Extreme living, extreme need

A report of the 2006 Kastom Gaden Association assessment of the food security and livelihood potential of the Weather Coast of Makira, Solomon Islands.

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The assessment was made as part of the AusAID-funded Sustainable Livelihoods for Isolated Rural Areas Project.

A production of Kastom Gaden Association, Honiara, Solomon Islands.

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Participating organisations

These organisations participated in the assessment of the Makira Weather Coast, either directly through their personnel or in a support role.

Kastom Gaden Association (KGA)

KGA is a Solomon Islands-based development assistance agency specialising in training for food security, livelihoods and community development. Practising since 1995, KGA is associated with the Solomon Islands Planting Material Network (PMN) which works with local farmers to produce, process and distribute agriculturally-useful seed and vegetative planting material. KGA is a member of the regional organisation, the Melanesian Farmer First Network.

KGA & PMN: www.terracircle.org.au/kga

TerraCircle development assistance consultants

A number of the participants who took part in gathering and assessing information for this report are associated with the South Pacific development assistance consultancy, TerraCircle, which works with local NGOs and agencies, governments and intergovernmental organisations in the region.

www.terracircle.org.au

Department of Agriculture and Livestock, (Makira Province), Solomon Islands

The Department is the Solomon Islands Government agency responsible for the development of agriculture in Makira and throughout the country.

Australian Agency for International Development (AusAID)

Part of the Department of Foreign Affairs, AusAID administers the Australian Government's aid budget and provides financial support to development assistance projects and programs in the region. AusAID funded the Weather Coast assessment.

Abbreviations

ACIAR	Australian Centre for International Agricultural Research
AusAID	Australian Agency for International Development
BFN	Baetolau Farmers Network
CBTC	Community-based training centre
CEMA	Commodity Export Marketing Authority
CHS	Community high school
CIP	International Potato Center
CITES	Convention on International Trade in Endangered Species
CSP	Community Support Program
DAL	Department of Agriculture and Livestock
DFMR	Department of Fisheries and Marine Resources
FAO	Food and Agriculture Organization of the United Nations
FSM	Federated States of Micronesia
HF	High frequency — radio
KGA	Kastom Gaden Association
ICT	Information and communication technology
NA	Nurse aide
NOSSA	North and South Star Harbour Association
NZAID	New Zealand Agency for International Development
OBM	Outboard motor
PAPGREN	Pacific Agricultural Plant Genetic Resources Network
PEDC	Paruparu Education Development Centre
PFnet	People First Network
PGR	Plant genetic resources
PMN	Planting Material Network
PRA	Participatory rural appraisal
PS	Primary school
RGC	Regional Germplasm Centre
RN	Registered nurse
RTC	Rural training centre
SAPA	Sub-Regional Office for Pacific Islands
SBD	Solomon Islands dollar (SBD5.4 = AUD1)
STI	Sexually transmitted infections
SIBC	Solomon Islands Broadcasting Commission
SIDT	Solomon Islands Development Trust
SIG	Solomon Islands Government
SLIRAP	Sustainable Livelihoods for Isolated Areas Project
SPC	Secretariat of the Pacific Community
SSEC	South Seas Evangelical Church
TB	Tuberculosis
TCBTC	Turasuala Community-Based Training Centre
TSAP	Transitional Support to Agriculture Program
USDA	United States Department of Agriculture
VARTC	Vanuatu Agricultural Research and Technical Centre
VOIS	Vois Blong Mere Solomon
WDA	Ward Development Authority

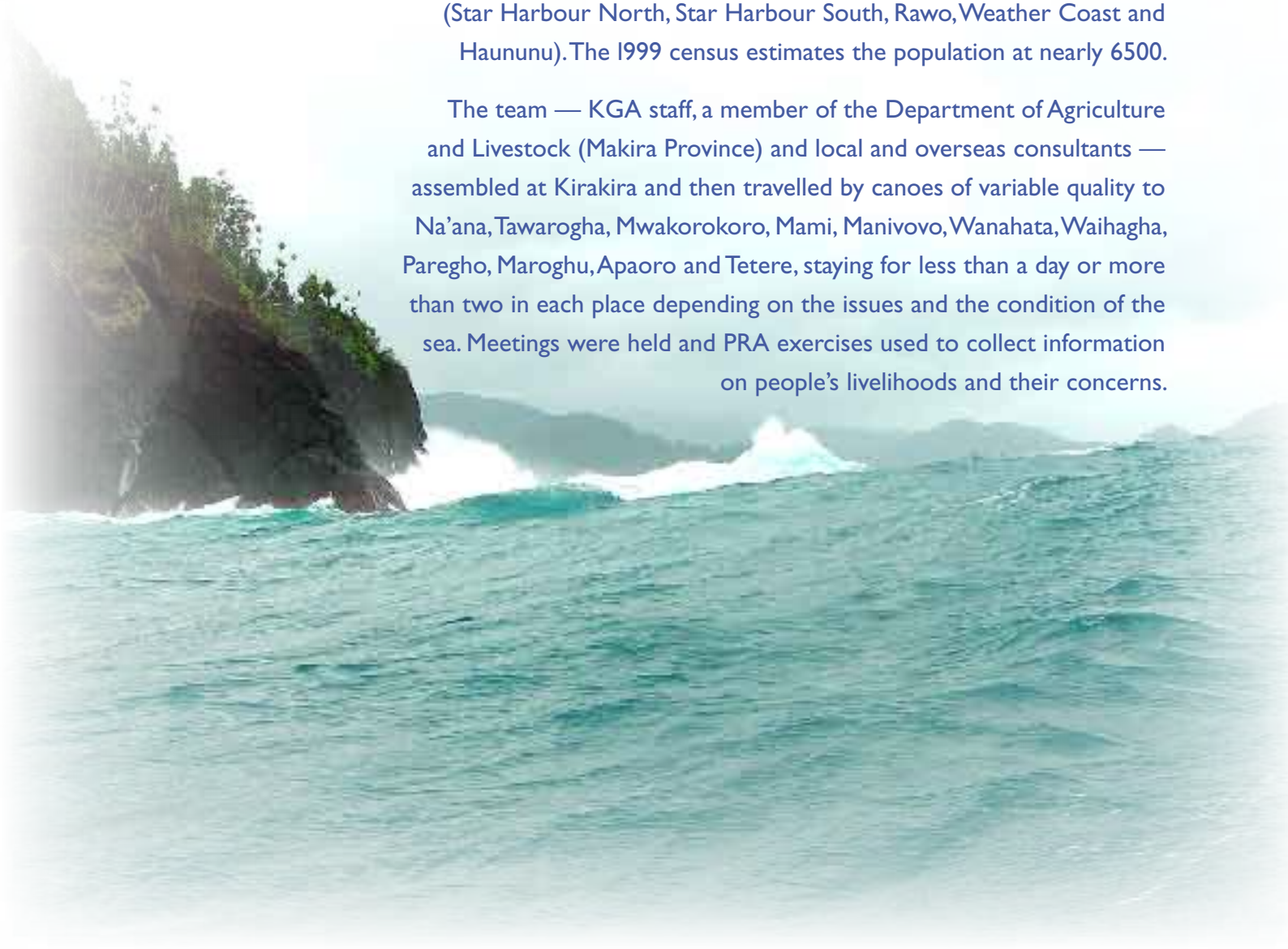
Contents

Summary

The assessment of food security on the Weather Coast of Makira, Solomon Islands, was made by the Kastom Gaden Association (KGA) and partners between 10 and 24 August 2006. It was carried out under the AusAID-funded Sustainable Livelihoods for Isolated Areas Project (referred to as Isolated Areas), which is implemented by KGA. This four-year project aims to improve food crop production and agricultural income-generating opportunities for people living in remote coastal and inland villages of Guadalcanal, Malaita and Makira. A similar assessment was done on the Weather Coast of Guadalcanal in April 2005 and reported in *People on the Edge* (published by KGA).

Nine villages and two rural training centres were visited in five wards (Star Harbour North, Star Harbour South, Rawo, Weather Coast and Haununu). The 1999 census estimates the population at nearly 6500.

The team — KGA staff, a member of the Department of Agriculture and Livestock (Makira Province) and local and overseas consultants — assembled at Kirakira and then travelled by canoes of variable quality to Na'ana, Tawarogha, Mwakorokoro, Mami, Manivovo, Wanahata, Waihagha, Paregho, Maroghu, Apaoro and Tetere, staying for less than a day or more than two in each place depending on the issues and the condition of the sea. Meetings were held and PRA exercises used to collect information on people's livelihoods and their concerns.



Brief overview

Weather, crops and services

Conditions on the Weather Coast of Makira are extreme, more demanding than even those on the similar weather coast of Guadalcanal. Rainfall is probably twice that on the northern coast of Makira (no records are kept) where it is 3500mm annually and temperatures are cool with heavy cloud cover. There are two periods of intense rains brought by the 'Toragina', the southeast trade winds, in June/July/August, and the 'Aworosi', the northwest winds, in January/February/March.

Travel is difficult or impossible along the coast. In most places tracks do not exist as steep cliffs descend to the sea. There are no beaches to walk along except in the deep bays where people live. In many places, it is easier to walk to the north coast, two days away, than it is to the next village. Dangerous seas limit travel by canoe, whether propelled by paddle, sail or, more rarely, outboard motor. There are HF radios in some villages with churches and clinics, but communications are poor. SIBC is rarely heard. Isolation is a fact of life; transport a priority.

Ships visit, but they are chartered and come to collect cocoa mainly, preferring it to copra because of its higher value. There is also trade in trochus, crayfish and clams, and vegetables are marketed locally and to Santa Ana and Santa Catalina by those villages within reach. The chartered ships come monthly, more often in some places, or they may not come for several months, especially in the storm season.

Trade stores are mostly empty, except in logging areas, testament both to irregular supplies and people's low income which is, on average SBD15 a month. Expenditure is more; people borrow from each other and in that way maintain social security and harmony. The irregularity of shipping makes life difficult and adds to the feeling of isolation.

The Weather Coast of Makira has torrential rain, high seas with strong currents and swells, especially during the Toragina, the southeast trade winds, making it dangerous to be at sea in a canoe

Crops

Cocoa is the main cash crop in most villages but yields are low. There is little knowledge of how to manage it properly and, consequently, losses from diseases — black pod, canker, root rots, pink disease and white thread — are high. Mostly, wet beans are sold as driers are uncommon. Women and youth tend the crop and sell the beans and they are keen to have training.

An unusual feature of the Coast is the dominance of *Cyrtosperma chamissonis*, giant swamp taro or kakake as it is called on Makira and throughout Solomon Islands. Previously, it was a reserve food or restricted to ceremonial use, now it is common in all villages from Tawarogha to Wanahata.

Banana is also important, as it is throughout the island, but taro and yam/pana are in decline. Taro has been decimated by alomae, a lethal virus disease, which has been brought to the island in infected planting material in the last 15 years or so. In some villages the disease is known as maehana hui.

Yam/pana are little affected by pests and diseases but they no longer fit farming systems that are intensifying in response to population increase. There is growing interest in processing foods, in particular, making chips from bananas.

Kakake, a main food crop staple of the Weather Coast, is sometimes harvested after 8-10 years and is heavy

Education

Schools are present in many villages, new classrooms have been built, more schools are planned and teachers are at post.

Student attendance is poor in some places and, generally, few children attend secondary schools or RTCs or, if they do, they leave early as parents have difficulty finding school fees.

Health

Health issues abound. Not only are there the common diseases of the country — diarrhoea, malaria, pneumonia, TB — but there are instances of STIs and also diabetes — perhaps an indication of changing food habits with greater consumption of rice and products made from flour.

Clinics are present, although it might be three to four hours walk or paddle by canoe to reach one. Piped water systems are in disuse and beaches are used as toilets.

Populations are increasing, outstripping resources, and there are concerns for the youth. In some villages, where there is good support from the community and good leadership, youth are well organised and committed. Elsewhere, they feel frustrated at being censured by their elders and not being able to put their skills to good use. Numbers of teenage pregnancies and of unmarried mothers are increasing.

Divisions of the coast

The Coast is not the same in all places. The assessment recognises five divisions that differ in:

- their relative isolation and access to markets
- the food crops grown
- environmental impacts, either from natural causes or from logging.

They are: the Kakake Coast; The Peninsular; Forgotten Coast; Commercial Coast; Loggers' Coast.

Kakake Coast

Na'ana to Star Harbour, taking in the north of the Surville Peninsula.

This division is outside the Weather Coast proper, with only the heavy rains of the Toragina recognised. Transport and access to markets (Kirakira, Santa Ana and Santa Catalina) are relatively good. There is a sub-station at Namungha in the Star Harbour and there are walking tracks along the coast. Cocoa and copra are sources of income and fresh produce is sold at local markets.

The Peninsula

On the south side, where most villages lie, conditions are similar to the Weather Coast but there are also characteristics of the Kakake Coast.

Kakake is a dominant food crop and cocoa is the main cash crop (and there are sales of trochus and crayfish), but transport is difficult.

There are footpaths along the north coast but access to Star Harbour from the south via the Maworona track is through a mangrove swamp.

Food crop intensification has resulted in reduced fallows, declining yields and landslides, where forest cover has been removed from steep hillsides.

Forgotten Coast

From Wanahata to the west as far as Woua is an extremely rugged coast with poor services, especially between Maraone and Woua. Ships terminate at Waihagha to the west and Namungha/Santa Ana to the east.

In the more remote parts taro is still important although the plant disease alomae is present. Cocoa is the main cash crop. Custom remains strong.

Commercial Coast

From Waihagha towards Maroghu is a rugged coastline with more-sheltered bays, allowing safer anchorage. There is copra and cocoa to collect.

The dominant food crop is banana, with sweet potato also important, but there is much less taro and kakake except where swamps allow. Rice consumption is high and garden land is increasingly planted to cocoa.

A mid-year 'time hungry' is recognised. Custom remains strong.

Loggers' Coast

From Maroghu to Tetere there is better transport (and there is a walking track across the island) and access to markets.

Fewer families grow food crops, relying instead on purchased rice except where logging has been and gone and people have returned to subsistence.

Banana, kakake and sweet potato are important; taro and yam/pana are in decline and diversity is being lost. Cocoa is the main cash crop.

Logging and its social and environmental consequences is an issue.

Recommendations for Isolated Areas (and others)

Apart from the Isolated Areas project, World Vision is about to implement the Makira Sustainable Rural Livelihoods project and may wish to work with KGA on the recommendations of this report.

There is scope for further support to these remote communities through targeted and coordinated donor inputs.

Strategy 1: Safeguard food production

Priority should be given to helping people manage the outbreak of alomae, a lethal disease of taro.

The disease is now present in a very wide area and it will take time to bring it under control. It is best to start on the Forgotten Coast, between Wanahata and Woua, where taro is still an important crop. To assist extension work a recently published leaflet on alomae needs to be translated into the language of the Coast.

Apart from alomae, other pests and diseases were noted and need to be kept under surveillance. These are:

- little leaf disease and a chrysomelid beetle of sweet potato at Na'ana
- yellowing of coconut palms at Na'ana
- yellow mottle of cassava at Mwakorokoro
- a putative virus disease of banana at Wanahata.

In addition, more disease-free varieties of sweet potato should be introduced to Mwakorokoro for testing by the SLIRAP coordinators and eventual distribution (preference should be given to 'old' Solomon Island varieties) and information should be given on banana scab moth and its control.

Kakake is widely grown on the Weather Coast but only a single variety is eaten. There is need to broaden the diversity of this crop by introducing varieties from Micronesia, Pohnpei State of FSM, in particular. This should be done with assistance from the SPC RGC so that introductions are free from pests and diseases. In addition, it is worth providing people with other

varieties of *Alocasia* and *Xanthosoma* to test. These, too, should come via the SPC.

Several awareness programs are needed. Fewer people are growing yam/pana, instead they are spending more time on cash crops and buying food. People should be encouraged to have broad food crop diversity. This needs to be explained, especially to safeguard against predicted falls in cocoa prices. Those growers who are still maintaining large numbers of varieties should be encouraged and their efforts widely recognised. Assistance should be sought from SPC PAPGREN.

Furthermore, awareness programs are required to:

- help people plan food crop production to take account of adverse conditions
- demonstrate techniques that will improve cultivation in the high rainfall of the Weather Coast
- demonstrate techniques for maintaining soil fertility as well as preventing soil loss on steep slopes.

Strategy II: Enhance income generation

Food security will be strengthened if people have greater access to cash. That means improving cocoa productivity.

Training in crop husbandry is an urgent need for women and youth in particular, as they often tend the crop and sell the wet beans. It should be done within the villages, giving demonstrations on planting (some areas will need to be replanted as trees are dead or dying), severe and routine pruning and disease control.

Increasing yields from existing cocoa plantations may reduce the trend to expand into land previously set side for food gardens. However, better crop husbandry is only likely to be attractive to growers if there are driers in all villages so that harvests are not so dependent on irregular shipping services.

Support should be given to entrepreneurs to build driers and, importantly, small storage sheds (concrete floor, iron roofs, solid walls), so that dried beans can be kept free from pests. Having more wet beans alone will not solve problems of marketing; extending the time that beans can be stored in villages may be a solution.

Introduce new crops

In the long term new crops should be grown to diversify cash-earning potential. They should be high value, light and easily stored.

Pepper and cardamoms are suggested. Pepper should be obtained as seed because of concerns about virus diseases, even though there will be variability.

Seed of cardamom should be obtained from Guadalcanal, germinated at Mwakorokoro (Isolated Areas coordinators' base) and planted in trial plots on hills there and in nearby villages. Later, training in cultivation techniques and processing can be obtained from PEDC, Bougainville.

Support small enterprises

Small village enterprises need more support.

Banana chip-making is generating much interest, but instruction should cater for all those who are interested, not only those who are members of PMN or newly-formed groups, otherwise it needlessly causes rifts in villages.

There is need for a farmer field school approach to train trainers in financial management and marketing (FAO SAPA should be asked for assistance).

Other products could be processed: there is kongkong taro (*Xanthosoma* sp.) for chips and Inkori for pickles/chutneys.

There is potential for intensification of livestock, pigs and chickens, in particular. KGA's *Sustainable Livelihoods for Rural Youth Project* should be resourced to train people in improved management practices and the results from the ACIAR poultry feed research project should be made known.

The emphasis on youth is important as they are failing to receive community support in many villages and, consequently, are not putting their skills to good use. There is need to make small loans available, for business skills training (an aim of the World Vision *Makira Sustainable Rural Livelihoods project*), and discussions with village leaders and youth on how each can contribute to more productive lives in local communities.

Lastly, harvesting rates of trochus and crayfish, and possibly clams, should be investigated to ensure that they are sustainable. There may be a need to restock trochus populations. Assistance should be sought from the Department of Fisheries and Marine Resources.

Strategy III: Strengthen an enabling environment for development

Institutions that might help the Weather Coast of Makira are not well developed (and this equally applies to the similar coast of Guadalcanal). There is no organisation that specifically looks after the people's needs and, consequently, they get disproportionately less assistance in relation to the hardships of their environment. DAL, for instance, is not represented on the Coast although this might change under the forthcoming World Vision project.

A Weather Coast Agriculture Support Group has been established following a similar assessment on Guadalcanal and reported in *People on the Edge*, but this does not have funds to action policies, although it has created a better understanding of the problems of these weather coasts and focused attention on their needs. A separate agency is required with a specific remit for the needs of remote communities.

Central and provincial governments need to consider how best they can intervene to improve transportation on the Weather Coast. People living there have special needs and if the only way to ensure they feel part of a wider society is to subsidise shipping, then this should be accepted. Relying on the private sector is not the answer. Failure to help people break their isolation could have social and political consequences as has been seen elsewhere in the country in recent years.

Apart from improved transport and access to markets, such an agency would represent the needs of the remote communities in areas such as the formation of farmers' networks, information dissemination, disaster preparedness, village energy possibilities, health issues and food security in relation to population increase.

Forming local networks is an important strategy so that villages can support each other and provide information and encouragement to those in need. NOSSA is a good initiative but members need help to formulate policies, to understand more clearly the duties of office bearers, how to attract new members and, importantly, how to develop market outlets for their products, processed foods in particular. Women and youth need to be involved in its management.

Providing information to communities on the Weather Coast is difficult because of the lack of regular shipping and paucity of radios (HF and wireless), but there are possibilities through churches, schools, clinics, aid organisations etc, and these need to be exploited further.

The greater difficulty is passing on information within communities; sharing information is not the norm. Lead farmer volunteers, who will receive support in lieu of payment, should be recruited to act as information brokers, ensuring information gets to those who request it. Possibly, they could be the zone trainers of the World Vision *Makira Sustainable Rural Livelihoods Project*.

Apart from alomae, information leaflets in local languages are required on the following:

- cocoa rehabilitation (planting, pruning, disease control)
- hygiene (toilets, skin diseases, piped drinking water)
- impact of logging (positive and negative benefits).

The training manuals of World Vision can provide a source of information. The booklets published by KGA on pigs, chickens and agroforestry need to be distributed to all villages, and this could be done at relatively little cost.

The recent history of the Coast shows its vulnerability to cyclones, tsunamis, floods and landslides, but there is no early warning system in place. Comparisons are needed between wind and solar power to charge radio and torch batteries, and to provide house lighting. More nurse aide posts are required, especially where people have to walk several hours to obtain medical attention and toilets and piped water should be installed (or reinstalled) and ways found to maintain such essential infrastructure.

Lastly, there is need to help people manage family size, otherwise attempts to provide food security will be undermined. There is no greater issue confronting governments wishing to improve the livelihoods of the people on the Weather Coast.

Part 1 – Introduction

This assessment looks at livelihood issues of the people living on the Weather Coast of Makira. It documents problems concerned with food security and offers solutions in the context of the AusAID-funded Sustainable Livelihoods for Isolated Rural Areas Project, implemented by the Kastom Gaden Association. This project is referred to as Isolated Areas.

This visit follows a similar assessment of the Weather Coast of Guadalcanal in April 2005, reported in *People on the Edge*.

Methods

The team (Attachment 1) assembled in Kirakira on 10 August 2006 and, for the next 14 days, visited villages considered to be representative of the different areas of the Weather Coast. These were Stuyvenberg RTC (Na'ana), Tawarogha, Mami, Mwakorokoro, Manivovo RTC, Wanahata, Waihagha, Paregho, Maroghu, Apaoro and Tetere (Fig. 1). The wards visited were: Star Harbour North, Star Harbour South; Rawo (border only); Weather Coast and Haunumu. Travel from place to place was by canoe: there are few places on the Weather Coast that have walking tracks along the coast.

Two of the team members (Joini Tutua and Grahame Jackson) had taken part in the previous assessment on Guadalcanal and were able to make comparisons between the two coasts, helped by people who had lived in both places. Other members of the team were senior staff of KGA, SLIRAP coordinators who are residents of Makira and a member of the Department of Agriculture and Livestock, Makira Province.

In each village, evening meetings were held with the community to introduce the team, to explain the purpose of the visit and to request the collaboration of the people.

The following morning, groups were formed and participatory rural appraisal exercises were carried out to collect the information required and to enable the community to ask questions.

Figure 1: The wards of Makira, with populations and places visited during the assessment

Source: Statistics Office (2000), report on 1999 population and housing census. Basic tables and census descriptions. Honiara, Statistics Office; modified by SPC Demography/Population Programme, Noumea, New Caledonia.

The exercises included the following:

- seasonal calendars
- timelines of family routines
- community mapping
- transect garden walks
- focus group discussions — village histories, plant genetic resources, incomes and expenditures, communications and information, problems of particular networks, youth.

Men and women formed separate discussion groups and there were sessions with young boys and girls. Youth were defined as those to the age of 25 years, whether married or not.

The information collected on PGR was done in a similar way to the previous assessment. Women were asked to bring varieties of food crops that were in their kitchens and these served to assist in listing the varieties grown and those of particular importance (Attachment 2). Afterwards, the different crops were ranked in importance, pests and diseases noted and trends in food production in recent years discussed. A small collection of sweet potato was made as this crop is of interest to KGA as implementer of the AusAID-funded *Searem Niu Plant Long Gaden Program.*

Transect walks were made to assess food gardens and also cash crops, mostly coconuts and cocoa, and to check on points of interest, especially pest and disease problems that had been raised during the group discussions. Meetings were held in Pidgin English and in the local languages with translation to English where needed.

After the assessment in each village, the team summarised the data collected under a set of common headings, concluding

The Coast still maintains a broad diversity of banana, taro, yam, sweet potato and cassava, but these are being lost in some villages

with key issues from which recommendations might be made (Attachment 3).

The assessment was made at the time of the year when the Toragina, the southeast wind, brings torrential rain. The team was left in no doubt as to hardships of living on the south coast of Makira: there were turbulent seas, storms and days that were uncharacteristically cold, conditions typical of this weather coast.

Limitation of the assessment

The team focused on agriculture, particularly food and cash crops, and less on livestock. There was no one on the team with expertise in household energy as in the previous study. However, the comments on energy in *People on the Edge* are relevant to the conclusions of the present study and Andrew Mears, a writer of that report, has provided some additional comments.

Other means of wealth creation were noted, some from the sea and forest, but were not examined in detail. As regards logging, the team obtained positive outcomes as well as detrimental aspects reported by the communities interviewed.

The team was also not well placed to give recommendations on transport, which, as on the Guadalcanal Weather Coast, is a pressing issue and invariably comes up as a priority in village discussions. The current situation is noted in this report but solutions are beyond the team to suggest.

Likewise, health matters are outside the team's expertise although some observations are made on prevalent diseases.

Population growth is an area of immense concern to the team because of its obvious impact on agriculture, food security and other aspects of people's livelihoods, however we offer no solutions. Although not a topic often broached in discussions, communities nevertheless have a growing awareness of the increasing pressure on land and sea resources, the depletion of forests for fuel and building materials and their growing inability to cater to education and health needs. Unfortunately, they are not well equipped to deal with these problems.

