Disaster Risk Management in Marginal Communities of Port Vila, Vanuatu

Win blong hariken Cyclone

Bigfala tidal wef Tsunami

Wora i run Flooding

Kraon i foldaon Landslide

Bigfala solwora ikam soa

Storm Surge

Kraon iseksek Earthquake

Project Summary

A SOPAC project to achieve improved security and quality of life for peri-urban residents at high risk from natural hazards

Funded by the United Kingdom Department for International Development DFID

THE SITUATION

The settlements of Mele, Maat and Blacksands lie slung along the shores of Mele Bay, on the north-western fringes of Port Vila, the capital of Vanuatu.

Situated on low-lying coastal land, they are arguably some of the World's most exposed communities in a region of extreme hazards that include river flooding, cyclones, earthquakes, tsunamis and pollution.

Mele, which operates under a traditional chiefly system, is the largest village in Vanuatu. It has relocated once already on traditional land some distance inland of the original coastal site of Mele Island following health concerns and epidemics in the early 1950s.

Nearby, the people of Maat village - also under a traditional system - sought refuge from an active volcano on Ambrym island some decades ago. They are now established on land originally belonging to Mele landowners.

Blacksands is an informal settlement of peoples from widespread locations in the Vanuatu archipelago. Many arrived as refugees from natural disasters and hardship. There are at least eight separate communities in Blacksands with different chiefly associations but no overall, cohesive organisational structure. These communities are tolerated as tenants by the traditional landowners, but have been unable to establish adequate water or electricity supplies because of insecure land-rights.

All of the villages and settlements lie outside the formal system of water supply and waste collection provided for the nearby capital Port Vila. Following any natural disaster, essential services such as water, sanitation and power are usually the first to be affected, placing the people of these settlements at an even higher risk.

In all, more than 7,500 people in this area occupy some 1,500 buildings - most of which are not constructed to any cyclone or earthquake building standard.

Much of the housing construction in Mele, Maat, and Blacksands falls well below any cyclone standards.

THE PROJECT

APPROACH

Since 1995, the South Pacific Applied Geoscience Commission (SOPAC) has been developing its Pacific Cities[1] program to quantify the risk in and around the capital cites of the Pacific, including Port Vila. Pacific Cities draws together information on demographics, building types and characteristics, physiography, bathymetry, and geological, meteorological and human-induced hazards for the purpose of risk management.

With this information already in hand, SOPAC was in an excellent position to carry out a rapid assessment of the damage and implications from the major earthquake that struck Port Vila in January 2002. The United Kingdom Department for International Development (DFID) funded SOPAC to carry out this survey.

The 2002 earthquake, following on the heels of many earlier disasters, strengthened the growing awareness that a major pilot project was needed to pay special attention to ways of treating the total risk of marginal urban communities in particular. When DFID undertook to fund such a risk management project, the peri-urban communities of Port Vila were in a select position to be able to take advantage of it, due to the years of lead-up work in the Pacific Cities program.

George Sokomanu *Administrator, Mele Chief's Council; ex Secretary-General of SPC; former Head of State of Vanuatu*

"It's time that something like this has happened in the village. As the village has grown, social economic and political problems have started to emerge with the expanding population.

If you look at the health and social side of the village, we try to do all that we can but due to economic problems and lack of land, things seem to be static. However, when we had the Workshop it began to open the mind of the people. They now feel things are in their hands, and through their hands it will lead to good living, good health, better education and more opportunities for the future. People are very enthusiastic about this project and willingly participate. Their efforts are going to make it work - and be sustainable. We all, and especially the young people, are looking forward to establishing a new village site. The Workshop was a stepping stone: I'm glad it happened and we look forward to a successful completion of the project. I hope other organisations will follow the lead that SOPAC and DFID have provided."

The project was to be undertaken over a period of one year by an inter-institutional, multi-disciplinary team using a scientific approach combined with participatory community planning.

The goal of the project was improved security and quality of life for these peri-urban dwellers in high-risk areas.

The outputs (see box) were to place particular emphasis on risk treatment. In doing so, the project not only addressed essential services in times of emergency, but also provided solutions to some of the pressing, day-to-day problems in the settlements and villages.

