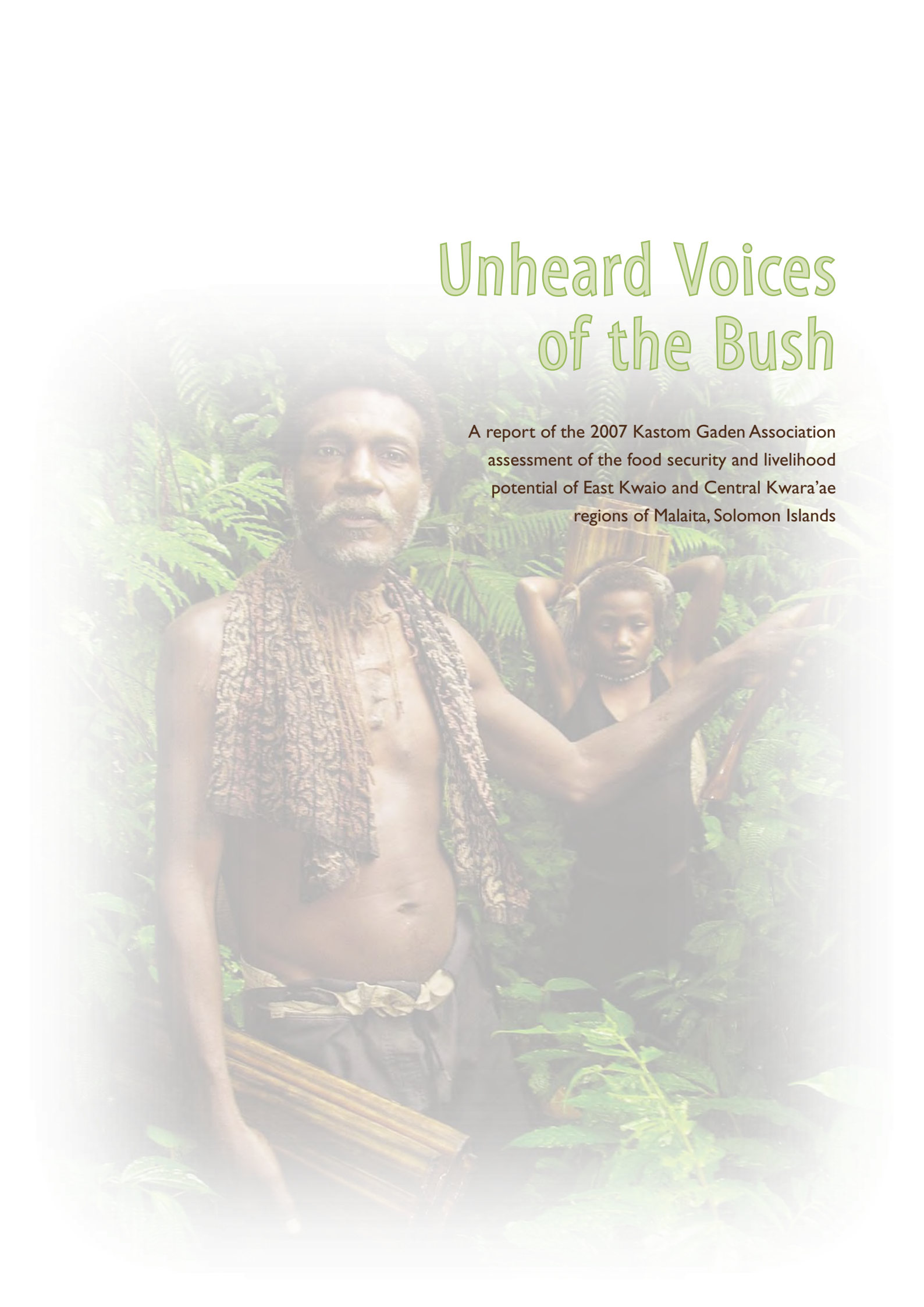
Unheard Voices of the Bush

A report of the 2007 Kastom Gaden Association assessment of the food security and livelihood potential of East Kwaio and Central Kwara'ae regions of Malaita, Solomon Islands



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A report of the 2007 Kastom Gaden Association assessment of the food security and livelihood potential of the East Kwaio and Central Kwara'ae regions of Malaita, Solomon Islands.

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 East Kwaio and Central Kwara'ae bush 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

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
APHEDA	Australian People for Health, Education and Development Abroad
ARI	Acute Respiratory Infection
AUD	Australian dollar
AusAID	Australian Agency for International Development
CEMA	Commodity Export Marketing Authority
HIV/STI	Human immunodeficiency virus/Sexually transmitted infections
KGA	Kastom Gaden Association
LBW	Low Birth Rate
MALD	Ministry of Agriculture and Livestock Development
MHMS	Ministry of Health and Medical Services
MP	Member of Parliament
NNS	National Nutritional Survey
PRA	Participatory Rural Appraisal
RTC	Rural Training Centre
PMN	Planting Material Network
PPH	Post-partum haemorrhage
RTC	Rural training centre
SBD	Solomon Islands dollar (SBD1 = AUD6)
SIG	Solomon Islands Government
SLIRAP	Sustainable Livelihoods for Isolated Areas Project
SPC	Secretariat of the Pacific Community
TB	Tuberculosis

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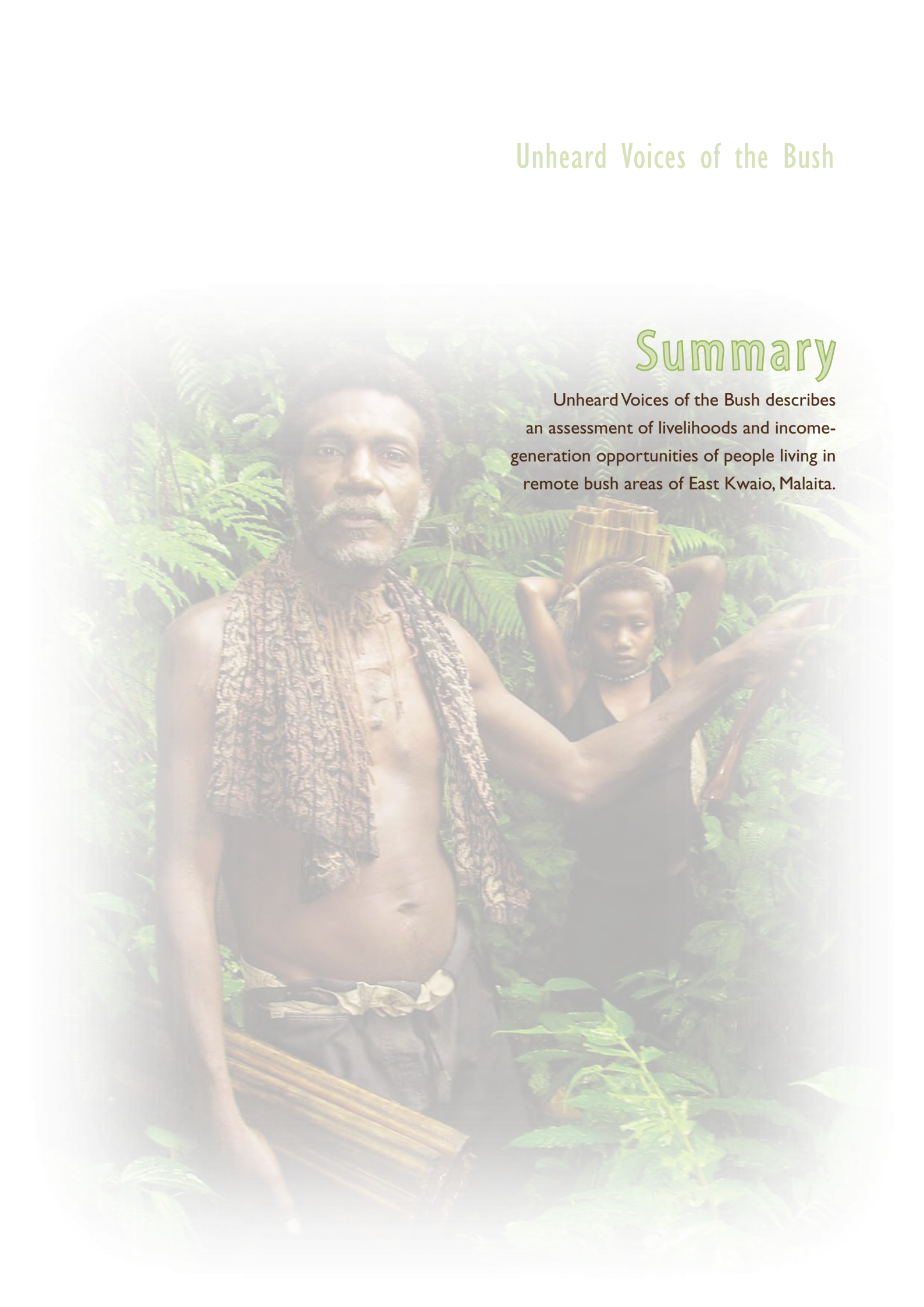


Summary

Unheard Voices of the Bush describes an assessment of livelihoods and income-generation opportunities of people living in remote bush areas of East Kwaio, Malaita.