One area of the Coast deserved greater observation — this is the Forgotten Coast between Wanahata and Woua. It had been the intention of the team to visit Maraone but the problem of transport made this impossible. It meant that Rawo ward was poorly covered and the problems of this isolated stretch of the coast had to be gleaned, in the first place, from conversations with informants at other villages and, later (28 August), by one of the team members, Peter Warita, visiting the community.

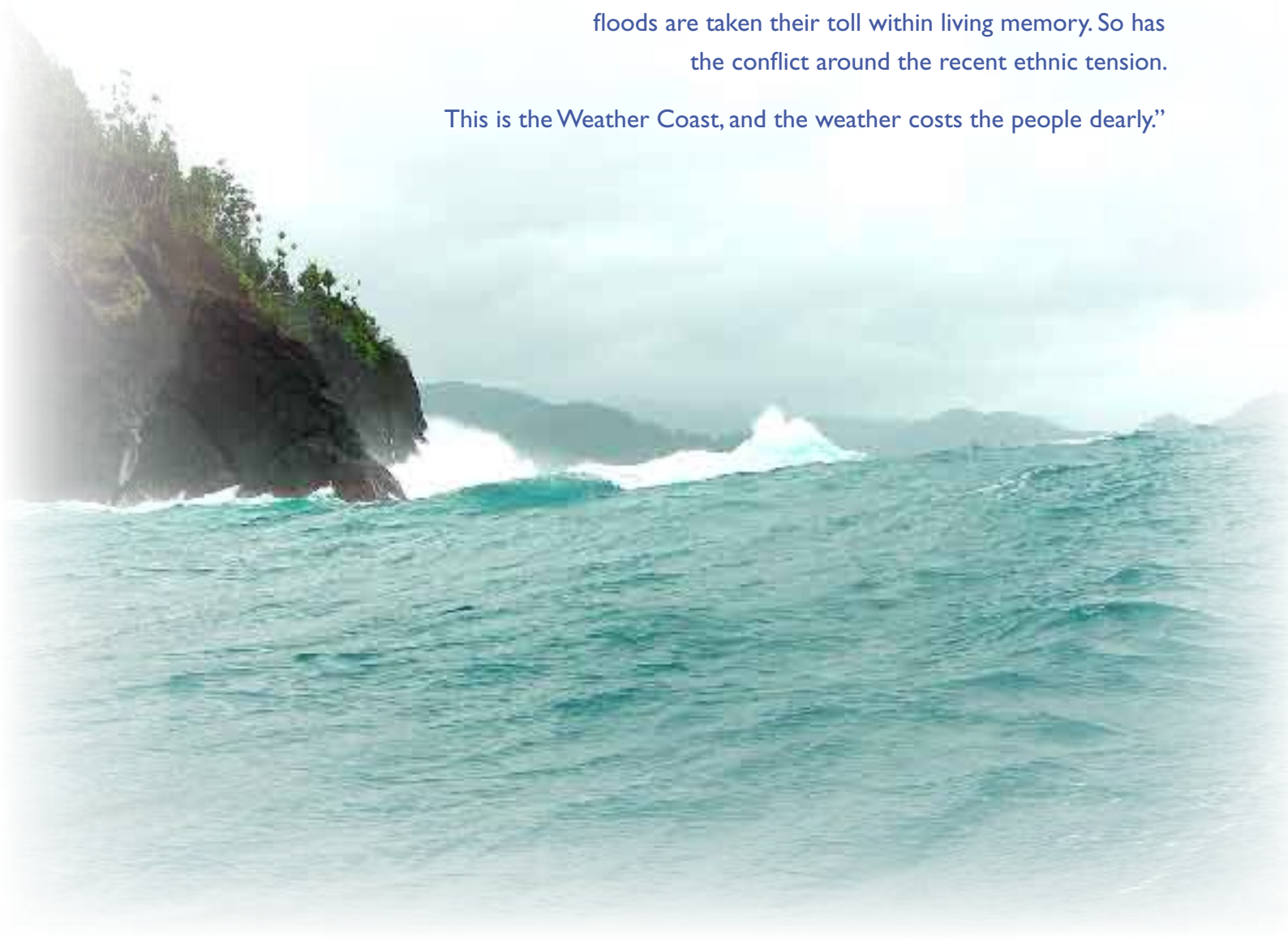
Part II – The findings

The Weather Coast of Makira has similarities to that of Guadalcanal, and what was said of that coast applies:

"The Weather Coast is unique in all of Solomon Islands. Other regions have high rainfall but not as high; other regions are remote but are not without roads or regular shipping; they are isolated but not locked in by steep mountains and shores that dip precipitously to meet huge seas that make anchorage dangerous or impossible.

This is a perilous place to live: tsunamis, earthquakes and flash floods are taken their toll within living memory. So has the conflict around the recent ethnic tension.

This is the Weather Coast, and the weather costs the people dearly."



The situation

Climate, topography and soils

The south or Weather Coast of Makira is deeply dissected. The coastline, without protective fringing reefs and exposed to the southeast trades, is prone to headland erosion and bay infilling by sand and pebbles (Hansell and Wall, 1975[1]).

Between the bays, beaches are rare as steep mountains of basalts rise from the sea, wave-cut in places. Rivers are numerous, flowing from hinterlands 400-600m above sea level. In the low-lying valleys there are poorly drained areas of alluvium and swamp.

It is not posible to walk along the Coast: there are no beaches

From April to November the Coast experiences the southeast trade winds, with strong winds ('Toragina') and heavy rain in July, August and September. There is unsettled weather in October and November followed by north-westerly winds ('Aworosi') and rains from December to March — often associated with cyclones. Afterwards, in April and May, there is a further period of changeable weather as the southeast trades return (Fig. 2).

The rainfall of the Coast is unknown but it is likely to be in excess of 5000mm annually. During the assessment, 257 mm of rain fell on Kirakira, the only place on the island where data are taken. Considerably more would have fallen on the Weather Coast during that time.

According to Hansell and Wall (1975) the soils are clay loams of various shades of brown and highly variable in depth. The valleys and river deltas have fertile alluvial soils whereas coral-derived calcareous soils of lower fertility occur on coastal terraces and plains. The parent materials are altered basalts and pillow lavas. Sharp ridge tops and narrow, deep, straight valleys between ridges are common.

The primary barrier to agricultural potential is the steep topography. Erosion is a continuous process both under crops and in natural forest systems.

Villages are on narrow shores with steep hills behind, so they are vulnerable to cyclones and tsunamis

Divisions of the Weather Coast

Five divisions have been defined to assist description of the Coast. These differences are not distinct but blur into each other.

They are based on several factors:

- access to transport
- the relative importance of different food crop staples, which is itself an indicator of land use
- environmental impacts, both natural and man made.

These divisions have been coined as follows: the Kakake Coast; The Peninsula; Forgotten Coast; Commercial Coast; Loggers'

[1] *Hansell JRF and Wall JRD (1975). Land Resource of the Solomon Islands: San Cristobal and adjacent islands. Land Resources study 18, Vol 7. Overseas Development Administration, UK.*

Coast. A short description of each of these follows, with summaries also provided in terms of vulnerabilities and assets (Table 1) where commonalities and differences can be easily seen.

Kakake Coast

From Na'ana to Star Harbour, taking in the north of the Surville Peninsula.

As the name suggests, *Cyrtosperma* — giant swamp taro or 'kakake' as it is known throughout Solomon Islands — dominates food production, moving from a reserve food and a food for ceremonial occasions to everyday use.

The Kakake Coast is outside the Weather Coast proper. It is more sheltered and only the strong winds and heavy rains of the mid-year Toragina are recognised.

Transport and access to markets (Kirakira, Santa Ana and Santa Catalina) are relatively good. There is a sub-station at Namungha in the protected Star Harbour and there are walking tracks along the coast.

Cocoa and copra are the main income-generating activities, plus sales of fresh produce.

The Peninsula

The south side of the Surville Peninsula is the start of the Weather Coast but it has some of the characteristics of the Kakake Coast.

Kakake remains a dominant food crop and cocoa is the main cash crop, with sales of crayfish and trochus, but transport is much more difficult because of open seas.

There are tracks along the north of the Peninsula where Namungha is located but access from the south is difficult except along the Maworona track, a difficult route through a swamp.

There are signs of intensification of land use with reduced crop fallow and declining yields. Removal of forest cover on steep hillsides has brought landslides during heavy rains to many places on the south coast.

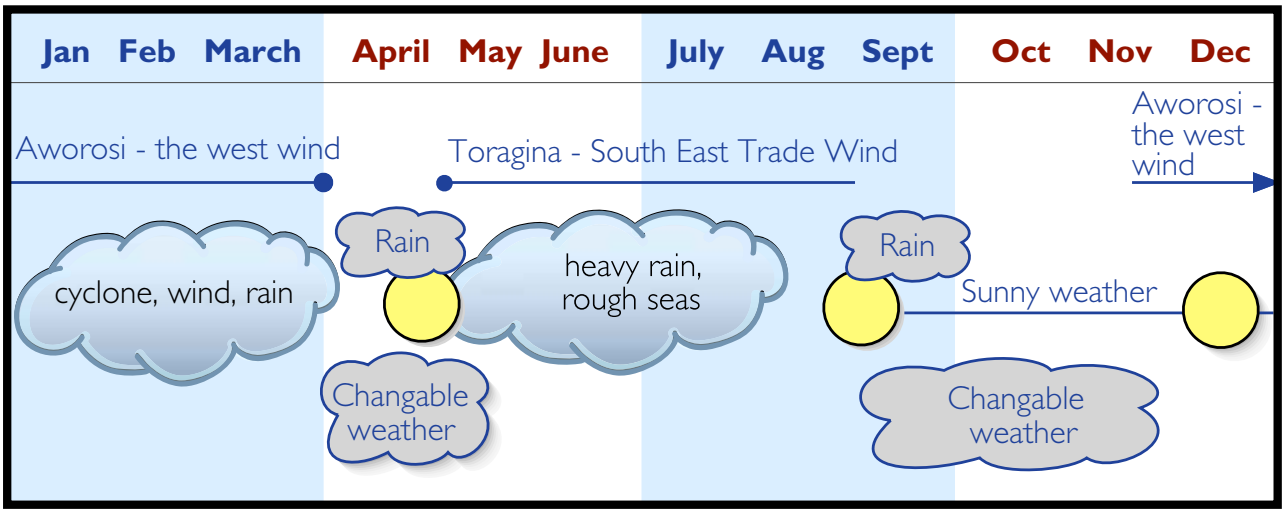
Forgotten Coast

From Wanahata to the west as far as Woua the Coast becomes extremely rugged with cliffs descending to the sea.

Access to services is extremely poor, especially between Maraone and Woua. There is a clinic at Waihagha (and an nurse aide post at Aurata) but it is up to four hours away by canoe if the weather is fine and the winds are in the right direction. Ships terminate at Waihagha to the west and Namungha/Santa Ana to the east, leaving this area unserviced (no ship has visited Maraone this year). There are bush tracks to Kirakira.

In the more remote parts taro remains important with banana and sweet potato (kakake is a reserve food). Alomae is present but the incidence is relatively low. In keeping with other divisions, cocoa is the main cash crop, with wet beans sold at Waihagha once or twice a year. Custom is still strong and youth — boys and girls — work well together.

Fig. 2: ***Annual weather pattern for the Weather Coast of Makira***



Commercial Coast

The rugged coastline continues from Waihagha to Maroghu but more sheltered bays allow ships safer anchorages and there are large plantations of coconut and cocoa. There are cocoa driers and trade in wet beans between communities, which attracts chartered vessels.

The dominant food crop is banana with sweet potato important but with much less taro and kakake, except where swamps allow. Rice consumption is high and garden land is increasingly planted to cocoa.

Custom is still strong with well-organised youth and women's groups.

Loggers' Coast

From Maroghu to Tetere, transport and access to markets are no longer such a problem in most parts, except where logging has come and gone and communities are as isolated as before and have returned to subsistence.

Tracks exist, leading to the north of the island.

Fewer families grow their own food, relying instead on purchased rice, with the first signs of associated health conditions, diabetes in particular. Banana, kakake and sweet potato are the food crops, and cocoa an important cash crop. Taro and yam/pana diversity is declining as these crops are no longer grown by all families. Logging brings wealth to landowners, and social and environmental problems to all.

Table 1: *Livelihood analyses of five divisions of the Makira Weather Coast*

Villages assessed: *Na'ana, Tawarogha (Kakake Coast)*

Vulnerabilities	▪ Reliance on one crop with one variety: kakake — harvesting progressively younger plants ▪ Rivers are liable to flood
Assets *physical*	▪ Relatively better off in terms of access to markets in Kirakira and Honiara, with regular shipping to the sub-station at Namungha (people walk to Star Harbour and then take a canoe) and an airport at Na'ana (returning point of ships is Namungha and Santa Ana) ▪ There is a walking track between Na'ana and Tawarogha ▪ RTC at Na'ana
human	▪ Generally fit and healthy ▪ Education to standard 6; some continue to forms 1, 2 or 3 or go to RTCs ▪ People share and borrow from each other — custom is still strong (but not among youth)
natural	▪ Access to large swampy areas for kakake in particular, but also for sago palm ▪ Sea and reef where many species are taken ▪ Forests provide wild yam and tree 'cabbages' ▪ Access to dry land where a wide diversity of staple foods, including fruit and nut trees, are grown
social	▪ Several church groups undertake communal work
financial	▪ Markets in Santa Ana and Santa Catalina; people from those islands visit to buy produce ▪ Stores that buy cocoa/copra/nuts and give credit ▪ Assistance from SLIRAP in making banana chips ▪ Average monthly income SBD12.5, expenses SBD155 a month ▪ Pigs are kept by each family for sale and customary exchange
Issues	▪ Food security: reliance on a single food crop; kakake corms are harvested progressively earlier ▪ Scarce sago palm; kakake is given preference ▪ Several pests/diseases of food crops; alomae started in this area and has spread around the coast; sweet potato — insect attack and possibly little leaf disease ▪ Poor yield from sweet potato ▪ Youth not completing education, without direction; increasingly, teenage pregnancies and unmarried mothers ▪ Not every family has land for coconuts and cocoa ▪ Management of cocoa (pink disease) ▪ CEMA buying centre at Namungha closed ▪ Health: no toilets or piped water; no clinic at Tawarogha; Mwanigagosi is 2 to 3 hours walk away ▪ Pigs destroying gardens

Villages assessed: *Mami, Mwakorokoro (The Peninsula)*

Vulnerabilities	▪ Beginning to feel the effects of population pressure with food shortages and fallow down to 1- 4 years ▪ Reliance on kakake — harvesting progressively younger plants ▪ Removal of trees, loss of soil (use of hoes) leading to landslides during heavy rains (especially along the Surville Peninsula) ▪ Cyclones and tidal waves
Assets *physical*	▪ The Maworona track across the Surville Peninsula provides access to Namungha (even though it is an hour's walk through a swamp) ▪ A radio at Mwakorokoro
human	▪ RTC nearby at Manivovo ▪ Clinics (but nurse aide is temporarily not at post); and schools (standard 6 and form 1) ▪ Most children reach standard 6 and some go on to RTCs; less so for girls
natural	▪ Access to sea resources: trochus, bêche-de-mer (previously), fish, clams and crayfish ▪ A wide range of plants are taken from the forests, especially tree 'cabbages'
social	▪ Takorogu Cooperative Society ▪ Community is still strong
financial	▪ Crayfish are sold locally, near Manivovo ▪ Trochus is sold to the Takorogu Cooperative Society ▪ Cocoa is the main cash crop ▪ Vegetables sold to people from Santa Ana and Santa Catalina ▪ Pigs are kept by each family for sale and customary exchanges
Issues	▪ Transport/marketing a problem; dependent on irregular charters ▪ Food security: reliance on a single food crop; kakake corms are harvested progressively earlier ▪ Not every family has access to land for coconuts and cocoa ▪ Graduates from RTCs not able to put skills into practice ▪ No driers at Mwakorokoro ▪ Loss of taro to alomae ▪ Youth: complaints of strict control by adults; teenage pregnancies and unmarried mothers ▪ Health: no toilets, no piped water; skin disease; betel nut

***Villages assessed**: Wanahata, Maraone (Forgotten Coast)*

Vulnerabilities	▪ Cyclones, landslides and tidal waves — a very isolated and inhospitable coast ▪ Low cash income ▪ Isolated and unable to market produce: ships pass by ▪ Alomae – but only relatively recently arrived
Assets	
physical	▪ There are cross-island tracks to Kirakira (but not along the coast)
human	▪ A clinic at Wanahata and nurse aide post at Aurata ▪ Pre- and primary schools (at Wanahata and other villages) and a secondary school at Baghare ▪ Most of the youth have attended primary school, although more boys than girls
natural	▪ Access to sea resources: bêche-de-mer (previously), fish, clams and crayfish ▪ Access to swamps and dry land where a wide diversity of staple foods (banana/kakake to the east; large taro gardens on hillsides to the west), including fruit and nut trees, are grown ▪ A wide range of plants are taken from the forests, especially tree 'cabbages', wild yams, wild mango, wild betel nuts and wild breadfruit
social	▪ NOSSA network established to assist in development of processed foods ▪ Custom is still strong (although less among the youth) and people share ▪ Youth have their own groups and work well together (although they need a leader)
financial	▪ Some banana chip making, coconut oil (SLIRAP/NOSSA) ▪ Cocoa is the main cash crop all along the coast, with markets at Waihagha ▪ Pigs are kept by each family for sale and customary exchanges
Issues	▪ Transport/marketing: a very isolated part of the coast past Wanahata with steep hills to the sea, strong currents and rough seas; ships terminate at Waihagha to the west and Namungha/Santa Ana in the east ▪ Ships do not stop between Maraone to Woua, so people take cocoa in canoes to Waihagha ▪ Cocoa in need of rehabilitation and improved disease control; need for driers ▪ NOSSA as a processors' support group needs strengthening ▪ Alomae reached Wanahata relatively recently and is at Baghare and Maraone — immediate action required ▪ Education: only some have attended school and there are divisions between those who have and those who have not ▪ Health: diarrhoea; no toilets, no piped water (pigs in the water supply); high incidence of skin diseases ▪ Youth cannot put skills learned at RTCs to use

***Villages assessed**: Waihagha, Paregho (Commercial Coast)*

Vulnerabilities	▪ Cyclones, tidal waves, landslides and river floods ▪ Reliance on purchased rice ▪ Little land for gardens — used for cocoa
Assets	
physical	▪ Cross-island tracks to Kirakira (but not along the coast)
human	▪ Primary schools (most attend, but not secondary or RTCs) ▪ Clinics with nurses, nurse aide and a microscopist (Waihagha) ▪ There are copra and cocoa driers
natural	▪ Access to sea resources: fish, shells, including trochus and crayfish ▪ Access to swamps in some places (less kakake grown) and dry land where a wide diversity of staple foods are grown — banana is dominant, taro (but less westwards), sweet potato, and fruit and nut trees ▪ A wide range of plants are taken from the forests, especially tree 'cabbages', wild yams, wild mango, wild betel nuts and wild breadfruit
social	▪ Youth groups function well, with good support from the community; boys with a bamboo band and "The Sunshine Girls" help the community; there are outreach missions ▪ Women's fellowships help the disabled, the church and household interests ▪ Customs still followed eg. to ward off diseases of taro
financial	▪ The buying centre of the Weather Coast (ships once or twice a month for copra and cocoa) ▪ Crayfish sold to a buyer near Manivovo ▪ There are a number of money-making enterprises, including trochus, sawn timber (rosewood, vasa and kwila) for sale in Honiara, canoe making, sale of betel nut, pigs and tobacco
Issues	▪ Food short if sweet potato does not bear well in July-September (few varieties) ▪ Alomae of taro, especially at Apurahe (where kakake is now dominant) ▪ Land management: shortage of flat land for gardens as it is used for cocoa ▪ Rice consumption is high from sales of copra/cocoa — less time spent gardening ▪ Unmarried mothers; teenage pregnancies ▪ Health issues: pneumonia and malaria, STIs, high blood pressure ▪ Cocoa needs rehabilitation and people want information

***Villages assessed**: Maroghu, Apaoro, Tetere (Loggers' Coast)*

Vulnerabilities	▪ Cyclones, tidal waves and landslides ▪ Exploitation by logging companies ▪ Rice consumption very high, as is noodles and alcohol
Assets *physical*	▪ There is a track from Tetere to Wango Bay on the north side of Makira (three hours walk) where there is a road to Kirakira ▪ HF radios
human	▪ Clinics are at Maroghu and Tetere; Apaoro has none ▪ Primary schools
natural	▪ Forests are being logged at Maroghu and areas nearby; logging at Apaoro and Tetere a decade ago ▪ Access to the sea: bonito are taken once a year using traditional methods of capture ▪ Access to swamps and dry land where a wide diversity of staple foods are grown (banana and kakake dominate, then sweet potato), including fruit and nut trees ▪ A wide range of plants are taken from the forests: tree 'cabbages', wild yams, wild mango
social	▪ Effects of logging, past and present, have harmed the social fabric of communities
financial	▪ Shell money is made at Tetere ▪ Trochus is marketed ▪ Cocoa is the main cash crop, processed where there are driers or sold as wet beans ▪ Pigs are kept by each family for sale and customary exchange ▪ Vegetables, including spices, sold to the logging company
Issues	▪ Loss of agricultural biodiversity: yam and taro ▪ Short fallow periods and declining yields; sweet potato does not do well in the wet ▪ Cocoa needs rehabilitation and disease management ▪ Logging and its social and environmental consequences ▪ Health: skin diseases; teenage pregnancies; sanitation; no piped water; malaria; diabetes ▪ Children go to school hungry (Tetere) ▪ High illiteracy rates and low secondary school attendance ▪ Lack of social groups and feeling of uncertainty ▪ High rice consumption

Livelihood issues

Food production

The *Solomon Islands Smallholder Agriculture Study* (volume 2: p. 15) states: "Makira-Ulawa is a sparsely populated province whose people are renowned for a comfortable subsistence". As a generalization for the entire province this may be so, but for weather coast communities (and also those on Ulawa), it is no longer the case, even if it was ever the fact. Life is not easy on the Weather Coast.

However, there is an impressive diversity of foods grown in gardens, planted in villages or taken from forests and sea. Root crops and banana form the staple foods and the diversity is greater here than on the Weather Coast of Guadalcanal. Land is scarce, however; the only flat lands being narrow strips around bays fringed by coconuts, the sides of rivers often prone to flooding and occasional plateaus atop of steep mountains. Otherwise, crops are grown on hill slopes.

Villages display a wide variety of tree crops, both fruits and nuts, similar in diversity to that of Guadalcanal. *Barringtonia* cutnut is prominent, present in many forms, as is banana, a staple food everywhere on Makira.

Many foods are taken from the forests or cultivated there, less where there is logging, and — as occurs elsewhere in the country — forests provide materials for the construction of homes as well as medicines. Fishing is common, when seas allow, and there are traditional 'herding' techniques for bonito when in season and a variety of shell food is collected on reef platforms projecting from village foreshores. Some seafood is sold to local businesses or to charterers. Pigs, an important source of wealth and cultural exchange, appear to be healthy, whether tethered — as is common — fenced or free ranging; chickens, too, run free and provide income and occasional protein and are common in all villages.

Intensification of land use in response to rapid population growth is encountered throughout the Coast. Fallow periods are reduced — one to four years being common — and crop priorities have changed. In places, the shortening of fallows and the removal of tree cover on steep hillsides have led to serious environmental impacts.

The staples: root crops, banana and rice

The traditional food crops of the Coast are taro, banana and yam/pana, with kakake the reserve food and a crop for celebrations.

In the last 20 years or so, major changes have occurred in response to population growth and plant diseases. Kakake has replaced taro as a dominant food crop in many places along the Coast. Taro is now important only in the remotest areas where lethal virus diseases have yet to reach. Banana retains its status and yam/pana are still grown, though declining. Sweet potato and cassava are common, as is kongkong taro in some villages, especially where swamps suitable for kakake are limited. Agroforestry is impressive with abundant variety within villages and trees are often used as living supports for wild yams.

Banana

As expected, a large number of banana varieties, some with special uses, were recorded. Banana is an important staple everywhere and in some villages — Waihagha and Paregho, for instance — it is the most important food crop, supplemented with imported rice.

Makira has a huge diversity of banana. For instance, Manivovo is said to have had a collection of 103 varieties and still has many, and 69 varieties are maintained in a village in the Central Bauro highlands (north coast), but people are still introducing varieties from other parts of the country. This is a concern because of the possibility of bringing in new pests and diseases. It would be a tragedy if, say, bunchy top virus from other Pacific islands, severe strains of Fusarium wilt from Papua New Guinea or Australia, blood disease from Indonesia or moko disease from the Philippines were introduced, albeit unwittingly.

In this context it is disturbing to find that several types of banana had symptoms of virus at Wanahata and plants were dying from infection. Growing nearby, but without symptoms, was a variety called 'West', newly introduced to the area. As with taro, new diseases come with new varieties. Apart from this disease, scab moth (*Nacoleia octasema*) is an ever-present problem and people ask how to control it.

Banana: there are many varieties on Makira, but people are bringing in new ones which might bring new diseases

Cassava

It was reported on the Guadalcanal Weather Coast that there were few varieties of cassava, now an important crop due to the demise of taro and yam.

A similar low number of varieties (5-6) was found on the Makira Coast. However, because of the presence of kakake there is not the reliance on cassava as on Guadalcanal, but this situation may change. White peach scale (*Pseudaulacaspis pentagona*) was said to affect yield and it was confirmed to be common in food gardens.