The project design called for the team to embrace the communities, Government and non-government institutions in planning a multi-stakeholder approach which would see ownership rest squarely with the communities involved.

It was envisaged that the way to success was to consult closely with the communities and to have them define their own perception of their vulnerability, and the ways to manage the consequent risks.

Footnote 1: For more information on the Pacific Cities program, please contact the Director, SOPAC.

The SOPAC Community Risk Programme employs a comprehensive hazard and risk management (CHARM) method to manage risk and build safer communities in its Pacific Island member nations – the approach taken by this project reflects those principles.

Scientific information on natural hazards, gathered through the Pacific Cities program, was shared directly with the communities for them to consider in their determinations, alongside their own local and traditional knowledge. The communities then developed a plan of action during workshops in the villages and settlements.

Feedback was obtained during a subsequent multi-stakeholder conference in Port Vila, and the plan was formalised into a series of sub-projects by the SOPAC team for the communities. Those same communities then put the sub-projects in place.

Disaster Risk Management in Marginal Communities of Port Vila

Project Outputs

Output 1: Risk Identified - Elements pertinent to security, quality of life and opportunity reviewed

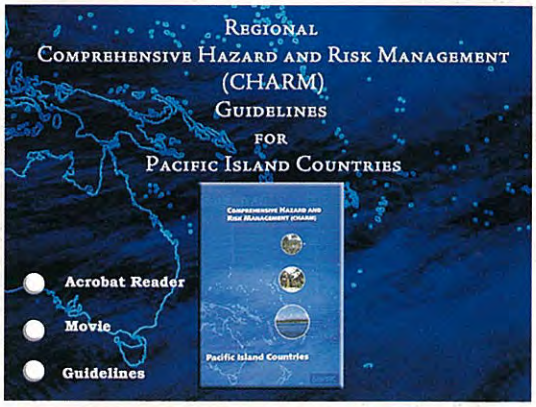
Output 2: Risk Analysed - Impact of natural hazards assessed

Output 3: Risk Evaluated - Disaster scenarios, damage and costs enumerated

Output 4: Awareness Raised - Education and awareness improved in a multi-lingual context

Output 5: Risk Treated - Security, quality of life and opportunity improved for marginal settlements

The implementation of the sub-projects was through village committees, supported by project coordinators and advisors from Government and non-government institutions. Overall administration was provided by the Vanuatu Red Cross Society.



Kelma Sope *Chair, Mele Disaster Committee*

"So many people have come to Mele and we've repeated our problems about water drainage and waste along the rivers but nothing was done until the SOPAC team came. We are all very happy now that everything has come to reality. When other projects come to reality, it is usually two or three years later, but this project was very fast. Looking for funds is very difficult for us. We prayed for the project team to give them strength to carry out their work.

This is the very first time we have run out of food cooking for the men on the Chief's Day – so many have turned up to do the work for the project. This time very many young men felt they wanted to help and contribute."

STEPS TO SUCCESS

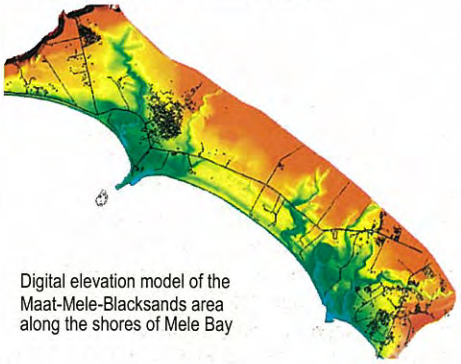
1. SCIENTIFIC HAZARD INVESTIGATIONS, MODELLING AND ANIMATIONS

There is no doubt that the level of risk analysis, and its presentation to the communities, was essential to the success of this project. While the communities had a deep appreciation of their own vulnerabilities, they consistently demanded more information on the hazards facing them in the process of making their decisions on risk treatment solutions. Such depth of information was only possible because of the underlying years of work contributed through the Pacific Cities program in Port Vila.

As part of the Pacific Cities program, the most advanced scientific techniques in investigation, numerical analysis, modelling and risk-loss analysis were applied to quantify the risks faced by the urban and peri-urban communities from cyclone, earthquake, tsunami, flooding and ground-failure.

