme) workshop, *Community Participation in Disaster Risk Sensitive Development Planning*[1], held in Suva from 25 to 27 September 2007.

Workshop Overview

The Pacific Centre for Environment and Sustainable Development (PACE-SD) of the University of South Pacific (USP) in collaboration with the University of South Australia (UniSA), convened the workshop at the Faculty of Islands and Oceans Conference Room, USP, Suva, Fiji – on 19 and 20 June, 2008 (see Appendix A for the agenda).

The workshop brought together critical stakeholders from USP – including representatives from Tonga and Solomon Islands, UniSA, the South Pacific Applied Geoscience

[1] http://regionalcentrepacific.undp.org.fj/Files/Publications/Commmunity_Participation_and_Disaster_Risk_Reduction.pdf

Commission (SOPAC), the National Disaster Management Office (NDMO) Ministry of Home Affairs, and community representatives (see Appendix B).

The specific aims of the workshop were to:

1. Understand the needs from the various stakeholder points of view
2. Agree on the goals and objectives of the work program.
3. Develop a network of participants willing to contribute to the core activities, advise on courses of action, or become involved in the community program.
4. Plan the activities necessary to achieve the desired goals and objectives of the work program

The first day of the workshop focussed on understanding the context of the proposed work, discussing what can be done with the resources available, what issues are relevant from the point of view of the stakeholders, and attempting to identify the needs that should be addressed. On the second day the workshop looked at specific activities being carried out by SOPAC[2] and UniSA, and addressed the needs and concerns of the community representatives. A roadmap for future activities and actions was drawn up and agreed to as far as possible within the context of the workshop.

[2] Further discussions between UniSA and SOPAC were held on the following Monday, and these are reported in Appendix C.

Day One

Welcome

Professor Koshy (USP, Director of PACE-SD) welcomed participants and introduced the need for the Programme and the Workshop from a PACE-SD perspective.

Background and Objectives

Stephen Russell (UniSA and Chairperson) presented the background and objectives to the programme and the Workshop.

Vision

To improve the quality of human life in Pacific Island communities through building **more sustainable and resilient livelihoods**.

Mission

To develop a systematic and affordable **mechanism** for improving resiliency to climate hazards in Pacific Island communities.

Aim

To elicit the traditional means used by Pacific Island communities for sustaining livelihoods and ensuring resilience to climate hazards, and to integrate these with relevant modern knowledge in order to synthesise a means for building more resilient communities.

Objectives of Research Program

1. **Literature Review** – Build on the findings of previous research, reports, studies and workshops devoted to ethnographic means for coping with climatic hazards
2. **Plan the Project** – Gather a core group of researchers together to plan the activities that will be carried out in the project.
3. **Pilot Projects** – Undertake a pilot projects to assess community resiliencies to climatic hazards and the role of traditional methods as coping strategies.
4. **Analysis and Synthesis** – Develop a tool for linking traditional and modern methods, and synthesising a means for improving community resilience to climatic hazards.
5. **Research Database** – Build a database suitable for recording traditional methodologies and provide a basis for synthesising new methodologies
6. **Validate modelling tool**
7. **Report Findings**

Work Plan

A possible work plan is as follows:

1. **Literature Review –**
   - Review literature on traditional community resilience in Pacific Island communities (using an Endnote database).
2. **Plan the Project –**
   - Refine needs to be met and methodologies for achieving objectives.

- Elicit most important issues from community perspectives
- Understand relevant political and policy environments
- Coordinate with relevant aid agencies working with the communities
- Establish database to store and collate knowledge gained from communities

3. Pilot Projects –

- Qualitative data will be obtained through open-ended fieldwork in at least four Fijian communities, two in Tonga, and two in Solomon Islands.
- The field activities might include:

  a) Establish representative groups

  b) Disaster Chronology – discuss community responses to previous disaster events, processes involved, and traditional disaster management practices.

  c) Community mapping – community asked to draw maps of extent of the climate related events and relationships with geography and available resources, including closest food, water and other resources, and available access routes.

  d) Transect walks – Walks will be taken with village members to the sites of chosen 'safe' areas, where they feel comfortable under threat from climate hazards.

4. Research Database –

- Align research database with the "Disaster Reduction Hyperbase - Asian Application (DRH-Asia)".
- Place traditional livelihood data into database. These might include:
  - Food security
    - crop diversity options
    - livestock diversity
    - marine practices – including mangroves, coral, seagrass habitats
    - farming practices
    - wild food gathering – including wild pigs, birds, fruit, fish
    - preservation of food
    - sharing of food
  - Water security
    - Storing water
    - River water use and preserving cleanliness
    - Sanitation or other pollutants to drinking water
    - Sharing water
    - Irrigation practices
  - Supplemental income options
    - on farm
    - off farm
  - Sanitation factors
    - Sewerage disposal
    - Rubbish disposal
  - Infrastructure factors (local)

        - Roads
        - Bridges
    - Logging practices
        - For building
        - For wind protection
        - To retard runoff
        - Species choice
    - Land use management
        - Coastal
        - River bank
        - Slope factors
        - Soil factors
        - Conservation
    - Power
        - Heat
        - Light
        - Muscle – community cooperative building
    - Hazard resilient housing
        - Private houses
        - Communal buildings
        - Farm buildings
    - Health
        - Hospitals
        - Medicines – awareness, preventative, treatment
        - Health personnel
        - Health practices – first aid, long term help
    - Hazard alerts
        - Tsunami
        - Cyclone
        - Flood
    - Disaster preparedness
        - Strategy – local and national
        - Education
- Place relevant modern technological data into database –
    - Insurance and credit schemes to compensate livelihood loss through crop damage or loss
    - Flexible repayment schemes
    - Building codes for hazard resilience of houses
    - Hazard resilient schools or other public buildings (e.g. hospitals, community halls, church) for use as emergency shelters
    - Communications, computers, Internet and other high technology
    - Price for goods – World markets, trends, strategies
    - Sustainable tourism
    - Food options – crops, livestock, feed, fertiliser, vaccinations, genetics, research, farming practices, farming technologies (e.g. tractors) etc
    - Alternative water storage and irrigation options
    - Foreign cash generation options
    - Sewerage handling options
    - Rubbish disposal methods, culture, education
    - Infrastructure factors (national)

  - Sustainable logging
  - Land use modelling (to identify best options)
  - Power options (e.g. diesel, wind, water)
  - Buildings – stone, metal, wood, plastic
  - Early warning – national tsunami warning, weather forecasts
  - Disaster knowledge

In order to obtain specific information on each of the factors important to a community livelihood, it will be necessary to tailor a series of semi-structured questions to elicit the necessary information. For instance:

- To the chief:
  - How many chickens (or fish, or pigs etc) are consumed by village each week?
  - How much land devoted to crops to feed village? (we can go out and measure fields, and derive details of number of fields, location etc)
  - How is cash obtained for village?
  - What do you do in a disaster situation?
- To family head person:
  - What jobs do family members do?
  - What do they produce?
  - How much do they earn?
  - Where do you obtain education?
  - Where do you obtain health care?
  - Where do you spend cash?
  - How do you travel?
  - How much does it cost to travel?
  - What do you do in a disaster situation?
- To woman of household:
  - What jobs do you do?
  - What are main issues with every day jobs?
  - What can't you do without (in disaster situation)?
  - What do you do in a disaster situation?
- To child:
  - Where is school?
  - How do you get to school?
  - What are you told at school about disasters?

5. Analysis and Synthesis –

- Apply Soft Systems Methodology of Checkland & Scholes (1999) and Total Systems Intervention methods of Flood and Jackson (1991) to the collected data and the inputs from the workshop to derive the best means for building resiliency to climate hazards in the context of the community environment.

  Example modelling artefacts (from Russell, 2007) are shown in the figures below.
- Use Agent Based Modelling and System Dynamic modelling to build a means for constructing a decision tool based on the data residing in the database.

Livelihoods include, for instance – fishing, crop farming, animal husbandry, construction, waged labour, crafts.

External influences include – tourism, government, non-government organisations, foreign people and governments, neighbouring people.