Kakake

Makira is said to have more swamps than any other island in the country. In one way, this is fortunate; without them communities would have experienced major food security problems in recent years as lethal virus disease decimated taro. As taro declined, people switched to kakake and in many places they are now dependent on that crop. This change has happened within people's memory, perhaps in the last 15 to 20 years. Elsewhere in Solomon Islands, regular consumption of kakake would be considered an indicator of stress. That view needs to be modified in the case of Makira.

In no other place in Solomon Islands is *Cyrtosperma* of such importance as in Makira. Usually, it is grown in small swampy patches. Only where Gilbertise (i-Kiribati) have settled or in the

The main foods of the Weather Coast are banana and kakake - also known as giant swamp taro or Cyrtosperma

Kakake is grown in swamps, invariably with sago palm, although in some places sago palm is becoming scarce as people more and more use the swamps for food

Polynesian-inhabited outlying islands of Ontong Java and Rennell is it more important. Elsewhere in the region, it is a crop of the atolls, grown in pits dug to the fresh water lens and mulched heavily or as in Yap State, Federated States of Micronesia and Palau, grown in swamps in small patches.

This change from taro to kakake is not without concern, however. The genetic diversity is very narrow. Only three varieties were recorded during the visit; one of these was planted as a border between 'plots' and is not eaten, and a third is newly arrived and has yet to be assessed. The lack of varieties may indicate the relative recent change in status of this crop from reserve to food staple. There are many more varieties in Micronesia.

Another concern is that kakake is a very long-term crop, with maturity coming at eight to ten years. With a rapidly increasing population, kakake is hardly an ideal crop. Intensification of production is not an option unless more productive varieties can be found. At present, people either have to find more swamps or, if insufficient, the cash to buy rice.

Lastly, there are corm rots, for instance at Apaoro, which were said to have started when soil washed into the swamps from hillsides denuded of forests. Although of concern to growers, these rots are not yet extensive or found in all the swampy creeks.

By contrast, kakake does have the advantage over other aroids: it can be stored when made into a pudding — six-month pudding.

This is made as follows:

1. grate the corm
2. parcel and cook in an earth oven
3. pound in a wooden bowl
4. add undiluted coconut milk
5. pound again
6. eat.

It can be left in the bowl and if mixed daily, when the oil from the coconut milk acts as a preservative, it will remain edible for about two weeks. It sours over time, probably because it ferments.

One of the consequences of being dependent on kakake, particularly in a time of increasing population pressure, is that people are experiencing a shortage of sago palm: preference is being given to food over leaf for thatch.

Rice

As elsewhere in Solomon Islands rice has become a staple food on the Coast and in many places a prodigious amount is consumed. As a consequence, the DAL, with donor support, has been encouraging communities to grow the crop locally (0.1 ha plots per family producing 100 kg of polished rice).

On the Weather Coast of Makira, rice was first planted in 1998/99. Initially, there was much interest with family groups receiving seed, tools, fertiliser, pesticides and advice from extension offices. However, milling was a problem. The mill, at first located at Manivovo, was later moved to Murunga, where it has broken down.

There are still a few people growing the crop (for instance, at Tawarogha, Mwakorokoro and Murunga), but most people have given up.

Rice has been grown in all villages along the Coast since the late 1990s, but has not been a success

Is rice the answer? One man's story

I worked as a carpenter for Pamua school in 1984—1993. I did not have any other ways to earn income to support my family of four children.

I'm from Santa Catalina and married a woman from Tawarogha. Rice planting started in the village in 2002. The Agriculture preached to the villagers to grow rice and at the same time supplied seeds, but they don't come back to assess the progress. I did not start until 2005. I managed to get 10 kg of seeds from other people and planted 0.1ha — that's the area recommended by the Agriculture. I asked the people the spacing and number of seed per planting hole but they don't even know so I planted the way I think.

During this time the people gave up planting rice because there is no machine to mill the rice. It grew well and I harvested in November and December and planted back again in March. From the second harvest I got six bags and these are still in my house ready to be milled.

The problem is how to get the rice to Wainoni, which is where the machine is to remove the husk. Six bags will only be 1 or 1½ bags of mill rice. I planted another crop in June, but this time it was yellow and weak. Maybe I planted too many seeds in one place, I don't know. I put 10 to 30 seeds in one hole and spaced the holes about four to six inches apart.

Over time, I learned that rice would not solve my problem. I thought that this is the only crop that I can sell to buy kerosene, soap, matches and tobacco.

I am going to use the land for teak. I have planted some already and I have planted some vanilla too. I will probably plant rice again in the new land that I have cleared on the hill if the Agriculture assist me with market and mill.

Rice may be not the right cash crop to grow. It occupies our garden area and people neglected to grow root crops to feed their family.

Sweet potato

In comparison to the Weather Coast of Guadalcanal, the number of sweet potato varieties grown is low. Different names in different villages mean that it is hard to be certain, but there are probably no more than a dozen varieties on the Coast compared to at least twice that number on Guadalcanal. This is understandable: sweet potato does not have the same status on the Weather Coast of Makira where kakake is a main food.

In this regard, many villages are fortunate as sweet potato does not yield well where rainfall is high. On Guadalcanal, sweet potato often fails in the wetter months (July, August and September), and people experience a 'time hungry'. A similar situation was reported only from Waihagha, a village where relatively little kakake is grown. Here, hunger occurs when sweet potato fails due to heavy rain mid-year and seasonal high winds cause bananas to topple over. However, there are also reports of poor yields from the Commercial and Loggers' Coasts, where sweet potato is now an important food.

Not only are there a low number of varieties on the Coast, visits to many gardens showed the dominance of a single one. This variety is No Care, No Break, Bishop or Isabel depending on the location. It is the same as No Grade on Malaita, so named as it bears well in different soil types. Dependence on a single variety, even one that is as good as No Grade, could have serious consequences and this vulnerability should be alleviated.

In general, pests are only occasionally severe. At Na'ana and Paregho plants were attacked by an orange chrysomelid beetle perforating the leaves and causing extensive damage. This has been identified as *Monolepta sp.* (Chris Reid, Australian Museum, Sydney).

Also at Na'ana, plants were seen with phytoplasma-like symptoms (little leaf or witches' broom disease). Shoots along the vine show excessive branching, appear bunched and plants do not produce tuberous roots. There was evidence of spread between plots. Specimens have been taken for confirmation.

Monolepta sp, *a small orange beetle, causes extensive damage to sweet potato in some villages*

Taro

The last 15 to 20 years has seen the demise of the crop over large parts of southeast Makira and the Weather Coast.

This has gone unnoticed by people outside. There are various versions of events but a common theme is that sometime in the early 1990s, new varieties -— Brother, Bishop or Taro Niugini — came to the southeast corner of the island and they brought disease, which quickly spread. This disease is known as maehana hui on some parts of Makira, alomae on Malaita and chuaka on the Weather Coast of Guadalcanal. Today, large taro gardens are present only on the Forgotten Coast, at Maraone and villages to the west, but alomae is starting to make an impact here too.

In places where the disease is new, people are very concerned; their taro are dying and they imagine the disease might infect them. This was the case at Wanahata where scared growers abandoned their gardens and let the disease run its course, with consequent loss of planting material. This is a shocking state of affairs and needs urgent attention.

Alomae started to destroy taro on the Weather Coast in the 1990s and there are few places now where the disease is unknown

There are still a number of varieties of taro grown on the Weather Coast but numbers differ from place to place. Around Na'ana, the local varieties have been replaced by a single 'new' one; at Tawarogha a few more varieties are grown but only three families plant taro now and at Mwakorokoro there has been a great loss, with no taro recorded during the visit. The women said, "during the '80s Taro Niugini came, which brought the disease and the taro died".

Taro are still grown at Wanahata and large gardens exist at Maraone, Nima, Mage, Hagaruhi on the Forgotten Coast, but further to the west, at Waihagha and beyond, the amount of taro grown is much less as cash crops increasingly take people's time.

At Tetere, people said that they had 17 varieties but only a third of those asked were actually growing them and many may have been just recalling names.

Xanthosoma (kongkong taro) is planted in many villages and was ranked an important fourth at Maroghu. Unfortunately, it was seen to be suffering from wilt caused by Pythium root rot.

Amorphophallus *is still grown in some villages, where it is known as Toa*

It is interesting to see that *Amorphophallus campanulatus* (Toa) is still grown in many villages on the Weather Coast. This is an unusual aroid and one that has been lost in most parts of the country. It was not seen on Guadalcanal. Lastly, a single variety of *Alocasia* is sometimes planted.

Yam/pana

These two crops are always mentioned together and often planted together. Interestingly, they are retained in most villages, even on the Loggers' Coast, although few people plant them (less than 50 per cent of those interviewed at Maroghu and only six per cent at Tetere).

In many places, yams were still in stores in specially made garden houses at the time of the visit, when the diversity could be seen. They are culturally significant as well as being the main food in the middle of the year.

There were reports of yam diseases, *Colletotrichum* dieback in particular, and some instances of *Pratylenchus* nematode, but

Coconut, cutnut, banana, breadfruit, guava, mango, orange, and many more fruit and nut species are grown in the villages and there are many kinds of 'cabbages'

Yam and pana are important crops; there are many varieties

nothing to the extent seen on Guadalcanal where the latter is a major threat to production.

At Na'ana, the Philippine variety, Kinabeyo, is planted, and it was said to yield well with resistance to dieback. The scale insect, *Aspidiella hartii*, is present on stored tubers of both yam and pana. When populations are high they can lead to desiccation of the tissues so that they become fibrous and unpalatable.

Wild yams are common in some villages, where fruit and nut trees are used as living supports. They are also taken from the forest, where they grow wild or they are also planted. Three types were recorded, with Auhi Haka being common in many villages; this has aerial tubers and is easily propagated. These yams are an important reserve food.

Agroforestry

Villages on the Weather Coast of Makira, like those of Guadalcanal, have an impressive abundance of fruit and nut tree crops.

Cutnuts (*Barringtonia*) abound, with many varieties, and there are ngali nuts and the following fruits:

- banana
- citrus (orange, pomelo and bush lime)
- guava
- Malay apple
- mango
- papaya
- Polynesia chestnut (*Inocarpus fagifer*)
- in some places, the Reef Island Alite (*Terminalia catappa*) and Inkori (Pidgin) or Uri (Makira) (*Spondias dulcis*).

Many species of leafy greens are grown or taken from the bush

- four corner fruit (*Averrhoa carambola*) is present, but small
- breadfruit is invariably seen and ranked the fourth most important food crop at Paregho.

Oranges are not as common as on the Weather Coast of Guadalcanal.

Importantly, there are wild mangoes of at least two forms in the forests and wild breadfruit, of which both seeds and flesh are eaten. All these fruit and nut species contribute useful supplements to the diet.

Vegetables — leaf greens

The large diversity of leafy greens is another similarity between the weather coasts of Makira and Guadalcanal. On Makira, wahere (*Pseuderanthemum reticulatum*) — known as 'pure' on Guadalcanal — is less common. Those that are frequently used are:

- geke (*Polyscias* sp.); very popular and used by women after childbirth
- tagiro, in the same genus
- awosi (*Ficus* sp — sandpaper cabbage)
- 2-leaf (*Gnetum gnemon*)
- gogona (a fern known as 'kasume' elsewhere)
- boroto — a tree fern
- two unknown species — agori (with yellow leaves grown on river banks); rawarawa
- Borneo cabbage (*Sauropus androgynus*).

Sliperi kabis (slippery cabbage) is also grown but does not do well. There are shoot borers, leaf rollers, grasshoppers and *Nisotra*, a chrysomelid beetle which, as elsewhere, makes numerous holes in the leaves and renders them useless as food.

Livestock

There are contrasts between Makira and Guadalcanal. 'Cough cough', thought to be swine influenza superimposed on an initial chronic parasitic infestation, common in pigs on the Guadalcanal Weather Coast, is absent on Makira.

In general, pigs appeared to be healthy and are fed on household scraps, coconuts and root crops. Another contrast is the absence of the large pig fences typically seen on Guadalcanal:

most pigs on Makira are tethered, rooting in the soil on the strand line beneath coconuts and Casuarina trees or around houses in the village. Otherwise, they are kept in small pens or left to roam. Unfortunately, this may mean in streams and rivers.

There are similarities, too, between the islands. A common problem is the damage done to food crops by pigs, in some cases — for example, Tawarogha — preventing use of potential garden land.

On the Kakake Coast, people mentioned that local pigs have been crossed with new breeds imported by the RTC at Na'ana, but a common complaint is that they are 'too thin'!

Chickens roam freely through the villages and are an important supplement to diets. They, too, appear healthy.

Income generation

From the land

Local vegetables

The sale of produce within the community is discouraged in many places. It is contrary to custom, which places greater emphasis on social obligations and mutual support rather than monetary gain, especially from subsistence crops.

The feeling of the youth at Wanahata was to the contrary. They wanted a market once a week but the chiefs did not allow this. Selling to outside communities is allowed but possibilities are slim except for those villages close to Santa Ana and Santa Catalina where this is a relatively lucrative market. Similarly, vegetables are sold to the logging company at Maroghu but there is no regular market day, which is what growers would like.

Pigs — tethered or free roaming — are an important way for families to obtain money, and most keep them

Copra, chips, cocoa and livestock

From time to time families make copra, but not all have access to coconuts. Even those that have find difficulty selling copra, as buyers prefer cocoa for its higher value-to-weight ratio. In many villages people no longer make copra on a regular basis. Shipping is too uncertain and, because of that, there is the risk of the copra going mouldy.

With the encouragement of SLIRAP, oil is being made from coconuts at Tawarogha, Mwakorokoro and Wanahata and used to make banana chips. A local press extracts the milk before it is boiled to produce the oil.

Chip making is attracting considerable interest, although at SBD2 a packet, sales bring only relatively small gains and wider marketing is needed. Women are keen to try out new ideas, anything to make some money.

"Chip program is truly a program to promote local food, kai kai, and income. Many have an interest in the program. In order to strengthen food security, the program should not only be directed to SLIRAP members but also to the community as well".

A woman from Tawarogha

Cocoa is the cash crop of the Coast, but it has major problems. The greatest is the problem of marketing. Some villages have cocoa driers, particularly those where ships call regularly, for instance, Tawarogha, Waihagha and Paregho. Others do not and people sell wet beans to licensed buyers, either within the village or in villages nearby.

(below and following page) Banana chips, fried in coconut oil extracted using a local press, have become the new 'industry' of the Coast

Extreme living, extreme need

For some people, especially those living on the Forgotten Coast, 'nearby' is many hours paddling away. Wet bean prices vary: at present it is from SBD1.30 to 2 per kg, which is relatively high, and brings an adequate return to labour, so there is a lot of interest in the crop.

As has been reported elsewhere, people value their labour, and enter the cash economy when they feel that conditions are right for them, when they feel the return is justified.

For cocoa, in particular, this has some detrimental consequences. It means that when prices are low, the crop tends to be neglected. Or, perhaps, it might be more accurate to say more neglected than is usual, and this increases serious diseases. Consequently, loss of pods is high at all times.

In the areas visited, the state of the bearing trees was poor. Cocoa is grown among coconuts or forest trees, mostly along river flats behind the villages. In some places, bananas are used as a nurse crop. People said that extension officers showed them how to plant 20 years or so ago but they had not been back since to tell them how to maintain the trees.

There were a number of problems:

- trees are too close, so branches tend to grow vertically, seeking light, rather than develop a horizontal canopy
- pruning is rarely done to remove low-hanging branches
- trees are multi-tiered, making it difficult or impossible to harvest pods at the tops of high branches
- chupons are not removed nor are black pods infected by the fungus, *Phytophthora palmivora*.

In short, trees are in urgent need of maintenance but people have no knowledge of cocoa agronomy.

As a consequence of this neglect, branches and even entire trees are dying from cankers, the inevitable consequence of not removing *Phytophthora*-infected pods, allowing the fungus to grow back into the tree. The cankers are enormous, which is most unusual for Amelonado cocoa, the variety commonly grown. None of the team had seen similar infection on this variety elsewhere in Solomon Islands, which might be a

consequence of the extremely high rainfall on the Coast. The incidence of black pod and canker was similar to that seen on the variety, Na32, which is considered highly susceptible to these diseases.

In addition to black pod and canker, there were other diseases that need attention. At Tawarogha, pink disease (*Corticium salmonicolor*) was common in patches affecting both young and old trees. In wetter areas, Waihagha and Paregho, for instance, white thread blight (*Marasmius scandens*) was killing leaves that were left hanging from the branches. *Phellinus noxius* root rot was seen occasionally

Pigs are a way of accumulating wealth on the Coast, as they are everywhere in Solomon Islands, and on the Makira Coast piglets are sold for SBD100 and mature pigs for SBD300 to 500, depending on size. They are in demand because of their cultural significance, especially for Christmas feasts and for bride price exchanges.

Most households raise one to two pigs at a time. Some raise more, up to five, but in these cases greater planning and effort are needed.

It is often the duty of young girls and women to care for the pigs, although they might not get the proceeds when the pigs are sold.

Raising pigs is an important activity and, often, the money is used to pay school fees.

Lesser amounts are taken from raising chickens, with birds selling for SBD25 and eggs at 20-50 cents each.

From the sea

A variety of products, for subsistence or for sale, are taken from the reefs and sea:

- many types of reef fish
- bonito, in season, herded ashore using coconut frond fences
- turtles caught in traps in the bays
- trochus
- bêche-de-mer (before a national moratorium)
- crayfish.

These are caught or collected and sold where transport and access to markets allow.

Fishing is said to be easier on the Makira Coast compared to Guadalcanal, as villages are sited in more protected bays.

In recent years, a market for crayfish has opened up, with a buyer just west of Mwakorokoro taking crayfish from as far as Mami and Waihagha. The catch is frozen locally and taken to Honiara.

Seaweed 'farming' was tried at Mami, at the instigation of the Department of Fisheries and Marine Resources, but failed due to the lack of transportation.

Cocoa trees are in need of severe pruning in many villages; they are too tall for easy harvest of the fruits or for removal of the diseased (black) pods

Diseases of cocoa on the Makira Weather Coast

Fungal black pods lead to trunk and branch cankers (left and centre)

Leaves are killed by another fungus — white thread (below)

Overall impressions on income and expenditure

The income of people on the Weather Coast of Makira is very low, possibly as low as any other part of the Solomon Islands. It comes mostly from cocoa and copra (Table 2).

Interviews with men and youth suggested that on average income is about SBD15 per month. Slight variations were noted between villages with more on the Commercial Coast but no large differences between families in any one place.

People said that two years ago their incomes were much lower. Since 2004, they can sell crayfish and this has made a difference to their lives. When people at Waihagha added up their expenses, it averaged SBD150 per month, which means that there is a lot of borrowing between those who have and those who do not. A group of 17 women in the same village had a total income of SBD1,720 for the year; some had none.

Table 2: *Income and expenditure at Waihagha: interview of 20 men and youth*

Income		**Expenditure**	
Item	**No. of people** (max. 20)	**Item**	**No. of people** (max. 20)
Copra	20	Rice	18
Cocoa	18	Matches	17
Garden produce	12	Kerosene	16
Fish	7	Cooking utensils	16
Chicken	7	Soap	14
Betel nut	7	Salt	14
Pigs	6	Noodles	14
Crayfish	6	Clothing	13
Canoe making	4	Sugar	13
Tobacco	4	Fishing gear	10
Bêche-de-mer	3	Garden tools	10
Trochus	3	Batteries	10
Wild pig	2	Betel nut/lime	10
Milling timber	1	Labour	9
		Medicines	9
		Garden vegetables	9
		Fish/crayfish	8
		Petrol for OBM	8
		Torch	6
		Sea fares	6
		Leaf for roofing	3
		Radio tapes/cassettes	3
		Tobacco	3
		OBM spare parts	2
		School fees	2

As it may take two to three months to sell copra or cocoa, depending on the weather and the arrival of chartered vessels, cash becomes very short in the villages. There is no possibility of making any savings; income is too small.

Services on the coast

Transport

Much has already been said about the lack of shipping, which restricts people's ability to access markets to sell produce from land and sea and otherwise improve their living.

This was not always the case; residents at Mami spoke longingly of the MV Kotu (a ship owned by Benedict Kinika, so it was said), which ran regular schedules in the 1980s; and, more recently, the Province owned the MV Bulava, which serviced the Weather Coast, but is still undergoing repair.

As chief Moses says: "We have the resources: trochus, crayfish, fish, clam shell, bêche-de-mer, seaweed, copra and cocoa, but the shipping is not there, so we just give up. We had a society before, but it is finished now".

Some areas are more remote than others, with the stretch of the coast from Wanahata to Woua being the worse off for transport. Ships rarely visit, the coast offers few safe anchorages and the quantity of produce is small. People from Baghare to Woua use large dugout canoes to transport goods to the buying centre at Waihagha.

Mostly, people paddle from place to place as outboards are beyond their means and petrol is dear (SBD47/gallon at the time of the assessment).

Villages on the Kakake, Commercial and Loggers' Coasts do comparatively better, with chartered ships calling once every month or so, depending on the seas and the produce to collect. But a common complaint is that the ships do not take all that the people have to freight. Copra, for instance, is not wanted, the charterers preferring the more lucrative cocoa.

People need information on agriculture, health, logging and much more

Communication and information

There are HF radios in many of the villages, mostly with clinics or the churches. They are accessible to the public but a charge of SBD2 is made. There are no postal services. Wirelesses are rare or people cannot afford batteries, so SIBC broadcasts are not heard.

Agricultural extension services are non-existent. Field assistants should be at Marunga, covering wards 18 and 19 (Weather Coast and Rawo) and at Namungha, covering wards 14, 15, 16, 17 (Star Harbour north, Santa Ana, Santa Catalina and Star Harbour south), but they are not at post and even if they were it is not likely that they would have the means to travel.

Communities have little contact with people from outside the village. Information comes from the schools (through the children), clinics (hygiene and reproductive health), churches (cooking, weaving, sewing and floral arts) and buyers. People at Paregho were asked to draw the links to various service providers and their (Venn) diagram is shown below (Fig. 3).

People have most difficulty in getting information about problems that arise in their gardens or commercial plantings. There are no books, leaflets or any kind of literature apart from religious texts and (primary) school books in the village. If people want information they might ask a neighbour or just live with the problem.

DAL extension staff were said to be concerned only with rice, not with other kinds of food production. Women at Paregho also said that they had heard about funding opportunities from CPS but did not know how to access it. Finding people to give them information and, as in this case, to help them further is a great need.

Fig. 3: Organisations directly or indirectly connected to people of Paregho that have potential to assist with agriculture and related activities

Large canoes, paddled with or without help from the wind, are used to ferry people, foods and commercial products along the Coast, between villages and buying points

Clinics, health, hygiene

Interviews with registered nurses and nurse aides at clinics along the Weather Coast found that, in the main, people are healthy. There are colds, influenza (at Apaoro most people had the 'flu), pneumonia and malaria, but malnutrition is not reported. There are signs, however, that changing lifestyles in villages such as Waihagha, Paregho and Maroghu are bringing diseases often associated with diets based on rice, noodles and biscuits. It is unfortunate that much sought-after cash is used to purchase food as a priority.

In places, diarrhoea is common and this comes as no surprise. Throughout the Coast, the beach is used as a toilet and few places have piped water. Rivers and streams are used for drinking water, to bathe and to clean household utensils. Men often bathe upstream, only a few metres from women and children and pigs often frequent the rivers too. The Province and aid organisations have installed water supplies many times in some places (for example, under the AusAID Rural Water Supply and Sanitation project, which ceased in 2000), but lack of maintenance, land disputes or natural catastrophes has brought them into disuse. There appears to be little awareness of basic hygiene, although clinic staff do attempt to educate communities.

Skin diseases are common in some villages. Fungal infections covering large parts of the body were very pronounced in Mwakorokoro and Wanahata, especially in young children and youth.

Piped water supplies are in disrepair and rivers are used to bathe and for washing household utensils and clothes

Clinics, too, are affected by the weather. If seas are too rough for ships to call, then clinics may run out of supplies or it is difficult to get equipment repaired. Microscopes used to detect malarial parasites were not in use at Waihagha and Paregho, so presumptive treatments were given if malaria was suspected.

Not all the villages have clinics and there are strong demands for them where they are absent. Clinics have catchment areas of a thousand people or more, covering several scattered coastal communities. For Apaoro, for instance, it is a day's journey, paddling by canoe to Tetere, or two to three hours by outboard motor canoe if funds allow. In other places, where there are tracks along the coast, a clinic may be three to four hours walk away (for example, either side of Wanahata), a distance too great for pregnant women. Nurses and doctors do tour, but only if the weather allows.

Education, gender, youth

In general, the situation has improved considerably since the end of the ethnic tension, with new schools built or proposed (CHSs at Baghare and Rea), new school buildings (for example, PSs at Mami, Mwakorokoro and Wanahata) and teachers now at post full time. In the future, there may be an administrative centre for the Coast at Manivovo.

Most children attend primary school and some even pre-school classes, although this was not the case at Tetere, where most girls have not been to primary school and illiteracy rates are high (they were also high at Mami and Wanahata). Those that do go to school at Tetere are invariably hungry; coconuts around the school are barren, having been stripped of fruit by needy children.

Attendance at secondary schools or RTCs follows a national pattern: more boys attend than girls and for both, the attendance rate is low because of the difficulty of obtaining school fees. Few children get past form three.

Meetings with youth found that it was difficult to make generalizations about their situation, but there were concerns. Most pressing, perhaps, is the rise in numbers of teenage pregnancies, unmarried mothers and attempts at abortion in all villages. It is also apparent that girls do not understand their bodies. Various reasons were given by adults for these 'problems' of youth as they saw them, including not wanting to do hard work, the intolerance of youth to custom, refusing to heed the advice of parents and chiefs and general lack of discipline — parents and teachers are not allowed to 'whip' the children!