The severity and extent of these major hazards were mapped on a geographic information systems (GIS) database, using orthophotos and digital elevation models to help relate the risk directly to the layout of community assets.

Animations of the impact of hazards produced by Global Environmental Modelling Systems and the Pacific Disaster Center were used to assist people to visualise the effects on community infrastructure and housing. These assisted in turn to identify risk treatment options and to develop safe evacuation areas.



Digital elevation model of the Maat-Mele-Blacksands area along the shores of Mele Bay

2. SURVEYS OF VULNERABILITY, SOCIAL CONDITIONS AND INFRASTRUCTURE

Household interviews and surveys of housing and construction, demography, and social conditions gave an overview of the vulnerability of the settlements. This provided an insight into the social, health, education, and economic situation of the various communities, as well as their past experience and perceived vulnerability to natural disasters, and the forms of risk-mitigation practised.

The Pacific Cities program combined this information with physical and hazard data, and analysed the implications using GIS technology to show the inter-relationship between hazards, elements at risk and vulnerabilities.

The format of GIS made the integration of community knowledge and scientific information easier. Maps of vulnerability and risk produced through this process were particularly useful in the community-planning discussions which followed. The results of the surveys were used to develop the first round of topics for discussion in the workshops.

Morrie (Jimmy) David *Chair, Blacksands Disaster Committee*

"I'm glad that SOPAC came directly to the community level. We are more active now - we can see the situation we live in more clearly and we can solve our needs."

3. TEAM DEVELOPMENT AND INSTITUTIONAL APPRAISAL

John Chaniel *Water Supply Manager, UNELCO*

"This is a real community-driven project. Before, there were always so many consultants coming into Vanuatu; there was a lot of money spent on consultants and not on pipes but we don't want more reports on the shelf. This project is a bit different - at last something is getting done."

One of the first steps was to set up a project team from SOPAC, Government and non-government institutions, together with support from other organisations and consultants (see box).

This arrangement guaranteed that knowledge and contacts within the communities and institutions would be brought to bear on the problem. It also ensured that the implementing and advising institutions were included at an early stage as part of the surveying, analysing and planning process.

SOPAC Project Team		
Vanuatu Government Departments	National Disaster Management Office	Job Esau (National Disaster Manager) Barton Bisiwei (Facilitator)
	Department of Geology, Mines and Water Resources	Richard MacEwen (Technical Advisor)
	Public Works Department	Richie Nichols (Technical Advisor) Denis Alvos (Technical Advisor)
	Department of Education	Rex Thomas (Institutional Appraisal)
Non-Government Organisations	Vanuatu Red Cross Society	Delvyn Sope (Facilitator)
	Wan Smolbag Theatre	Alice Kalo (Facilitator)
Other Institutions	UNELCO	John Chaniel (Technical Advisor)
	UN ESCAP/POC	Alastair Wilkinson (Organisational Support)
SOPAC	SOPAC Members, Associates and Consultants	Graham Shorten (Project Coordinator) Susanne Schmall (Community Project Planning) Purnima Naidu (GIS Analysis) Ken Granger (Risk Analysis) Stephen Oliver (Cyclone Modelling) Stan Goosby (Risk-Loss Analysis) Vasily Titov (Tsunami Modelling) Paul Jones (Town Planning) Tu'u'u Taule'alo (Urban Services) Jenny Suckale (Project Assistance)

The team visited a wide cross-section of institutions in Port Vila to gain their involvement in the planning and implementation process. All institutions contacted were invited to take part in the subsequent community planning workshops and final risk seminar.

4. COMMUNITY PLANNING WORKSHOPS

Wan Smolbag Theatre group introduced the community planning workshops by performing a play which related cyclone disasters to community attitudes. Almost 60 representatives of various community groups attended the three and four-day working group sessions, including about 15 from Blacksands, and 40 from Mele and Maat. All proceedings were conducted in Bislama, giving the project team access to the local language and culture, as well as contact with local institutions and communities.