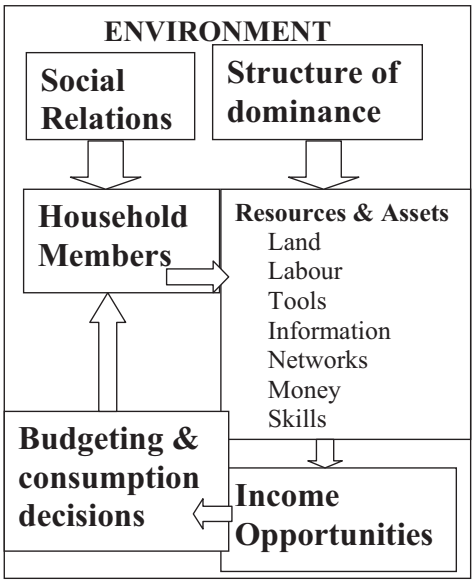


Figure 1 – Livelihood model

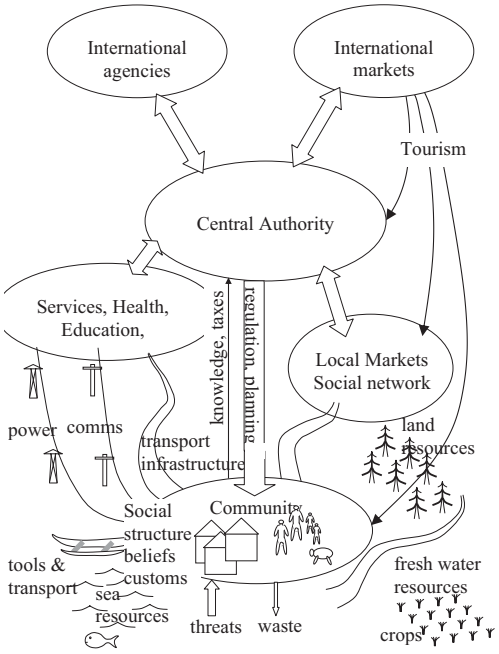


Figure 2 – Rich Picture of community

A simple model might, for purposes of illustration, be based on the following flow diagram (Figure 3):

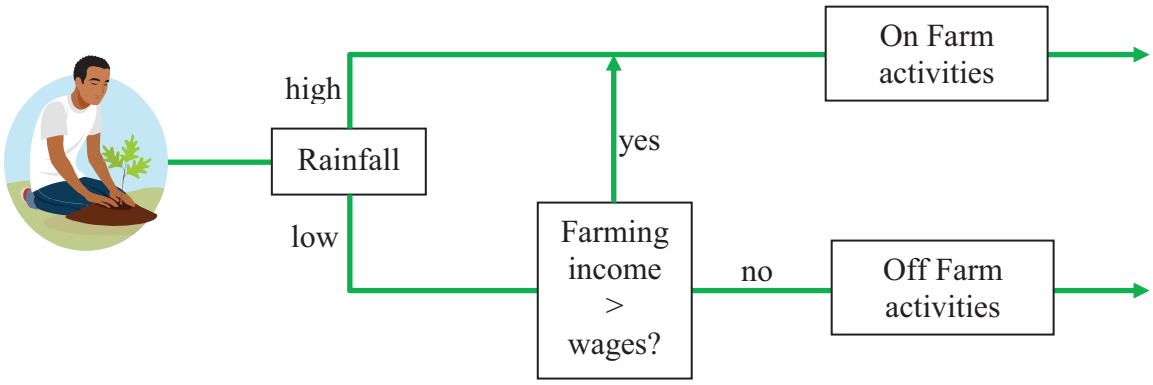


Figure 3 – simple decision tree

6. Validate modelling tool –

Demonstrate decision tool to the communities themselves, and validate the tool. This will involve returning to the communities and providing the computer based tool, with a suitable interface, and allowing community members to self-determine future decision strategies.

The components of this activity include:

- The computer based model
- The interface
- Training for community members to use tool
- Verify community members are able to use tool as intended
- Verify community members see enough value in using tool to want to use it in future
- Verify tool actually makes useful decision outcomes in the real world.
    - This will require sufficient historical data to show that decisions actually made by communities resulted in outcomes predicted by model.
    - This feeds back into the data that we need to elicit in the first place.

7. Report Findings –

- Report project findings to stakeholders
    - pictures
    - films
    - games
    - theatre
    - written word (if high enough literacy)
- Report project findings to a more general audience

Desired Outcomes

- A report on this workshop
- A list of practical objectives
- A plan for achieving objectives
- A database for recording knowledge
- Modelling tools to assist in decision making
- Validation of the model
- Communication of findings
- Inputs to a major program designed to develop resiliency in Pacific Island Nations

This is not a study alone, but a means to developing resiliency. So there needs to be a strong commitment to acting on outcomes of the study. This means understanding the resources required, obtaining government support, partnering other organisations, training and education, staff allocation, funding, extension to other communities.

Individual introductions and issues of concern

Name	Issues of Concern
Leone Limalevu	• Flooding • Coastal erosion • Drought
Fine Lao	• Environmental management • Communications • Knowledge – where to run? **Tonga** • Communications • Diversification of renewable energy – solar, hydro, bio • Disaster response strategy is missing • Disaster information • Links between communities • Knowledge on how communities are supposed to respond (with or without information)
Shakuntla Kumar	• Education • Training • Workshops
Joeli Cawaki	**Solomon Islands** • Water quality – upstream villages pollute water for villages down stream • Food security • Pesticides • House construction – e.g. bures are resilient to earthquake but not to wind • Coastal erosion • River bank flooding – fertile but prone to flood (trees are being cut down – more run-off, more debris causing dams and more flooding) • Power – there is often no power • No 'Awareness' programme • Education on responding to disaster • Capacity building programme • National Disaster Management Council only tend to respond to disaster, rather than invest in preventative measures. • Radio receivers are common, but no means exist for transmission (except in some outer islands) • In time of disaster, aid priorities are rice, water and shelter, but there is no seed for planting crops. • In times of disaster people eat damaged crops first (e.g. staples – cassava and tapioca), and leave wild yams and swamp taro until last since they survive well. They also cut tops of staple crops to help them survive winds. • Swamps threatened by influx of salt water – reducing disaster crops

	• Need to understand best cash crops (e.g. squash pumpkin was grown as niche crop, but market collapsed) • Need to understand management of tourism Hazards include: • Earthquakes • Cyclones • Tsunami • Sea level rise National Disaster Committee have no clear disaster strategy, and need help (e.g. modern technology options, advice)
Sefa Nawadra	• Oil-spill response (South Pacific Regional Environment Programme (SPREP) responsibility?) • Fresh water supplies (i.e. streams, rain collection, ground water) • Food security – disaster crops like *swamp taro* and *wild yams*, are disappearing due to forest clearing • Community self-reliance is reducing • Logging • Silting • Coastal erosion – cemeteries falling into sea
Osea Naloaqa	• Logging for building means increased run-off, more silt, and less shells • Losing shells for food and sale at market • Coastal erosion – losing burial sites • Flash floods – squatter settlements developing on creek banks tend to block drains, and expect government to 'do something' • Big trees tend to fall down in strong winds, blocking roads • Power – fuel prices are rising • Fresh water
Noud Leenders	• Traditional knowledge needs preserving • Communications and consultation are essential • Monitoring and review of programs are essential
Other comments	**NDMC** (National Disaster Management Council) • Budget of $2M/year set aside in case of disaster • Can only act on receipt of disaster assessment forms, but no training provided locally as to filling in forms. • Office only employs three people, so there are no resources to administer a disaster response • Decision process must wait until skilled person goes to disaster site, assesses needs, presents outcomes to minister, and awaits decision before any action. Can take 5 months – needs faster response process. • Need 'Quick Look' guidelines and fast decision process. • Do we replace dodgy bridge, or train locals to replace bridge? • Do we train people to respond to disaster or to reduce vulnerability to disaster? • Do we rehabilitate pumps for irrigation or plant deep-

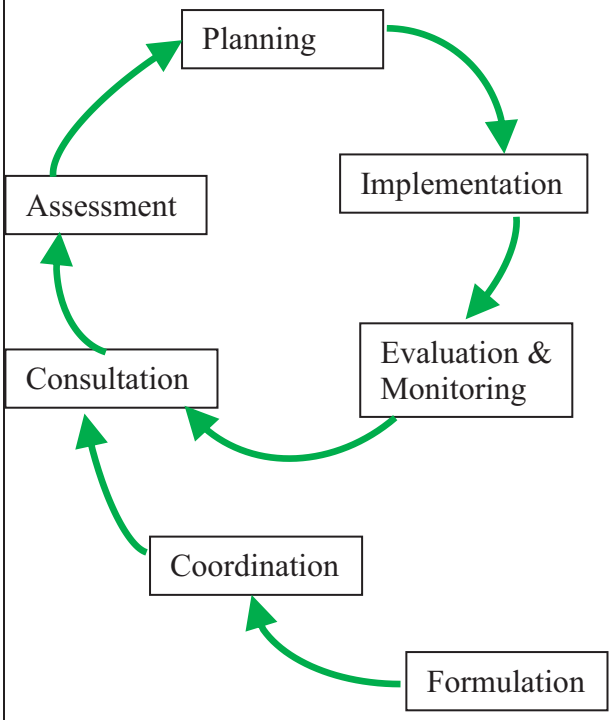
	root grasses? **Warnings** • Warnings – mobile phones for tsunami? • Traditional knowledge – e.g. roosters fly to top of trees when cyclones coming • Needs ideas from rest of world • Response to disaster needs to be sustainable • Most effort required in training

Individual presentations

Leone Limalevu gave a presentation on the PACE-SD view for an integrated assessment and action methodology for climate change and sustainable development for Fiji.