The extent of these problems is hard to discern as people are unsure of age, count teenage pregnancies with older unmarried mothers and mix those who marry later, but in the villages visited the number of unmarried mothers ranged from three to 15. More telling, perhaps, was the fact that numbers were on the increase and that it was a topic of conversation. However, the short group meetings held in each village were not sufficient to explore the likely complex explanations of the youth.

It might have been expected that, in the more isolated villages, the youth would have been better organized. That

was not the case. It seemed that organisation depended upon leadership, both among the youth as well as their elders. Where there was good support from the community, as at Waihagha, the youth groups were strong and in return they helped the community, did church work or went on outreach missions to neighbouring villages (Paregho). Where there was little support from the community, elders were stopping youth activities or were unhelpful (Mwakorokoro, Tawarogha, Tetere), and/or where there were tensions within the community that affected the youth and leadership was poor (Tawarogha, Mami, Wanahata, Tetere), then the youth groups were inactive. But in all places girls and boys said they enjoyed working together, although in some cases girls were critical of boys' behaviour and complained of their smoking and drinking beer.

"We are happy here and enjoy the place, except that we are too far from receiving regular shipping services and communications".

...Waihagha boys

Youth said they wanted money for their groups and as individuals. They wanted uniforms, footballs and tools. They raised money through hiring their labour and, sometimes, by having a communal garden so that they could sell produce.

As individuals, their successes followed those of their groups: Waihagha youth take income from fishing, copra, cocoa (although only twice a year because of seasonal fruiting), pigs, betel nut, tobacco, marketing local foods and may earn up to SBD200 a year.

Girls help with household items. Boys buy garden tools, tape cassette players and save for bride price.

In other villages there is dependence on working for salaried people such as teachers (SBD10 per day) or, more commonly, obtaining money from parents. Cocoa is the main source of income but where there are no driers it means a lengthy paddle by canoe to buying points (for instance, Wanahata boys go east to Nukumaghe or west to Waihagha to sell wet beans).

At Maroghu, the logging village, the young men and girls work for the company. There, the community does not work together any more.

"We have the skills, we want to put them into practice. We are tired of just singing in the church!"

...Tawarogha youth

A common complaint among the youth is that although they had been to RTCs and were given capital to start activities on their return home, it was not enough to achieve success. At Wanahata, the youth said that they could do carpentry but they did not have a chainsaw to cut timber; at Mwakorokoro, they needed business training — they had tried to do things but failed.

There was a lot of frustration. They have skills but need help to start businesses; and, importantly, they want support from the community. Occasionally, it was said that the village leaders needed the training, not them!

Women appear to do a disproportionate amount of work compared to men in most of the villages. They feed pigs, rear children, grow food and in many places tend to the cocoa, taking the wet beans for sale. Their participation in cocoa growing is unexpected, as elsewhere in Solomon Islands it is men who have charge of the crop.

Environmental impacts

Natural events

The history of villages on the Weather Coast is testimony to the vulnerability of the lives of the people there. In the last 75 years, there have been tsunamis, earthquakes, cyclones, floods and, more recently, landslides. Villages have been washed away and gardens ruined. Coconuts on the strand line commonly show the erosive force of the seas.

In recent years, landslides have become commonplace along the south coast of the Surville Peninsula. Pressure on land by growing populations has seen forest cover removed on steep hillsides, reduced fallow periods and, as a consequence, landslides occur during heavy rains. This year, Geta lost three houses, Naruka one and at Mami the hillside came into the church. More landslides are expected along this coast.

Logging

"Logging is one of the most significant threats to subsistence and livelihoods in Makira" (Solomon Island Agriculture Smallholder Study, volume 2: p.16). Nothing seen during the present assessment is contrary to this conclusion. Previously, in the late '80s and early '90s, IFI had the concession; today, logging is carried out by another company, Middle Island, based near Maroghu. Logging started there in 2004 and may continue for 15 years. IFI was said to have been more selective, taking only the larger trees.

In order to gain a better perspective of the effects of logging over time, visits were made to Maroghu, and then to Apaoro where logging commenced in 1989 and ceased in 1995. Discussions with the communities at these villages detailed both the negative and positive aspects of logging (Table 3). People at Apaoro are very disillusioned: they saw no benefit from logging and said that they did not want any company to return. But whether or not the view of the community will prevail is uncertain. For the most part, the communities have little say about whether or not the logging companies will come. At Maroghu, for instance, the community was consulted and many people, including most women, rejected logging; however, it went ahead on the decision of the landowners. Women at Paregho, too, are opposed to logging, feeling that it will destroy their source of drinking water, and that only the 'big' men will benefit. They worry because there is talk about logging coming to their village. SIDT did awareness programs about logging in the 1990s, but since then no other organisation has continued the work.

"Very little is done in the garden these days, as my husband works for the company. He earns SBD268 a month.

At the end of every month, my husband doesn't spend money for the family, instead he gives it to Mr Beer".

...A woman from Maroghu

The Maroghu community still remains hopeful that there will be positive outcomes. They would like to see the company develop cocoa and cattle along the roads, electrify the village and build a road from Maroghu to Apaoro and then across the island via the Wairaha river to Kirakira. Whether or not these hopes materialize time will tell. The experience of Apaoro would suggest they are unlikely. The logging company agreed to build a school with a permanent roof, but there was no expertise in the village to assist, and so it did not materialize.

However, from this assessment, there appear to be few short- or long-term benefits from logging. Logging has huge impacts on communities that are ill equipped to deal with the social and economic consequences. Unfortunately, what is seen on the Weather Coast of Makira is not unique: it is reported from other places in Solomon Islands, elsewhere in the Pacific and beyond.

Extreme living, extreme need

Evidence of an extreme environment: tidal waves, floods and landslides (this page, top following page)

At Mami, the hillside partly filled the church this year

The logging camp at Nagonaone, near Maroghu

Table 3:

Logging - positive and negative effects on communities on the Weather Coast of Makira

Aspect	Positive	Negative
Economic	Jobs for the young men (SBD1.80-3.50 per hour (up to SBD5 for operators); and for young women, who work as house girls (SBD15 per day)	Companies bring their own operators and other personnel rather than employing people from the community
	Vegetables sold to the company, including chillies and ginger	There is no market place or market day
	Firewood is plentiful	
		Company provides no assistance with milling hardwoods (as done in the Western Province)
Health		People are not producing food as previously, but relying on purchased foods of rice, noodles and biscuits
		Health concerns: cases of diabetes, high blood pressure and STIs; and rise in malaria as stagnant ponds and blocked streams increase populations of mosquitoes
Social		People are not willing to do community work unless paid
		Drinking is causing fights and tension in the family and community
		Borrowing (and stealing) is high: people want money for alcohol and for gambling
		Benefits go mostly to landowners, as they do not share the royalty with the community. Only the landowners have stores
		Culture not respected: loggers marry local women, then leave without them; there is prostitution; teenage pregnancies
		Women's work load increased: have to look after children as well as work in the garden alone; often a shortage of food, as the money is spent on beer/ gambling
		Youth are attracted to money and leave school early to take jobs with the companies
		More land disputes
Environment		Coconuts removed for the logging camp, and no compensation
		Effects on the gardens: fertility has declined; soil has entered kakake swamps and caused corm rots; and there are landslides in the logged areas
		Eels and tilapia populations in the river have declined as breeding sites destroyed
		Sea polluted with soil from the land, and oil from ships and trucks (have to go further to fish and dive); rivers, too, contaminated
		Loss of medicinal and other useful plants from the forests

Aspect	Positive	Negative
Infrastructure	Stores, outboard motors and canoes	At Apaoro, none of these remain
	Roads into the forests, so women can use them to gain access to new garden land	Merremia creeper (Gapi) has blocked the road at Apaoro, so it is no longer usable, and bridges have collapsed as they were only made of logs covered with soil
	Help with a water supply, bringing it into the village (promised at Maroghu)	Disruption to the source: when wet, soil gets into the pipes; when it is sunny, the supply ceases
	Assistance given to the school and clinic when requested	
	Assistance with transport: free passage as well as freight for timber, cocoa and trochus to Kirakira and Honiara	
	There is a proposal to bring electricity to Maroghu, using the company's generator	

Another view on logging

"People have accepted logging in the area at the moment because they are desperate, and this is the only fast way of earning money from their trees.

People do not look into other problem issues that may affect the future generations.

Having no roads and accessibility is difficult. MAOPA arranges boats to the area to load cocoa and cubic (timber) where there are large quantities available. The charter boat is the MV Niutoli, owned by a Langa Langa woman from Malaita Province. The arrangement is to pick these products from Waihagha to Heuru in Arosi 1 and then sail to Honiara.

People are just desperate for money, and think short-term".

...the opinion of two men, Apaoro village

Part III – Solutions

This section of the assessment discusses strategies that might help the people on the Weather Coast improve their livelihoods. It acknowledges a statement of the Solomon Island Agriculture Smallholder Study that subsistence and smallholder cash crop production are the 'twin pillars' of the economy and crucial to food security.

This report makes recommendations on both these facets of the economy.

Strategies for the Coast

Throughout the section, reference is made to solutions recommended in *People on the Edge* as many of the problems found on the Weather Coast of Guadalcanal are of a similar nature to those on Makira. Primarily, the recommendations are made to KGA, the organisation that commissioned the assessment under the Isolated Areas project. However, many of them are outside the capacity of that project to implement, but they may be of interest to other development assistance organisations with an interest in rural development in Solomon Islands.

In this regard, the recommendations take account of a new project — *Makira Sustainable Rural Livelihoods* — to be implemented by World Vision in collaboration with DAL and KGA, among others, and with financial support from NZAID.

This will be a three year project to assist communities in all wards of Makira, excluding Wainoni west and east and Star Habour north. It aims to:

- increase cash incomes through improved financial planning
- identify new business opportunities, food processing in particular
- improve food security by providing awareness of new production techniques and family nutrition.

Many of the activities are those initiated by KGA in Makira and elsewhere and which continue under SLIRAP, so there is good reason for cooperation between the two NGOs.

As explained under *Limitations of the Assessment* (Part I Introduction), there are areas about which the team lacked competence to make recommendations. Logging is one of these. However, notwithstanding the team's lack of expertise, it felt compelled to say that considerable harm was being done to the community and environment by the logging operation at Maroghu and there appeared to be a complete lack of benefit from a similar operation a decade earlier at Apaoro. At the very least, a review of the operation and its impact is required.

From the findings detailed in Part II of this report, solutions are suggested under three strategies as follows:

- safeguard food production
- enhance income generation
- strengthen an enabling environment for development.

Throughout the discussion, attempts are made to compare and contrast the weather coasts of Makira and Guadalcanal as cost-efficiencies can be obtained by providing assistance to both at the same time (Table 4).

A summary of the recommendations is given in Table 5.

"Makira has abundant forests that have become the recent focus of multinational logging companies as forests are exhausted in other provinces. Logging is one of the most significant threats to subsistence and livelihoods in Makira"

...Solomon Islands Smallholder Agriculture Study (volume 2: p.15)

From the findings detailed in Part II of this report, solutions are suggested under three strategies as follows:

- Safeguard food production
- Enhance income generation
- Strengthen an enabling environment for development

Throughout the discussion, attempts are made to compare and contrast the Weather Coasts of Makira and Guadalcanal as cost-efficiencies can be obtained by providing assistance to both at the same time (Table 4).

A summary of the recommendations is given in Table 5.

Table 4: *Weather Coasts of Makira and Guadalcanal compared*

Similarities	Differences	
	Makira	**Guadalcanal**
Isolation, with only a few visits by mostly unscheduled (chartered) ships, making access to markets a major issue. Provincial sub-stations at easterly ends of the islands, with protected harbours, elsewhere absence of wharfs and safe anchorages	Ethnic tension indirectly affected communities as economy collapsed and education and health standards declined and markets stopped functioning	Ethnic tension had major impact on fabric of society: flight to safer inland areas, trauma from marauding militias, loss of PGR, with still unresolved community relationships
High rainfall, dangerous seas (no fringing reefs, and cool temperatures, especially mid-year)	Population of the wards Star Harbour (north and south), Rawo, Weather Coast and Haununu (excluding Santa Ana/Santa Catalina) is about 6500	Population of wards Wanderer Bay, Duidui, Vatukulau, Talise, Avuavu, Moli, Tetekanji and Birao is about 20,000
Limited land suitable for agricultural development: restricted to narrow coastal strips, river flats and steep hill slopes	Mostly impossible to walk along the coast; mountains to the sea, and deeply incised coastline	Possible to walk along the entire coast (although parts of the 'Keke Coast' are difficult)
Bush tracks to the provincial capitals (Honiara and Kirakira)	Relatively smaller rivers and estuaries, between steep hills, often bordered by swamps	Large rivers, with extensive flood plains, that regularly alter their courses; high mountains along the coast
Vulnerable to landslides, cyclones, river floods and tsunamis	No airports on the weather coast – only at Na'ana and Santa Ana	Airports at Mbambanakira, Avuavu and Marau
Cocoa and copra main cash crops; cocoa in need of improved management	Kakake a main staple all along the coast (made into six-month pudding)	Kakake not grown or only as a reserve food
Taro losses due to alomae – a new disease on Makira, called maehana hui in some places (chuaka on Guadalcanal)	Yam, *D alata,* diversity still maintained	Yams lost in many places due to diseases, particularly *Pratylenchus coffeae*
Wealth of leafy greens, fruits, nuts and wild yams produced in the villages and taken from the bush	*D bulbifera* not used for 'taumana'	*D bulbifera* made into 'taumana', a local 'ice-cream'
Banana a main food crop (probably more so in Makira)	Bonito 'herded' using coconut leaf fences in October-December; shell fish, crayfish and clams taken from reef platforms extending from the shore	Seasonal fishing for bonito when weather allows; no (or few) protecting reefs
Methods of lining organic matter in gardens (*lusu*, Guadalcanal; *paravou*, Makira)	No remittances	Remittances (some villages) from relatives in Aruligo and Honiara
Pigs are an important commodity, kept tethered or fenced (but sometimes free and damaging food gardens)	The effects of logging by international companies is a major concern	No logging by international companies at present

Strategy 1: Safeguard food production

There are several issues:

- first, the decline of taro and the need to safeguard what is left from lethal virus disease
- second, the vulnerability of having a single variety of kakake
- third, the loss of yam germplasm in some villages
- fourth, pests and diseases of other food crops
- fifth, how to improve family food production — planning for food needs and protecting against soil erosion and loss of organic matter.

Protect the remaining taro: provide technical training

That taro should have been destroyed by alomae over such a wide area in the last 15 — 20 years, without any effort to help the people, is nothing less than shocking. There is no point in ascribing blame for the introduction of the disease but there is need to heed the lesson: take great care when introducing germplasm to any island in the country and take even greater care when introducing germplasm to isolated places where monitoring is difficult.

Although alomae (known as 'maehana hui' in parts of Makira) is a very severe disease it is controllable. The key to success is to help people understand the etiology of the disease and for the entire community to agree to act together. The method of control has been documented recently in a leaflet written by KGA, DAL and PestNet and published by SPC. This leaflet should now be translated into the language of the Weather Coast.

The area affected by the disease is large. It is from Naharahau in the east to Tetere in the west. Students from RTCs have spread the disease, unwittingly, by taking infected taro back to their villages. However, in the more isolated parts of the Coast, from Baghare to Woua, where taro is still dominant, there is hope that the crop can be saved but only if there is immediate action. In some other villages, such as Tawarogha and Mwakorokoro, people have given up growing taro as "it no longer grows well" and it may be too late to help. Alomae is at Maraone but it is not yet severe. It can be controlled if it is dealt with immediately.

The SLIRAP staff at Mwakorokoro are well trained in alomae disease, its cause, its method of spread and how to control it. The staff need to make a program and then visit the villages of the Coast, starting with those that are more isolated. Their aim should be to help people understand the disease and the management options. It is particularly crucial to do this in places that do not have extensive swamps, where people cannot grow kakake as an alternative food crop.

Summary of recommendations for taro

1. Translate into the language of the Makira Weather Coast the leaflet on alomae; print, with SPC support, and distribute
2. Develop a program of action to explain to villages from Naharahau to Tetere about alomae's method of spread and management, starting in the more isolated villages where taro is still an important food crop staple
3. Obtain additional donor support if the work cannot be done with present support from AusAID/KGA Isolated Areas and NZAID/World Vision Makira Sustainable Rural Livelihoods projects.

The alomae leaflet produced by KGA, DAL and PestNet needs to be translated into the language of the Coast

(below) People do not know how to control alomae in their gardens, as it is a new disease; they just leave the plants to die and this enables the disease to spread

Create awareness: loss of taro and yam genetic resources

Apart from taro, there is loss of germplasm of yam/pana. In this case it is not because of disease, it is because people are intensifying food production to feed larger families.

Yam/pana are seasonal, relatively long-maturing crops, and at best provide food over a three-month period. In villages where people are relying on store-purchased food, for instance, Waihagha and villages to the west, the number of people planting yam/pana is diminishing even though many varieties can still be found. Fewer people maintain the crops and so there is a greater chance that varieties will be lost. Wild yam and taro are showing the same trend. Maintaining germplasm is important as people may want to return to these crops in the future, perhaps when present high cocoa prices decline or when people want to have diversity in their diet. But how can this be done?

First, there is need to create awareness among communities about the importance of maintaining a wide diversity of food crops: if one crop fails then there are others to rely on.

Secondly, there is need to identify local conservation champions and support them. In all communities there are people who are hobbyists, collectors of crop varieties. Dorothy Tamasia is an example. She has a collection of 69 Makira highland banana varieties. Because of the uniqueness of the collection and its value in terms of genetic resources, international agriculture organisations have helped her to describe the germplasm. She has been to Malaysia to learn how to do this and, with this international recognition, the collection has become more secure. Articles have been written in local and overseas newspapers and journals, and people from other countries have visited the collection, reinforcing its importance. The same is needed for taro and yam/pana on Makira and also on Guadalcanal.

Summary of recommendations for yam/pana

1. Identify people in each of the villages who have a passion for taro and yam/pana and who have the greatest number of varieties
2. Train these 'collectors' in describing the varieties
3. Publish their achievements widely within the country and overseas
4. Contact SPC PAPGREN — regional PGR network for assistance
5. People should be encouraged to plant wild yams in villages, using fruit and nut trees as support; this will increase reserves of food and also conserve the varieties.

Food security is based on maintaining different food crops and their varieties; this wisdom is being lost in places of the Weather Coast

Strengthen kakake production

There are two concerns: the vulnerability that comes with being dependent on a single variety, and to a lesser extent, corm rots.

Three varieties of kakake are reported from Wagina (Tony Jansen, Advisor KGA; personal communication) and these should be obtained, grown first at Mwakorokoro and, if new to the Coast, multiplied and distributed. Care should be taken when transferring planting material and DAL should be asked for advice.

Many varieties of kakake exist in atoll countries — in Kiribati and Tuvalu and in Pohnpei State of the Federated States of Micronesia where there is a collection of more than 40. Some have yellow flesh, indicative of high vitamin A, and mature in 18 to 36 months depending on variety, soil and other environmental conditions. These can be made available to Makira (Adeline Lorens, Chief of Agriculture, Pohnpei State; personal communication).

Also offered are early maturing breadfruits. It is likely that some form of intermediate quarantine will be required before the plants enter Solomon Islands and, if that is the case, SPC RGC should be asked for assistance.

That kakake should be reported to have corm rots is a concern, although they are only reported from Apaoro. The rots are also present in only some of the swamps, those that have been contaminated with soil from logging operations. There is not much that can be done at present other than to periodically check to see if the problem has worsened. If it increases to the extent of reducing production significantly then there is only one solution: all kakake will have to be removed and the swamp left fallow for 2-3 years.

As a precaution, growers should be careful when replanting 'tops' from plants grown in affected swamps. They should ensure that all decayed roots are removed and that the basal corm piece is free from obvious infection.

Summary of recommendations for kakake

1. Check on varieties in Wagina and introduce any that are new to the Coast
2. Seek information on characteristics and availability of *Cyrtosperma* from Pohnpei, FSM
3. Import varieties from Pohnpei, FSM, through SPC RGC
4. Keep a watching brief on pests and diseases of kakake by requesting regular information from SLIRAP and other extension staff.

Try other crops with potential

In Vanuatu, on the islands of Pentecost and Ambae, *Alocasia* is being grown increasingly (Vincent Lebot, VARTC, Vanuatu; personal communication). It is a hardy crop and does not require the attention that taro demands. Alocasia may have potential in areas where taro has been lost, where people are busy with cash crops or where they do not have swamps to grow kakake.

Alocasia and *Xanthosoma* are known on the Weather Coast of Makira but they are not common and only one variety of each was seen during the assessment. The SPC RGC is negotiating with other countries in the region to establish a collection in culture that has been pathogen-tested, and should be contacted for information. There are several varieties in Samoa and Tonga. Pests and diseases rarely affect *Alocasia* and *Xanthosoma*.

Growers in Makira are always seeking new varieties of sweet potato and people on the Weather Coast are no exception. Recently, the Isolated Areas project sent seven varieties from Papua New Guinea to Mwakorokoro for bulking and distribution to growers. The program of introduction and testing should continue, but emphasis should be given to Solomon Islands varieties that were important in the 1980s. These can be imported from SPC. All have been virus tested.

Summary of recommendations for other food crops with potential

1. Keep in contact with SPC RGC to follow progress on the establishment of a pathogen-tested collection of *Alocasia* and *Xanthosoma* varieties from other Pacific Island countries, and import them with assistance of DAL
2. Continue the program of introducing sweet potato varieties from SPC, but focus on those from Solomon Islands.

(above and below) Banana virus is infecting some varieties of banana and killing them

Monitor pests and diseases

Sweet potato little leaf is thought to be at Na'ana and samples were taken back to Burns Creek to check. They will be grown in a screen house and if symptoms develop sent overseas for examination. The only remedy for this disease is to pull out the affected plants when symptoms are first seen and burn them.

The disease is spread by a leafhopper, *Orosius spp*, so it may take some time to bring it under control. An advisory leaflet can be found on the SPC website[2].

Any condition adversely affecting banana has to be of concern because it is such an important food on Makira. Symptoms similar to black streak virus were seen at Wanahata affecting several varieties. However, when photographs were sent to experts at the University of Technology, Queensland and the Queensland Department Primary Industries, Brisbane, they were unsure of its aetiology. Fortunately, the disease did not seem to be of major importance, although during such a short visit it is hard to be certain. One plant was collected and samples will be sent to Australia for examination. Plants with symptoms should be pulled out, chopped up, burned or buried.

Banana scab moth was seen in many food gardens and people asked about its cause and how it can be controlled. The moth lays its eggs on the bracts, the leaves that enclose the flowers, at an early stage in their development. The eggs hatch in a few days and the caterpillars crawl under the bracts and feed on the skin of young fruit. By the time the bunch is exposed, the caterpillars have moved to the next unopened bunch further up the stalk. Because it is difficult to see the caterpillars, control is difficult. Spiders and other general predators exert some control, but in commercial plantations only bagging the fruit or using pesticides give effective control. Neither option is appropriate for growers on Makira, but they could try blowing ash into the unopened flowers — a method reported from Samoa.

There are three chlorotic Malayan Dwarf coconut palms at the Stuyvenberg RTC that need to be watched. If others become chlorotic DAL should be notified. It could be they have a disease or just that they are growing in soil impoverished by the scrapings removed to make the airstrip.

Yam scale is often present on stored tubers giving them a white spotted appearance. Whether or not the scale reduces yield is not known. When asked, people said they put the tubers in the rain for a few days before planting and this removed the infestation. It may be that the scales are already dead by this stage and the rain was just washing off the dead bodies.

Summary of recommendations for monitoring pests and diseases

1. Keep a watching brief on the suspected little leaf disease of sweet potato at Na'ana (Stuyvenberg RTC) as well as the possibility of a virus disease of banana at Wanahata. Report to KGA and DAL if these conditions spread
2. If the yellowing of Malayan Dwarf palms at Stuyvenberg RTC spreads, report to DAL
3. Growers who are concerned about the banana scab moth should try using ash to prevent infestations.

Scab moth,* Nacoleia octasema*, is a common problem on Makira and one that is difficult to control

[2] *www.spc.int/pps/pest_advisory_leaflets.htm*

Yam scale, Aspidiella hartii, on the surface of yam at Tawarogha; there is no information on the damage done by this insect

Improved family food production

Planning for food needs

A recommendation in *People on the Edge* was to hold an awareness program to encourage families to plan ahead, taking account of the likelihood of adverse growing conditions in the high rainfall of the Guadalcanal Weather Coast. A similar awareness program would be useful for the Weather Coast of Makira where the climate is similar, isolation is extreme and getting assistance in times of need is even more difficult than on the Guadalcanal coast.

A list of topics was provided in *People on the Edge* and these are repeated here:

- understanding and awareness of the need to plan for the months of most rain
- what crops are best suited to different times of the year
- what soil types are best suited to different crops
- what methods of cultivation are suited to hill and to flat terrain

Cocoa is a valuable commodity but it is being planted on land reserved for food crops. What if prices fall and people need to go back to growing their own food?

- the size of garden blocks necessary to meet family needs
- how to plant to ensure continuous harvests
- what crop rotations should be used
- how to plan to make best use of available time
- techniques for protecting soil from erosion and for maintaining soil fertility.

In addition, the report mentioned the raised bed-deep trench method used in high rainfall areas of Bougainville for rotations of sweet potato and peanut. This system should be tried on both Guadalcanal and Makira weather coasts. Sweet potato invariably performs poorly in these places during the wettest times of the year. However, it is an important crop throughout the Weather Coast of Guadalcanal and gaining in importance on Makira, especially in villages without swamps and kakake (for example, Paregho).