The planning workshops were designed on the basis of collaborative decision-making principles which emphasised the importance of customary knowledge and encouraged people to produce their own appraisals, analysis and plans, given access to the modern scientific research on hazards relevant to their particular region.

During the workshops, the team provided to the communities visual summaries of the social and demographic surveys, and technical materials on hazards developed by SOPAC consultants, including photographs, coloured charts and maps, modelling, computer animations and fly-throughs.

Performances in the villages on the theme of cyclone preparedness by Wan Smolbag Theatre provided an eye-catching introduction to the workshops.

Basic written information was handed out in summary form in the local Bislama language. Working group topics and issues were then prioritised by the workshop participants (see box).

The output from the workshop process was a community plan of action incorporating all topics. The plan defined activities, identified advising institutions and assessed resources.

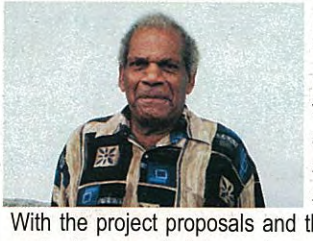
Ultimately, the workshops were designed to ensure that the community group which would implement the project, should also have the key role in the planning process.

Working Group Topics

- **Water Supply Upgrading**
- **Solid Waste Management**
- **Drainage**
- **Community Risk Management (awareness raising, training, construction methods, food security, evacuation)**
- **Relocation**

5. JOINT COMMUNITY RISK SEMINAR – LE MERIDIEN

A Community Risk Seminar involving up to 90 attendees was conducted over three days at Le Meridien Hotel in Port Vila. This event provided the opportunity to cross-check the plan of action and proposals from the community working groups with the assistance of representatives of Government and non-government institutions.



Lik Simelum *Elder, Maat Village*
"For three years now we've been having community meetings on disaster, and it seemed as though this workshop would be the same old effort and afterwards nothing would be done. But then in the seminar at the Le Meridien, I could start to see something would be done.
With the project proposals and the money allocated, then immediately we started to work. I'm very glad the project will have a water tank – everyone in the village looks forward to it. We'd like to thank you and we are all very happy."

It also gave a better understanding of the feasibility of the proposals and an opportunity to identify implementing agencies.

The special feature of this high-level seminar was that so many people from the settlements and villages were present. The seminar also provided a unique opportunity for the National Disaster Management Office (NDMO) and the Department of Geology, Mines & Water Resources (DGMWR) to report on their collaboration in the five years of SOPAC lead-up work related to this project.

6. SUB-PROJECT DEVELOPMENT AND IMPLEMENTATION

Sub-Projects and Project Coordinators

1. **Upgrading of Water Supply System for Mele and Maat** - Jonas Cullwick
2. **Improved Access to Clean Water in Blacksands** - Jonas Cullwick
3. **Solid Waste Management in Blacksands** - Alice Kalo
4. **Solid Waste Management in Mele and Maat** - Alice Kalo
5. **Disaster Management in Mele, Maat and Blacksands** - Delvyn Sope
6. **Improved Drainage Provisions for Mele and Maat** - Denis Alvos
7. **Traditional Cyclone Safe-House in Blacksands** - Delvyn Sope
8. **Demonstration Cyclone House & Skills Upgrading in Mele** - Delvyn Sope
9. **Management Plan for Relocation of Mele Village** - George Sokomanu

The plan of action was formalised into a series of project proposals reflecting the themes of water supply, sanitation, risk management, construction practices, and relocation that came out of the community planning workshops.

The result was a balance of projects spread amongst the various communities (see box), with enough funding available for the first seven projects to proceed. They are anticipated to make significant improvements to the standard of living and disaster preparedness in those communities. The last two projects will be promoted and taken forward to the donor community.

Village project implementation committees were set up spontaneously - where they did not already exist - to handle the issues as the project developed.

Together with the Vanuatu Red Cross Society, these committees provided the leadership and administrative qualities to bring together the manpower of the villages and settlements with the project coordinators and technical advisors from Government and non-government areas.

Alice Kalo
Coordinator, Solid Waste Projects in Blacksands and Mele

"Drawing on my experience with Wan Smolbag Theatre, I wrote and produced my own play on waste management.
Some of my teenage children, and my sister, act in it. Many people from my settlement have come to watch the performances. They like it, and they respond to it. Now there is a better attitude to waste in the settlement. The project was already in my heart a few years ago, and now with the support to carry it out, I'm really happy."