Introduction

The assessment was carried out in August 2007. It is the third assessment made in isolated areas of Solomon Islands by the Kastom Gaden Association and partners. It follows those of the weather coasts of Guadalcanal (April 2005) and Makira (August 2006).

These assessments were made under the AusAID-funded ***Sustainable Livelihood for Isolated Areas Projec***t, implemented by KGA.

Starting from Gwauafiu Farmer School West Kwara'ae, the team — composed of KGA staff, local and overseas consultants and lead farmers — headed for the Kwaibata River, visiting Deresaia village, and from there followed the river to Jordan. The members then visited two highland villages in the interior of the island — Bobota and Goikwalasinga — before reaching the west coast at Olumburi.

In each village, information was collected on people's livelihoods and their concerns using PRA techniques — seasonal calendars, time lines, village map, focus groups and garden transects. The time spent in each village was one to two days, with walks of three to 12 hours between them.

Some limitations of the assessment are noted:

- agriculture was the main focus but more information was obtained on crops than livestock
- household energy was considered important but, unlike the Guadalcanal assessment, there was no expert on the team, although some information was obtained through correspondence
- the team did not stay overnight in a village with people of traditional faith.

By contrast to the other assessments, the team benefited from having a health expert.

Geographic overview

Rainfall

Rainfall throughout the region is very high, at least 5000mm a year, with two major 'wets'. This makes the highlands similar to the weather coasts of Guadalcanal and Makira.

Such high rainfall is far from ideal for growing food and cash crops.

Soils

Soils are loams and clays derived from volcanic and sedimentary rocks.

In general, they are more fertile than those on the coasts, but like them, bush fallows maintain soil fertility of cultivated garden areas.

Topography makes movement difficult

Highland topography is rugged, with a central spine along the island and flanking ridges and hills.

Walking from village to village is a succession of ups and downs.

Vegetation

The route passes though rainforest that is well-preserved, composed of hard woods and bamboo in the valleys and on the lower slopes,

It becomes less dense and stunted over 750 m, where it is cloaked in mists. Here, mosses, lichens and liverworts thrive.

Cropping

In the highland's environment, growing crops is more of a challenge than in the coastal areas.

- sweet potato dominates subsistence production, having replaced taro in the last 50 years or so.
- other root crops are banana and cassava and occasional giant swamp taro, giant taro and yams
- a variety of leafy greens are present, grown or plucked from the forests
- cash crops are few: there are coconuts at lower altitudes and cocoa everywhere, some well established, some yet to bear.

Terrain and social factors limit potential

Distance from the coast, lack of market opportunities and a difficult cropping environment conspire to create hardship.

Opportunities for improvement are fewl, exacerbated by poor health and low education attainment.

Schools are few, with children either missing out or boarding on the coast, which is expensive and ill-equips them for the rigours of the bush.

Consequently, there is a constant movement of peoples from the highlands to the coast, as they seek economic improvement, access to health services and eduction for their children.

There is also back migration to settle on ancestral land and avoid the constant bother of land disputes that are common in burgeoning coastal settlements.

Divisions of the bush

Four zones are recognised based on topography, access to the coast and faith: river plains/bush lowlands; lower foothills; remote interior; villages or hamlets of traditional faith.

River plains/bush lowlands

Here, there are river terraces where sweet potato and cocoa are grown and where cattle and pigs are kept. Buyers come from Honiara to buy wet bean and meat.

There are schools and clinics within easy reach, although the coast may still be three hours walk or paddle away, when the river is navigable.

Lower foothills

Isolation and distance from the coast begins to impact on livelihoods, reducing economic opportunity and access to clinics and schools.

Sweet potato is the main food crop and cash is earned from raising pigs, selling vegetables on the coast and from cocoa.

Remote interior

Here, it is isolated, cold and wet. Still sweet potato is the dominant food, although taking six months to mature and sometimes failing and creating times of hunger.

Economic opportunities are few, although cocoa is being tried. Pigs are kept, but suffer from diseases.

Services are non-existent. Children do not go to schools and clinics may be a day's walk away. Consequently, health is poor.

Traditional hamlets

The hamlets are a subdivision of the remote interior but the traditional, non-Christian faith of the inhabitants sets them apart from the rest of society. There is discrimination because of the perceived evil of people's faith, and few people visit.

Economic activity is low, partly because of customary belief against selling certain commodities as well as isolation from markets. Tobacco and betel nut are the main items and, occasionally, pigs and taro are sold.

Living conditions are relatively poor, with, seemingly, little awareness of hygiene and human nutrition. By contrast, aspirations are similar to those elsewhere. people want to better their lot, especially to earn money and have their children educated.

Livelihood issues

Poor returns and narrow crop diversity

Sweet potato

There is near total reliance on one crop for carbohydrate supply — sweet potato. In addition, the number of varieties is low.

Along river terraces and in villages within three hours or so of the coast, sweet potato yields appear to be good and harvests are marketed in coastal areas. Elsewhere, returns are less predicable and there are some unusual agronomic practices.

Taro

Taro, once the dominant, staple is now an important cash crop, but 'alomae' disease remains a major factor in producing a successful crop.

Cassava and banana

Cassava is gaining in popularity. Banana is important, especially along river terraces,. But even in the remote highlands banana is affected by toppling disease, due to nematodes.

A similar disease affects yams, which are now rare.

Fruit and nut diversity

Overall, there is considerable diversity of fruit and nut species. However, the number of trees seen in village areas is low, perhaps indicative that the settlements are new. This is particularly so for the traditional hamlets. It may also indicate a lack of awareness of the importance of these foods in people's diets.

Leafy Greens

The same can be said about leafy greens. They are present and there are a number of species, but they are undervalued.

People prefer to sell vegetables at coastal markets rather than consume them in their households.

Wild harvest

Forests are mostly untouched by loggers and present people with a variety of medicines (although in one Christian village people were concerned about using them because of their associated with past faith).

A variety of supplementary and reserve foods and building materials are taken from the forests.

Livestock — cattle, pigs and chickens

Livestock — cattle, pigs and poultry — is an important component in the socio-economic life of the people.

There are very large cattle projects along the banks of the Kwaibaita River. The largest at Deresaia has 150 head and is very well managed.

Pigs are extremely important and, perhaps, the foremost means of making money in all villages, except for those of traditional faith where they are mostly raised for ceremonial purposes.

Stealing is common and at higher, colder, altitudes so are diseases. 'Cough-cough', also a problem on the weather coast of Guadalcanal, was present in the highlands.

Chickens are not common, and deaths were reported: they fell off their perches.

Migration to the coast — and back again

People in the bush seem to be always on the move. There is movement to the coast to seek better economic opportunities, education and health services. There is movement within the bush for those of traditional faiths.

Young men often leave for a few years to work on plantations, although few save the money earned.

Back migration also occurs as people decide that coastal life is unsuitable or perhaps they want to secure ownership of customary title.

Many families have repeated the movement from the coast to the bush and back again and there is considerable frustration over the attempts to develop acceptable livelihoods in the bush — there is a lack of basic services.

There appeared to be little in the way of remittances from Honiara or elsewhere reaching people in the bush. Even if people wanted to send money, it is extremely difficult for them to do so.

Income, expenditure and the effect of distance

Not surprisingly, there is a strong correlation between distance from the coast and income.

Income activities

- on the river plains there are cattle and cocoa, with buyers coming from Honiara
- in the lower foothills, cocoa is still prominent but there is much less grown and selling vegetables in coastal markets becomes more important
- by contrast, in the remote highlands and in the traditional hamlets, cash is difficult to obtain; taro is taken to the coast and so are sugar cane, banana, sweet potato and ***sliperi kabis***, but perhaps only once in three months
- in these divisions of the bush, axe handles, even canoes are made, although the difficulty of getting the latter to the coast can only be guessed at
- shell money is made in traditional hamlets, and, along with pig raising, is an important means of obtaining money.

Expenditure

The main items of purchase are:

- kerosene
- salt
- sugar
- Taiyo (canned tuna)
- rice.

Unfortunately, even noodle is mentioned. Christians pay a tithe to the church.

Health & nutrition

Considering the terrain and the small population, health services are reasonable. There are clinics and aide posts in the bush and at Atoifi Adventist Hospital, but they may be three to 12 hours walk from many villages.

The Atoifi Adventist Hospital has an outreach programme, visiting four inland aide posts every two months. A new clinic is being built at Nammalaelae, not far from Deresaia. Unfortunately, Nammalaelae did not have vaccines and there were no child health cards. Jordan had run out of kerosene, and has to access medicines from Auki, a considerable journey, mostly by foot. There is no SIG outreach program.

The main illnesses are:

- malaria
- diarrhoea
- acute respiratory infections, including pneumonia
- hookworm.

Hookworm is particularly common in woman and children in bush villages because of their close proximity to pigs. Infection can result in anaemia.

Traditional living conditions linked with ill-heath

The health of those living in traditional hamlets is much worse than those in Christian villages:

- animals roam in or near sleeping areas and kitchens
- there are no beds or mats to sleep on
- there is an indication of less frequent washing.