Even in those villages where kakake is grown, people need help in balancing use of the swamps for food with other needs. Increasingly, swamps are used for kakake at the expense of sago palm. Consequently, in some villages (for example, Tawarogha), people are experiencing a shortage of leaf.

There is need for improved crop planning in villages where cocoa is popular. The enthusiasm for cocoa is understandable because of improved prices, but expansion into garden land could have serious consequences in the future. People need to be reminded about the volatility of cocoa prices and realise that by the time the new crops come into bearing the value of beans will most likely have fallen again. At that time, subsistence production will be crucial to survival. A much better strategy is to rehabilitate old cocoa plantations (see below).

"Better to support rehabilitation rather than new plantings of cocoa."
…. world cocoa prices are currently in a relatively favourable phase in the price cycle. It could be expected that by the time the production from any new plantings is completed, prices will have entered the bottom of the price cycle"

…Solomon Islands Smallholder Agriculture Study (volume 3: p.32)

Using hoes to make mounds for sweet potato on steep hillsides can cause soil erosion. A digging stick is best.

Preventing soil and organic matter losses

It is especially important to give advice on protecting the soil from erosion and on maintaining soil fertility. There were innumerable instances on the Makira Coast where soil erosion is exacerbated by using a hoe to make sweet potato mounds on steep hillsides. In extreme cases, more frequent land use coupled with soil exposure has caused landslides. Invariably, organic matter is heaped to sides of garden plots or burnt in situ rather than used as compost or mulch. Where possible, talks were given on these aspects of cultivation during the visit, but far greater efforts are needed to encourage people to change entrenched practices.

It is interesting to note, however, that on both Makira and Guadalcanal there are traditional methods of cultivation that do not involve burning the vegetation before planting. Yam cultivation on Guadalcanal is an example where undergrowth is cleared, yams are planted and, later, upon emergence, trees are felled, leaving the litter to provide nutrients and the branches to support entwining vines. On both islands, vegetation is heaped in rows within the garden and crops are planted between. On Guadalcanal, it is known as 'lusu' and used for yam, taro and sweet potato, whereas on Makira, a similar method, 'paravou', is restricted to yam/pana. People need to be reminded of these traditional conservation practices and encouraged to put them to use.

Summary of recommendations for improving family food production

1. Implement the recommendations in the *People on the Edge*, namely: hold a food security awareness workshop at Turasuala Community Based Training Centre, inviting innovative farmers from the Weather Coasts of Guadalcanal and Makira identified as being successful in managing food security, lead farmers from other parts of Solomon Islands and trainers from PEDC, Bougainville. The workshop would develop content and a plan for an awareness program
2. Put the program developed at the workshop into practice. This will need to be done by members of the workshop visiting the areas of concern to hold village meetings.

   There will be need for leaflets and other extension documentation
3. For such a program, the Isolated Areas project should liaise with the Melanesian Farmer First Network (and work with the World Vision Makira Sustainable Rural Livelihoods project) and, if funds are needed to bring people together, request supplementary donor assistance.

Strategy II: Enhance income generation

Helping to improve cocoa production can make the greatest impact on people's livelihoods on the Weather Coast. People need cash and cocoa is the crop most likely to provide it. At present, the island produces a third of the country's exports (*Solomon Islands Smallholder Agriculture Study*, volume 3: p. 29). However, because of poor maintenance, yields of wet beans are very low.

Interest in the crop and in improving production is high, and there may be the potential of increased prices or stabilisation of prices if Solomon Islands is able to develop a niche market for organic cocoa (Ibid, volume 3: p.29). That should be a goal for the country, with CEMA taking the lead.

More immediately, the aim should be to increase the yields of trees already planted as this may reduce the trend to plant more. Planting more would be acceptable if it were not for the fact that new plantings are taking over land used for food gardens. (See *Planning for food needs*, above.)

In the longer term, other commodities should be tried and, if found suitable, developed along the Coast. Cardamom and pepper are the most likely candidates. The potential for both has been describe in *People on the Edge*, but they are again highlighted in this report. These two are chosen because of the need to diversify from reliance on cocoa, to choose commodities of low weight/high value and with potential to fit present farming systems.

Copra, betel nut, coffee, crafts and indigenous nuts have been dealt with in *People on the Edge*, and the reader is referred to that report. What is written there is relevant to the Weather Coast of Makira. There is some, albeit less, potential for all of them, but as transport and thus markets are so poorly developed on the Makira Coast it is best to concentrate resources where there is a reasonable chance of making some improvements in the foreseeable future.

In addition to crops, some comments are made on food processing, livestock and also marine resources.

Cocoa

Rehabilitate the trees

First and foremost, cocoa should be rehabilitated on the Weather Coast of Makira. There is enormous potential to improve the crop and, according to the *Solomon Islands Smallholder Agriculture Study* (volume 3: p.28), medium term price forecasts are favourable.

The Study (Ibid: p.90) gives an average return of SBD30 per day to a family with a 0.5 hectare planting of cocoa selling wet beans at SBD2 per kg, which is near to the present price on the Weather Coast of Makira. However, the Study allows only one and a half and five days a year for pest/disease control and routine pruning/cartage, respectively, in coming to its estimates of returns and this might be considered too low for the weather coasts.

Whatever the case, people need to develop a better understanding of the crop and how crop losses can be reduced.

"We were shown how to plant the cocoa trees 20 years ago, but no one has been back since then to tell us what to do. We just sell the wet beans to anyone who wants to buy them".

...woman from Paregho village

The following is required:

- severe pruning to —
  - remove the tiered storeys to improve access to ripe and diseased pods and preventing black pod-infected fruits raining spores on those lower in the canopy
  - remove low hanging branches to improve airflow through the canopy so that leaves and fruit dry faster
  - remove branches infected with pink disease and white thread
  - remove branches with severe canker

- make drains around swampy areas or those prone to flood
- replant areas where trees are dying or dead
- replant at proper spacing — most trees are planted at 2.4m X 2.4m (8 ft x 8 ft); this is too close under dense coconut or forest shade
- remove black pods on a regular basis (weekly during seasons of fruit production)
- break the pods outside the plantation to prevent build up of the black pod fungus in the soil.

Women and youth should be trained as they tend the crop in most places and sell the wet beans.

Recently, four DAL extension personnel have been trained by CEMA in cocoa agronomy. This is a good start, but none of them is resident on the Weather Coast although one should be at Marunga. Thus, there is an opportunity for the World Vision and KGA projects to assist.

Fortunately, KGA has expertise in cocoa and has staff at Mwakorokoro. They should be trained in cocoa rehabilitation. As they already have a program to tour villages on the Coast to promote banana chip manufacture, it will be relatively straightforward for them to give workshops on cocoa during these visits. Ideally, two extra staff, a man and a woman, should be hired under the Isolated Areas project and assigned to cocoa rehabilitation for one year.

There are many villages and, as transport is difficult, it will take some time to visit the entire area where cocoa is grown. There is also the need to monitor the results of the training. In addition, the World Vision zone trainers could also be trained so that they, in turn, can carry out training in their communities.

Build more driers and storage sheds

Rehabilitation of the cocoa trees is not the only need. There is also the need to store the crop and that means drying the wet beans.

At present, most people sell wet beans and, in many villages, they take them in canoes to places where ships come, for instance, Waihagha and Paregho, or they just wait for buyers to visit — and that is very risky. They can lose the crop — either the wet beans mould (after picking the fruit, the beans must be extracted within a week) or the fruits become diseased on the trees.

Drying them is a better option and there is sufficient cocoa grown in most villages to warrant a drier. If there were driers then people will have a greater incentive to care for the crop. Otherwise, having more beans is not useful — there is still a problem of selling them.

However, in isolated areas, where ships do not visit frequently, it is necessary to have good storage conditions. Discussions with Moses Pelomo, Acting Manager, CEMA, suggests that proper storage sheds can prolong storage life to two to three months.

There is a need for simple, low-cost structures, well ventilated, with concrete floors, corrugated iron roofs and solid walls. Cured cocoa is sensitive to moisture because the beans are hygroscopic — they absorb moisture from the air. Maximum moisture content of cured cocoa beans should be eight per cent. Values above this level lead to the development of both insect pest infestations and moulds.

Having a drier in each village and proper storage facilities are key to cocoa improvement on the Weather Coast of Makira.

Summary of recommendations for cocoa

1. Train SLIRAP staff at Mwakorokoro villages (male and female) in cocoa husbandry, including disease control, and integrate training into present SLIRAP activities
2. Train zone trainers of the World Vision *Makira Sustainable Rural Livelihood Project* in cocoa husbandry
3. If funds allow, hire extra staff under KGA supervision to assist with cocoa training in villages along the Coast
4. In collaboration with CEMA, attract donor support to improve or establish driers and temporary storage sheds in villages.

Pepper

In *People on the Edge*, it was recommended that plants should be obtained from Papua New Guinea, Vanuatu or Fiji as tissue cultures. Assistance in this regard should be sought from the SPC RGC. The recommendations went on to say: develop trial plots, engage the Farm Support Association, Vanuatu, to assist with training, and also make contact with the Honiara Bulk Store about potential sales.

Unfortunately, there has been little progress as establishing plants in tissue culture has proved difficult. Even if successful, there will still be the need to test the plants for viruses and, unless cultures are established from meristems, the likelihood of virus infection is high. In these circumstances, a better way forward is to introduce pepper as seed. The advantage is that seed will most likely be free from viruses. The disadvantage is that there will be some variability between plants.

However, as Dr J Thomas, Director (Research), Spices Board of India, said recently during a visit to Sydney: "better to have variability than viruses! There are severe viruses in some countries of South East Asia that have the potential to destroy an industry before it starts".

Summary of recommendations for pepper

1. Import seed of pepper, not tissue cultured plants, unless these can be obtained reasonably soon and indexed for all known pepper viruses
2. Contact Spices Board India for latest information on the crop and for a source of seeds if it cannot be obtained from the Pacific. [3]

Cardamom

This is a crop with great potential for the weather coasts of Guadalcanal and Makira and, unlike pepper, there is a source of seed in the country. It is likely that plants still survive at Betilonga, behind Mount Austin, Guadalcanal, although those at Fine Water in the highlands of Malaita are said to have died out. Immediate attempts should be made to locate plants at Betilonga, to clear the remaining patches and to monitor them for seed production. The seed should be taken to the Weather Coast and grown in nurseries at Mwakorokoro and then planted in the hills behind the village and elsewhere, under the supervision of the SLIRAP coordinator.

It is very likely that in the relatively cool, rainy conditions of the Weather Coast, cardamom will grow well. The challenge will come later, to dry the capsules properly and to find markets. Assistance may be possible from AusAID TSAP, which has an interest in spice crops (Owen Hughes, Interim Assistance Manager, TSAP; personal communication).

Summary of recommendations for cardamom

1. Determine if seed can be obtained from Betilonga, Guadalcanal
2. If present, collect the seed, make nurseries at Mwakorokoro and distribute plants to growers there and in villages around for planting in the hills
3. Later, train SLIRAP coordinators in cardamom production by visits to Bougainville (or other parts of Papua New Guinea)
4. Later still, seek markets with TSAP assistance.

[3] *dirres_spices@rediffmail.com or dirres_spices@yahoo.com*

Food processing and marketing

There is no doubt about the interest in banana chip making: people have taken to it in a big way. Not everyone has cocoa, so making chips is an alternative way of obtaining money, albeit a modest amount.

But, soon, marketing will become an issue. At present, the chips are sold in the villages, but the market is small. SLIRAP and the World Vision project will be required to help producers get the chips to Kirakira and Honiara, and that will not be easy.

The idea to develop farmer producer groups is the correct one and NOSSA is a good initiative. However, the SLIRAP coordinator needs to ensure enthusiastic members of communities are not denied the chance to participate in these small business ventures because of village feuds and animosities. All the farmers interested in chip production need to work together as there are savings to be made if marketing chains are established.

Further, a collaborative environment is needed to:

- consolidate shipments to reduce freight costs
- avoid unnecessary journeys of individual producers by making arrangements with buyers in urban centres
- enable bulk purchases of supplies, plastic bags in particular.

There is also the need for training, helping groups to understand the costs of production and to calculate profits. In this regard, there is an opportunity for FAO involvement.

Some suggestions have been made as to how farmers in Solomon Islands might be better assisted to market their produce (Heiko Barmann, FAO SAPA; personal communication):

- there is the need to train service providers, for example KGA staff, so that they, in turn, can train farmers
- starting with the basics, there is a need to explain the difference between simply selling a product and planned marketing, including financial management, ie. income and expenditure, profits and losses and how to construct and maintain a balance sheet.

A farmer field school approach should be used. This way, farmers could be helped to understand the importance of cost-saving measures. For example, the advantages of combining and coordinating sales, having an agent to do the selling and making bulk purchases of supplies and equipment.

Assistance of this kind is necessary but, for it to bring results, it is conditional on improved infrastructure, access to information, better education and also an understanding of basic hygiene.

With the new foods — chips, jams, etc — there comes an interest in using local foods in different ways for everyday consumption. People are keen to be trained in cooking. This should be on the curriculum of all RTCs (there were complaints from some youth that there was too much gardening and not enough 'new' things to learn).

In some villages there were trees laden with the fruits of inkori (*Spondias dulcis*) which makes a wonderful pickle and chutney. There is the potential of sales in Honiara. Additionally, kongkong taro (*Xanthosoma sagittifolium*) is grown extensively in some villages (for example, Maroghu) and could be used to make taro chips.

Summary of recommendations for food processing

1. Make sure that all those who want to make chips have access to information about the technology, irrespective of membership of any network
2. Use a farmer field school approach to train trainers (NGOs) in basic marketing (seek FAO assistance)
3. Suggest that RTCs include food preparation and cooking classes for both girls and boys in their curricula, teaching students how to use local foods in traditional and new ways, growing the ingredients where practical
4. Continue to explore the potential of processing local foods for sale in Kirakira and Honiara.

Livestock, marine resources and youth

KGA has considerable expertise in improved methods of production of pigs and chickens in Solomon Islands. It demonstrates breeding and keeping chickens for food and market at Burns Creek and has produced booklets under its *Sustainable Livelihoods for Rural Youth Project*.

KGA is also a partner in an ACIAR research project *Feeding Village Poultry in Solomon Islands* and has knowledge of up-to-date methods of producing feeds from local ingredients. Also, KGA has trained innumerable people in improved livestock practices, through workshops and attachments, and these people can help train others, youth in particular.

The focus on youth is appropriate as they often take care of village livestock, girls especially, and they are in need of assistance. Tawarogha youth specifically identified the need for training in intensive production of pigs and chickens.

KGA's experiences in its youth livelihood project should be brought to bear on the weather coasts of both Guadalcanal and Makira. For this, it will need to expand its present assistance to Malaita, Guadalcanal (north and west), Kolombangara and Choiseul. This will require donor support.

In many villages of the Makira Coast, youth are not finding community support and, so, there will be need for dialogue with chiefs and elders. There may be need for adult education classes too, so that these matters can be discussed in context. Discussions with youth during the visit showed they were clear in what they wanted and their demands were not unreasonable. They felt they had much to offer but needed assistance if their aspirations were to come to fruition.

They wanted:

- to be able to use the skills they had gained, for instance, at RTCs
- to be able to take small loans, for instance, for chainsaws so that they could get the wood they needed for carpentry
- to have financial training to help with business ventures
- above all, support from their communities.

Successful local business people as trainers

Starting small businesses is difficult, as Paul can vouch. He is a graduate of an RTC and started his business in the 1980s by selling petrol. Now, he has a store. He has achieved much, with sales of over SBD100 a day, depending on the amount of goods in stock, which in turn depends on shipping. Paul juggles running a business with family and community obligations, and that can be difficult. He might be asked to pay school fees or help with the construction of the church, and he gives credit with little hope of repayment. There's a lot he could teach youth on the Coast if he was asked to do so.

There are a number of areas where World Vision and KGA could assist with training, based on their experiences working with youth in Solomon Islands. For instance:

- increasing the concern of youth for their community and its environment
- building self-confidence and esteem so they can better accept their responsibilities and obligations towards improving rural life
- helping them to make decisions affecting their future and social participation
- encouraging parents and village leaders to be more concerned about youth affairs.

The consequences of not developing programs to help youth could be serious. Already, there are signs of discontent, refusal to follow custom, rising numbers of unmarried teenage mothers, STIs and use of homebrew. The youth in these places, many of whom missed years of education during the ethnic tension, need to feel involved in the community so they have meaningful lives.

Marine resources and those from rivers are plentiful on the Coast, accessible on or at the edges of reef platforms that extend into the calmer waters of the bays. In this regard,

Makira has advantages over the Weather Coast of Guadalcanal where coastlines shelve steeply from the beach, unprotected from pounding waves and high seas. Trochus, giant clam and crayfish are already taken for sale locally or in Kirakira and Honiara and there may be possibilities for further exploitation, but first investigations are needed to ensure sustainability of the resources.

Attempts should be made to estimate the present harvest rate of trochus to see if it is sustainable. If stocks are depleted then strategies can be put in place to aggregate adults to increase natural spawning rates, resulting in increased populations (Warrick Nash, Senior Scientist, The Worldfish, SPC; personal communication).

The traditional way of bringing smaller clams into a nursery in the protected waters of the bay is a well-known method of keeping them and ensures a reserve food for use in times of need. There is high demand for clams in Honiara and there is a small, but buoyant, export market. with sales to the aquarium trade. Some work on this is being done as part of an NZAID-financed project by Worldfish in the Western Province. There appear to be two concerns for the Makira Weather Coast:

- first, whether selling *Tridacna* (clam) species is allowed under CITES (Warwick Nash, ibid)
- second, whether or not the clams survive.

Whether or not clams survive transportation depends on the species, size and, in particular, how well the shell closes. These facts could be checked (Barney Smith, ACIAR Fisheries Program Manager; personal communication).

There has been considerable interest in crayfish along the Coast in recent years, after a buying centre was established near Manivovo. It is important to establish if present rates of extraction are sustainable. This can be estimated with knowledge of the length and type of reef as well as harvest rates. The Department of Fisheries and Marine Resources could help in this.

Discussions with the Department indicate that a fisheries base will be re-established at Aorou (Tetere) and there are plans to establish seaweed farming at Namungha and Apaoro. The protected bays at both these locations may be ideal for such a venture, but success will be determined by the availability of transport. Seaweed farming failed at Mami and the lack of transport was given as a reason.

Summary of recommendations for livestock, marine resources and youth

1. KGA to extend its *Sustainable Livelihoods for Rural Youth Project* to cover the weather coasts of Guadalcanal and Makira, linking with World Vision in financial planning under its *Makira Sustainable Rural Livelihood Project*
2. Through training (World Vision/KGA) improve young people's civic responsibility; train youth leaders to help invigorate youth groups, how to plan activities and ways of raising income; successful local people could also be used as trainers
3. Request assistance from the DFMR to help establish sustainable rates of trochus and crayfish harvests from village reefs and to explore the potential for clam cultivation aimed at sales in Honiara, if CITIES regulations and transportation allows.

Strategy III: Strengthen an enabling environment for development

This section looks at policies that might be instigated to assist development on the Weather Coast of Makira in order to overcome the socially divisive disparities that exist.

The need is to promote an enabling environment based on a people-centred approach to sustainable development with expanded access to transport, information technology, education and health-care services. There is need, too, to have increased protection and conservation of the natural environment.

The aim is to create broad-based economic growth and sustainable development which will speed poverty eradication and contribute to an improved quality of life.

A weather coast agency

There is no one organisation that looks after the needs of the weather coasts — this should change.

A separate agency is required. The isolation of these coasts means that they cannot lobby for assistance as successfully as other parts of their provinces. Because of their particularly difficult circumstances, they should be treated as a special case. As the *Solomon Island Agriculture Smallholder Study* says (volume 2: p. 15): "This isolation, and frustration at the lack of development, is at its most extreme on the weather coast of Makira, which suffers from developmental constraints similar to those of the Guadalcanal Weather Coast".

After the assessment of Guadalcanal in 2005, the Weather Coast Agriculture Support Group was established. The aim of the Group is to mobilise resources for agricultural development and food security in isolated areas of the country and facilitate better collaboration between stakeholders. There have been meetings of interested parties — NGOs, Solomon Islands government and provincial agencies and individuals. Between meetings, discussions continue via an email list established to facilitate interchange.

Through the activities of the Group there is now a much better understanding of what is being done on the Weather Coast of Guadalcanal. There have been exchanges of information concerning the rehabilitation of the road from Marau to Kuma, the opening of airfields and news of training in cocoa husbandry by CEMA.

Representatives of the World Bank and CIP have attended meetings to talk about their development assistance ideas. However, the Group has not reached the stage of mobilising resources and putting into effect any of the recommendations of *People on the Edge*. This is not surprising as, apart from KGA, World Vision and Guadalcanal Province, there are no other agencies giving particular attention to the weather coasts and the funds at their disposal are small.

Unfortunately, DAL is not well resourced to provide assistance to the weather coasts of Guadalcanal or Makira. It mainly concentrates on rice development. Further, not all staff are at post. However, DAL is collaborating with the World Vision *Makira Sustainable Rural Livelihood Project* which is scheduled to begin in late 2006. Under that project, DAL will provide an agriculture facilitator. There will be activities on seed saving, food crops, composting, crop rotations, etc; and there will be a nutritionist/training officer. These officers, and others, will train and backstop so-called zone trainers in the villages. PRAs will be carried out in target communities to define areas of greatest need and to develop plans for project implementation.

There is little doubt that the Weather Coast is an area of great need and the project might consider making it a focus for its activities rather than spreading limited resources throughout the island.

A Weather Coast agency would also complement plans by Makira/Ulawa Province to establish a Ward Development Authority, whereby communities develop their own action plans and put them to the WDA for review and support (Jackson Sunaone; Provincial Member, Arosi 2; personal communication).

Perhaps it could administer this program on Makira and also on Guadalcanal, obtaining resources and overseeing its implementation.

One agency working under the combined supervision of both provinces might be a cost-effective and efficient way to tackle development issues on the weather coasts. If such an agency was established it would have to tackle the problem of transport as a priority, but there are a number of other issues, including farmer networks, access to information, disaster preparedness, energy requirements and health.

Improve shipping services

Previously, the Coast was well serviced by ships, or so it was said, but these days only chartered vessels visit.

The availability of transport, or rather its unavailability, is a recurring theme in this report and it is unlikely that people's livelihoods are going to improve in a major way unless it is addressed.

Lack of shipping acts in two ways:

- the obvious is that communities are shut out of potential markets in Kirakira and Honiara and beyond
- also, the isolation creates despondency and frustration in villages where populations are increasing rapidly and standards of living are declining.

The youth, especially, feel this isolation. Elsewhere, such feelings have contributed to anti-government movements and to ethnic tensions and there are no reasons why they would not do so on Makira, in time.

Ironically, the only areas that have regular transport and help with marketing products to Kirakira and Honiara are those where there is logging by foreign companies, which in other ways is destroying the communities and the environment.

Perhaps as part of the agreements to log, and to improve public relations, logging companies on the Coast can help improve infrastructure. They alone appear to have the resources to assist in the more isolated areas where seas are too rough for most local ships. There is also the potential for these companies to establish roads across the island and, in the short-term, maintain them.

Opening the Coast in these ways would improve people's lives enormously. If help from the private sector is not forthcoming, then the onus will fall on central and provincial governments to subsidise the development of infrastructure on the Coast. There seems little alternative.

Waiting for a wave: it can take a long time to launch a canoe, and then the problems really begin (below and following page)

Ways to improve infrastructure?

"Significant incentives also need to be provided to the shipping industry to better service more remote locations.

For incentives to be effective, regulations need to be strengthened and enforced to ensure that private shipping companies keep to their contracted shipping schedule for a particular route.

Furthermore, subsidies, in the absence of improvement in basic infrastructure, are unlikely to be effective. Most important is the provision of all-weather jetty facilities that will lower operating costs and encourage regular services".

...Solomon Islands Smallholder Agriculture Study (volume 1: p.9)

There is a proposal to have an airfield in the Houra area (Hounuru and Rawo wards), but the location has not been decided (Jackson Sunaone; ibid). It would make an enormous difference to the Coast: it would have the obvious benefit of creating a fast link to Kirakira and elsewhere, and also help to overcome the feeling of exclusion that comes with isolation.

Sustain networks and provide access to information

Networks

KGA's attempt through the Isolated Areas project to build farmer networks is the right approach, but this will take time and a lot of resources.

So far, there is no network of farmers operating on the Weather Coast of Guadalcanal although preliminary discussions about forming one took place at a workshop at Avuavu in May 2006. Links between CBTCs are also required on this coast between TCBTC, Tari Bible School and Balanimanu Training Centre. If these are established it may help to stimulate networking between lead farmers and farmer groups and provide the backstopping that they will require. The Coast is too big for one centre to cover it all. On the Makira Coast, the Isolated Areas project helped establish NOSSA — North and South Star Harbour Farmers' Association — at a food-processing workshop in March 2006. It is composed mainly of PMN members and SLIRAP food processors, some 15 to 20 people with the Mwakorokoro SLIRAP Coordinator as secretary. The overall aim of NOSSA is to support food security in isolated areas. Its more immediate objectives are to:

- support local farmer networking
- assist marketing of processed foods
- develop communication links between KGA and NOSSA
- generally, to improve local livelihoods.

A similar network — the Baetolau Farmers Network — formed of PMN members and with similar objectives, started in north Malaita some years ago. This has also been supported by KGA.

Networks are based on getting the right information and on sharing

During the assessment, meetings were held with the NOSSA chairperson, secretary and some of the committee members. Using PRA mapping tools, bottlenecks were identified.