Application	The methodology is generic and can be used in any community or national development or adaptation programmes. e.g. • Natural Disaster Risk Management • Biodiversity • Climate Change • Community Sustainable Development.
The Method	Has 3 components: (1) The 7 Steps [Phases] (2) The Procedural Framework (3) The Strategic Adaptation Framework
Application	The method is being applied to 2 programmes here in Fiji. (1) APN funded biodiversity project (3 Sites) (2) AusAID funded Climate Change Adaptation project (6 Sites)
Application to the Climate Change Adaptation Project	Background: • 6 community sites in Fiji • Focus on Water & Coastal Sectors • Started in October 2006 • Executing Agency – Pacific Centre for Environment & Sustainable Development (PACE-SD), USP • Implementing Agency – Institute of Applied Sciences (IAS), USP
The 6 community sites & their most critical issues **Stakeholders:** • Chiefs, politicians, teachers, clergy • Men, women, young and old • Non-land owners, land owners • Minority groups, clans, religions • Fishermen, farmers, craftsmen	• Bavu – Western Viti Levu [Fresh Water Shortages] • Votua – Southwest Viti Levu [Coastal Erosion & Fresh Water Problems] • Buretu – Southeastern Viti Levu [River Bank Erosion & Inundation] • Navukailagi – Lomaiviti [Coastal Erosion & Inundation] • Korotasere – Vanua Levu [River Bank Erosion & Flooding] • Druadrua Island – Vanua Levu [Fresh Water Problems]

The 7 Phases

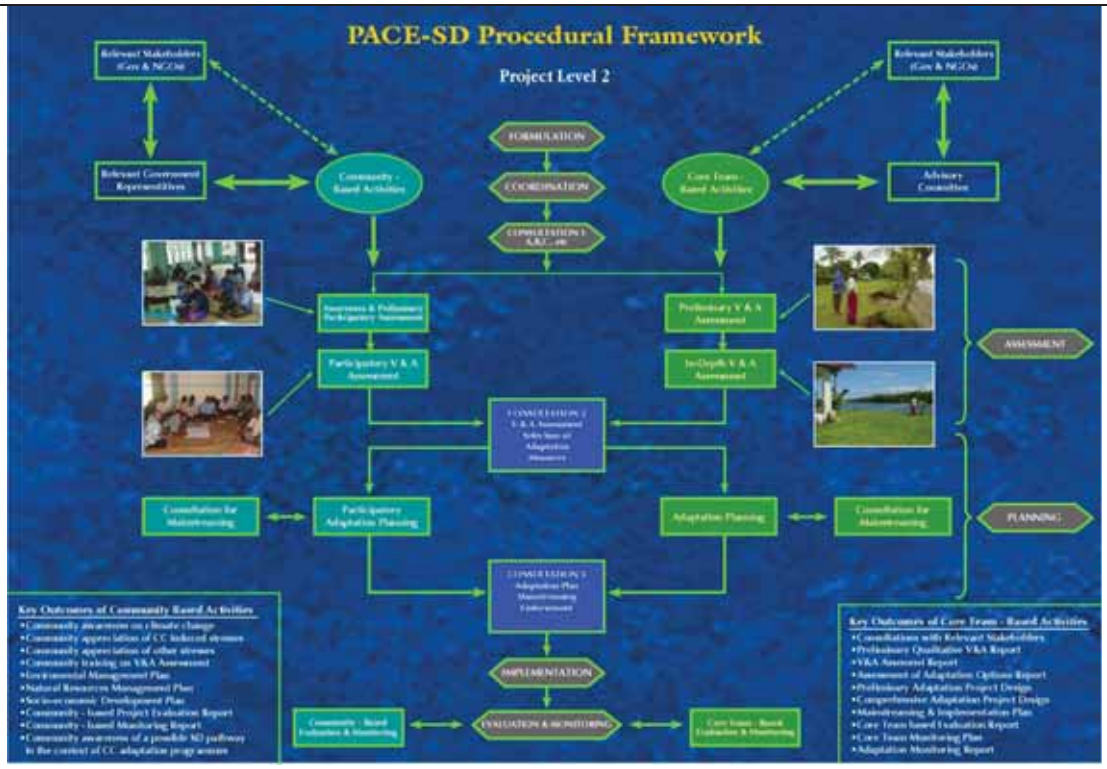


1. **Formulation**
   Define project objectives, policy context, scope & design.
2. **Coordination**
   Management, coordination, facilitator team & advisory team set-up
3. **Consultation**
   Initial community consultation, stakeholder involvement & participation
4. **Assessment:**
   - Identification and characterisation of hazards.
   - Identification & characterisation of exposure units with respect to vulnerability and resilience.
   - Adaptation assessment (Assessment of adaptations options through risk assessment and other assessment tools)
5. **Planning**
   Formulation of adaptation plans, stakeholder consultation & community endorsement of adaptation measures or projects
6. **Implementation:**
   Implementation of endorsed adaptation measures
7. **Evaluation & Monitoring**
   Evaluation of the effectiveness & efficiency of the execution of the overall project and monitoring of the effectiveness of the implemented adaptation measures

PACE-SD Procedural Framework

- Describe the process well to the community
- Set up a "good" advisory team
- Set up a "good" facilitator/expert team
- Ask for a committed community core team
- Stakeholder participation needs to be encouraged from all field – social, economic & technical fields
- Community participation needs to be encouraged in assessments & consultations.

You need to have a "good" adaptation framework/strategy to follow when consulting with the communities.



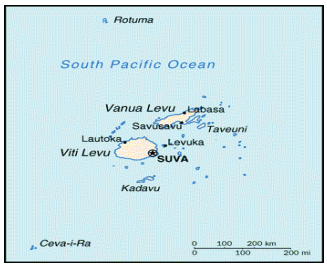
PACE-SD Strategic Adaptation Framework

Adaptation to climate change is, in large part, a continuous process that involves the adjustment of society to risks arising from climatic extremes

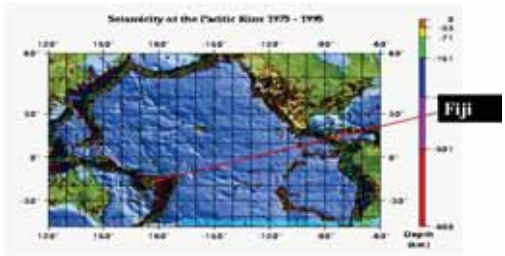
Risk Management	Risk Equation: • Hazard + Vulnerability = Risk Vulnerability Equation: • Impact - Adaptation = Vulnerability Realised Risk is Disaster
Other Issues	• Site selection through a proper characterisation procedure is required. • Climate change awareness needs to be planned out properly and implemented well. • Communications of issues and findings needs to be properly done to suit the various stakeholders' needs as well as meeting the specific objectives. • The more remote the location, the more preparation is required, unless you have a lot of money on hand.
Strategic Adaptation Framework	• Adaptation needs to be strategic so that you do not overwhelm the community e.g. tease out the most critical problems currently faced by the community which are CC related and deal with them first. • A baseline socio-economic and environmental assessment is required. • Choose a project level you will implement related to the funding at hand, and make this clear to the community during your initial consultations. • We have proposed 3 project levels. Project Level 1 requires the least resources whilst Project Level 3 requires the most.

Ms Shakuntla Kumar (Acting Senior Disaster Management Officer of the National Disaster Management Office (NDMO)) presented on: Building community resiliency to natural hazards in the Pacific Islands Nations. Risk Management – Fiji's perspective.

Map of Fiji Islands

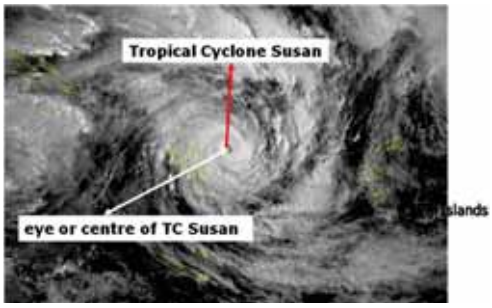


Fiji's Geographical location is prone to Cyclone & Earthquake



Cyclone tracks

Cyclone Susan



Vulnerability to disasters

The hazards with Medium to High risk of emergencies or disasters in Fiji

Hazards	Rate
Cyclone	H
Flood Coastal/River	H
Earthquake	H (low impact)
Drought	Moderate
Storm tides	M
Fire - Bush/Structure	M
Landslide	M

Disaster Name	Year	Estimated Damaged US$
TC Eric & Nigel	1985	39,712,636
TC Raj	1986	14,000,000
TC Rae & TC Sina	1990	36,300,000
TC Joni	1992	1,600,000
TC Kina	1993	100,000,000
TC Gavin	1995	18,300,000
TC June	1997	60,000,000
TC Dani	1999	2,000,000

TC Paula	2001	800,000
TC Ami	2003	22,089,200
flash flood	2004	11,585,392
Total		306,387,228

Cyclone Cost 2005-2008

Year	Disaster	Cost in FJD $
2005	Flash Flood Western Central Division	FDJ 113,066,08
2007	February Flood Northern Division (Vaturova Tikina and Labasa District	FDJ 15,145,378
	TC Cliff and Flood February, March and April- Northern Easter and Western Division	FDJ 4,308,991
	TC Daman	$500,251 Estimated Cost
2008	TC Gene	$45 Million.

Preparation for Disaster

- Early Warning System-(Regional Specialised Meteorological Centre for Cyclone Forecast).
- Flood Early Warning System for Navua.
- Training and Awareness Program at all levels.
- Annual National Disaster Awareness Program
- Suva Earthquake Risk Management Pilot Project.
- Early Warning Alarm System.

National Disaster Risk Management Structure

…and NDMO Organisational structure

Including:

- 10 Establish staff
- 2 Un-Establish Staff

Information Management Coordination	• The NDMO with the assistance of ITC[3] has developed the National Disaster Management database system which is now operational.