The old and the new: Tongoa/Tongariki cyclone safe-house in Blacksands, and an inspired foyer at Le Meridien Hotel in Port Vila.

Simeon Poilapa *Administrator, Vaturisu Chief's Council*
"Reality came to us with the Workshop. We thought originally that the village might be safe in the long run, but global warming made us decide in principle two years ago to move to a new site. Relocation has to proceed - it isn't really safe for the people of Mele, and prevention is better than cure.
We have had relocation in mind now for two years but it was like a dream; it was not real. The reality was that the funds never come through, but SOPAC organised this project so that the benefits from DFID came to the village."

Morris Otto *Secretary, Blacksands Disaster Committee*

"After the workshops we reformed the disaster committee and we went to the different communities of Blacksands with the charts and maps from the workshop in order to pass the information on and to raise awareness. The people we talked to all appreciate the work of SOPAC and DFID. The cyclone house for evacuation is nothing new to the people from the outer islands. It's good for Blacksands to have one to demonstrate to the people how to make it so they can copy it.
There is easy access to local resources to build the house. The challenge now is to inform everyone that the house belongs to the whole community and that it should be used for meetings on disaster awareness and customary ceremonies and information on disaster or annual meetings. When there's a cyclone, people just go to the road to get picked up to go to Port Vila. With the model coming out of the project, we can copy it with our own labour and local resources."

Kalo Dick *Executive Secretary, Mele Disaster Management Committee*

"When we talked about the project in the Chief's Council in the *nakamal*, the people joined in to set up three committees and a management committee. The workshop and the seminar were very beneficial for all of us. I've never come across a project funded like this - where the money comes directly to the community. I will remember this project - I'm proud to be part of it. We see the project as a gift and we have to offer to it what we have. Lots of awareness has been created during the workshops.
Everybody contributed freely because we have to sweat-out on the project. The *nakamal* council members are very happy about this project."

Sebasdien Yalu *Tanna Community; Chair, Blacksands Solid Waste Committee*

"Before, we could not understand what is bringing the sickness but now we understand that it's very important for people to live cleanly – we must make an effort to reduce the amount of waste.
You can see now that the people from different communities are very happy to work together to do the job of cleaning up the settlement."

Albea David *Chief, Maat Village*

"*Mi glad tumas*. For a long time we had trouble with water. Over the last three years we went to different workshops - but this time I was excited and confident. *Ola pipol are happi tumas* that the water project has come to Maat. We've cleaned the areas and found the leaks already and now we are waiting for the material and advisors to come.
The project is supposed to be finished in seven weeks which is only a short time but, with the way our people are working, we hope it will be sooner."

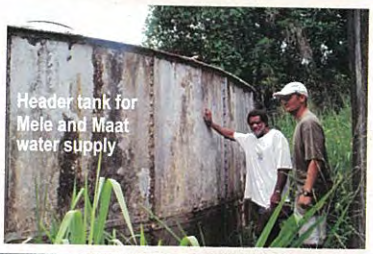
Pala Malapa *Elder, Mele Village*

"I've just come from the Chief's Day of work on the project with all the other men of the community and we were all *happi tumas* as we were singing along the way – everybody was working and it made me feel proud. The standard of living is coming up. In my lifetime, the drainage and water quality and health in the village have all gone downhill, bringing sickness and disease – we live in a disaster zone. Now, with this project, it's a joy to know something is really working. I'm *happi tumas* - I want to live longer to enjoy these new benefits!"

Susanne Schmall
Participatory Planning Facilitator & Community Project Planning

The people of Mele, Maat and Blacksands have proved that the knowledge and willingness to change the *status quo* exists in those communities at the grass roots.
It was very encouraging to see organised, enthusiastic and informed people, needing only facilitation to bring together various stakeholders - with a financial kick-start from outside - before taking over the full running of community projects. The people of the settlements and villages showed impressive dedication to solving their own problems and running their projects. *Thank yu tumas*, from the SOPAC Project Team.