There is need to bring more women into managing the network. Membership should be open to anyone, not just PMN members, otherwise it might create tensions in the villages. There needs to be greater clarity on goals and objectives and office bearers need help in carrying out their roles and responsibilities.

Suggested solutions that came from the meeting included:

- train office bearers in project management, especially financial management
- clarify roles of SLIRAP coordinator (NOSSA secretary) and committee
- develop the technical skills of members through farmer-led extension, especially through farmer-to-farmer visits
- recruit women to the management of NOSSA
- ensure there are constant supplies of chips to satisfy demand in Kirakira and Honiara; this may require further planting of bananas
- organise bulk purchases, for example, plastic bags, which are expensive
- learn to be patient; the organisation has just started!

There is always a tendency for such networks to rely on the organisations that help to initiate them, at least to begin with. This has been the experience of the BFN and it is to be expected as members come to terms with the difficulties of operating and sustaining networks of this kind. However, the NOSSA committee realise these difficulties and also the benefits that a successfully run network can bring and are willing to persevere. They realise the need for training and that, in itself, is a good sign.

Access to information

Communication on the Makira Coast is extremely difficult but people need information on a wide range of topics, so solutions have to be found.

There are a number of ways that information on agriculture and other livelihood activities could flow between the communities and external assistance agencies; these are via:

- members of the churches who visit on a regular basis
- school teachers, nurses and doctors moving between provincial centres and villages
- HF radio; many villages have radios although charges are made for their use
- programs on SIBC — for example, programs of VOIS (when people have money to buy batteries)
- messages sent with ships that visit, albeit irregularly and with long intervals between visits in some places
- KGA and, soon, World Vision staff posted on the Coast.

Therefore, passing information to people in these remote areas may not be as intractable as it might seem at first glance, although, obviously, it will not always be easy.

But for those agencies working on the Coast there has to be a better way of transmitting written information. Email is the answer. A PFnet rural information station should be established at Mwakorokoro. HF radio alone is not sufficient: modern ICTs are needed. The station is unlikely to be sustained by the community as there is not sufficient money. It should be installed to improve the efficiency of SLIRAP but the community should be allowed to use it for a modest fee. An alternative location is the RTC at Manivovo, but only if it can be linked to Mwakorokoro.

Exchanging information and advice between the Coast and outside is only part of the problem. A greater difficulty, perhaps, is making people aware that information can be obtained for the asking. Women, in particular, do not seek information from outside their kinship groups, immediate family or close friends. Discussions with communities during the visit showed people seldom obtained information from outside the village (see Fig. 3).

As a solution, a lead farmer(s) is required in each village who will liaise between his or her neighbours and external agencies, in this case, KGA, DAL and World Vision. These lead farmers might be the zone trainers mentioned in the *Makira Sustainable Rural Livelihood Project*, although it may be difficult for one or even two

people to service several villages because of transport difficulties on this isolated coast.

Nonetheless, the idea of having champions to serve as information brokers is sound. These people would be volunteers, but in lieu of payment would receive training, attachments, membership to PMN and other benefits, as do other lead farmers working on KGA projects. They might be the growers given support to conserve taro and yam/pana (see above).

While decisions are being made on recruiting village volunteers, there are leaflets and fact sheets to prepare. Mention has already been made of the need to translate an existing leaflet on alomae into the local language and to ask SPC to print it.

Illustrated leaflets are needed on:

- cocoa rehabilitation — methods of pruning, black pod, canker, *Phellinus* root rot and white thread control
- village hygiene — toilets, skin diseases, drinking water, etc
- the reasons why broad crop diversity is important
- and, perhaps, awareness about the impacts of logging (women in particular asked for information on the positive and negative aspects. See Table 3).

World Vision has developed short training manuals covering a broad range of income generating ideas (copra and cocoa production, livestock, coconut and ngali oil, banana chips, chillies and peanut butter) and these could be starting points for more detailed handouts on each topic. There is much to do.

Disaster preparedness

The histories recorded in each of the villages show that living on the Makira Weather Coast is fraught with danger (Attachment 2).

Apart from landslides, cyclones and floods, there have been tsunamis that have destroyed villages, with loss of life and garden lands. Early warning systems are not in place, and even if they were, raising the alarm would be impossible in villages that do not have HF radios. In recent years, the world has been made only too aware of the destructive force of cyclones and tsunamis with events in Indonesia, Maldives, Papua New Guinea, Sri Lanka and the USA.

Solomon Islands is on an unstable tectonic plate and future catastrophic tsunami events can be expected. Thus, there is a need for surveillance on coasts open to the sea and a means created to alert villages before disaster strikes.

Energy requirements

Importing energy into the area in the form of kerosene, dry cell batteries, or petrol is expensive and unreliable. Whilst there are local energy resources in the form of coconut oil, hydro, solar and wind, they are not utilized. People rely on wood fuel for most of their cooking and lighting. As a result, people are energy poor and cannot benefit from the social, health and economic advantages derived from electric light, radio communications, food processing machinery and other modern technologies.

In the report, *People on the Edge,* case studies were provided on pico-hydro, solar battery recharging and coconut oil as a diesel alternative, but wind was not included. The reader is referred to those sections of the report, as they are pertinent to the Weather Coast of Makira. Andrew Mears, an author of that report has provided additional information and this is presented here.

High rainfall is often an impediment to solar as the cloud cover reduces the available energy and the electrical energy produced. This decreases its cost effectiveness. However, the high rainfall and steep terrain are positive indicators for the viability of small pico-hydro turbines to harness the power of flowing water to generate electricity.

The main difficulty with wind is:

- it is very difficult to assess the resource potential
- its cost effectiveness compared to solar and pico-hydro

The wind profile is very important. Unfortunately, there is very little wind data available for the weather coasts of Guadalcanal and Makira.

It is unlikely that the financial or institutional capacity is available for anything but very small solar, pico-hydro or wind systems. These would best be utilized by groups/organisations to provide energy for lighting, communications, specific income generating uses, health or educational purposes. For households, there is potential to use very small solar systems for lighting (solar lanterns) or battery charging, small pico-hydro or wind turbines for battery recharging (much like the systems used on yachts).

Radios, wind and solar power

Wind-up radios have, in the past, been a bit hit and miss. Some, costing about AUD50, are robust and come with a torch. The problem is that they are not cheap, and those that are cheap are not durable.

A more cost-effective option would be to use rechargeable nickel-cadmium batteries and a small solar powered battery recharger. A small pico-hydro or wind turbine is also good for this purpose as long as the rains come or the wind blows all year; otherwise a solar panel is a better investment.

The small solar rechargers use panels about the size of an A4 book and charge a couple of D-cells in 4-5 hours. This technology is available from Honiara. A slightly larger solar recharger (cost about AUD120) could recharge radio and torch batteries (nickel-cadmium) for several families, with each family buying their own batteries. Initial capital cost may still be too high for the weather coasts; there may be need for a credit or barter scheme.

***...Andrew Mears, Rural livelihoods and energy consultant, and an author of* People on the Edge**

Solutions to improving energy access must start with raising awareness and supporting households and institutions to modify their expenditure patterns. This information should include practical details on where to acquire components and typical costs. People are spending hard-earned cash on kerosene and dry cell batteries whereas small solar lanterns and rechargeable batteries can be more cost effective in the long term. People need to be aware of the benefits of the higher initial investment required for these new energy options. People need to see this in action and so demonstrations, possibly via the extension activities of KGA, DAL, World Vision or the *Makira Sustainable Livelihoods Project.* These and other programs should be encouraged to see energy as integrated with other livelihood outcomes. Information resources should include energy issues and stories and where projects or facilities are established, multi-purpose renewable energy resources should be developed if feasible. For example, a small pico-hydro established to power the lights and radio in a health or training centre during the night, can also be used for battery recharging or running a bag sealing machine for packaging chips during the day.

Education

There is no doubt that there are major improvements in education with new schools being built, improvements to classrooms, increased teacher numbers and more teachers at post. These efforts are to be applauded.

Now, the task is to encourage parents to send their children to school. Teachers tell how communities are split between those with education and those without. Many of the youth have not been to school or have only attained primary level. Waihagha is presented as an example of the diverse education of youth in the villages of the Weather Coast. Of 28 youth, 14 boys and 14 girls, attainment was as follows:

- boys — 7 had attended primary school; 6 to form 3; 1 to form 5
- girls — 8 had attended primary school; 3 to form 1; 2 to form 2; and 1 to form 3.

None of those that had dropped out of secondary school had been to RTCs.

Health issues: some way to go

Improvement for women

There is a paragraph in the *Report on the 1999 Population and Housing Census (Analysis),* Solomon Islands Government Statistics Office, Honiara, that is worth quoting as it sums up the conclusions of the assessment team (p.258). The report notes that the position of women in Solomon Island society has improved, with increased labour market participation, education and literacy and reduced fertility. In general, women's health has improved.

The report goes on to say:

"Despite these favourable developments, the census also identifies certain areas of concern... Malaria incidence as well as fertility are among the highest in the world and — where comparable information is available — within the Pacific region, the Solomon Islands is consistently among the poorest performers.

This applies, for instance, to primary school attendance, infant mortality, professional birth attendance, piped water supply and availability of modern toilets. Also, with high fertility, young commencement of childbearing and childbearing at later ages, Solomon Islands women are at risk for reproductive health related impairment and material mortality".

Therefore, there is still some way to go. There is need to have more nurse aide posts. It is not acceptable that people have to paddle or walk for a day to get to a clinic. It is not possible for women to do this when about to deliver and this means delivery in villages, which is a risk to health. The plan to have nurse aide posts at CHSs is a good one.

There is need for more sex education, particularly aimed at youth. Girls do not understand human reproductive biology and it is likely boys don't either. This is all the more important in light of increasing numbers of teenage pregnancies and unmarried mothers, STIs and the threat of HIV/AIDs.

The issue of toilets and piped water supplies is a vexed one. In the past, both the Province and World Vision have installed piped water supplies in most villages along the Coast. People have not maintained them or there have been land disputes, landslides or vandalism resulting in their disuse. People have to understand the benefits of piped water and toilets. For change to occur, communities need to make the connection between human diseases — diarrhoea in particular — defecating on the beach and using unboiled drinking water from rivers, which are also used to bathe, wash household items and where pigs wallow.

Awareness campaigns are required but these will not be enough. The failure to maintain water supplies and to make proper toilets is an indication of wider issues — weak village structures and the declining influence of chiefs and church leaders to motivate people to act for a common good.

Solutions will be hard to come by and the situation is unlikely to change until the most pressing need — access to transport — is satisfied. People are too preoccupied in the search for cash.

Just some of the lovely children of the Weather Coast; but will they have sufficient resources for a fulfilled life?

Population and food security

The Coast is starting to see the impact of population increase and people need help to plan for its effect on their lives. At present, they are passively allowing events to take their course.

In this situation, food security is being compromised. There is not enough garden land and the traditional staples are no longer grown in many places, either because of plant diseases or because they no longer give acceptable returns on labour. For many people, kakake is the new staple food, but there is only one variety and this poses a risk.

At present, there is no 'time hungry' as exists in many villages on the Weather Coast of Guadalcanal, where sweet potato and cassava fail in seasons when rainfall is highest or where there are pest infestations. But in villages without kakake, at Mami, Paregho and Waihagha, for instance — villages that do not have extensive swamps — people are starting to feel the effects of increased population. At present they can buy rice, paid for from sales of cocoa beans, but this makes them vulnerable to fluctuations in world market prices. There is good reason to believe these have peaked and will fall soon.

The present solution to population pressure is for people to move to new settlements as is happening at Mami and also at Tetere where people are moving to Hunihu and to places within Maro'u and Paumatawa bays. However, there will come a time when resettlement is not possible.

It would be preferable if there is more awareness and discussion within communities about present population trends and the options available if people want change. Government and provincial administrations have the responsibility to develop policy in these matters and to a large extent their decisions will determine the future of the people of the Weather Coast of Makira.

As the concluding statement of the *Report on the 1999 Population and Housing Census* (Ibid: p.259) says: "In the past, a population policy has been formulated without being followed by a vigilant decision to accept and implement it. Again disregarding population development as a policy area would represent a policy decision even though it is a passive decision, but it would be one with far-reaching consequences".

Summary of recommendations for an enabling environment for development

1. Seek donor funding to establish a Weather Coast support agency for Guadalcanal and Makira to act as a focus for development assistance to these isolated areas
2. Concentrate on the following priority areas in order to establish a framework in which sustainable development can take place:
   - transport — establish regular shipping schedules and all-weather wharfs
   - networks — continue to facilitate the establishment of NOSSA, helping it to define its goals and carry out its objectives, by training the office bearers
   - information access:
     - identify volunteers in each village to act as information 'brokers', facilitating the flow of information from outside and within the communities
     - establish a rural email station either at Mwakorokoro (or Manivovo) under PFnet
     - prepare leaflets on — cocoa rehabilitation; village hygiene; impacts of logging; crop PGR
   - disaster preparedness — develop early warning systems
   - energy requirements — investigate water, solar and wind generators
   - health issues — clinics, toilets, piped water; family planning: effects of population increase on food security.

Concluding remarks

This report concludes a study of the weather coasts of Guadalcanal and Makira, possibly the most economically deprived places in Solomon Islands. The studies endorse KGA's view that these areas are a special case for assistance and the wisdom of donor support to the *Sustainable Livelihoods for Isolated Rural Areas Project* in an effort to bring about change.

When taken together, the two coasts have much in common:

- both are extremely isolated and are shut off from services that, elsewhere, are taken for granted
- people live precariously on narrow shores between steep mountains and open seas that are exposed to strong winds and high rainfall that makes them among the wettest places on earth; these conditions hinder the development of infrastructure such as roads, wharfs, airfields and telecommunications
- shipping is irregular at best and mostly chartered
- population increase is resulting in unsustainable use of resources and the social fabric is starting to fall apart exacerbated on Guadalcanal by the recent ethnic tension and on Makira by logging.

Similarities extend to the agriculture that most people depend on for their livelihoods:

- on both coasts there has been a loss of staple food crops in the last 15 to 20 years through pest and disease outbreaks — taro and yam on Guadalcanal and taro on Makira
- there is now a dependence on banana and 'new' staples, such as sweet potato and cassava on Guadalcanal and kakake on Makira, and cultivation of these crops brings additional risks
- cocoa is the main cash crop and yields are low and marketing difficult.

If food security is to be improved, with more dependable food crops and higher incomes — up from the hundred dollars or so a year at present — then agriculture must be developed. There is much to do.

For KGA and the *Sustainable Livelihoods for Isolated Rural Areas Project* the way ahead is clear. With the limited resources at its disposal the project should focus on strengthening both subsistence and cash crops in Guadalcanal and Makira. This means continuing present activities on food processing, developing farmer networks and importing new varieties of food crops, as well as adding new components on the management of taro and yam diseases and cocoa rehabilitation.

It also means improving operational efficiency by establishing email links between area coordinators and the project base.

Adjustments to the project design will be needed as well as extra funding.

These activities will make an immediate impact, all the more so if government, provincial agencies and other NGOs collaborate in identifying the weather coasts of Guadalcanal and Makira as areas of extreme living and extreme need.

Table 5: *Summary of recommendations*

Item	Activity	Kakake Coast	Peninsula	Forgotten Coast	Commercial Coast	Loggers' Coast
Safeguard food production						
Taro	1. Translate alomae leaflet into language of the Coast 2. Program of action in villages to train farmers 3. Seek supplementary donor support, if necessary	×	xx	xxx	×	×
Yam/pana	1. Identify 'champion collectors' in each of the villages 2. Train 'collectors' in description of varieties 3. Publish their achievements widely 4. Contact SPC PAPGREN for assistance	×	×	×	×	×
Kakake	1. Import varieties from Wagina, multiply and distribute 2. Import varieties from Pohnpei State, FSM, through SPC RGC 3. Keep a watching brief on pests and diseases	xx	xx	xx	xx	xx
Other	1. Import Alocasia and Xanthosoma varieties via SPC 2. Continue to introduce sweet potato varieties from SPC, focusing on Solomon Islands vars.	xx	×	×	xx	xx
Pests	1. Watch: little leaf disease of sweet potato & yellowing of Malayan Dwarf palms at Na'ana 2. Watch: putative banana virus at Wanahata 3. Try using ash against banana scab moth	×	×	×	×	×
Food production techniques	1. See People on the Edge: hold food security awareness workshop at TCBTC to develop program 2. Put the program developed at the workshop into practice. Liaise with the MFFN and World Vision (Makira Sustainable Rural Livelihoods project)	xx	xxx	×	×	×
Enhance income generation						
Cocoa	1. Train SLIRAP staff at Mwakorokoro in cocoa husbandry 2. Train zone trainers of the World Vision *Makira Sustainable Rural Livelihood Project* in cocoa husbandry 3. If funds allow, hire extra staff under KGA supervision to assist with cocoa training 4. In collaboration with CEMA, attract donor support for driers and temporary storage sheds in villages	xxx	xxx	xxx	xxx	xxx
Pepper	1. Import seed of pepper, not tissue culture plants 2. Contact Spices Board India for latest information on the crop and for a source of seed if not available from Pacific	×	×	×	×	×

Cardamom	1. Determine if seed is available at Betilonga, Guadalcanal 2. If present, collect and transfer to Mwakorokoro, germinate and distribute plants to growers for planting in hills 3. Later, train SLIRAP coordinators in cardamom production 4. Later still, seek markets	×	×	×	×	×
Food processing	1. Ensure ALL people have access to information 2. Use FFS approach to train trainers in marketing skills 3. Suggest RTCs include food preparation and cooking for (girls AND boys: traditional and non-traditional foods) 4. Continue to explore the potential of processing local foods for sale in Kirakira and Honiara	xx	xx	xx	xx	xx
Livestock, marine resources & youth	1. Extend *Sustainable Livelihoods for Rural Youth Project* to cover the weather coasts of Guadalcanal and Makira, linking with World Vision in financial planning 2. Through training, improve youth engagement in community life and train leaders to invigorate youth groups 3. Ask DFMR help to establish sustainable rates of trochus and crayfish harvests from reefs and explore potential of clam	xx	xx	xx	xx	×
Strengthen an enabling environment for development						
Establish a Weather Coast support agency for Guadalcanal and Makira	1. Establish a framework for sustainable development to deal with eg: shipping services; farmers' networks; information access; disaster preparedness; energy requirements; health issues	xxx	xxx	xxx	xxx	xxx
	• Improve shipping services – subsidise if necessary, and ensure companies keep to schedules	xxx	xxx	xxx	xx	xx
	• Help NOSSA network define its goals and carry out its objectives and train office bearers	xxx	xxx	xxx	×	×
	• Identify volunteers as information 'brokers', facilitating flow of information from outside and within communities; prepare leaflets on: cocoa rehabilitation; village hygiene; impacts of logging; maintaining (crop) PGR; establish an email station at Manivovo or Mwakorokoro	xxx	xxx	xxx	×	×
	• Develop early warning systems for natural disasters such as tsunamis and cyclones	×	×	xx	×	×
	• Energy – compare wind and solar (wind-up radios)	×	×	×	×	×
	• Health – more clinics and awareness of health issues	xxx	xxx	xxx	xx	xx

Extreme living, extreme need

Attachments

Attachment I

The team

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Attachment 2

Summary tables of PGR

Sweet potato — *PGR data*

	Village								
Variety	**Na'ana** [1]	**Tawarogha**	**Mwakorokoro**	**Wanahata**	**Waihagha**	**Paregho**	**Maroghu**	**Aparoro**	**Tetere**	**Total**
Arosi 1							*(1)			1
Bishop (Isabel, West)	*	*	*(1)		*		*	*	*(1)	7
Carpenter						*				1
Christin					*					1
Come back tomorrow			*							1
Gagafione								*		1
Gina			*							1
Hogohogosia			*							1
Isaac				*						1
June									*	1
Kawaro			*							1
Low down light			*							1
Madu									*	1
Malu'u					*					1
Mangalo (Managaro)					*					1
Maoambo							*			1
Mareko (Sister)	*	*	*		*					4
Marou						*				1
Masu							*			1
Matrini				*						1
Matu								*		1
Peanut							*			1
Pilot									*	1
Piruma (Poitete)			*							1
Poroa	*	*								2
Rariawa									*	1
Rata					*					1
Repi								*		1
Rigi								*		1
Ripo								*		1
Saegua					*					1

	Village									
Variety	Na'ana [1]	Tawarogha	Mwakorokoro	Wanahata	Waihagha	Paregho	Maroghu	Apararo	Tetere	**Total**
Sodu									*(2)	1
Soto								*		1
Tapioka								*		1
Taramatanga								*		1
Tatahoro									*(4)	1
Tegumarere									*	1
Three months	*	*		*	*	*	*(2)		*	7
Wari									*(3)	1
Totals	***4***	***4***	***8***	***3***	***8***	***3***	***6***	***9***	***10***	***55***

[1] ***The information for all crops at Na'ana was from one respondent (Joyce Katavea)***

() Favourite varieties

Banana — *PGR data*

	Village									
Variety	Na'ana	Tawarogha	Mwakorokoro	Wanahata	Waihagha	Paregho	Maroghu	Aparoro	Tetere	**Total**
Aebo Bwoku (Boku)					*	*				2
Aghoa	*	*			*	*	*	*		6
Agi Etagave					*					1
Akeakenisusu				*						1
Angaghietaghai							*			1
Bweanaowasi						*				1
Five pounds		*	*		*		*			4
Fuki Aninetagai								*		1
Fuki Garagu			*					*		2
Fuki Gasufe								*		1
Fuki Matarofa			*							1
Fuki Mwaneqoqo								*		1
Fuki Ngari								*		1
Fuki Pula								*		1
Fuki Raeraegi								*		1
Fuki Rafu (Rahu)					*	*		*		3
Fuki Sukapena								*		1
Gahu Rea[1]					*					1
Garere		*	*			*				3
Gasuae[2]					*					1
Gasuhemae			*							1
Gaworaha				*						1
Gitagitanaurao			*							1
Go'ora		*	*	*						3
Guaha					*					1
Gualekana		*								1
Gu'ue			*							1
Hagahiga		*	*	*						3
Hahi					*		*			2
Haka							*(1)		*	2
Hamuara						*				1
Hia					*		*		*	3
Huki Auraporo								*		1
Huki Awogi (2 types)								*		1
Huki Fa'afi								*		1
Huki Go'gra		*								1
Huki Hagu			*		*					2
Huki H'e'				*						1
Huki Hele				*						1

	Village									
Variety	Na'ana	Tawarogha	Mwakorokoro	Wanahata	Waihagha	Paregho	Maroghu	Aparoro	Tetere	**Total**
Huki Mafui								*		1
Huki Matawa[3]					*		*			2
Huki Na'ana					*					1
Huki Sura				*						1
Huki Takai								*		1
Huki Tapi						*	*(2)			2
Huki Vara	*			*	*					3
Huki Wagae (West)					*	*	*			3
Hybrid			*	*						2
Kamare	*		*							2
Karehagatau			*							1
Kawa									*	1
Maetotona	*		*				*			3
Maketi							*			1
Manepago					*					1
Manuniasi	*									1
Marauraha				*						1
Mareto	*		*	*	*	*		*		6
Maritowa	*									1
Mavoro	*									1
Mawororaha		*	*	*						3
MMT						*				1
Mwagon			*							1
Ngari							*			1
Panepane				*						1
Ponuponu					*					1
Pua							*			1
Raerae Raeraesina)			*		*	*	*			4
Raesi (Matarofa, Raesina)	*	*	*	*	*			*		6
Ragapora						*				1
Rahu	*		*	*	*				*	5
Rahuni						*				1
Rapolo							*			1
Raumasa						*				1
Ria							*			1
Samua (Fiji, Fiti)				*	*	*				3

	Village									
Variety	Na'ana	Tawarogha	Mwakorokoro	Wanahata	Waihagha	Paregho	Maroghu	Aparoro	Tetere	**Total**
Sugar									*	1
Suka Pena					*					1
Supani	*									1
Taoro							*			1
Taukawa (2 types)								*		1
Tikopia									*	1
Tomalo (Tomora)					*	*				2
Topa (Tapa, Tapi))		*			*	*	*			4
Topeparususu (Topeqarusuna)		*	*	*						3
Toraka	*		*	*	*	*	*		*	7
Toraka Akeakesusu				*		*		*		3
Toraka Gatagata						*				1
Toraka Inatawa								*		1
Toraka Qonuqonu				*				*		2
Toraka Riwonao'o								*		1
Tuvaruhu					*					1
Twisti	*		*		*	*				4
Ulawa									*	1
Wae							*		*	2
Waghae				*	*	*	*			4
Waihaga			*							1
Waiiro						*				1
Wakerana (Wakenane, Wakena)	*	*		*	*	*	*			6
Waroi Wawo					*	*				2
Wowoa (Woaoa Gaworaha)				*						1
Totals	***14***	***12***	***24***	***23***	***31***	***25***	***22***	***22***	***9***	***182***

[1] Take out skin before cooking; too thick

[2] Rats like to nest in it

[3] Came from the sky

() Favourite varieties

Cassava — *PGR data*

	Village									
Variety	Na'ana	Tawarogha	Mwakorokoro	Wanahata	Waihagha	Paregho	Maroghu	Aparoro	Tetere	**Total**
Bedsusu								*		1
Kaotave						*				1
Kapoi (Kepok)		*		*			*			3
Nimale'e				*						1
Nanopa								*		1
No squeezem			*							1
Raraki								*		1
Roqoroqosusu			*	*						2
Takeanapara						*				1
Tapioka Mahui	*							*		2
Tapioka rice[1]					*	*				2
Tapioka ni Marau				*						1
Tapioka Nimade'e				*						1
Tenaru			*	*						2
Three months	*	*	*	*	*	*	*	*	*	9
Topioka yellow (Curry)	*	*	*	*	*		*	*	*	8
Underpan						*	*			2
Wasipo									*	1
Totals	***3***	***3***	***5***	***8***	***3***	***5***	***4***	***6***	***3***	***40***