General health and sanitation

Indoor smoke

People of all faiths are exposed to smoke, as much of their lives are spent in kitchens.

Water supply poor

Water supplies are poor. Water is often carried to villages and may be in short supply. Consequently, food and hands are not washed properly before food preparation and eating.

Sanitation could be improved

Sanitation, too, is poor. Pit latrines are invariably badly designed and located, and are mostly without lids.

Poor hygiene and sanitation increase the risk from diarrhoea.

Child health

In general, child and maternal mortality is high, although exact numbers are hard to come by.

There is evidence that the age of mothers at first birth is decreasing — 28 per cent of mothers were 16 or younger, with a trend to increased family size.

Access to contraceptives and family planning advice is poor. On average, pregnancies are occurring before the previous child is two years old. Pregnancies occurring within 18 months of a previous birth can pose dangers for mother and child, especially if breastfeeding stops before the child is one year old.

The nutritional status of the mother is important in determining the nutritional status of the child at birth and is reflected in birth weight.

In East Kwaio, it appears that low birth weights are common and caused by, for instance, malaria, heavy workload, anaemia, poor diet and smoking.

clinic data at Nammalaelae showed that 25 per cent had malnutrition. This is probably an underestimate

Unfortunately, many children are not being taken to aide posts and clinics for immunisation, and so their weights are not being recorded.

Recording weights regularly on the Child Health Record chart is important. It provides a good indication of child health and an opportunity for intervention if weights are below the 80 per cent median line in the Road to Health growth chart.

Another reason why children are underweight is improper weaning, with mothers often starting to introduce solid food too early.

During the assessment it was found that foods are introduced at two to three months, reflecting a cultural practice on Malaita and a failure of health messages about exclusive breastfeeding in the first six months.

Overall, half the children's weights were below the 80 per cent weight-for-age standard, and clinic data at Nammalaelae showed that 25 per cent had malnutrition. This is probably an underestimate.

Education

Access to education, like access to health, is determined by distance to the coast.

- there is a school near Deresaia at Nammalaelae
- Jordan is fortunate for a remote village to have a government primary school at which children of Christian and traditional faiths attend.
- there is a kindergarten at Goikwalasinga.

There are no schools of any kind elsewhere.

As for training establishments, there is an RTC at Atoifi that takes 20 students a year, far less than the numbers who wish to attend. There is a woman's centre at Olomburi.

Gender and youth

The is said to be considerable equity between the sexes in the Christian villages, although it seemed that women still have very busy days, taking care of the food gardens, children, house, pigs and collecting firewood.

Much greater division of labour exists in the traditional hamlets. Here, women do more work and are more socially constrained than their counterparts in Christian villages.

- first food goes to men and sharing is not possible
- women raise pigs, but do not eat pork
- nor are women allowed fish
- girls are less likely to be educated, as elsewhere in the country.

However, those youth interviewed were keen to contribute to society and become involved in productive activities. Girls often worked in cocoa and they and boys were keen grow betel nut and tobacco and help their mothers raise pigs and cultivate food gardens.

There were no reports of alcohol abuse or a desire to leave and go to Honiara. In fact, may youth and women had never been outside their village or to another island and, seemingly, had no desire to do so.

Energy

In bush villages, the majority of people — 99 per cent — do not access to modern forms of energy, even though that is considered essential for economic development and is a factor in the calculation of any country's Human Development Index.

The benefits of lighting, for example, are enormous, allowing increased effectiveness of health services, productive earnings, improved safety, and the opportunity for increased hours of study.

The kerosene used at present is costly, and few households can afford to use it for more than three nights a week.

The solar battery charging operation at Derasaia is an example of improved livelihoods from having access to electricity.

Recommendations for SLIRAP & other projects

Safeguard family food production

Food crops:

- translate the leaflet Alomae — *Lethal Disease of Taro* into the Kwaio language (and, possibly, the leaflet on yam dry rot, too)
- develop a program of action using trainers from north Malaita to train people in the Kwaio villages to act as 'information brokers', knowledgeable about alomae disease and its control, and who can then teach others
- include information about taro leaf blight in the program; use local varieties to demonstrate differences in resistance to the disease; introduce taro varieties from north Malaita that are commercially popular

Support Gwaunafiu Farmer School to:

- maintain a sweet potato genebank of local and overseas varieties
- provide training to the information brokers in sweet potato cultivation techniques and the maintenance of soil fertility (use of legumes, mulches, etc)
- multiply African yam
- provide training on planning food production to avoid 'time blong hungry', the period of food shortage
- monitor to determine impact of the program
- contract local experts from Ngella to advise on yams and pana, and from the Makira highlands to advise on banana varieties suitable for Kwaio bush (multiply at Gwaunafiu)
- carry out an awareness program on the need to improve diets, especially the need to increase consumption of vegetables and fruits; link to supsup garden and nutrition improvement programs
- establish Searem-type bulking plots (sweet potato) with contracted group at Deresaia.

Propagate PMN open pollinated vegetable and green manure seeds

- Gwaunafiu Farmer School and Atoifi Adventist Hospital to become distribution points for PMN seeds, receiving PMN membership payments and providing basic services to members
- Masilana Seed Centre to continue testing and bulking seed of highland vegetable varieties
- exchange and share highlands-adapted, open pollinated, seed through a highlands network to be established under SLIRAP.

Livestock

Train people at Gwanafiu Farmer School in:

- pig management, especially how to diagnose, treat and prevent disease though improved pen construction and nutrition
- intensive poultry management, to increase flocks rapidly as well as to have regular supplies of eggs for household use and sale; investigate the problem of chickens falling from their perches, reported at Faunalea (a traditional hamlet above Jordan).

Improve nutrition and health

Link agriculture and nutrition through clinics and hospitals:

Training for improved food gardens

Organise KGA to work with nursing student and outreach teams on:

- improving soil fertility
- growing different varieties of root crops and greens
- accessing seeds and planting materials
- pest and disease control
- establishing kitchen gardens
- other nutrition garden skills

Replicate the Sasamunga successes

Introduce Sasamunga nutrition approaches including:

- a hospital garden for in-patients and their relatives at Atoifi Adventist Hospital
- kitchen gardens
- demonstrations by nurses
- regular weighing of infants
- use of nutrition materials (including recipes in local languages)
- nutrition education for paediatric and maternity ward patients, including showing nurses how to use the Child Heath Card as a record and teaching tool
- improve feeding patterns for children (quality and quantity), emphasising exclusive breastfeeding for the first six months and the delaying of the introduction of solid foods
- record children's weights when they present for treatment at the hospital and clinic (and fill in the Road to Health graph)
- test compost toilets and demonstrate improved pit toilets made from local materials at Gwaunafiu Farmer School
- tell people about the dangers to their health from continuous smoke inhalation; demonstrate new types of stoves
- basic population growth awareness should be included as exercises in KGA village workshops.

Enhance income generation

Food processing

- introduce methods of making chips from root and tuber crops — taro, kongkong taro and banana, in particular — and selling through Farmer Fresh in Honiara
- investigate the possibility of making jam from a wild *Rubus* species growing in the bush and, if it has potential, encourage its propagation and cultivation; a trial plot should be established at Gwaunafiu.

Produce marketing for traditional women

- investigate potential ways to assist women from traditional villages to market vegetables and food crop staples from their gardens
- use their gardens as an opportunity to introduce new varieties
- identify women from traditional villages who could train others.

Cash crops

Training in cocoa management is needed and should be given at Deresaia, encouraging women and youth to take part as they manage the crop

The extension of the training to villages in the bush is necessary. There are established plantings and those about to bear fruit.

KGA should liaise with MALD and CEMA

Trials plots are needed of the following, taking germplasm from Isabel or Guadalcanal:

- cardamom, above 600m
- arabica coffee
- kava.

Crafts

A number of items are manufactured that have potential for sale in Honiara:

- axe handles
- finely woven baskets
- shell money

The potential is limited but outlets for these products should be investigated.

Value chain workshop for crafts from the three isolated areas of SLIRAP is an option to facilitate improved linkages between producers and markets.

Financial skills

Training in financial management should be incorporated into the curricula of all KGA training courses.

This should include:

- balance sheets
- basic principles of marketing
- ways of saving money by using local products.

Create an enabling environment

Improve extension services

Develop a special training and support program at Gwaunafiu and Masilana dedicated to farmers from bush communities:

- quotas and specific intakes for men, women and young people, are to be included
- separate intakes for Christian and traditional communities are proposed
- an affirmative action policy is to be used to ensure the latter are given priority.

Establish a PMN highlands bush network

KGA should facilitate the development of a PMN highlands bush network.

The network would share information and resources on current programs in Malaita and elsewhere.