[3] www.itc.gov.fj

	• Inputting of data, such as Evacuation Centers and all disasters affecting Fiji since 2004.
Disaster Preparedness – Baseline Data	• Baseline data such as information on population, livelihoods, health, and education facilities etc are available in the NDMS (National Disaster Mitigation Strategy). • Input of the latest data 2007 census will be carried out.
Hazards	• Information on hazards affecting Fiji is available in Brochures, flyers, power point presentation, and reports.
Support/Response Plan and Communication	• Disaster Management Plan - Operational • Cyclone Support Plan – Operational • Flood Response Plan (Navua - already tested) • Drought Support Plan – (draft) • Tsunami Support Plan (already tested but still in draft form) • Landslide Support Plan (draft)
Challenges and good practices in pre-disaster information management.	• Population Data is available only through Census so it takes roughly 12 years to update information. • The difficulty in accessing or sharing information amongst key agencies like NFA, Police, Military, Health, etc. • Information management systems in many government organisations are not developed or completed. • Lack of resources directed to improve Information Management Systems (need IT professionals and funding).
Initial Damage Assessment	• Initial Damage Assessment in Fiji is a government responsibility. Three Assessment phases: 1. Emergency Phase Assessment a. Initial damage and relief needs assessment reports. b. Relief needs assessment report (within one week) c. Sectoral Damage assessment and outstanding relief needs report (upon completion of emergency phase, usually within two weeks of disaster) 2. Rehabilitation Phase Assessment 3. Post Disaster Review
Initial damage and needs assessment	• Assessment formats *Initial damage forms are used for conducting assessment*. • Data collection methodology: *Interview and field observation* • Assessment capacity: *Government officials at district, divisional, and national level are responsible for conducting initial assessment*. *Community participation is limited in our existing legislation, however the FNDRMP envisage community participation*.
Challenges and good practice for initial assessments	• Need of accurate data information management system, e.g. population figures, number of houses in a village, etc. • All government officials conducting assessment should undergo IDA training. • Community Participation
Monitoring of Response	• Experience with setting humanitarian priorities (e.g. Health, Water, Sanitation and Shelter)

	• Different sectors compile their own report and submit to the National Disaster Management Office for the compilation of the National Report.
Identifying data source and data collection mechanisms	• Different sectors collate their own data, and each has their own database. • Analysis of the data is done by the different sectors before submission to NDMO. • Community involvement in data collection is very little. • The new NDRMA (National Disaster and Risk Management Authority - still in draft) is intended to involve community participation.
Challenges and good practices for monitoring disaster responses	• Strengthening NEOC (National Emergency Operations Centre) Management Information Flow. • Monitoring, Feedback of information
Overall Summary of Good Practices	Good Practices • Report Mechanism in place • Institutional Capacity
Key Gaps	1. Community level linkage 2. Lack of capacity building 3. Lack of financial support and development of database. 4. Lack of network 5. Updating of data 6. Lack of coordination and good practice
The way forward	• Improve networking and partnership at all levels: – International, Regional, National, Divisional, District and Community. • Strengthen participation at all levels. • Focus planning and resources on disaster risk reduction programs. • Strengthen Education and Awareness at all levels. • Continuous review of the Disaster Risk Arrangements and Regulations.

A presentation was made by **Noud Leenders**, from SOPAC – *An international and regional perspective of risk management*:

SOPAC CRP GOAL	To improve disaster risk management practices to build safer and more resilient communities
International Guidance	1990-2000 IDNDR (International Decade for Natural Disaster Reduction) 1994 World Conference on Natural Disaster Reduction →Yokohama Strategy 2005 2nd World Conference on Natural Disaster Reduction → Natural Disaster Reduction in Pacific Island Countries + **Hyogo Framework for Action 2005** → The ten-year review of the implementation of the 1994 Yokohama Strategy and Plan of Action
Regional Guidance	**Pacific Plan 2005** *calls for the development and implementation of policies and plans for the mitigation and management of natural disasters* **Regional Framework for Action 2005** supports an 'all hazards' and integrated approach to the mainstreaming of disaster risk reduction and disaster management -Regional Early Warning Strategy **Pacific Islands Framework for Action on Climate Change 2005** advocates the reduction of risks associated with the impact of extreme weather and climate variability through the application of various principles **World Bank Policy Note 2006 – Not if but When** *advocates risk management of natural hazards in order to minimise the impact of disasters*
Regional Framework for Action	The Framework states : • Robust, effective national and regional monitoring and early warning systems established and strengthened for all hazards incorporating **traditional knowledge** and appropriate technology and tools.
Developed following the 2nd World Conference on Disaster Reduction held in Kobe, Japan Approved by Regional Disaster Managers in July and then Pacific Leaders in October 2005 at their annual meeting in Madang, PNG	**6 Themes** Theme 1: Governance – organisational, institutional, policy and decision-making frameworks Theme 2: Knowledge, information, public awareness and education Theme 3: Analysis and evaluation of hazards, vulnerabilities and elements at risk Theme 4: Planning for effective preparedness, response and recovery **Theme 5: Effective, integrated and people-focused early warning systems** Theme 6: Reduction and underlying risk factors

Regional Early Warning Strategy	• Strengthen appropriate agency partnerships to monitor human health, crop and animal pests and diseases, encouraging feedback from the community to extension offices of all relevant agencies and, inclusion of technological and **traditional practices**, instrumental and sensory systems. • Use warning dissemination methods that are easily accessible, and understandable including **traditional technologies (lali/drum, conch shells/horns and church bells etc)** as well as such appropriate, existing and new information communication technologies such as RANET: a robust 2 –way communication system with alerting capability including emergency alert capability, Internet, E-mail, text-messaging and satellites systems, in order to build redundancy in warning systems at all levels.
Pacific Disaster Risk Management (DRM) Partnership Network	• Formed in February 2006 to assist Pacific countries in developing and implementing disaster risk reduction and disaster management strategies to help ensure sustainable development. • The main objectives are to: ◦ Provide regional support for the development and implementation of National Action Plans ◦ Establish and sustain a regional network of regional assistance and development partners that work in the different fields of disaster risk reduction and disaster management to improve regional cooperation, coordination and collaboration. ◦ Strengthen the key thematic areas identified in the Regional Framework for Action 2005 –2015, as endorsed by the Pacific Leaders and in other associated frameworks and strategies. ◦ Monitor and evaluate national progress against the targets of these national action plans. ◦ Reduce duplication of efforts and to ensure that assistance is built on the efforts and experiences of each other.

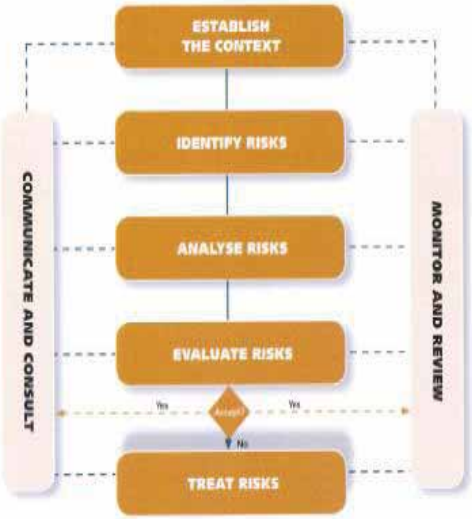
Pacific Disaster Risk Management Partnership Network
OVERVIEW OF INSTITUTIONAL CAPABILITIES OF PARTNERS SUPPORTING THE IMPLEMENTATION OF
"An Investment for Sustainable Development in the Pacific Island Countries Disaster Risk Reduction and Disaster Management A Framework for Action 2005 – 2015"

ORGANISATION	WMO	UNDP PC	UN/ISDR	AFAC	OXFAM	FSPI	NZAID	MCDEM	BOM	GNS	IFRC	SOPAC	FDC	RSMC
SUBJECT AREA														
Governance														
Policy, Organisational Development, Management	X	X	X	X	X	X		X			X	X	X	
Community Participation		X	X	X	X	X				X	X	X	X	
Early Warning And Forecasting														
Monitoring	X		X		X			X	X	X	X	X	X	X
Capacity Assessment	X		X			X		X	X	X	X	X	X	X
Modelling			X						X	X		X	X	X
Risk Management Applications														

Overview of institutional capabilities of partners supporting the implementation of "An Investment for Sustainable Development in the Pacific Island Countries Disaster Risk Reduction and Disaster Management A Framework for Action 2005 – 2015" 1

Disaster Risk Management tools

- Regional Framework for Action 2005 - 2015 promoted and advocated.
- National disaster risk reduction plans based on the application of CHARM strengthened. (Comprehensive Hazard And Risk Management)
- **Community** based disaster risk management (CBDRM) training coordinated.



Indigenous Knowledge

Indigenous disaster reduction and management practices have been discounted and eroded over the years yet they often provide the most cost-effective way of reducing the impact of disasters in developing nations.

Unless these practices are recorded and their value recognised and supported they continue to die away leaving communities more dependent on outside support.

Sukulu Rupeni (Institute of Applied Sciences) presented on the Pacific Future Environment Leaders Forum, Suva, Fiji, 13 March, 2008, entitled "Climate change & variability implications on biodiversity – Youth scenario simulations."