[1] ***Rises up like rice when cooked***

Yam — *PGR data*

	Village									
Variety	Na'ana	Tawarogha	Mwakorokoro	Wanahata	Waihagha	Paregho	Maroghu	Aparoro	Tetere	**Total**
Aehi Toraka			*							1
Ae Kenisi	*	*	*	*						4
Ae Solomoni		*	*	*						3
Ae Fiti			*							1
Apa Apa									*	1
Apa Lolo			*							1
Apa Oro	*		*	*					*	4
Ari Pauna					*					1
Aufi Aekenisi								*		1
Aufi Aesoromoni		*						*		2
Aufi Fa'au								*		1
Aufi Faisi (Paisi)							*(1)	*	*	3
Aufi Fisu								*		1
Aufi Gapunasite	*	*						*		3
Gatagorahu						*				1
Aufi Ghapaghapa (Gatagata)				*	*	*	*	*		5
Aufi Mananga		*	*	*				*		4
Aufi Mwo'ou								*		1
Aufi Nifaka			*							1
Aufi Pagerisu								*		1
Aufi Porosiki								*		1
Aufi Qaumaniro								*		1
Aufi Rate								*		1
Aufi Risu (2 types)	*	*	*(1)	*(1)				*		5
Aufi Rokona'ainuni								*		1
Aufi Ruruta			*	*(1)				*		3
Aufi Sofoa (Tafoa, Tahoa)								*		1
Aufi Fito								*		1
Auhi Gogo		*	*	*	*		*			5
Auhi Hau					*					1
Auhi Kare					*					1
Auhi Matawa					*					1
Auhi Ogaoga			*							1
Auhi Toraka		*								1
Aunaufi			*							1
E'hi Gaga			*							1
E'hi Goro				*						1

	Village									
Variety	Na'ana	Tawarogha	Mwakorokoro	Wanahata	Waihagha	Paregho	Maroghu	Aparoro	Tetere	**Total**
Fara			*							1
Fogepepe			*							1
Gogo Biga (D pentaphylla)				*	*					2
Gope				*			*			2
Gope mani (D bulbifera)				*	*					2
Hagawara					*	*	*			3
Hara							*			1
Hasihasi									*	1
Huhinihaka				*						1
Huro				*						1
Huto (2 types)	*	*	*			*	*		*	6
Kakare	*									1
Kenesi					*		*		*	3
Kokoru			*							1
Kuvo	*									1
Kumare (2 types)			*							1
Maemae Owo					*					1
Mananga		*	*	*	*		*		*	6
Marao Rata					*					1
Moro	*		*							2
Mute					*					1
Mwamwa		*	*				*			3
Ngote					*	*				2
O'o									*	1
Ope									*	1
Pagherisu							*			1
Paumaniro									*	1
Pautaki					*					1
Peka			*							1
Philipian (?Kinabeyo)	*									1
Porokokoni			*							1
Porosiki							*			1
Qaumarino			*							1
Ruruta (2 types)		*	*(2)	*			*			4
Sahoa							*(2)		*	2

	Village									
Variety	Na'ana	Tawarogha	Mwakorokoro	Wanahata	Waihagha	Paregho	Maroghu	Aparoro	Tetere	**Total**
Sinamo									*	1
Susuata						*	*			2
Tahoa (2 types)	*	*	*							3
Tahasi					*	*				2
Temotu									*	1
Uhi Sikare							*			1
Vanuatu (?D rotundata)		*	*			*			*	4
Wai							*			1
Wango			*							1
Wano					*					1
Wapa Roro		*								1
Waromarawa						*				1
Totals	***10***	***15***	***29***	***16***	***18***	***9***	***17***	***18***	***14***	***146***

() Favourite varieties

Wild yam *(D nummularia) — PGR data*

	Village									
Variety	Na'ana	Tawarogha	Mwakorokoro	Wanahata	Waihagha	Paregho	Maroghu	Aparoro	Tetere	**Total**
Ama Ma					*					1
Amama							*			1
Auhi Haka				*	*	*	*			4
Ha'awato							*			1
Hagha Wara							*			1
Me'e									*	1
Meghe							*			1
Mute							*		*	2
Paisi							*			1
Paumagumagu					*					1
Tomu					*	*				2
Totals				***1***	***4***	***2***	***7***		***2***	***16***

Pana — *PGR data*

	Village									
Variety	Na'ana	Tawarogha	Mwakorokoro	Wanahata	Waihagha	Paregho	Maroghu	Aparoro	Tetere	**Total**
Aroha'I									*	1
Ataro							*			1
Fana Aufi			*					*		2
Fana Furu (Huru, Uru)	*		*	*	*	*		*		6
Fana Ifu								*		1
Fana Nikare								*		1
Fana Nimwara								*		1
Fana Nitoro								*		1
Fana Niuki								*		1
Fana Qagare (Qanarae)			*					*		2
Fana Qo'o								*		1
Fana Rapaoro						*		*		2
Fana Susuripenga								*		1
Fana Tapioka	*	*	*	*	*	*		*		7
Garoghaghi							*			1
Hana Apaoro					*					1
Hana Cyclone					*		*			2
Hana E'hi (Reefi)		*		*						2
Hana Gahroe				*						1
Hana Gau		*		*		*				3
Hana Gela							*(1)			1
Hana Ghe'e				*						1
Hana Gogo					*					1
Hana Igelo						*				1
Hana Kakare						*				1
Hana Kare					*		*(2)			2
Hana Mororawa		*								1
Hana Paoro		*	*	*	*		*			5
Hana Para			*							1
Hana Qaungeto		*								1
Hana Raha		*			*					2
Hana Risu				*	*		*			3
Hana Roto	*		*	*						3
Hana Siporo						*				1
Hana Sura (Huru)			*	*						2
Hana Tomasi				*						1
Hana Topioka		*	*	*						3
Hana Ugi (Uhi)				*	*	*	*		*	5

	Village									
Variety	Na'ana	Tawarogha	Mwakorokoro	Wanahata	Waihagha	Paregho	Maroghu	Apararo	Tetere	**Total**
Hana Wai		*								1
Hana W'e			*							1
Hui									*	1
Kare			*						*	2
Marerawa	*				*					2
Ouou (Owo'owo, Wowo)	*	*	*		*	*			*	6
Punaniu							*			1
Pwagare							*			1
Qaningeto		*		*						2
Rabaul							*			1
Rihoia									*	1
Totals	***5***	***11***	***12***	***14***	***12***	***9***	***11***	***12***	***6***	***92***

() Favourite varieties

Taro *– PGR data*

	Village									
Variety	Na'ana	Tawarogha	Mwakorokoro	Wanahata	Waihagha	Paregho	Maroghu	Apararo	Tetere	**Total**
Aro Fanefane								*		1
Aro Hanehane		*								1
Aro Kaia						*				1
Aro Matawa						*				1
Aro Nihaka (2 types)									*(2)	1
Aro Qa'a		*								1
Aro Taretore		*								1
Aro Toraka				*						1
Brother (Taro Niugini)	*				*					2
Bwanitawa									*	1
Elizabeth				*						1
Fare Faupagewa								*		1
Fare Kiririfu								*		1
Fare Mwourafa								*		1
Four Months						*				1
Guhaha					*					1
Gapanabo				*						1
Haka							*			1
Hanehane									*	1
Hanganitoto				*						1
Hango					*	*				2
Haremouraha									*	1
Herehere Kawo				*						1
Here Rawao					*					1
Hira (Hia)				*	*				*	3
Huini Sugu					*					1
Kabwara					*					1
Kamoa							*			1
Kaone				*	*	*				3
Kaqa'a (Kaba'a)				*	*					2
Kareko				*						1
Karuguhebo				*						1
Kohani				*						1
Ma'ahane				*						1
Maeworo					*					1
Magautora				*	*					2
Makia						*				1
Mareto					*					1
Marawaibo				*						1

	Village									
Variety	Na'ana	Tawarogha	Mwakorokoro	Wanahata	Waihagha	Paregho	Maroghu	Aparoro	Tetere	**Total**
Matanga									*	1
Matangatanga								*		1
Mataroha				*						1
Memegare									*	1
Ogaoga									*	1
Ohua									*	1
Ona									*	1
Qii (Bwii)								*		1
Rihomisu									*	1
Riwonau						*				1
Rungure				*						1
Siare				*						1
Sinagea								*		1
Solomon (Aroni Soromoni)							*	*	*(1)	3
Su'u							*			1
Taro Kaone				*	*		*			3
Taurawa					*	*				2
Toa					*					1
Toraka								*	*	2
Toretore						*	*			2
Utapua									*	1
Vanuatu									*	1
Wahango				*			*			2
Waibo				*		*				2
Wakena					*					1
Waiborava				*						1
Waniwai									*	1
Waingetara						*				1
Watoragi[1]				*						1
Wawata				*						1
Totals	***1***	***3***		***23***	***16***	***11***	***7***	***9***	***16***	***86***

[1] ***Early maturing***

() Favourite varieties

Attachment 3

Village summaries

Village: *Stuyvenberg Rural Training Centre, Na'ana*

Setting & history	▪ An RTC on the east coast of Makira, on an extensive flood plain of the Weinagho (and other) river, about 2 ½ hours by canoe from Kirakira ▪ It was opened in 1991 with 25 students and now has over 100 ▪ The construction of the airport started in 1998 ▪ The aim of the Centre is to assist standard 6 and form 3 leavers in planning their future careers ▪ Agriculture is the main part of the course; other subjects include maths, business, Christian education, leadership, woodwork, carpentry and home economics.
Farming systems	▪ The Centre has demonstrated the use of Gliricidia as hedges with sweet potato and cassava between on an area depleted of topsoil. Good example of soil reclamation and the potential of leguminous trees. There has been no uptake by the community
Food crops	▪ Taro varieties (several) were introduced from St Martins, Tenaru, some years after the establishment of the RTC, according to the agriculture instructor, Joseph Bai. In small villages surrounding the stations, a variety similar to LA16 is planted (known as 'Brother') ▪ Crop diversity is still maintained in the communities surrounding the Centre: yam (10); pana (5); sweet potato (4); cassava (3); and banana (at least 15). African yam is grown and popular (information from Joyce Katavea) ▪ The sweet potato variety No grade or No break is common and said to yield well ▪ There are several leafy greens used: kasume; sandpaper cabbage; Borneo cabbage
Cash crops	▪ Cocoa is an important cash crop from Nahunhu to Makorokoro, but transport is the problem. In the main, wet beans are sold to buyers ▪ Cocoa around Na'ana is said to be affected by pink disease (see Tawarogha) ▪ Copra is third in importance after cocoa and pigs ▪ Two palms in a row of Malayan Dwarf coconuts bordering the airstrip at the Centre have bright yellow leaves and small nuts. If others develop similar symptoms, DAL should be informed
Pests & diseases	▪ There has been loss of taro in the area, with the spread of alomae disease. Taro at the Centre show symptoms of alomae and, more commonly, *Colocasia bobone* disease virus ▪ Alomae is said to occur in all coastal and bush villages from the RTC to Wanahata, having been distributed, unwittingly, by students returning home with planting material ▪ Other pests/diseases of food crops are: - Lightening/dieback of yam, caused by a fungus, *Colletotrichum sp.* (variety Kinabeyo is grown and is resistant) - Scale of yam *(Aspidiella hartii);* said to be controlled by leaving the infested tubers in the rain before planting - There is white peach scale *(Pseudaulacaspis pentagona)* on cassava, and also on sliperi kabis. Cassava also with minor dieback and leaf wilt, probably due to *Amplypeleta sp.* - Several problems associated with sweet potato: rots are common in the river flats; beetles (an orange chrysomelid, possibly, *Monolepta sp.,* smaller than the pumpkin beetle, *Aulacophora similis,* causes extensive perforations to the leaves; possibly witches' broom disease (said to have been taken by teachers from local gardens and then by students to their villages)
Livestock	▪ The Centre demonstrates intensive pig and chicken operations ▪ Local pigs have been crossed with new breeds and distributed, but a common complaint is that they are too thin! Piglets are sold for SBD100 and mature pigs for SBD300-500, depending on size

Key issues

- Loss of taro diversity, due to alomae
- Sweet potato problems, especially spread of witches' broom disease
- Need for assistance with cocoa, especially pink disease management
- Need for the RTC to introduce local varieties of fruit and nut trees, from Temotu Province or from Weather Coast (introductions of mango from Tenaru not growing well)
- Irregular transport and purchase of cocoa

Village: *Tawarogha*

Setting

- A broad valley opening to a sheltered bay, with flat land adjacent to the Ahea river, extensive swamps to the south and steep hills behind
- About 780 inhabitants, 105 houses, with some people from Malaita, Guadalcanal and Santa Ana/Santa Catalina (more than 10 families)
- 2 tribes: the Atawa and Ameia (these two tribes are present in all villages throughout the island)
- There is no clinic, but one is present at Mwanigagosi, two to three hours walk
- There is a primary school
- A radio is with the Father
- Three churches are represented: Anglican, SSEC and Roman Catholic

History

- 1955: village constructed with 10 houses; and later name changed to 'place of the wind'
- Up to the 1960s, the main food was taro, yam/pana and banana. Kakake was used as a reserve food and at celebrations
- 1950/60s: a time of Masina Rule - land was 'registered' by walking the boundaries; interfaith tensions occurred; school operated by church (taken over by SIG in 1975); sweet potato and cassava introduced; copra production began (£4 per 80lb bag)
- 1960/70s: men left for work on Lever's plantations at Yandina, Three Sisters and Kolombangara
- 1970/80s: cattle development, and a society formed; cattle lasted 5 years, and the society 10; cocoa planting began, and logging for 3 years, until stopped by a land dispute
- 1971: a cyclone damaged the village
- 1980/90s: taro and yam/pana yields decline as pests and diseases increase; another attempt at logging, but not successful; three fishing projects (locally funded), but unsuccessful
- 2002: rice project, with DAL giving seed, fertiliser, tools and pesticides. Family groups involved and it created a lot of interest
- 2003: teak and balsa introduced by DFMR
- 2005: SLIRAP demonstrated production of coconut oil, banana chips and soap manufacture

Livelihoods

Food crops

- Kakake (one variety) dominates food production, eaten mainly boiled or as 6-month pudding; taste said to be poor during the main rainy season
- Other crops grown on the flat land adjacent to the river are: banana (10); yam (13); pana (8); taro (3); sweet potato (said not to yield well) (4), with fallow periods now down to 1-5 years. Some taro said to be grown still in the hills by three families
- Inocarpus is important in August when the fruit falls, boiled or cooked in an earth oven (only Wainoni people boil with coconut milk)
- Rice: one person has continued; most gave up because of lack of transport to the mill

Cash crops

- Not every family has coconuts or cocoa (there is a drier)
- Cocoa under mature coconuts, too close together, not bearing well (showing nutrient deficiency), poorly maintained
- The CEMA buying centre at Namugha closed during the ethnic tension

Pests & diseases

- Taro varieties have been lost due to alomae since the introduction of Taro Niugini
- Yam tubers with scale insect *(Aspidiella hartii),* but not too important
- Sweet potato tubers reported to be attacked by a small black cockroach (not seen); leaves attacked by a chrysomelid beetle
- Sliperi kabis attacked by caterpillars
- Cassava/sliperi kabis with white peach scale *(Pseudaulacaspis pentagona)*
- Both young and old cocoa severely infected by pink disease *(Corticium salmonicolor)* in patches of 10 or so trees

Agroforestry	▪ A large number of species in the village: Polynesia chestnut *(Inocarpus);* cutnuts *(Barringtonia* - two species are common, with many varieties); breadfruit; banana; orange; guava (common); lime; kapok; betel nut; mango; Malay apple; ngali nuts; and papaya
Livestock	▪ Wild pigs said to be a problem in the hills, destroying sweet potato and yam gardens ▪ Pigs are common in the village, tethered or roaming free ▪ Chickens, free range and appear healthy ▪ There is a small group maintaining cattle, with bush killings for local sales
Marine	▪ Many species of fish taken from the sea and rivers, plus crayfish, crocus, bêche-de-mer (previously, but now exhausted). Crayfish are sold to the buyer near Manivovo
Forests	▪ Teak planted in food gardens ▪ Wild yams taken ▪ Sandpaper, tree fern and two-leaf (Gnetum) 'cabbages'
Overall wealth	▪ Average income of 26 families is SBD12.50 a month from copra, cocoa, chickens, pigs, eggs, weaving and market produce ▪ Produce is marketed in Santa Ana and Santa Catalina, and people from these islands come to the village ▪ Expenses are SBD155 a month! There is a lot of borrowing ▪ People now work individually (households) as they have realised communal projects are seldom successful
Gender	▪ There are several church groups that undertake communal work, eg maintain drainage ditches ▪ Women grow the food, while men build houses and fish ▪ Men dominate decision-making! ▪ Many children do not complete their education due to lack of funds; they leave at standard 6 or forms 1, 2 and 3, or do not complete their RTC courses ▪ The village youth do not have activities and leaders do not help: they are tired of singing in the church! They have resources and skills, but they need something or someone to help them start ▪ Increasingly there are teenage pregnancies and unmarried mothers
Health	▪ The beach is used as a toilet ▪ There is no piped water in the village: because of a failure to pay for maintenance and land disputes
Key issues	▪ A lack of transport to take goods to Kirakira and Honiara is the main problem ▪ The village is vulnerable to flooding from the rivers ▪ Kakake is the dominant food staple, but corms are now taken earlier, compared to previous times when they were left to grow to 30-40 kg ▪ Loss of taro and narrow diversity of food crops generally ▪ Not enough sago palm as the swamps are used for kakake ▪ No clinic in this relatively large village; there are no toilets or piped water supplies ▪ Youth frustrations: not helping the community or themselves and teenage pregnancies increasing – leading to a loss of or disrespect for custom (and chiefs) and loss of indigenous knowledge ▪ People do not follow their chiefs; they do not work together as before; they want payment for any activity

Village: *Mami*

Setting	▪ Shallow bay, narrow beach and high hills behind; Naruka and Geta similar – landslides common along the southern coast of the Surville Peninsula ▪ The number of families in the village is 56; the number of inhabitants is not reported (probably about 300) ▪ Some people have settled from Santa Ana ▪ The Roman Catholic faith is followed
History	▪ No information
Livelihoods *Food crops*	▪ The main crop is kakake, followed by banana, yam/pana, sweet potato and taro ▪ There is the beginning of food shortages because of population increase and decline in soil fertility
Cash crops	▪ Cocoa is the main cash crop, with the highest production in the Star Harbour area (SBD2 per kg for wet beans; SBD8 per kg for dry beans - in Honiara) ▪ The community is still strong; there are community cocoa projects as well as individual holdings ▪ There are two cocoa driers on the northern side of the village ▪ Everyone has access to coconuts, but no copra is made ▪ Tobacco is sold locally (SBD10-50 per roll)
Pests & diseases	▪ Banana is attacked by a swamp hen with a red beak (parare) and other birds
Agroforestry	▪ No information
Livestock	▪ No information
Sea	▪ Trochus, clam shells and crayfish, bêche-de-mer (previously), sea weed (previously, but lack of transport stopped production)
Forests	▪ No information
Overall wealth	▪ There is no 'society'; it finished in 1986!
Gender	▪ Youth do not have funds for activities – they want uniforms, to be able to play games and to start clubs ▪ Five teenage pregnancies reported and 20 unmarried mothers
Health	▪ The Province put in a water supply, but no one was trained to maintain it ▪ A nurse aide post is being built by the Province (women go to Namungha to deliver, but it is far) ▪ A low incidence of malaria
Key issues	▪ Intensification of land use: removal of trees on steep slopes and more frequent cropping resulting in landslides during heavy rains ▪ Coconuts have been planted on steep hillsides and on top of the ridges ▪ Transport is a problem, although people can take produce across the peninsula and travel to Namungha (Provincial sub-station) by canoe. Often, ships pass by as the sea is too rough (last ship was 2 months ago)

Village: *Mwakorokoro*

Setting	▪ Deep bay with platform reef extending from the shore, narrow flat area behind the village before very steep hills surrounded by extensive swamps ▪ Nurse aide post, but nurse aide in Santa Catalina for 3 months at time of visit ▪ Primary school with 120 children; temporary form 1; 4 teachers ▪ SLIRAP radio; free for medical purposes and teachers; otherwise a charge of SBD2 ▪ There is a 'society' (Takorogu Cooperative Society)
History	▪ In 1956, the people moved to Mwakorokoro from Tunakumwa ▪ The Anglican church was first to be established, but later the people turned to Roman Catholicism ▪ In 1931, there was a tidal wave that washed out the village ▪ There was a major cyclone in 1971, when all the houses were damaged as well as the mangroves ▪ The school moved from Manivovo in 1986
Livelihoods *Food crops*	▪ The same range of crops are grown as at Tawarogha, with kakake the staple food crop and banana an important second ▪ *Dioscorea bulbifera* is grown – gope ghogho; and what appears to be *D pentaphylla* ▪ The number of varieties is: kakake (1); banana (24); yam (28); pana (8); sweet potato (8); cassava (5); taro (?); and breadfruit (1) ▪ The most popular sweet potato variety is Bishop; it is the same as No break (Na'ana) or No care (on Malaita) ▪ The best variety for banana chips is Toroka ▪ Fallow period down to 1-4 years; a mix of farming techniques apparent, with some people using hoes for planting sweet potato and cassava on steep slopes, with consequent soil loss ▪ Rice was grown in 1998/9, but the mill was moved from Manivovo, so people gave up. About seven families are still growing rice – they used to take it to Manivovo, but the mill is no longer there
Cash crops	▪ Cocoa and coconuts are the main cash crops. Cocoa is far from the village (not seen) and sold as wet beans to buyers from other villages; and copra is sold to any passing boat – the last was in June! ▪ There are no cocoa driers in the village
Pests & diseases	▪ Most of the taro was lost in the early 1990s, with the introduction of *Taro Niugini*
Agroforestry	▪ Large diversity of fruit and nuts trees in the village, as seen at Tawarogha, with addition of *Pometia sp.* ▪ A large number of bush cabbages in and around the village: - *Polyscias sp.* - geke (most popular and used by women after delivery) and tagiro - *Ficus sp.* - awosi (sandpaper) - Ferns – gogona and boroto - Unknown species - agori (with yellow young leaves grown on river banks) and rawarawa
Livestock	▪ Every family keeps local breeds of pigs and chickens; the pigs are left to roam the village ▪ There are a few Muscovy ducks
Marine	▪ Shell foods are taken from the reef and people fish when seas allow. Trochus and crayfish are taken and there is a clamshell nursery (people collect small clams, placing them in shallower, protected areas nearer the shore, where there is no current) ▪ Crayfish are sold to a man from the Philippines near Manivovo (the MV Marinto takes the frozen crayfish to Honiara)
Forests	▪ Same as for Tawarogha
Overall wealth	▪ At one time or another, families make copra (50%) or sell garden produce to each other ▪ Coconut oil is extracted to make chips, ring cakes and for use in kerosene lamps ▪ People from Santa Ana and Santa Catalina come and buy garden produce ▪ Cocoa and crayfish are sold only by a few families ▪ Trochus are sold in Kirakira ▪ Main items of expenditure are tobacco, school fees, rice, sugar, saucepans, clothing, biscuits, flour, soap, matches, kerosene and tinned fish

Gender	▪ There are teenage pregnancies (six in the village at the time of the visit) and unmarried mothers, with several children from different fathers ▪ Most of the youth reach standard 6 (80%) and some go to RTCs. ▪ Graduates from RTCs are not able to put their skills to good use because they lack support from the community: they need small business skills training ▪ Women maintain: "if men are involved it will fail!" ▪ Youth are not allowed by adults to carry out the activities they wish; and the adults do not provide the support they need
Health	▪ Water pipes exist, but they have been damaged by pigs and especially by the sea. The Province tried to help twice, but provided no training for maintenance (or so it is said) ▪ No toilets: people use the beach, but the school is in the process of building four toilets ▪ People consume more than 20 betel nuts a day, some many times that number; consequently teeth are stained and absent in a majority ▪ About 20% of the children have extensive skin disease (bakwa)
Key issues	▪ The lack of transport and the difficulty of marketing is the main concern ▪ Health issues: very high use of betel nut; no toilets; skin diseases; teenage pregnancies ▪ Youth with nothing to do ▪ The village is vulnerable to tidal waves, on a narrow strip in front of steep hills ▪ There is loss of soil fertility on steep hillsides used for cultivation of root crops ▪ Reliance on kakake; and loss of taro varieties due to disease (yam/pana still maintained)

Village: *Wanahata*

Setting	▪ Situated in a deep bay with reefs to the east and west, fringing coconuts, very steep hills behind and the Wanahata river to the west with swamps ▪ A village of 26 houses and a population of 94 in 2005; probably over 100 today ▪ There is a nurse aide post with nurse and nurse aide ▪ There is a school with standard 2, 4 and 5; and a pre-school; at nearby Baghare, there is an affiliated school, the Nema Extension Community High (catchment area of six villages) ▪ The people follow the Roman Catholic faith ▪ The Chairperson of NOSSA has a radio ▪ There is a cross-island road via the Warihito river to Kirakira
History	▪ Previously the village was called Napasive; it was started by a single family; most people have come from Baghare to the west ▪ In 1971, a cyclone badly damaged crops and there were landslides in 1973 ▪ In 1980, the school was established, but only this year has the village got a permanent building after the school was destroyed by Cyclone Namu in 1986 (it also washed out gardens of yam/pana) ▪ In 1982, a tidal wave killed all the livestock ▪ Taro began to die in the late 1980s ▪ In 1999, rice planting began
Livelihoods *Food crops*	▪ The dominant crop is kakake, with banana also important ▪ Previously it was taro with yam/pana and banana; now only a few people grow taro ▪ The number of food crop varieties is: kakake (2, one is used only as a border row); banana (23); yam (15); pana (12); sweet potato (3); taro (22) and cassava (7) ▪ Rice was planted in 1999; it grew well and it was replanted, but it was short and the ears were empty
Cash crops	▪ Cocoa wet beans are sold to a man in nearby Nakumaghe; there is no drier at Wanahata ▪ Cocoa along the river terraces is planted too closely (8 ft x 8 ft), so it is very tall and it is in need of pruning
Pests & diseases	▪ Taro varieties are being lost to alomae, which reached the village in 2001; this is the border area of the disease, but it is also reported from Baghare to the west ▪ There was concern that alomae would cause a human disease, so gardens were abandoned when first seen ▪ Custom is still strong (through less among the youth) and people observe certain rituals to ensure healthy taro crops ▪ Only a few families have large areas of taro ▪ Banana in gardens along the coast to the west of the village with ?banana streak badnavirus (garden of Leonard Haga) – samples will be sent to Dr Rob Harding, QUT, Brisbane. It affects several varieties and causes systemic necrosis and death
Agroforestry	▪ There is an abundance of cutnuts *(Barringtonia spp.)* in the village; also citrus species and bananas, plus the array noted at Tawarogha
Livestock	▪ Some pigs are fenced in small pens, but most roam the village and cause problems in the hills behind the village ▪ One or two pigs are kept per family, sometimes more
Marine	▪ People fish when the weather allows; crayfish are taken for sale
Forests	▪ Two-leaf *(Gnetum sp)* is taken, plus wild yams *(Dioscorea spp);* sago; wild mango; wild breadfruit; and a variety of tree 'cabbages', including ferns and sandpaper *(Ficus spp.);* Coastal Pandanus is used for weaving baskets and mats, although drying is difficult
Overall wealth	▪ The main income earning activities are coconut oil pressing to make banana chips, copra (but not made because of shipping difficulties), cocoa (about 10 people have cocoa) and selling crayfish (SBD30 per kg) ▪ Average earnings are SBD15 a month, but some earn up to SBD30 ▪ There is no store, so people have to go to other villages for kerosene, salt, matches (if none, then sticks rubbed together or fires are kept burning) ▪ Pigs are sold: small SBD25-50; adults SBD400-600 ▪ People's expenses exceed incomes!