It would conduct advocacy on roads and other service delivery issues, including:

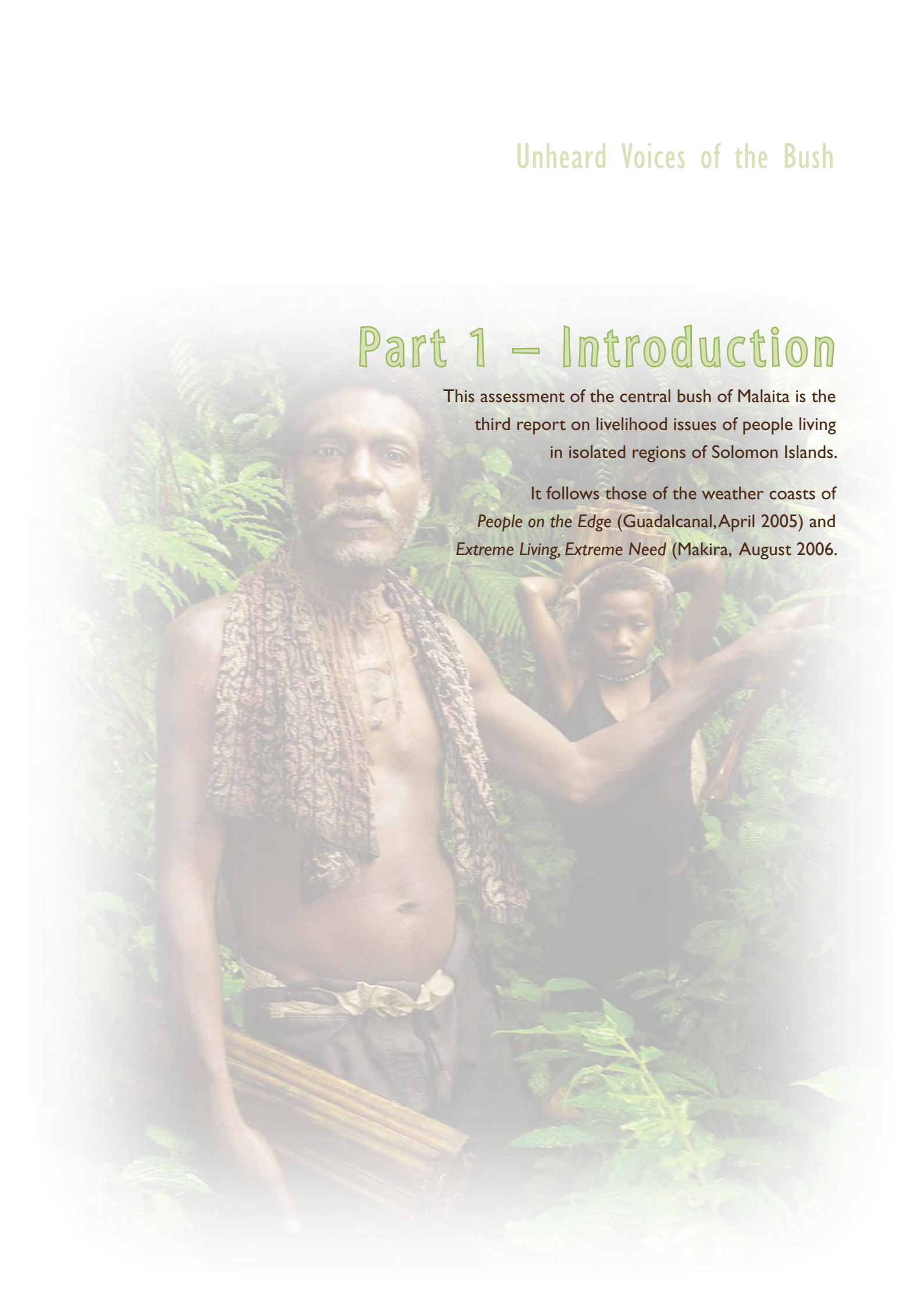
- a socio economic benefit/impact study of the Busurata feeder road
- appointment a facilitator to develop communications between the partners
- arrange annual meetings to exchange experiences, innovations, planting materials etc.
- make links with Bougainville highlands
- develop a database of experts and contract their services to share their experiences and knowledge, eg.:
  - Dorothy Tamasia, Makira highlands for banana germplasm
  - Lionel Maeliu, Gwaunafiu Farmer School
  - Johnson Ladota, Masilana Seed Centre, among others.
- provide radios to isolated communities, traditional and Christian, as part of a highlands network;the choice of locations will depend on people's willingness to assist others after training at Gwaunafiu Farmer School.

Energy

Improve access to information about modern forms of energy and their costs;

KGA would develop partnerships with commercial enterprises in Honiara to make information about solar charging systems and coconut oil powered diesel generators and lamps available to rural people.

Gwaunafiu and Masilana should be sites testing the improved stoves made from local materials, for greater efficiency and smoke reduction.



Part 1 – Introduction

This assessment of the central bush of Malaita is the third report on livelihood issues of people living in isolated regions of Solomon Islands.

It follows those of the weather coasts of *People on the Edge* (Guadalcanal, April 2005) and *Extreme Living, Extreme Need* (Makira, August 2006.

Introduction

As with the other reports, *Unheard Voices of the Bush* describes problems with food security and health, and offers solutions in the context of the AusAID-funded Sustainable Livelihoods for Isolated Rural Areas Project implemented by the Kastom Gaden Association.

Bush populations are to be found living in inland regions of Choiseul, Guadalcanal, Isabel, Makira and Malaita (see Table 1 below).

Malaita was chosen for this assessment as it has the largest bush population of all the provinces of the Solomon Islands. Within the Province, bush areas of East Kwaio and Central Kwara'ae were selected for the assessment for three reasons:

- first, they are remote, with a relatively large but dispersed population
- second, they have people of Christian and traditional faiths
- third, the survey provided an opportunity for KGA to expand its current bush focus areas of Masilana and Busurata, about which much is known in terms of food security.

The team (see Attachment 1) assembled in Auki on 10 August 2007, briefed the Premier of Malaita Province about the assessment, drove to Busurata and spent the first night nearby at Gwaunafiu, the village of one of team members, Lionel Maeliu.

Over the next nine days, the team spent two days in each of the following villages: Deresaia, Jordan/Faunalea, Bobota and Goikwalasinga. It passed through many traditional hamlets along the way before descending to the coast at Sinaragu Harbour.

- Deresaia and Jordan are on the banks of the Kwaibaita River, the latter in its upper catchment
- Bobota is 10 hours' walk away, high in the centre of the island;
- Goikwalasinga is at slightly lower altitudes, nearer the coast on the edge of a large cluster of traditional hamlets.

On the last day, a visit was made to Atoifi Adventist Hospital where information on health was collected from nurses.

Table 1: *Divisions of the bush in five provinces where there are highland communities: Choiseul, Guadalcanal, Isabel, Makira and Malaita.*

Province	Inland lowlands	Lower foothills	Remote interior/ high altitude	Traditional hamlets
Malaita	✓	✓	✓	✓
Guadalcanal	✓	✓	✓	
Isabel		✓	✓	
Makira		✓	✓	
Choiseul		✓		

The team

Three members of the team had taken part in previous surveys — Tony Jansen, Grahame Jackson and Johnson Ladota.

The presence of two people (Johnson Ladota and Lionel Maeliu) from the Central Baelelea and Central Kwara'ae areas of Malaita allowed a comparison between the area surveyed and other highland areas.

Other members of the team included:

- Onyx Oifalu and Jezrel Siofa from East Kwaio, who provided local knowledge
- Kastom Gaden Association SLIRAP Project Manager, Claudine Watoto
- APHEDA community health specialist, Chris Chevalier, whose presence strengthened conclusions on health compared to the surveys of the weather coasts of Guadalcanal and Makira.

The methods

The methods used to collect information on which the assessment is based were similar to those used successfully in the previous studies.

PRA — collecting information together

At each village, after a general meeting with the community to introduce the team members to explain the purpose of the visit and to seek collaboration, groups were formed and exercises carried out using internationally accepted Participatory Rural Appraisal (PRA, also known as Participatory Learning and Action) techniques.

Seasonal calendars were recorded, time lines and village maps drawn and visits made to gardens.

Focus group discussions were also held to obtain information on village histories, plant genetic resources, incomes, expenditures, and health.

Separate group discussions were held with youth (under 25 years) and, where appropriate, with men and women.

Not all the exercises were done in each of the communities, only those deemed useful and practical in the time available. Most of the communities were small by comparison with the coastal villages of the previous surveys.

Checking the data

The garden visits were important as they allowed points that arose in discussions to be checked.

The visits were particularly useful to assess pests and diseases and to provide demonstrations of management options. In some cases, the garden visits uncovered quite unusual production practices that will be the basis of recommendations for future assistance.

The best local sweet potato varieties were collected from each village and will be added to the field collection at Gwaunafiu Farmer School.

After the assessment in each village, the data collected were summarised under a set of common headings, concluding with a list of issues (Attachment 2).

Finally, at Atoifi Adventist Hospital, the team debriefed and constructed a livelihoods summary of the villages in terms of their vulnerabilities and assets — physical, human, natural, social and financial — and went over the main issues at each one.

Additional information on energy was added, based on literature searches and the inputs of an energy and livelihoods specialist, a team member of the Guadalcanal weather coast assessment.