Introduction	• What are the implications of Climate Change and Variability on our Biodiversity? • Who and how can we ensure **Sustainability** of our biodiversity? • Climate Change and Variability threatens our **sources of food security, livelihood and culture – the basis of our existence.**
Project Site and Partners	• A project of the Institute of Applied Sciences –University of the South Pacific • Funded: Asia Pacific Network for Social Change and Research • Project Sites: • 2007 Pilot in Fiji – Rewa, Tailevu & Cakaudrove • 2008 Replicated - Tuvalu, SI (cont. Fiji) • Partners: Locally Managed Marine Areas Network (FLMMA & FSPI)
Goal	Foster community youth (the future custodians of Pacific Islands' natural resources) contribution in resource conservation through raising awareness regarding climate change impacts and implementing adaptation projects to ensure security and availability of resources for future generations.
Objectives	• Build capacity of 3 community based youth groups in the project sites to use drama as a tool to raise awareness on climate change and variability impacts on biodiversity • Conduct 30 theatre performances on climate change and variability impacts on biodiversity • Undertake 3 community risk assessment workshops in project communities • Implement 2 soft measure adaptations in each of the project communities
Activities	1. Community Capacity Building Workshops (Navakavu, Rewa; Ucunivanua, Tailevu; Naboutini, Cakaudrove) 2. Community Theatre Performances 3. Community Risk and Adaptation Management Planning Workshops 4. Community Adaptation Implementation 5. Monitoring and Evaluation
1. COMMUNITY CAPACITY BUILDING	**OBJECTIVES:** • Introduce the Project (Tailevu, Rewa, Cakaudrove) • Provide information and knowledge

	◦ Climate Change and Variability ◦ Biodiversity ◦ Sustainable Development • Provide information and skills in Theatre for Development **OUTPUTS**: • 75 youth trained 8 story lines, 6 songs and two mekes developed **LESSONS LEARNT:** Target the community as a whole but emphasize significance of youth involvement • Drama productions to include the past, present and future
2. COMMUNITY THEATRE PERFORMANCES	**OBJECTIVES:** • Raise awareness on Climate Change and Variability implications on Biodiversity and Sustainable Development • To generate discussions on issues dramatised • Evaluate performance impact **OUTPUTS**: • 28 community performances conducted (youth rally, village meetings, workshops, national, district and provincial events) About 5000 people have enhanced awareness on climate change impacts on biodiversity **LESSONS LEARNT:** • Post performance discussions • Eye opening for communities –emphasise greater participation in conservation to resist extinction of biodiversity and foster youth involvement
3.COMMUNITY RISK & ADAPTATION PLANNING WORKSHOPS	**OBJECTIVES:** a) Community to appreciate CC related stresses and other socio-economic stresses b) Train community on how to conduct V & A Assessment (participatory approach) c) Train community to assess the identified adaptation options i.e. assessment & prioritization d) Facilitate the community to formulate adaptation projects & programmes e) Facilitate the communities to draw up a natural resource management plan
Workshop Outputs	• Sustainable socio-economic plan • Natural Resources Management Plan • Hazard Reduction and Management Plan • Adaptation Plan for Most Prominent Problems related to Climate Change
Issues:	• Erosion • Flooding

	• Siltation and Sedimentation • Sea Water Intrusion • Water
Adaptation Options:	• Planting of mangroves and native sea water resistant plants • Planting of orchards
Community Commitment:	• Village Council endorsement of plans • Mainstreaming plans into village development plan • Establishment of village CC project committee • Area Identification –Mataqali owners agreement
Lessons Learnt:	• Community attendance during workshop • Presentations in the vernacular • Definitions in the vernacular
4. COMMUNITY ADAPTATION IMPLEMENATION	a) Technical Assessment b) Area Preparation c) Gathering seedlings d) Planting of mangroves, fruit and sea water resistant trees
5. MONITORING AND EVALUATION	a) Monitoring b) Evaluation c) Feedback

Day Two

Jutta May gave a presentation on the SOPAC **Pacific Disaster Net** - A Web Portal for Disaster Risk Management in the Pacific Region.

Pacific Disaster Net is a Web Portal and Database System -*Virtual Centre of Excellence*-for Disaster Risk Management in the Pacific Region. It is currently available online as a test version through the website *www.PacificDisaster.net*. Regularly updated versions will be available offline on DVD.

The portal is designed to be the largest and most comprehensive information resource in relation to Disaster Risk Management for Pacific Island Countries. It is consistent with the commitment to provide the region with information systems that can host the required data for DRR and DM as reflected in the Regional Disaster Risk Reduction and Disaster Management Framework for Action 2005-2015.

As a living collection and growing resource it improves Information and Knowledge Management as vital element in DRR and DM to enable and facilitate actors and stakeholders to research and collaborate.

The Pacific Disaster Net hosts material relating to Governance, Risk Assessment, Early Warning and Monitoring, Disaster Risk Management, Training and Tools from various sources like Countries and Organizations and Agencies at regional, national and international level.

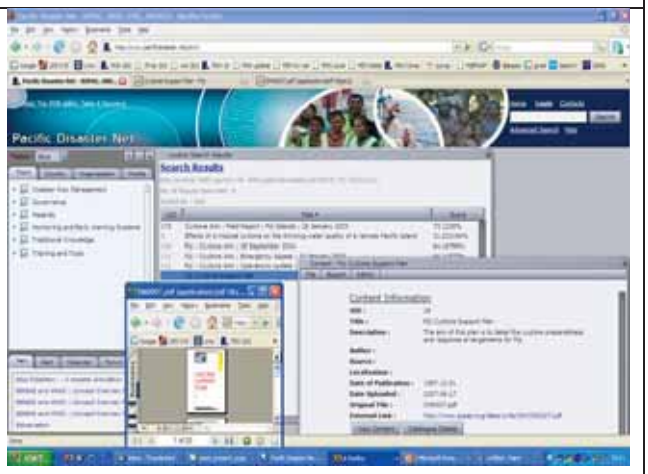
Some user friendly features are:

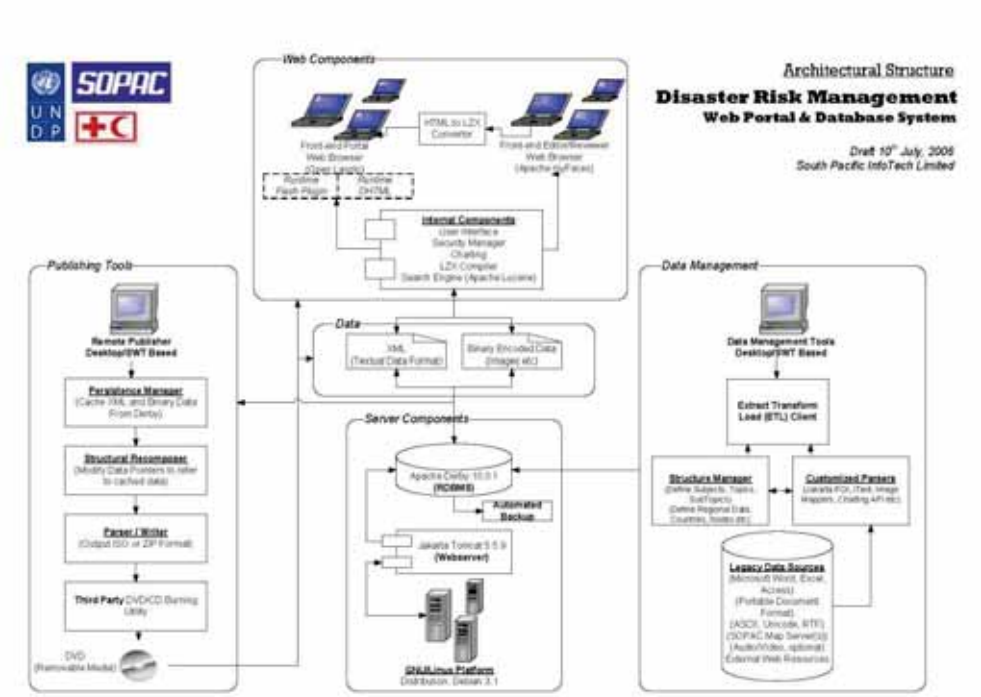
- Free use
- Multiple access entries with a range of retrieval and display options.
- The ability for inexperienced (and expert) users to find data and information within a range of formats.
- Formats which include up-to-date and 'alive' information: SMS, Text, Audio, Visual
- Information includes Alerts, Events, Calendar, Contacts, Forum, Message Board, Publications, Reports, Data inventories, Hazard Maps, Links.
- All information from the portal can be viewed, downloaded, sent by email and also be imported and exported into other formats.
- Different levels of access to discuss a variety of issues.
- A Country page which provides filtered, dynamic and fixed data and information with Events, Contacts, Links and Basic facts available per country or organization.
- Version control and saving

Supports Pacific Island Countries to develop and implement DRM National Action Plans and strengthen policies for DRR and DM, under the umbrella of the 'Pacific Disaster Risk Management Partnership Network'. Improving Information Management as a vital element of DRM with a living information resource. Developed through cooperative effort by IFRC, UNDP-PSRC, UNOCHA and SOPAC.	