Gender

- There is a Wanahata Youth Group that has been going on and off since 1995. There was a group garden last year, but not now. There is no strong leader and the group seems to be distracted by small interfamily disputes
- Not all girls are sent to school; in a meeting with 12 girls from 16 to 28 years of age, some had education up to standard 6; three had secondary eduction and two had been to an RTC; three were unmarried with children
- Most boys have reached standard 6 or form 1-2
- Only one of 12 girls had been to Honiara
- RTC training is useful, but although one person had tools, he did not have access to a chainsaw to cut timber
- Most youth depend on family support, taking money from copra or cocoa production
- The chiefs do not like people selling produce to each other; selling outside the village is allowed, but difficult and there is little to sell
- Youth want a market day each week to sell their produce
- There is some homebrew making from pineapples
- Custom is still strong: no shorts for the women!

Health

- Betel nut is chewed in prodigious amounts
- Incidence of skin diseases high; and there are cases of yaws
- Diarrhoea is a problem: pigs are in the river that supplies water to the village and the beach is used as a toilet
- Coughs are common: it is a cold windy place and colds can lead to pneumonia
- Malaria is more common between April-September

Key issues

- Transport: ships come to the village or pass by about six times a year. Seas between Bhagare and Murapui are very rough and ships do not stop, so people take copra and cocoa in canoes to Waihagha
- Custom is still strong in the village and people share produce, but not always ideas: eg NOSSA members have not helped those outside the group to learn chip making, although others are keen to learn
- There is a lack of radios; some of the youth had them previously, but then could not afford batteries, or the radios developed faults
- One variety of kakake is grown; taro used to be the main crop, but is now affected by alomae
- Pigs are an issue – the land behind the village cannot be used safely
- Health issues: skin diseases, colds and pneumonia
- There is an educational gap causing friction: most youth are illiterate, especially the girls
- Unmarried girls/women with children
- NOSSA established, but the group needs assistance; it is not sharing information with those outside the group
- Homebrew used by the boys
- Vulnerable to tidal waves and landslides; during the team's visit waves came into the village

Village: *Waihagha*

Setting	▪ From Wanahata westward the coastline is extremely rugged, with hills descending to the sea, undercut by pounding waves, or with narrow coves and sparse fringes of coconuts, occasionally deeply dissected by long valleys ▪ Situated at the mouth of a large valley of the Waihagha river, with a narrow beach, extensive reef platform projecting into the bay, large swamp behind the village, and steep surrounding hills ▪ An SSEC village of about 50 houses and 300 plus people ▪ A primary school (an extension of Waniworosi) established in 1980, and a clinic with radio. There is one RN, one NA and a microscopist, although the microscope does not work. The clinic has a catchment area from Maraone to Ahganiwai ▪ The village has two chiefs, but one has died ▪ There is a cross-island road
History	▪ The people are from the bush; they came to the village in 1945 (at the same time that other villages – Waniworosi, Hagegana, Woua and Hunamkui - were settled on the coast) ▪ In c.1943 there was a tidal wave and many people died ▪ Cyclone Nina severely damaged crops in 1983. There was little advance warning: it was of short duration, but intense. Afterwards there was food shortage
Livelihoods *Food crops*	▪ Banana is the dominant crop, followed by sweet potato, kakake, taro, cassava, yam/pana (previously taro was the staple crop) ▪ Although most people still grow taro, all have a problem with diseases, alomae in particular ▪ Rice farming started in 1998, there and all along the coast; but efforts did not last long as the villages are far from Manivovo where the mill was situated ▪ The number of crop varieties is: taro (12); banana (28); sweet potato (8); yam (18); pana (12); cassava (3) ▪ There are examples of *Amorphophallus campanulatus* (1), *D bulbifera, D pentaphylla* and several wild yams *(D nummularia)* ▪ There is a food shortage from July to September when sweet potato does not bear well, and bananas sometimes fall in the strong winds and rains ▪ There are swamps, so people could use them for kakake (at present it is a reserve food) ▪ There is a shortage of flat land for gardens as they are used for cocoa
Cash crops	▪ Coconuts and cocoa dominate; there are five cocoa driers ▪ Cocoa needs pruning and routine maintenance to remove black pods and chupons ▪ Waihagha is the buying centre of the coast from Maraone (to the east) to Anganiwai (to the west)
Pests & diseases	▪ The following are present: alomae of taro; black pod and canker of cocoa *(Phytophthora palmivora),* white thread blight *(Marasmius scandens);* and scale of cassava *(Pseudaulacaspis pentagona)* ▪ The disease of taro is said to be associated with that on cocoa: when growers see the disease, they throw the plants in the water! ▪ Mile-a-minute *(Mikania cordata)* is a nuisance in yam gardens
Agroforestry	▪ Cutnuts, ngali nuts, breadfruit and bananas are common in the village
Livestock	▪ One steer kept (as a pet?); pigs, fenced and free ranging; chickens
Marine	▪ People fish, capture crayfish, and take shells from the reef
Forests	▪ Wild breadfruit (seeds eaten), wild yams, and tree 'cabbages': two-leaf, sandpaper, fern and kasume ▪ Wild pig hunting
Overall wealth	▪ Sources of income are: crayfish sold to buyer from the Philippines living near Manivovo; copra (some families); cocoa (most families); trochus; betel nut; pigs; tobacco; timber milling (rosewood and Vasa for sale in Honiara); and canoe making ▪ Expenditures are: rice, kerosene, soap, clothing, paying bride price, church offerings, transport, garden food ▪ People have difficulty obtaining sufficient funds, so borrow from relatives

Gender	▪ Most of the youth get as far as standard 6, but few (five of 31 interviewed) get to form 3, and none have attended a RTC ▪ The youth groups function well: the boys have a bamboo band, and the girls their own sub-group: "The Sunshine Girls", helping their community, especially the old folk ▪ The youth obtain money from cocoa, fishing and cooking, using the money (SBD100-200 a year) for tobacco and games, and the boys save for bride price ▪ Support from the community is said to be very positive ▪ The women have formed the Women's Fellowship Band concentrating on sewing, weaving, church matters and helping disabled people; the Band hires its labour to obtain funds
Health	▪ Much less betel nut than at either Mwakorokoro or Wanahata ▪ The clinic has a catchment area from Maraone to Ahganiwai ▪ Diarrhoea is common; coughs mid-year; some malaria and pneumonia ▪ No diabetes, but some cases of high blood pressure ▪ Some single mothers (5/10)
Key issues	▪ Health issues: pneumonia and malaria, STIs; transport difficulties affect supplies to the clinic; no piped water to the village (damaged by a landslide); cases of high blood pressure (?changing diet); no toilets - people use the side of the creek ▪ Single mothers ▪ Food crop issues: pests eg taro with alomae; yam gardens with mile-a-minute; sweet potato has poor yields in the wet season (mid-year time of hunger); use of food garden land for cocoa affecting food security ▪ High rice consumption (plus sugar and noodles), creating potential vulnerability ▪ Vulnerable to cyclones, tidal waves, landslides and floods from the river (ruining sweet potato, cassava and yam/pana garden) ▪ NOSSA: more training of the office bearers is required

Village: *Peragho*

Setting	▪ A deep, well-protected bay, with extensive reefs extending from the shore to the east and west, at the mouth of a wide valley formed by confluence of the Peragho and Maianiara rivers, surrounded by high hills ▪ There are three chiefs ▪ The SSEC faith is followed ▪ There is a clinic with two RNs, one microscopist, but the microscope does not work ▪ There is a primary school with 60 plus pupils and two teachers ▪ There is a cross-island road
History	▪ In 1944, at the time of Masina Rule, two villages came together to establish Paregho on the border between Rawo and Hoununo districts ▪ 1940s: SSEC church started a bible school for people from Wainoni, Star Harbour, Rawo and Hoununo ▪ In 1952, a cyclone damaged the village and most of the gardens ▪ 1980s: heavy seas went through the village covering it with sand ▪ Previously, Chinese traders bought copra and people sought work at Taura (end of the peninsula), Yandina or Three Sisters
Livelihoods *Food crops*	▪ Main crops are banana, sweet potato and cassava, then kongkong taro, followed by taro/yam/pana (unstaked in some gardens) and breadfruit, grown in the river flood plain and hills ▪ Not everyone has kakake and not much is planted, but it is important at Apurahe, where there is an extensive swamp (and alomae) ▪ Custom still followed for taro and yam cultivation (eg a 2-3 day wait before going to gardens after eating bêche-de-mer) ▪ Most taro are planted in January and they are long maturing (9-10 months); but variety 4-month is planted at any time of the year ▪ The number of crop varieties is: taro (11); banana (20); cassava (4); sweet potato (3); yam (9); pana (9); kakake (1); and breadfruit (2) ▪ Amorphophallus campanulatus (Toa) and several wild yams (D nummularia) are grown ▪ Rice cultivation was tried, but people gave up as the mill is at Maroghu about 15 km away by sea ▪ Rice is important and large quantities are consumed
Cash crops	▪ Cocoa is very important, but in need of severe pruning and routine maintenance
Pests & diseases	▪ *Cocoa var. amelonado* with large cankers killing the trees; black pod *(Phytophthora palmivora)* incidence is very high; a lot of dieback caused by white thread blight *(Marasmius scandens)*; and occasional death from root rot *(Phellinus noxius)*; horse hair blight *(Marasmius crinis-equi)* too, but this is not a serious disease ▪ Sliperi kabis with caterpillars (leaf folders), grasshoppers and white peach scale *(Pseudaulacaspis pentagona)* – also on cassava - (but Nisotra not seen) ▪ Pumpkin beetle *(Aulacophora sp.)* on sweet potato ▪ Alomae is present, having started in the 1990s, and also said to be severe at Apurahe to the west, since 2001
Agroforestry	▪ Apart from the usual array of cutnuts, breadfruit, guava, bananas etc, a Reef Island form of Terminalia catappa (Alite) is present ▪ Wild yams *(D nummularia)* are common in the village (eg Auhi Haka) ▪ *Pseuderanthemum reticulatum* (whaere) used as a cabbage (pure, Guadalcanal)
Livestock	▪ Pigs are common, free ranging and tethered, especially along the beach; there are chickens
Marine	▪ Fish and trochus are taken
Forests	▪ Wild yams are taken and also planted; the seed and flesh of wild breadfruit are eaten
Overall wealth	▪ There is copra and cocoa, with cocoa dominating the cash economy: there are three driers ▪ Individual income is about SBD200 per year ▪ Expenditure: most goes to buy rice, noodles and kerosene ▪ Women think that the amount of earnings is satisfactory, and they do not want logging

Gender	▪ All the youth interviewed had attended school; there was an equal number of boys and girls who had been to secondary school or RTCs ▪ The youth have an average income of about SBD200 a year, spent on school fees, household items, games and mission outreach programs (Paregho Youth visits other villages); this and other activities are supported by the community ▪ The youth are more interested in financial return for their efforts than Waihagha and want to be paid for their services! ▪ Two teenage pregnancies and eight single parents (one later married) ▪ There is a women's fellowship (SSEC) and it trains women in cooking and sewing ▪ RRO (Rawo Resources Owners) provides women with funds for income generating activities (operated previously from Waihagha to Tetere, wards 18-20). Local milling company involved in a 2002 scheme to bring industrial waste from Taiwan for storage on Makira ▪ None of 13 women interviewed had been to Honiara ▪ Women understand the bad effects of logging, but they want more information from forestry organisations; their fear is that they are not consulted when decisions are made
Health	▪ Malaria is common (the microscope does not work so diagnoses are presumptive, on symptoms only); coughs, especially during the cold weather, high blood pressure and diabetes (common, even children)
Key issues	▪ Transport is much better here: ships come to collect copra and cocoa twice a month, depending on the weather – copra/cocoa sold to businessmen ▪ Heavy rains cause flooding in cocoa plantations, wash out the food gardens and cause landslides; winds break the bananas (times of hunger) ▪ Sweet potato an important crop, but only three varieties ▪ A lack of information: cocoa - there is need for short courses at RTCs on basic agronomy; taro – information on alomae and how to control it; awareness on logging and its effects on communities ▪ Health issues: no toilets - sides of the river are used ▪ Do not want logging (but it occurs nearby towards Maroghu) ▪ Cases of diabetes have been reported in the clinic's catchment area

Village: *Maroghu*

Setting	▪ A deep double bay, with reef, steep hills and a narrow strip of flat land with swamp to west. Small streams run off the hills to the beach ▪ There are 40 households and about a 100 plus people ▪ Logging camp of Middle Island Co. (at Nagonaone) to the east, with roads to the inland, established in 2004 ▪ There is a school (up to standard 6) ▪ The Anglican faith is followed, except for a few families at the logging camp that are SSEC
History	▪ There is a poor recall of history ▪ In 1946, at the time of Masina Rule, there was a much larger village; later, people dispersed to Rauraha, Sugu, Waimarenga and Houtarohagu, and even to Star Harbour area ▪ In 1930s, three churches were established: Anglican, SSEC and Roman Catholic ▪ 1931, there was a tidal wave that washed away the village – it was widespread in the Haununu area and did a lot of damage in coastal villages ▪ 1958, people started to seek work on plantations, eg Mamara (£4 per month)
Livelihoods *Food crops*	▪ The main crops are: sweet potato and banana, followed by cassava, kakake (grown by every family), kongkong taro, yam/pana ▪ Many people (21 of 45) do not have taro and fewer (14 of 49) have yam and (11 of 49) pana ▪ The number of crop varieties is: banana (21); sweet potato (6); cassava (4); kakake (3); taro (7); kongkong taro (1); yam (17); pana (11) and breadfruit (said to be many types) ▪ Present gardens are following the logging roads ▪ Rice was planted, harvested and milled at Kirakira ▪ People are not maintaining their food gardens; instead, they are buying store food (a lot of rice is consumed – one canteen sells 30 bags of rice a month, and there are at least four canteens in the village) with money earned from the logging company
Cash crops	▪ There is an interest in cocoa, but it is presently planted only in small areas behind the village ▪ There is one cocoa drier, but no copra driers ▪ Chillies and ginger are grown for sale to the logging company
Pests & diseases	▪ Taro has been lost recently due to alomae ▪ Yams with nematode rot *(Pratylenchus coffeae)*, and dieback reported, discouraging people from planting the crop ▪ Cocoa with black pod disease *(Phytophthora palmivora)* ▪ Xanthosoma with root rot *(Pythium sp.)* ▪ Cassava with white peach scale *(Pseudaulacaspis pentagona)* ▪ Sliperi kabis with Nisotra
Agroforestry	▪ Apart from the usual array of species, there are *Calophyllum inophyllum* along the beach and wild yam (Paisi) climbing up the trees
Livestock	▪ Pigs are tethered along the beaches; chickens run free
Marine	▪ Trochus and bêche-de-mer (previously)
Forests	▪ Wild mango (many types) taken from the forests ▪ Logging is extensive, with Middle Island having negotiated a 15-year lease, and all species except hardwoods (rosewood and Vasa) are taken ▪ Loss of wild betel nut for house flooring, lawyer cane, bamboo, wild yam (five kinds are recognised), wild mango

Overall wealth	▪ Revenue from logging goes to landowners and little to the community as a whole ▪ There are small earnings from cocoa ▪ Copra is produced, but buyers are more interested in cocoa as this has greater value by weight ▪ Vegetables are sold to the logging company, but there is no market day as yet ▪ Girls obtain money by growing vegetables (average of SBD50 a day) or working as house girls (SBD15 per day) for the logging company ▪ Young men (30-50 in number) are eager to work for the logging company, driving machines, etc ▪ Expenditure: rice, beer and gambling!
Gender	▪ Women are the main agriculturists for both subsistence and cash; and they have an interest in cocoa, but no information or training is available ▪ Girls' education varies from standard 1-6 but none have attended secondary schools or been to a RTC ▪ General feeling that life is no longer stable since the logging company came; these days everything has to be paid for, even among relatives; and there is far less community work ▪ There is prostitution, with girls going to the camp, obtaining money and then going to Kirakira and Honiara ▪ There were seven single parents in the village at the time of the visit
Health	▪ 19 people from five villages (Piruma, Apurahe, Hinikawa, Waimaraga and Rea) have diabetes, out of a catchment area of 1000; all from the same tribe ▪ The incidence of malaria is unknown, as there is no microscope, so presumptive treatments are given ▪ Malnutrition is rare as people have money to buy food
Key issues	▪ Problems associated with logging: loss of soil fertility, pollution of water supplies and the sea (affects fishing and salt making), drinking and violence, gambling, land disputes, damage to coconuts, garden land and forests (and loss of diversity), loss of custom, teenage pregnancies ▪ Taro and yam diseases ▪ Diversity of traditional crops still present, but fewer people are growing them ▪ Narrow diversity of sweet potato, now the main crop ▪ Need for training on cocoa production

Village: *Apaoro*

Setting	▪ A village situated equidistant between Maroghu and Tetere, in a west facing bay, sheltered by Marau Island and with hills around ▪ A swamp to the west, drained by the Faukifukifu river, where kakake is grown ▪ A village of 40 houses and a population of 300 plus ▪ There is a school (pre-school and standard 1, 3 and 4) (5 and 6 at Maroghu) and two teachers (one yet to arrive) ▪ There is no clinic and people have to travel to Maroghu or to Tetere, a day's paddling by canoe (it is possible to walk to Maroghu, but not to Tetere) ▪ A radio is owned privately by a resident of Marau Island
History	▪ The village was established in 1930s by people who came from the bush, when Christianity came to the area ▪ In the 1930s, a tidal wave struck the village and again in 1987 ▪ There were cyclones in c.1970, 1986 and 1990 ▪ Logging began in 1989 and continued until 1995 ▪ Another company started in 2002, but there was a dispute over the MOU and licensing agreement, and it stopped after 3 months
Livelihoods *Food crops*	▪ Main crops are kakake, banana (22), sweet potato (9) and cassava (6), but sweet potato does not yield well in the wettest time of the year ▪ Rice was planted in the village in 2000, in the swampy area, and the harvest was taken to Kirakira to mill. No other plantings have been made ▪ A second variety of kakake has been introduced recently, but the taste is unknown ▪ Not everyone has yams (only 10 of 15 women interviewed) – 18 vars or taro – 9 vars
Cash crops	▪ Cocoa is mostly Amelonado, but there is also 18 months, which may be a Sabah Hybrid (said to have come from Boroni) ▪ Wet beans are sold: there is no cocoa drier – perhaps people do not know how to ferment and dry the beans
Pests & diseases	▪ Kakake with corm rot; said to be worse where soil from logging operations has contaminated the swamps, but the rot is not reported from all the creeks ▪ Cocoa with black pod, cankers *(Phytophthora palmivora)* and white thread blight *(Marasmius scandens)*
Agroforestry	▪ The usual array of species as seen in other villages
Livestock	▪ Pigs are kept in small pens or tethered
Marine	▪ No information
Forests	▪ The first company (1987-1995) was IFI; later in 2002, Foo Ling was given a licence, but logging ceased after 3 months: it was said it did not follow the agreement; in particular it did not employ local people, but brought its own staff ▪ Logging commenced in the area in 2005, with Moupa holding the licence (a company of a local resident), but not at Apaoro – they do not want logging because of its effects on the environment ▪ *Merremia cordata* has blocked logging roads preventing people accessing garden land ▪ Wild mango taken (two varieties)
Overall wealth	▪ Cocoa is the main means to obtain money, but marketing is difficult: harvests are made only when the buyers come; otherwise the pods are just left to rot ▪ Copra is made, but often it has to stay a long time before it is sold, affecting its quality ▪ The store contained sugar and noodles only. It is used by people from the other side of the bay where there is logging
Gender	▪ Women consider the logging was of no benefit: the loggers married local girls and then left (two with children) ▪ They would like to have a group for sewing, weaving, etc, but there is no leader and the priest does not visit often ▪ Most girls do not go to secondary school as there is not enough money, or they do not complete their education

Health	▪ A serious outbreak of influenza during the visit and no medicine in the village, not even aspirin ▪ The Province helped install a water supply in 1983 (or '86), but there was no training on maintenance and it was spoilt by cyclones, tidal waves and vandalism ▪ A nurse comes in good weather
Key issues	▪ Transport and marketing (the Province had a ship before, with a regular schedule) ▪ The effect of previous logging on the village ▪ Water supply and toilets ▪ In the recent past, the school has been closed because there were no teachers (they are there now, but it is still a concern) ▪ No proper organisation within community, eg no school committee ▪ No clinic: it takes a day to paddle to Tetere or at least two gallons of petrol (SBD47 per gallon) if an OBM is used ▪ Need a nurse aide post

Village: *Tetere*

Setting	▪ Within a sheltered bay (Makira Harbour), with surrounding high hills, at the border of Haununu and Arosi 1 ▪ The population is 510 and there are 55 houses ▪ There is a school (pre-school and standard 1-6) ▪ The clinic was established in 1985; there is one RN and a nurse aide ▪ Three churches: Anglican, SSEC (largest number of people) and Roman Catholic ▪ Two radios, one with the Catholic church, the other with the clinic ▪ Only chartered ships visit
History	▪ The village was established in 1845; it was Roman Catholic at first and then other churches came later ▪ Renown for killings of first missionaries in Solomon Islands! ▪ There are three chiefs and a village chairperson ▪ In 1971, a cyclone destroyed most of the gardens ▪ In 1979, Cyclone Kerry damaged food gardens ▪ There was a tidal wave this year, which destroyed some of the kitchens
Livelihoods *Food crops*	▪ Banana is the most important crop, followed in order of priority by: kakake; sweet potato; cassava; taro/yam/pana; previously taro and yams were the main foods grown ▪ The number of crop varieties is: banana (9); sweet potato (10); cassava (3); kakake (1); taro (17); kongkong taro (1); yam (14); pana (6); and wild yam (2). Alocasia also planted ▪ Only 6% of the informants had yam and 33% had taro ▪ The fallow period is very short; for some it is less than one year – thus the only crop that can be grown to any extent is sweet potato
Cash crops	▪ Cocoa is grown on an inland plateau, where it has the same problems as elsewhere: there is one drier and people buy wet beans from villages further along the coast
Pests & diseases	▪ Papuana beetle on taro is said to be important ▪ There is said to be a problem on banana, but none seen; all the leaves die, fruits are small and the plants fall over (possibly nematodes)
Agroforestry	▪ The usual array of fruit and nut trees, plus *Terminalia catappa* (Alite)
Livestock	▪ Many pigs are kept, mostly tethered
Marine	▪ Fish, bonito once a year using traditional methods of capture (coconut fronds); possible to catch up to 500 fish at one time
Forests	▪ Wild mango are taken ▪ Logging started in 1994 when a French company (TFR) came for 6 months, using a helicopter to extract the logs, but after one shipment it left
Overall wealth	▪ Shell money is made here and sold (four strings are worth SBD500; SBD1-2 an inch); often used to pay school fees
Gender	▪ Most children do not go to school; consequently, illiteracy is high ▪ In 2005, there were 10 teenage pregnancies in the village
Health	▪ Malaria is common: in April (32), May (74), June (12) and July (14); diarrhoea is also common ▪ Skin diseases are a problem with more than 70% of the inhabitants infected
Key issues	▪ Declining number of people growing taro and yam ▪ Health issues: skin disease and teenage pregnancies; toilets and water supplies ▪ Cocoa in need of better management ▪ Children are not well fed before attending school ▪ Illiteracy is high; most girls do not have primary education ▪ Teachers want to upgrade their knowledge by undertaking extension courses through USP