Central Malaita is a rugged region of mountains and steep valleys

Limitation of the assessment

As acknowledged in the two previous reports, some areas of the livelihoods analysis received less attention than others:

- the focus was on agriculture, with a greater concentration on crops than livestock
- household energy received some attention, but without a specialist on the team the conclusions are tentative
- health aspects of smoke inhalation were noted in an area where much of life is spent in kitchens; this is where people cook, eat, meet, sleep and keep warm.; in general, the presence of a health expert for the first six days of the survey strengthened the teams' conclusions in this area compared to previous surveys.

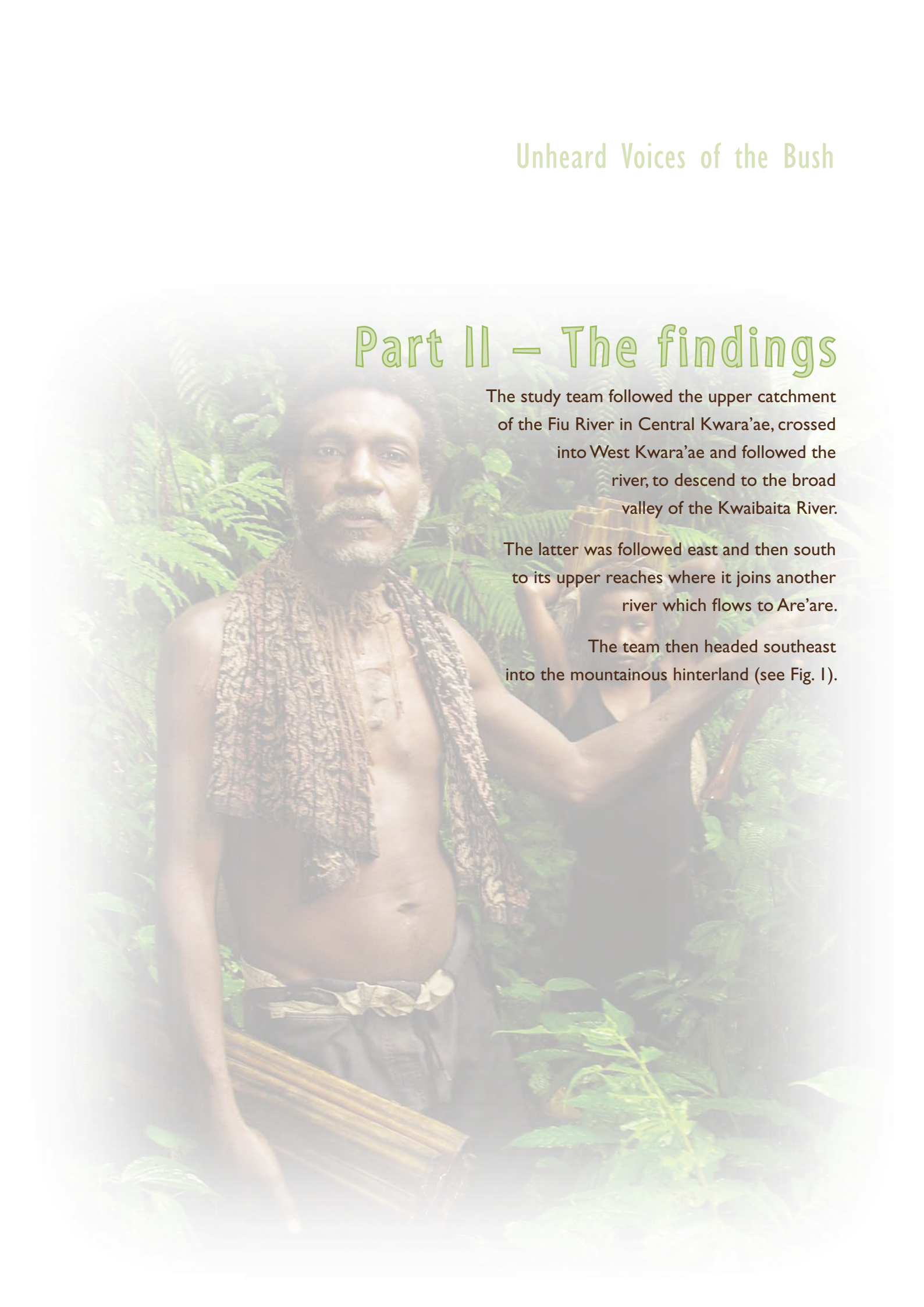
The team did not stay overnight in a village or hamlet with people of traditional faith. It would have taken more time than was available to make arrangements for such a large team, with men and women, to comply with local customs.

However, a short visit was made to one hamlet, Faunalea,, above Jordan; an old man was interviewed on the way from Bobota to Goikwalasinga and discussions were held with people from traditional villages who came to visit the team at Jordan and Goikwalasinga.

The two team members from Central Kwara'ae and Central Baelelea in north Malaita were asked to compare their observations in the study area with conditions and livelihoods in their own bush villages. Differences and similarities were noted. In addition, data from earlier visits by team members to the bush villages of Masilana and Gwaiau, and to bush areas of other provinces were added to this assessment and generalisations were made.

The team's equipment did not include a GPS receiver to record altitude and location of places visited. This was unfortunate, as the maps used proved unreliable for recording precisely the sites of the villages visited.

Completing the assessment involved much movement on foot through rugged terrain.



Part II – The findings

The study team followed the upper catchment of the Fiu River in Central Kwara'ae, crossed into West Kwara'ae and followed the river, to descend to the broad valley of the Kwaibaita River.

The latter was followed east and then south to its upper reaches where it joins another river which flows to Are'are.

The team then headed southeast into the mountainous hinterland (see Fig. 1).

Climate, topography and soils

The forests

The lower slopes of the hills, up to about 750m, are covered in typical Solomon Islands rainforest, including Indo-Malayan hardwoods of various kinds as well as banyans, *Canarium* nuts and bamboo.

Above these forests, clouds of mists swirl through sparse undergrowth and stunted trees with a more open canopy cloaked with mosses, lichens and liverworts.

The rugged valleys east of these forests have scattered hamlets — many traditional — all the way to the main ridge above Sinarangu Harbour.

The geology

Central Malaita is part of the Ontong Java oceanic plateau, composed of basalt lavas with intervening thin cherts and mudstones, reflecting formations in deep water.

Locally, the rocks are intruded with dykes of coursergrained rocks.

The study area is part of the Kwaio anticline. A main structural feature of Malaita is the central ridge that runs along the length of the island, with flanking ridges and hills.

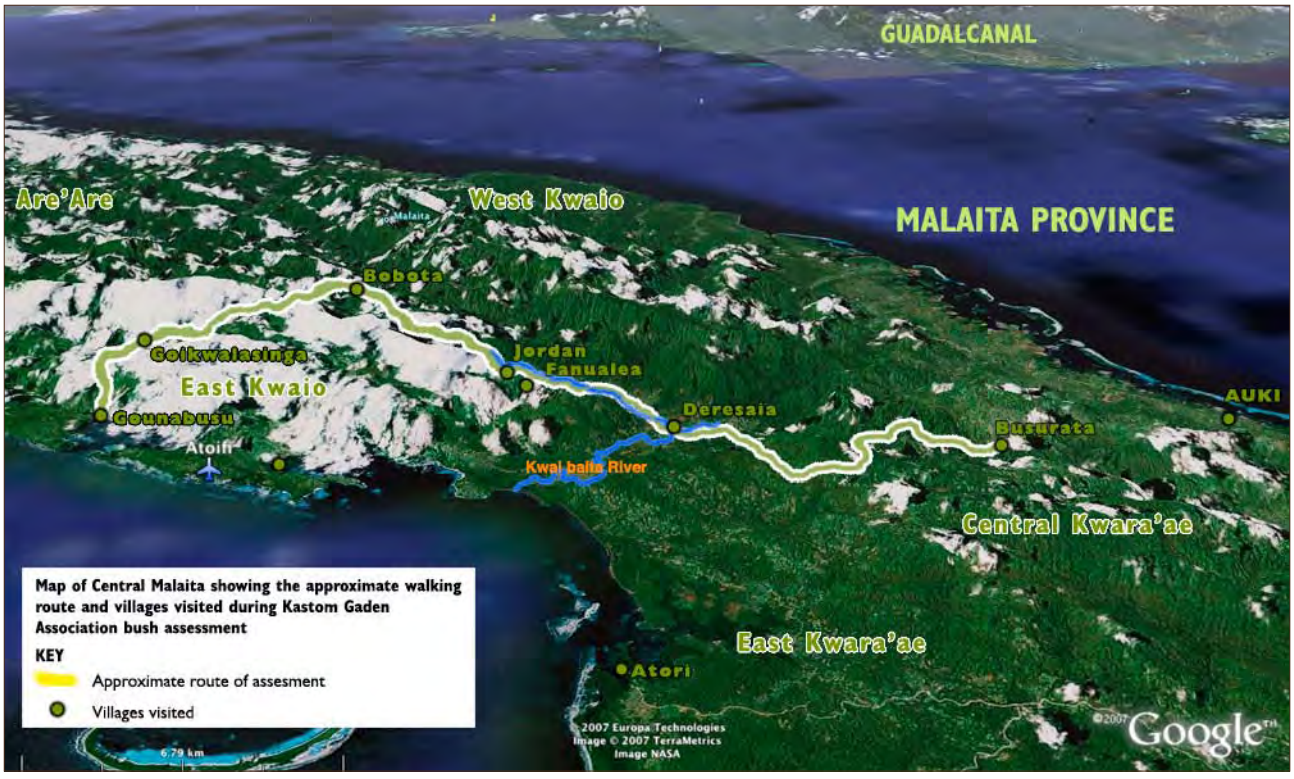
Difficulty of access

Walking across the ranges is demanding.