Web Portal and Database System
- Virtual Centre of Excellence -
Disaster Risk Management in the Pacific Islands Region
	• Following the Regional Disaster Risk Reduction and Disaster Management Framework for Action 2005-2015 and in line with the Pacific Plan:
	  ◦ To support National Action Planning with development and implementation
	  ◦ To improve access and usage with Information Management as vital element in DRR and DM
	• Living collection and growing resource
	• Enables and assists actors and stakeholders to share research and work together
	• Available online (*www.PacificDisaster.net*) and offline (frequently updated DVD distribution)

Hosts and provides Documents and Material	• Relating to Governance, Risk Assessment, Early Warning and Monitoring, Disaster Risk Management, Training and Tools • From various sources like Countries, Bodies, Organizations and Agencies - at national, regional and international level • Up-to-date and live information like Alerts with notification, Calendar, Contacts, Forum & Message board etc. • Evacuation Plans, Hazard Maps, Disaster Response Plans • A range of formats, including Publications, Reports, Data inventories, Maps, Events, Discussion (threads), Links, Audio / Visual files etc. • Multidimensional Retrieval for different levels of expertise

Multidimensional Retrieval Quick Search – Freetext Browse and Filter Advanced Search	
Document – Information and Display Information Access in different formats • HTML from PDN Server (low bandwidth) • Original from PDN Server • Original from URL • Offline from PDN Local Edition (DVD – frequently distributed)	
Functions	• Events • Alerts • Calendar • Forum • Contact Information • Links • Country Page – with a Range of Information • Country facts • Data Management Tool for Administration and Maintenance
System Architecture	



Under the umbrella of the 'Pacific Disaster Risk Management Partnership Network' … supporting Pacific Island Countries to strengthen policies and plans for DRR and DM	Developed after signing the MoU in September 2006 in cooperation with International Federation of Red Cross & Red Crescent Societies (IFRC) United Nations Development Programme – Pacific Sub Regional Centre (UNDP-PSRC) United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA) and the Pacific Islands Applied Geoscience Commission SOPAC - as the implementing partner with 2 fulltime staff working on PDN as part of a larger project team
Outlook – Future Perspective	• Data collection and input – from Partners and in-country (support with training, document preparation and cataloging) • Hardware upgrades / Hosting • Graphic Design • Maintenance and Quality Control with Statistics and Evaluation • Development phase 2 – additional features and improved functionality ◦ Enhanced Integration with standard protocols such as Z39.50, EDXL (Emergency Data Exchange Language), CAP (Common Alerting Protocol), OAI-PMH (Open Archives Initiative Protocol for Metadata Harvesting) etc. ◦ Performance Improvement (pre-cache, pre-compilation, meta-data (xml) compression …) ◦ Enhance interaction via web-portal (Alerts, Events, Contacts, Calendar etc.) ◦ Security augmentation for user-defined content encryption, selected document access via public / private keys, content-expiry, time-limited viewing etc. ◦ Disconnected Data Migration for transfer and merge from detached (local) instances with integrity control (check overwrite, repetition etc)

	◦ Extended Web Visibility for search engines (Google, Yahoo, etc.) • Fulfill growing information needs of partners and users →*Towards quality assurance and user friendliness* →*The DRM Information Resource for the Pacific Region*
Contact	**www.pacificdisaster.net** Jutta May Information and Database Management Advisor SOPAC - Pacific Islands Applied Geoscience Commission Ph: +679 338 1377 (ext 248), Fax: +679 337 0040 E-mail: jutta@sopac.org Noud Leenders Senior Adviser Community Risk Programme SOPAC - Pacific Islands Applied Geoscience Commission Ph: +679 338 1377 (ext 283), Fax: +679 337 0040 E-mail: noud@sopac.org www.sopac.org

Stephen Russell presented on Soft Systems Methodology

Checkland's Soft Systems Methodology (SSM)	**Soft System Methodologies:** • address "***What*** should be done?" in a continuous learning/action cycle • depends on ***participation*** of all stakeholders and accepts plurality of viewpoints • seeks to understand social situations through **action concepts** (real world is **not assumed to be systemic**) • ways forward are decided upon in terms of **relevance**, ***cultural* feasibility** and **systemic desirability** • changes must meet organisational and social constraints in the real world
Stage 1 The Problem Situation: Unstructured	• Initiated within an organisation when a situation is considered problematical • There are no clearly defined "needs" or objectives • This stage seeks to understand the issues and views • The output of this phase is the recognition that a problem situation exists.
Stage 2 The Problem Situation Expressed	• The aim of this phase is to understand a situation with which participants feel unease • Seeks to understand structure, process and features of the problem situation • Relevant viewpoints or "relevant systems" are elicited and captured • Viewpoints often expressed through drawing a "rich picture" of the problem situation

Stage 3 Root Definitions	• This stage is concerned with expanding the relevant systems into concise verbal statements
	• Each statement can be tried out by moving around Stages 2-5
	• The "root definitions" are idealised views of what each relevant system should be
	• The aim is to draw out the essence of:
	  ◦ What is to be done
	  ◦ Why it is to be done
	  ◦ Who is impacted
	  ◦ What are the environmental constraints
	• Formulate around the six CATWOE elements:
	  ◦ **C**ustomers – victims and beneficiaries of the purposeful activity
	  ◦ **A**ctors – those who do the activities
	  ◦ **T**ransformation Process – the purposeful activity that transforms input into output
	  ◦ **W**eltanschauung – the view of the world that makes the definition meaningful
	  ◦ **O**wners – those who can stop the activity
	  ◦ **E**nvironmental constraints – those constraints in its environment that this system takes as given.
	• Useful to do T's and W's first.
	• When deciding T make sure that it is something that can be transformed from the input

Stage 4 Building Conceptual Models	• A Root Definition is an account of the idealised system • The Conceptual Model describes the activities which the ideal system must do • The Conceptual Model is constructed by drawing out the minimum number of verbs (~7) that describe the activities necessary • Order these according to how they depend on each other • Consider what insights they provide for the real-world • Only proceed if they are useful.

Stage 5 Comparing Models to the Real World	• Debate about possible changes that could bring about improvements
	• Differences between pure systems thinking models and reality can challenge assumptions of the participants and lead to alternatives not considered before
	• Various approaches have been outlined:
	  ◦ Look for differences between the set of models and current perceptions of the problem situation.
	  ◦ List differences and ask questions of the situation eg:
	  – "Does this activity exist in the real world?"
	  – "How well is it done?"
	  ◦ Write scenarios to uncover how the system is expected to behave into the future
	  ◦ Model the part of reality that the conceptual model covers and compare it with reality

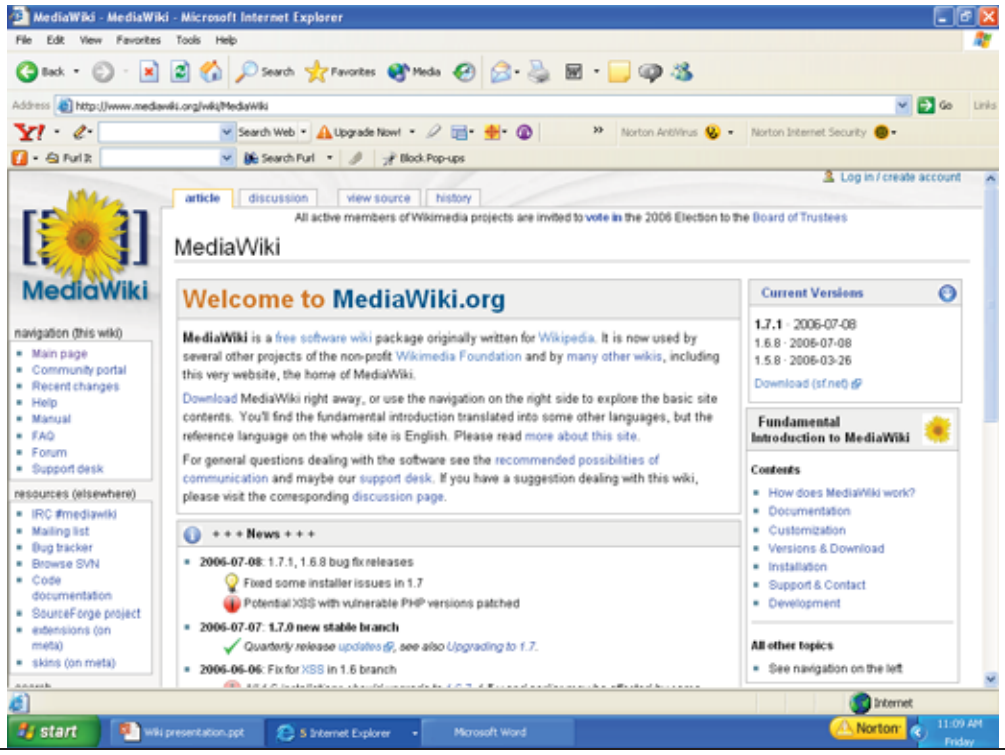
Stage 6 Defining Changes	• Comparisons of models against reality raise considerations of possible changes • Debate in this stage confirms which changes are systemic-desirable and culturally feasible in the organisation at this time. • Write recommendations in a way that relates to the participants.
Stage 7 Taking Action	• This stage implements changes that are both desirable and feasible • These changes can be classified as attitudinal, structural, and procedural • SSM may be used to develop a means for implementing the defined changes.
Enhanced SSM	• Later versions of SSM refer to the original seven-stage model as the logic-based stream of analysis • The implied concept of a sequential process through the seven stages of SSM are further de-emphasised • A second interacting stream of cultural analysis is added that: • Considers the situation as a culture • Undertakes a social system analysis • Undertakes a political system analysis

Summary	• SSM is essentially a
	means of introducing ordered, structured, systems thinking into the flux of events and actions that is everyday life
	• It is systemic in:-
	  ◦ Promoting systemic learning.
	  ◦ Orchestrating different appreciations of a situation.
	  ◦ Introducing systems models as part of the process.
	• Each use of SSM must be adapted to the problem situation.
	• Application of SSM evolves as experiences gained by practitioners.

Stephen Russell presented on an overview of Wikis, as an interactive interface for exchanging information.