Illegal dumping of commercial solid waste near Blacksands



Header tank for Mele and Maat water supply

Extent of the maximum storm surge flood modelled around Blacksands

Effects of the January 2002 earthquake on a bridge abutment between Mele and Blacksands.

Graham Shorten *SOPAC Project Coordinator, Environmental & Community Risk International*

One of the challenges facing SOPAC has been to demonstrate the relevance of its scientific work to the decision-makers and communities of the Pacific. This project has brought the practical applications of science to people in a way they can understand in order to reduce their risk, and perhaps save lives. As a scientist it has been deeply satisfying to see the information from the Pacific Cities program employed directly in the communities. One example has been the use of Pacific Cities information as the basis for developing tsunami modelling and animations with Vasily Titov and the Pacific Disaster Center. These animations have allowed people to visualise what might really happen in the event of a tsunami.
The Mele-Blacksands communities, faced with uncertainty and fear in the minutes following the intense earthquake on January 2002, evacuated to a ridge-top some 140 m high and kilometres from the coastal settlements.
After seeing the SOPAC tsunami simulations developed for the Port Vila area, those same communities have now set out new, and much more realistic, evacuation areas only several hundred metres distant and around 10 m above sea level. This change in attitude, based on new knowledge, better provides for the evacuation of young children and older people, and even some essential belongings. This is especially important when faced with the brief, 10-15 minute warning likely for tsunamis in this area.

THE FUTURE

Implications for Future Regional Projects - Lessons Learned

- essential that technical post-disaster studies are conducted rapidly so that critical and relevant scientific information on hazards is not lost to the communities
- better for output-oriented project planning to conduct group discussions and key-person interviews rather than employ statistical questionnaires on communities
- extracting information, for its own sake, from communities can lead to resentment in the longer term if there is no attempt to implement solutions to their problems
- important to ensure that project implementation funds are available up-front so as not to raise the expectations of communities unrealistically during planning and discussions
- need to stress the community-strengthening aspects during the planning as well as the implementation of projects: local participants can experience on-the-job training as well as provide necessary input for the working groups
- a rich resource of people and talent exists in the villages and settlements with untapped knowledge and energy that needs only to be facilitated and fostered
- while Government resources and ability to assist might be limited, the manpower and energy available within the beneficiary communities can multiply the impact of a project
- essential to work together with the communities, employing their local knowledge, but within the overall Government systems, and drawing on the resources of non-government organisations and private institutions
- when science and traditional decision-making are harnessed together, their combined power is much greater than the sum of their individual parts
- the community component of regional disaster projects is paramount: it is essential to have at least one local pilot community project embedded in any future disaster management scheme
- community ownership, involvement and commitment is fundamental to success in seeking solutions for the treatment of risk

Acknowledgments: Government of the Republic of Vanuatu for permission to publish, and particularly D-G Steven Tahi, D-G Johnson Wabiat, Job Esau, Chris Ioan and Barton Bisiwei for assistance; UK DFID Pacific for project funding and specifically James Medhurst for project development; HE Michael Hill British High Commissioner Port Vila for support; Alf Simpson, Director SOPAC, Staff and Consultants, particularly Purnima Naidu and Jenny Suckale; CEO of Vanuatu Red Cross Society and Delvyn Sope for project administration; Wan Smolbag Theatre Group and Alice Kalo; Workshop Facilitators; Project Coordinators and Technical Advisors; Ken Granger; Stephen Oliver of GEMS; Vasily Titov and Stan Goosby of PDC; and notably the Chiefs and People of Mele, Maat, and Blacksands.

Blacksands villagers make efforts to protect the schoolhouse roof with plastic sheeting held down by banana trunks as Cyclone Beni threatens during the workshop in January 2003.

SOPAC Miscellaneous Report 507. May, 2003
Editorial & Content: **Graham G. Shorten** and **Susanne Schmall**

SOPAC Secretariat, Private Mail Bag, GPO, Suva, Fiji Islands.
phone: (679) 338 1377; fax: (679) 337 0040; www.sopac.org; email: director@sopac.org

Q* PRINT AUSTRALIA PTY LTD +61 7 3262 3100