When there is sun, paths are dry and walking is relatively easy; when it rains, and that is often, the paths are transformed

Fig.1: Map of central Malaita showing the route of the assessment, from Auki the provincial capital to Atoifi, with visits to Gwaunafiu, Deresaia, Jordan, Bobota and Goikwalasinga.

Image courtesy of © 2007 Google™, © Europa Technologies Image and © 2007 TerraMetrics Image NASA.



and getting about is precarious. Mud dominates tracks made deep in places by wallowing pigs or, where better drained, narrow, the width of a foot, and slippery.

In places, the tracks follow streams, dry or in torrents., Either way, a slip can be dangerous on land or in rivers swollen by rain. Variation comes quickly, with hills so steep that legs, hands and knees are required to make progress, followed by precipitous ravines and gullies where feet struggle to retain a grip.

Rainfall in the centre of the island may reach 6000mm annually

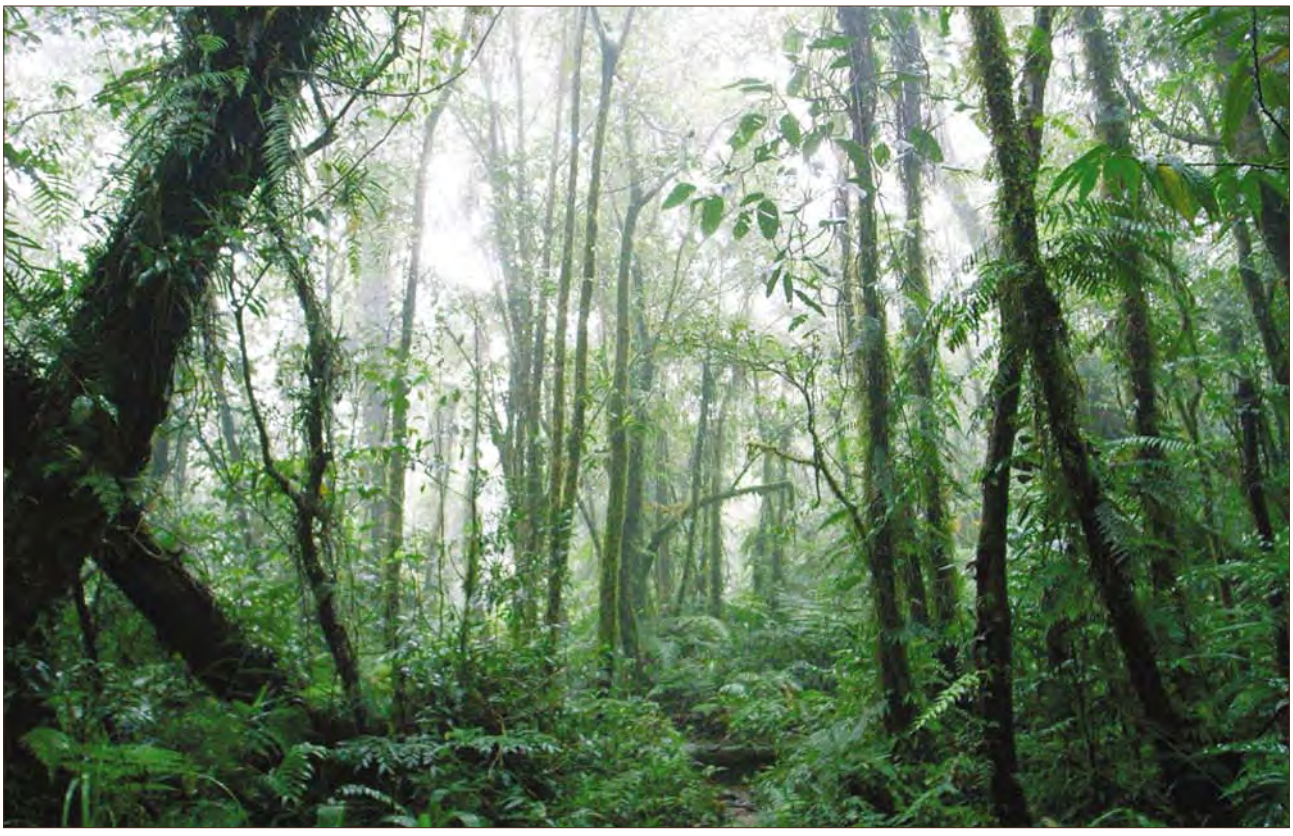
Rainfall

Rainfall at Dala on the west coast is some 3500mm annually, in the mountains much greater. The *Solomon Island Smallerholder Agriculture Study* (volume 4: Provincial Reports for Malaita, p.84) states:

> *Rainfall is high everywhere. More than 3000mm per year falls on the western and northern sides of Malaita, rising to an estimated 6000mm in the centre of the island.*
>
> *The north and northeast parts of the island (from about Auki north) receive more rainfall when the north westerlies blow in November to April driven by tropical depressions; Most of the rest of the islands receive more rainfall when the southeast trades blow in May to October. Rainfall of over 3000mm per year is not optimal for cocoa, sweet potato or some other crops.*

There is similarity to the weather coasts of Guadalcanal and Makira, with the bush East Kwaio and West Kwara'ae having two periods of very wet weather.

Wet rainforest clothes the steep slopes



Soils and maintaining fertility

According to Wall et al. (1979) soils on the steep ridges are moderately shallow to deep, well-drained loams and clays derived from volcanic rocks… deep, humus-rich clays over the largely sedimentary rocks of hills at lower altitudes; and clays or clay loams in valleys. Soil fertility is maintained exclusively by bush fallow:

- traditional communities use long fallows
- Christians use a mix of short and long fallows depending on the interaction of land availability, proximity to the settlement and productivity.

Mostly, gardens are cleared and burnt following the practice of swidden. At Jordan, an unusual method is used to prepare new gardens:

1. Undergrowth is cleared under large forest trees.
2. This is left to rot for about three months.
3. Tall trees are then cut down, left to dry (see photo below) and burned, apart from some useful timber and nut species which are left standing.

Land is very steep and very prone to erosion and this method allows some of the organic matter to return to the soil.

Organic by default

As with the other isolated areas, agriculture is 'organic' by default. Synthetic fertilisers or other chemicals are not used.

Incomes are too low to purchase agricultural commodities, and so improvements have to come without external input, other than that of new varieties.

The rains

The weather pattern is similar to that on the weather coasts of Guadalcanal and Makira:

- the Koburu, the west wind, brings cyclones, wind and rain at the beginning of the year, lessening in April.
- heavy rains return from May till July/August brought by the south east trades (Ara), lessening in September and October
- sunnier weather returns, until, once again, the Koburu arrives in November or December.

Women at Deresaia found it difficult to identify seasons.: It was always raining!

Clearing in a bush garden at Faunalea

Divisions of the bush

For the sake of discussion the survey area can be divided into four zones on the basis of topography, access to the coast and faith, as follows:

- river plains/bush lowlands: Deresaia
- lower foothills: Goikwalasinga and Busurata
- remote interior/high altitude:
  a. Christian Bobota and Jordan;
  b. Traditional Faunalea
  c. Masilana
- traditional hamlets (Faunalea and Furiau)

River plains/bush lowlands

This area is reminiscent of Marasa, west Guadalcanal, with wide fertile river terraces used for subsistence and cash crops.

Sweet potato is the staple food crop. Cash is earned from pigs, cocoa and cattle. The coast is some distance, but can be reached in three to four hours' walk. The river is navigable by small outboard motor canoes.

Buyers of cocoa, cattle and pigs come from Honiara. Schools and clinics are accessible.

A road is a few kilometres away and if it were extended into the valley it would bring about rapid commercial development.

Lower foothills

This division encompasses areas that are similar to the river plains/bush lowlands in terms of time to walk to the coast. The hills create much greater isolation, however.

Services are poor: schools and clinics are present but getting to them is difficult.

Money is earned through sales of vegetables (sweet potato dominates food production) on the coast and some cocoa.

Busurata has been included in this division due to its geography, but the presence of a road has transformed the life of the village and demonstrates the impact that a road can have on such inland bush communities.

Remote interior/high altitude

Life is difficult here. It is cold and very wet.

Sweet potato takes at least six months to first harvest and yields are erratic, sometimes creating 'time blong hungry'.

Services are extremely poor. Children do not go to school for the most part and earning money is a challenge when the coast is far distant and taking produce to sell is not a practical option.

Some taro is still grown and pigs are very important but sometimes suffer poor health.

Human health is poor, too, compared to other divisions, with greater incidences of malaria, pneumonia, TB and anaemia.

Masilana is included here. It is an isolated highland village in north Malaita. The presence of the coastal road and, therefore, access to Honiara, has inspired people to grow taro (and in the process, and with good management,, overcome alomae, **an important d**isease of taro,) and successfully obtain cash.