What are wikis?	• **Free, online writing spaces** • **Users can** add, remove and edit available content • **Uses simple formatting rules** • Old files don't get overwritten • Accepts image and multimedia files as well as documents • **Developed by Ward Cunningham (mid-1990s)** from WikiWikiWeb meaning 'quick web'
Uses	• Provide a space for free writing • Debate topics • Share resources and documents • Maintain a journal of work performed • Discuss innovations and issues • Track changes • Electronic Search by topic and/or date
Obstacles	• Loss of authorship • Participants can feel reluctant to contribute • User interface options are limited • Editing may be a hassle for some • Hard to validate inputs

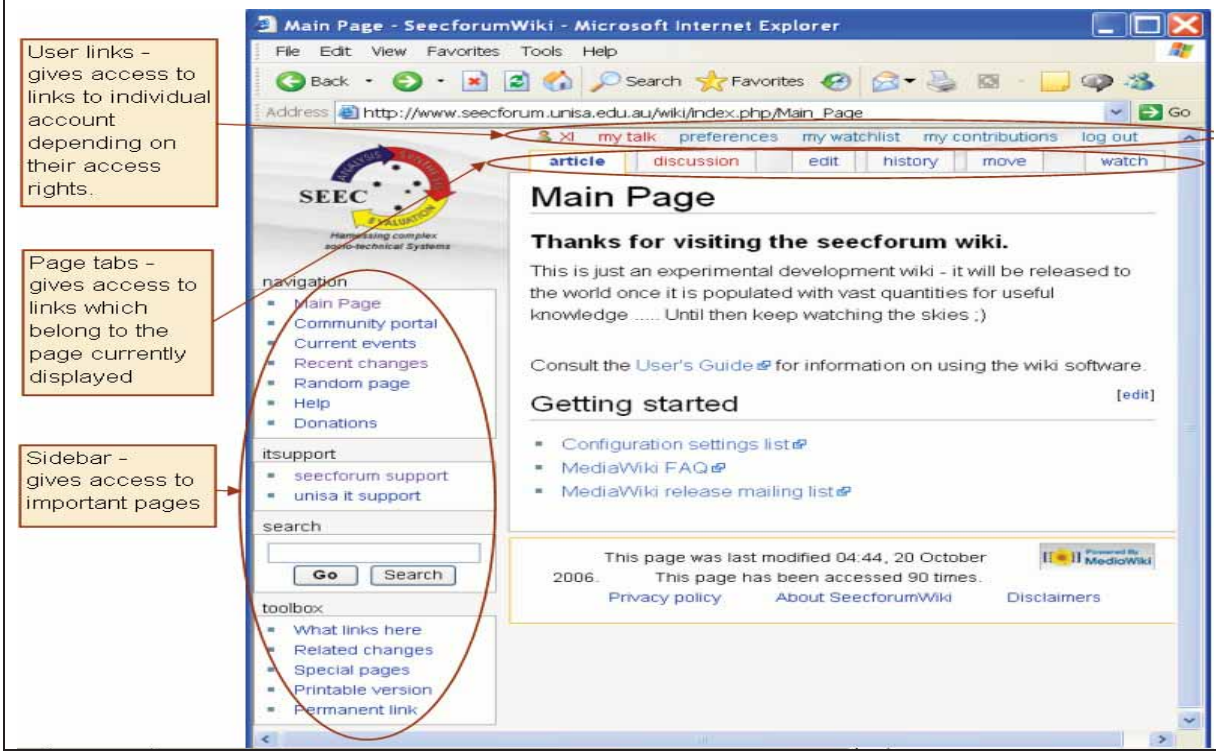
MediaWiki http://www.mediawiki.org/wiki/Main_Page



Ease of Use http://meta.wikimedia.org/wiki/Help:Wikitext

MediaWiki syntax	Equivalent HTML	Rendered output
" “Doctor“? No other title? A “scholar“? And he rates above the civil authority?" "Why, certainly," replied Hardin, amiably. "We're all scholars more or less. After all, we're not so much a world as a scientific foundation — under the direct control of the Emperor."	 "Doctor? No other title? A scholar? And he rates above the civil authority?" "Why, certainly," replied Hardin, amiably. "We're all scholars more or less. After all, we're not so much a world as a scientific foundation — under the direct control of the Emperor." 	"*Doctor*? No other title? A *scholar*? And he rates above the civil authority?" "Why, certainly," replied Hardin, amiably. "We're all scholars more or less. After all, we're not so much a world as a scientific foundation — under the direct control of the Emperor."

Display



Stephen Russell made a presentation summarising work on modelling complex scenarios in island communities, based on http://jasss.soc.surrey.ac.uk/9/1/6.html, http://epress.anu.edu.au/cs/pdf/ch12.pdf and http://cormas.cirad.fr/en/applica/catchscape.htm.

Breakout Sessions

Participants formed two groups:

Group 1: Community members

Identify issues important to communities

Group 2: Others

Identify effective activities and interventions

GROUP 1

Facilitator: Leone Limalevu

Identify:

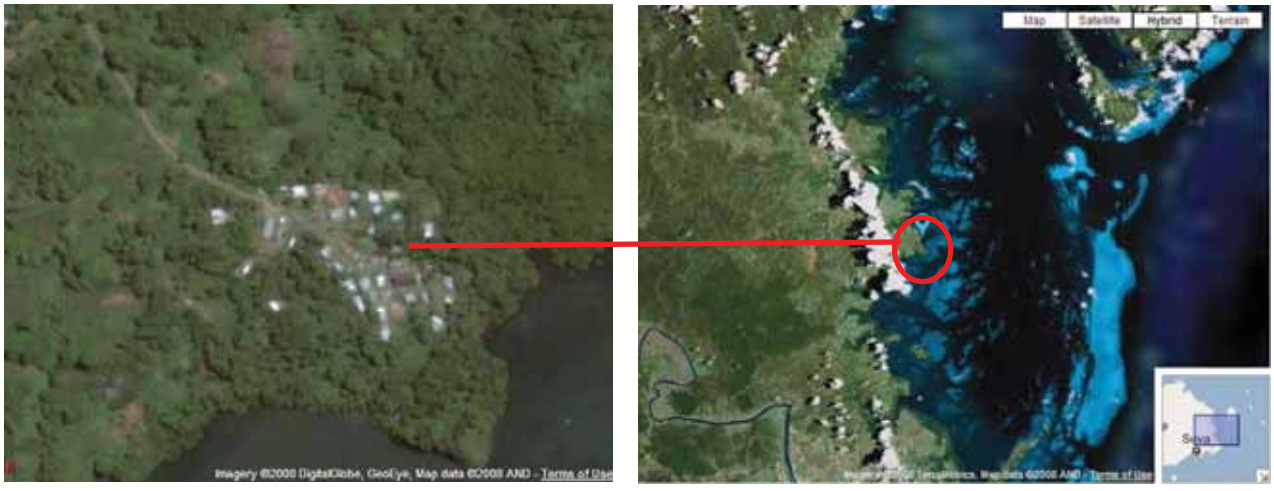
a. Population of the community – families, men, women, children, old people
b. Important people in the community – chiefs, medical, clergy, teachers
c. Livelihoods – crops, animals, fishing, crafts, building, waged labour
d. Outside influences – tourism, government, NGOs, foreigners, neighbours
e. Specific resources – taro, coconut, pawpaw, banana, cassava
f. Coping with Cyclones – strategies in place

Community name: Naivuruvuru Village, Tailevu Province, Fiji Islands

Aspect	Details	Issues
Groups in Community		
Families	Approx. 40	
Adult males	50	Generally healthy, but lots of commitments, education
Adult females	80	Generally healthy, but lots of commitments
Old people	20	Generally healthy
Children	40	Attend pre-school, primary and secondary schools
Important People in Community		
Chiefs	1	Possess leadership skills, huge responsibilities as a traditional leader
Medicine people	Approx. 20	Generally effective
Clergy	10	Play an important role in facilitating social cohesion
Teachers	4	None residing in village
Livelihoods		
Crop farming	Dalo, cassava, yaqona, breadfruit, vegetables	Support livelihood and traditional obligations
Animal farming	Cattle, pigs, chickens	Support livelihood and traditional obligations
Fishing	Nets, lines, shellfish	Support livelihood and traditional obligations

Aspect	Details	Issues
Craft making	Mats, basket, fan	Support livelihood and traditional obligations
Building	Traditional and modern houses	Ability to build and sustain good and affordable houses
Waged labour	None (wage labourers reside in urban centres)	Send money to support family members
Outside influence		
Tourism	No	
Government	Provision of development assistance	
NGO's	Yes	
Foreigners	No	
Neighbours	Neighbouring villages	Villages meet during traditional occasions
Specific resources		
taro	Approx. 1 acre (village owned)	
coconut	Approx. 10 acres	
pawpaw	No	
banana	Approx. 20 acres	
cassava	Approx. 50 acres	
Coping with Cyclones		
Preparedness	Build houses near forest or windbreak Cut trees down close to houses Prepare sandbags	
Before cyclone	Early warning through radio or TV Cut stems of cassava to reduce damage Get livestock into safe place Prepare torches or other personal lights Ensure fresh water available	
During cyclone	People shelter in strong house or community hall	
After cyclone	Community effort to rebuild damaged property	

Naivuruvuru Village



GROUP 2

Facilitator: Stephen Russell

Identify the activities that will best elicit the information we need in a socially acceptable way. For instance:

- Focus group meetings
- Community mapping – social and resource mapping
- Transect walks
- Historical time-line
- Daily routine
- Hazard response
    - Safe area identification
    - Evacuation procedure
- Individual semi-structured interviews

Identify how we should interact with the community to feed the information back to them for their own purposes. For instance:

- Who has the authority in the respective community?
- Who has the responsibility in the community?
- What training is required?
- What facilities are required?
- What is the most effective way of disbursing the information?
- What are the power issues in the community (e.g. gender, youth, chief), and how may these be overcome to achieve participatory involvement?