Traditional hamlets — behind the 'heden' curtain

Traditional hamlets are a subset of all the divisions. Everything said above in the remote interior/high altitude also applies to traditional hamlets. They are considered separately to highlight their isolation and the discrimination that the inhabitants experience.

The traditional faith of the inhabitants excludes them from the support that Christian villages receive from their churches. They are stigmatised because of their faith and its perceived 'evil' and few people visit them because of the fear it engenders.

Cash is difficult to come by, due in part by customs against selling certain varieties of food crops, inaccessibility to markets and having little to sell other than baskets, betel nut, taro and tobacco.

Health is poor and food uncertain, with people resorting to wild yams in 'time blong hungry'.

The 'conversion' pathway to development

To some extent, those who are in a majority control pathways to development. The only way for non-Christians to partake of what limited services are on offer is to convert to Christianity: then their lives will improve.

Conversion is often motivated by the desire to access education for their children and to access resources and a more comfortable way of life.

It is obvious that these, traditional, people have similar aspirations and needs to other communities in the rural areas. They want to earn money and to improve their lives and they are eager for agricultural information, new food crop varieties and, above all, training opportunities and education for their children.

Bobota to Goikwalasinga 'heden' (heathen) hamlet

The poorest of the poor

There is little doubt that these traditional communities — perhaps numbering over 2500[1] in Kwaio alone — are among the poorest of the poor in Solomon Islands. They lack even the basic 'essentials', including pots for cooking, decent clothing, covers to sleep under, mats, basic toiletries, etc.

By any comparison they are worse off than other Solomon Islanders. None of the communities have piped water supplies, houses with raised floors, a basic understanding of sanitation and health or access to clinics.

There was even an unsubstantiated rumour that because of poverty, newborn babies in hamlets around Jordan, are wrapped in wild banana leaves to keep them warm.

Frequently, there were attempts made to divert the survey team from meeting or staying with them. However, they were welcoming and eager for information and opportunities to improve their lives.

Traditional life

Traditional villages and gardens follow an erratic, semi-nomadic, pattern with families moving from time to time — after generations or after just a few years.

The decision to move is made according to signs from the spirit world. An advantage from moving is that it allows a shift to more fertile soil; a disadvantage is that there is no incentive to improve the village.

Typically, a traditional village has three main areas:

- a communal house where the women and men meet together and where pigs, women and children stay at night
- a sacred men's shrine house where women cannot go
- a women's house for menstruation and childbirth.

Women use separate gardens when staying in the menstrual/childbirth houses as they cannot eat food from the communal garden at such times.

There are strict rules for women to prevent 'pollutions' and consequent retributions from the spirit world. For example, if a woman urinated in the compound at night, sacrifices would have to be made and, possibly, the village would have to move to prevent some calamity.

However, a woman from a traditional village could go and train other women. She would have to do this outside her 'season' (menstruation) or she could work in Christian villages at that time.

There are some common vulnerabilities that are present in all places, such as:

- cyclones
- two wet season
- pig stealing
- smoke in kitchens
- loss of key people
- health issues, including sanitation.

These and other issues are discussed in detail under Livelihood Issues below.

1 The Report on the 1999 Population and Housing Census: Analysis (p.36) gives a combined figure of 2633 for people of traditional belief on Malaita and Guadalcanal, that is 2% of 122,046 and 0.2 of 60,042, respectively

Description of villages assessed

Table 2: *Livelihood analyses of* East Kwaio and Central Kwara'ae regions of Malaita

Villages assessed: *Deresaia*

Vulnerabilities	• Floods (heavy rain and cyclones) and soil erosion from the Kwaibaita River: damage to food and cash (cocoa) crops. • Economy dependent on outside buyers of cocoa, cattle and pigs. • On river terraces, there is competition for land between food and cash crops. • Sweet potato dominates food production; there is a lack of vegetables. • Lack of water supply. • Some concern about sorcery from nearby (jealous?) villages.
Assets *physical*	• An 'old' road is 7 km away. • A radio is nearby at Nammalaelae. • There is a walking track to the coast; the journey takes four hours. • The river is used to transport goods to the market, three to four hours' away.
human	• Schools and a clinic are nearby at Nammalaelae. • There are large cattle paddocks that are well fenced; ducks and fish are also raised. • Five families work together growing cocoa and raising cattle; these projects are well-planned and exhibit a high degree of self-reliance.
natural	• Flat, fertile land exists along the river banks; food crop yields are high. • There are reserves of forest.
social	• There is a youth group. • There are three markets, albeit far away.
financial	• Cocoa, cattle, pigs and sweet potato (although profit is low). • Money is earned through battery recharging services.
Issues	• Lack of a road. • Dependence on sweet potato. • There is an opportunity to add value by processing.

Sweet potato is mounded to lift the roots above saturated soil. Banana grown on the edge of the potato field. The village of Deresaia is dependent on the sweet potato crop.

At Deresaia, five families work together to grow cocoa and keep cattle.

Cocoa is grown below coconut palms.

Villages assessed: *Jordan*

Vulnerabilities	▪ Extreme isolation: a days' walk to the coast. ▪ Lack of readily available information. ▪ Soils are being exhausted along the river; some families do not like to cultivate the hillsides. ▪ Sweet potatoes take six month to harvest. ▪ Clinic gives 'presumptive' treatments.
Assets *physical*	▪ Tracks along the river to Deresaia and the coast. ▪ A radio will be installed shortly.
human	▪ There is a new school (traditional children are among the pupils) and clinic. ▪ People with education have come back to the village (three brothers who have specialised in teaching, nursing and cocoa).
natural	▪ There is a waterfall that has potential for electricity generation. ▪ Forests are abundant.
social	▪ There is a Sunday school. ▪ There are well-organised community days to care for the school and the clinic.
financial	▪ There is a market once a week, mainly for vegetable sales.
Issues	▪ Sweet potato diseases and planting methods. ▪ Low fertility of soils along the river bank. ▪ General lack of information. ▪ Low food diversity.

Villages assessed: *Faunalea — a traditional village*

Vulnerabilities	▪ Extreme isolation: long distance to coast and no services; no visits by anyone. ▪ Sweet potato planting method and low yields. ▪ Food shortages, especially between March and August, resulting in poor nutrition; resort to wild yams from the bush. ▪ Health issues: pneumonia, malaria (from visits to the coast), anaemia, hook worm (from close contact with pigs). ▪ Women give birth in bush huts and without experienced helpers, putting them at risk. ▪ Pig diseases.
Assets	
physical	▪ None, except tracks in the forest.
human	▪ There is no school, but some children are sent to school at Jordan.
natural	▪ Forests are abundant and used for food, medicines and housing materials.
social	▪ None apparent.
financial	▪ Sales of pigs. ▪ Use of shell money.
Issues	▪ Protein politics — man first! ▪ Very low cash income. ▪ Sweet potato planting methods. ▪ Discrimination against those of traditional faith. ▪ No services and lack of information.

Steeply sloping land is cleared for bush gardens.

(below) A cleared bush garden freshly planted to sweet potato.

(right) Sweet potato spreading across a bush garden, with taro (the broad, trianglar leaves) interplanted.

Villages assessed: *Bobota*

Vulnerabilities	• Extreme isolation — Atoifi Adventist Hospital is a 12 hour walk. • No services: children do not go to school (parents do not want them to go due to distance); there is no clinic nearby. • High out-migration, especially after three Fijian teachers left. • Lack of food: sweet potato take six months to produce a crop; there are crop disease problems — alomae on taro and *burua* (nematode) on yam and banana; cultivation techniques are poor; there is use of wild yams. • Pig stealing is common. • The presence of pig diseases. • Communities are small with no one to assist when needed. • Loss of vegetable seed.
Assets	
physical	• None, except tracks in the forest.
human	• Some children have gone to school. • Men have taken work on other islands and returned.
natural	• Have access to large areas of forest where plants are taken for food (eg. wild yams), medicine and building materials. • There is land for a variety of food crops and cultivated reserve foods, eg. kakake.
social	• Boys are active.
financial	• Income is very low: axe handles, bowls and canoes are fashioned. • Traditional communities sell tobacco and betel nut. • Teak is planted and cocoa is being considered.
Issues	• High rainfall and poor crop yields. • Early pregnancies. • Distance to markets. • Loss of pigs through stealing and disease.

The rugged terrain around Bobota

Bobota: Forward and backward migrations

'Rain barava spoilem mi fala' ...Sale

1967	▪ Families moved from bush to be close to Atoifi Adventist Hospital and School. ▪ They established a village on their mother's land on the coast.
1974	▪ Moved to Honiara and worked for Solomon Taiyo, rest of community stayed on the coast.
1992	▪ Land disputes started. ▪ Two families decided to move back to the bush on their tribal land.
1992-1998	▪ Some traditional families joined the village, as well as others from the coast. ▪ At its peak, the village had 120 people.
1998	▪ Fijian missionaries established a school at Bobota.
1999	▪ School closed down due to SSEC (South Seas Evangelical Church) internal politics. ▪ School has not reopened.
2000	▪ Ethnic tension and coup occurred, but in the bush it had no effect on them. ▪ They had no services before and did not notice the collapse of the central government.
2003	▪ Most of the families gave up and returned to the coast. ▪ Four families moved to start new hamlets in the bush nearby, settling on their tribal land.
2007	▪ Scattered hamlets with one or two families in each remain. ▪ No one has ever received any support from the government or any other agencies in these migrations.