Fijian administrative environment

Fiji is divided administratively into four divisions, which are further subdivided into fourteen provinces. Each division is headed by a *Commissioner,* appointed by the Fijian government. Each province has a *provincial council,* headed by the *Roko Tui* (usually a high chief), which may make bylaws and impose rates (local taxes), subject to the approval of the *Fijian Affairs Board*, a government department headed by the Minister of Fijian Affairs.

Non-Fijian communities are administered by the *Department of Multiethnic Affairs*.

The *Roko Tui* administers a province through direct contact with the various headmen of the provinces. Any local intervention by a research group such as ours, would need to inform the *Roko Tui* of whatever is proposed, as well as the relevant headmen.

Interview scenario

Key informants include: chief or headman, elders, church leader, health nurse or leader, women's group leader, youth leader.

Disaster awareness and issues can be effectively transmitted to community members through song, drama, mekes (traditional dance), and through group discussions.

Traditional practices

Traditional disaster preparedness includes preserving crops (though the practice is dying out). This involves, for cassava: soaking, skinning, removal of the string, and drying, before wrapping in leaves and burying for up to three years. Breadfruit can also be buried, while yam can be stored for up to six months in a dry place.

In some islands cassava is grated before drying, and keeps for three months.

Tivoli (hard yam) and kawai (sweet yam) are crops that tend to grow well under any conditions.

Indo-Fijians dry or pickle mango, and store dried rice, beans and lentils.

Animals include: pigs, cattle, goats, chicken, ducks, wild birds, and wild pigs.

Traditional house construction in Tonga included having the roof suspended on four pillars, which could be lowered in case of cyclone.

Much land in Fiji is now not used. People earn enough money to buy food. Main cash crop is sugar, while main staple is cassava.

STRATEGY for the Future

1. Put together an Australian Pacific Network proposal for $50,000 per year for two years.
2. Coordinate other funding opportunities (e.g. Global Development Network Awards, South-South Cooperation Program).
3. Research possibilities of funding from other sources, such as British High Commission, European Union, the Global Environment Facility (GEF) Small Grants Programme, and AusAID.
4. Coordinate activities with UNDP, Local Governments, and other government bodies
5. Coordinate activities with NGOs, people's organisations, community-based organisations, and religious groups.
6. Research current adaptation plans
7. Research intellectual property rights of traditional knowledge owners
8. Research means for training and capacity building for communities to use computer based technologies, or other relevant technologies (mobile phones, communications Internet, etc)
9. Research means for improving education in schools for disaster resiliency

Appendix A: Workshop Agenda

Day One

8:30 – 9:00	Registration
9:00 – 9:15	Welcome & Housekeeping
9:15 – 9:45	Background and objectives
9:45 – 10:15	Brief individual introductions
10:15 – 10:30	Morning tea
10:30 – 12:30	Brief individual introductions – continued
12:30 – 13:30	Lunch
13:30 – 14:40	Setting the scene: a) System Analyses Methodology – Broad overview and case studies (UniSA) b) Risk Management – International perspective (Hyogo Framework) c) Risk Management - Regional Perspective (CHARM - SOPAC) d) Risk Management – Fiji's perspective (Fiji National Disaster Management Office) e) Integration of Risk Management into Climate Change Programme (PACE-SD Methodology)
14:40 – 15:10	Agree on terms and objectives of program
15:10 – 15:20	Agree on stakeholders
15:20 – 15:35	Tea
15:35 – 16:40	Identify needs of the project
16:40 – 17:00	Identify political, cultural and social context
17:00	End Day 1
19:00	Dinner at 'JJs'

Day Two

8:30 – 9:00	Coffee and Tea
9:00 – 9:05	Welcome
9:05 – 9:45	Introduction to the SOPAC Pacific Disaster Net - A Web Portal for Disaster Risk Management in the Pacific Region
9:45 – 10:00	Describe the characteristics of the database that we need to build to accommodate the data and resources available to build it

10:00 – 10:15	Describe the type of modelling that will be built to characterise the communities
10:15 – 10:30	Tea
10:30 – 12:30	Breakout sessions
	a) Identify the information that we need to obtain from communities
	b) Identify activities that will best derive the information
	c) Identify how we should interact with the community to feed the information back to them for their own purposes
12:30 – 13:30	Lunch
13:30 – 15:15	General discussion of issues
15:15 – 15:30	Tea
15:30 – 16:00	Decide how to go about obtaining future funding
16:00 – 16:30	Decide on roles and responsibilities, schedule and resourcing
16:30 – 17:00	Conclusions and comments from community representatives

Appendix B: Workshop Participants

No.	Name	Position	Address	email	phone/fax
University of Adelaide					
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SOPAC					
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Appendix C: Meeting at SOPAC, Fiji – 23 June 2008

Participants

Jutta May (SOPAC)
Noud Leenders (SOPAC)
Stephen Russell (UniSA)

Objective

To understand the perspectives and activities of SOPAC towards increasing the resilience of Pacific Island communities to natural hazards, and any local knowledge that may assist the programme.

Discussion

Discussions were held at SOPAC (at the kind invitation of Jutta May and Noud Leenders) and the following points were considered noteworthy:

- Mrs Sukulu Rupeni (rupeni_su@usp.ac.fj) is best USP person for leading Fijian field investigations
- Kathryn Hawley (kathryn@sopac.org), Programme Director, USAID/OFDA Pacific Disaster Management Programme, The Asia Foundation – is recommended SOPAC person to lead Fijian field investigations
- The Pacific Islands Association of Non-Governmental Organisations (PIANGO) is a regional network of NGO focal points for coordinating bodies known as National Liaison Units (NLUs) based in 22 Pacific Island countries and territories. See http://www.piango.org/
- Professor William Aalbersberg (aalbersberg@usp.ac.fj), Institute of Applied Science, USP, is a recommended person to approach regarding indigenous / traditional Fijian knowledge
- Issues in Fiji include:
    - Upstream water use – polluting downstream water
    - Oil from cars polluting drinking water
    - Waste disposal and Rubbish attitudes – chucking stuff out bus windows
    - Started with cleaning up Suva – bins on foreshore
    - Bins not used in communities, so rubbish is put in plastic bags by side of road, and quickly attacked by dogs; or rubbish dumped in rivers (now includes non-bio-degradable plastic)

Poor sanitation – leading to typhus cases e.g. Buca Bay (North Vanua Levu) has contaminated springs and wells (see SOPAC water page http://www.sopac.org/tiki-index.php?page=CLP+Water+Quality).

    - Composting toilets aren't always appropriate – example on low lying island where toilet needed to be built high above land surface (tallest building on island) and wasn't used.
    - Water storage and collection
    - Coast and riverbank erosion

- SPREP – South Pacific Rural Environment Program (http://www.sidsnet.org/pacific/sprep/sprep/about.htm) – useful resource on environmental issues and research
- There appears to be no scientific evidence for Sea Level rise in the South Pacific over the last 10 years, according to ~18 tidal stations. Most coastal issues are related to human activities – sea walls, poor building site, rubbish, sand mining (see Arthur Webb's research on Kiribati - http://www.sopac.org/data/virlib/ER/ER0053.pdf), etc
- Food is typically grown for subsistence, plus a little for cash or barter to obtain rice, fuel, etc
- Indo-Fijians own little land, but focus on building money and assuring education for children
- Indo-Fijians drink yaqona as a cultural habit (having relaxant side effects), alcohol (expensive) and smoke marijuana
- Many Fijians drink yaqona – often until late in the night and sometimes even until early in the morning
- Fijian culture practice *kerekere* – traditional borrowing of money or goods with friends or within extended family without necessary obligation to return (for a brief explanation see http://www.fijianstudies.org/dload/vol1no2/grao.pdf, p. 311) (so there is no incentive to save money, and no point having a shop).
- Children and learning
    - Children tend to learn by observing, but there are no longer people around to watch doing traditional practices or crafts (such as building bures).
    - People deal with emotions such as anger or sadness differently. Mothers often just 'laugh it off' if children are hurt or sad.
    - People rarely express their opinions openly as it isn't seen as being respectful.
    - Schools teach a lot of group work, such as singing, but little individual work (see Kathryn Hawley).
- Traditional knowledge questions
    - What is done in Australia to preserve traditional knowledge?
    - What meta-data is used?
    - How do laws and rights in Fiji relate to traditional knowledge, and how do they relate to disaster risk management?
    - What is the key Fijian traditional knowledge we should be aiming to preserve?
    - What is in it for Fijians in sharing their traditional knowledge?
    - Will they want to share their knowledge?
    - Is their any value to Fijians in recording knowledge in an electronic format?
- Relevant websites (SOPAC, NDMO, Red Cross):
    - PreventionWeb.net – http://www.preventionweb.net/english/
    - PacificDisaster.net – www.PacificDisaster.net
    - ISDR – http://www.unisdr.org/isdrindex.htm
    - Pacific Disaster Risk Management Partnership Network – http://www.sopac.org/tiki-download_file.php?fileId=1670 (contact details of relevant organisations)