I feel happy with my life because, finally,
I have placed my children on their real land where they are safe.

We don't want more trouble in the future. I hope they will stay here and do something with their land" ...John and Sale, chiefs/elders of village

Villages assessed: *Goikwalasinga*

Vulnerabilities	▪ Less isolated (2-3 hours from the coast). ▪ Traditional faith/Christian divide — large difference in resources. ▪ Loss of key people. ▪ Tourism is a lost opportunity (for those of traditional faith) due to corruption.
Assets	
physical	▪ There is a water supply.
human	▪ A kindergarten is present.
natural	▪ Have access to large areas of forest where plants are taken for food (wild yams), medicines and building materials.
social	▪ None apparent.
financial	▪ There is a canteen. ▪ Cocoa is grown in a neighbouring village. ▪ The beginning of teak plantations. ▪ There is an opportunity for traditional women to market produce from their menstrual/childbirth gardens. ▪ People on the coast order food crops.
Issues	▪ A road would assist. ▪ Lack of education, especially for women.

Livelihood issues

People's livelihood activities are various and varied, as they are elsewhere in Solomon Islands. Those that are of major and minor importance in terms of food generation and described are given in Table 3.

> *'Mi fala no save long eniting. Kasim dis fala taem mi fala stap blind no moa*
> *('We know nothing — until now we have been left in darkness')*
>
> *...Jordan villager*

Wild harvest of the forest

Table 3: *Livelihood activities in the bush villages of East Kwaio*

Major		Minor	
Subsistence	*Cash*	*Subsistence*	*Cash*
Grow root crops in shifting gardens	Sell sweet potato and taro to small village and larger coast markets	Collect and eat small insects	Make and sell baskets
Grow greens in gardens and in beds	Make and trade shell money	Raise chickens	Make and sell axe handles, bowls
Grow fruits and nuts around village and in bush	Sell tobacco (traditional)	Raise ducks, cattle, *Tilapia*	Sell cattle
Raise cattle	Sell cattle (Kwaibaita River area only)	Stealing pigs from gardens	Small canteens (family)
Grow betel nut	Sell in local market and to each other	Hunt bush meat — frogs, possums, birds	Young men: temporary migration for work (eg. west)
Collect yams, medicine, food from forest	Grow cocoa — sell to traders	Make bows and arrows, traditional crafts / tools	Solar battery charging
Raise pigs	Sell some pigs / exchange for shell money	Cook using bamboo	Money from 'honourable'
Collect water and firewood	Paid labour for carrying	Ceremonies and feasts (traditional and Christian)	Paid employment outside
Build houses		Traditional people — sacrificial ceremonies	
Grow and consume tobacco and betel nut			
Fish and shells from river			

Food production

The general situation on Malaita is summed up in the *Solomon Islands Smallholder Agriculture Study* (volume 4: p86) under subsistence food production:

> *Sweet potato is by far the most important food crop in the province. Its cultivation dominates food gardens on Malaita.*
>
> *Cassava is an important food crop and is increasing in significance.*
>
> *Taro is commonly grown, mainly in the mountainous interior and in the foothills.*
>
> *Banana is also widely cultivated, and the overall area is perhaps as great as that for cassava and taro.*
>
> *Minor staple foods are yam (Dioscorea alata), pana (D esculenta), kongkong taro (Xanthosoma), giant swamp taro (Cyrtosperma) and giant taro (Alocasia).*
>
> *The main green vegetable grown was previously slippery cabbage, but it is being severely attacked by insect pests and less is now grown as a result.*
>
> *A wide range of other vegetables are grown or collected from the bush, including six common leafy greens.*
>
> *The most common food-producing trees are ngali nut, cutnut (Barringtonia procera), pawpaw and wild mango. Betel nut and betel pepper are widely grown and consumed.*

Wild harvest

Food is also collected from primary and secondary forests. For example, wild yams, mushrooms, fruits and nuts, and a range of leafy greens.

Rivers provide some protein (fish and prawns) for households skilled enough to catch them. Swamps are important for kakake planted as a reserve food.

Most households have at least a few coconuts and there are some old coconut plantations on the coast. Coconuts grow slowly and yield poorly at higher altitudes.

There are also sago palms for thatch, wild mango and the occasional breadfruit.

Swidden (bush) gardens

Most food is grown in swidden cultivation.

A typical household has two to four gardens at any one time, each at different stages of production.

Fallow periods vary considerably:

- where land is still abundant they vary from four to ten years
- on river flats they can be as short as one (Deresaia) or two years (Jordan).

Cropping cycles vary, too. In Bobota and Faunalea, only one crop is planted before a return to fallow; elsewhere there may be two or three crops.

In the swidden garden

Poor returns, narrow diversity

Two observations dominate any discussion on food production in the Malaita highlands:

- first, sweet potato is overwhelmingly the most important food crop but in some places is failing to provide adequate returns
- second, diversity of food crops is narrow, both in terms of the number of species grown and the number of varieties within species (Table 3); taro and yam, for instance, were little grown in the villages visited, including the traditional one.

Table 4: *Number of root crop varieties remembered and present in five villages in East Kwaio*

Crop	Deresaia	Faunalea	Jordan	Bobota	Goikwalasinga
Aroids				×	
• Taro	2	×	xx	6/6*	8/4
• Kakake	2	×	×	2	
• Kongkong	1		×		?
• Edu		×			0
Banana	8	×	×	9/5	2
Cassava	2	×	×	4/2	2
Pana	2			0	0
Sweet potato	6	8	8	14/6	9
Yam	5			2	8/0
Wild yam	4	×	×	5	4

KEY:

* The number grown in the past/the number grown today.

x The crop is present but the number of varieties was not recorded.

Food vulnerability

Whereas the loss of some crops, for example, slippery cabbage (*sliperi kabis*), though serious, can be overcome by substitution by a range of other leafy greens, the loss of taro has more serious consequences in the extreme rainfall of the Kwaio bush.

A reliance on sweet potato, the only practical alternative, brings its own vulnerability: a failure to tuberise when soils hold excessive moisture. The result is a period of hunger and a dependence on bush foods such as wild yam, as households lack sufficient cash to purchase food

In addition to vulnerabilities caused by climate and loss of agrobiodiversity, land problems were noted that affect food production. At Jordan, people were restricted to gardening on lower slopes and along the river; but whether this was due to a shortage of land or other reasons was not certain.

In general, and as to be expected, land pressures from increased population were less than those of coastal areas. However, this might change in the near future. The survey found that people are moving from the coast because of population increase and land disputes and settling on their ancestral lands in the bush. This back migration is complex, however, with people to-ing and fro-ing between bush and coast in response to competing demands for access to land and services.

Sweet potato that has failed to tuberise in soils that are too moist

The staple foods

Sweet potato

Along the river flats at Deresaia yields are high, as much as 20t/ha, and frequent flooding of the river ensures replenishment of nutrients. At other places yields are much lower, although not measured.

At high altitudes — at Jordan, Bobota and Goikwalasinga — crops takes four to six months before roots are fit for first harvest. Another three harvests are then carried out over the next six months.

At Goikwalasinga, the last harvest is strictly for family use as roots are too small to market. For some cultivars, eg *Gwanau'u*, *Teknic* and *Julie*, the plants are left to produce a crop from the vines, which takes another six months. Several factors, described below, affect production.

Pests and diseases

Two varieties, *Saltwater* and Pixa, showed symptoms of virus.

In a garden at Bobota, a single shoot of *Saltwater* bore leaves with a mild chlorosis. In contrast, everywhere *Pixa* was grown, plants showed small, 1-2mm diameter, purple spots, that were more numerous on older leaves (see photo below). It is possible the spots were caused by whiteflies.

Ring spots of similar size were also present, typical of virus infection. A tuberous root has been planted at KGA to observe if symptoms appear on newly emerging shoots.

Sweet potato weevils were not seen, and damage to leaves by leaf folders (*Herpetogramma*) and fleahoppers (*Halticus*) was insignificant.

Production techniques

Low yields were reported at Jordan, Faunalea and Goikwalasinga.

Planting techniques at all these sites were unusual and unlikely to produce acceptable yields.

Sweet potato cultivation at Jordan

At Jordan, people were cultivating river flats with only short fallow periods between crops and soil fertility appeared low.

The gardens were high above the river, out of reach of floodwaters that might otherwise bring periodic influx of nutrients.

Inspection of the vines showed that they were damaged near ground level, symptoms similar to sweet potato weevil larval damage; however, examination of the vines failed to find this pest. A more likely cause is fungal infections by *Athelia rolfsii* at an earlier date.

Whatever the cause, growers were planting up to 20 cuttings in a mound to ensure some survived. This probably exacerbated the situation, providing the fungus with more leaves and vine to colonise.

Purple spot on sweet potato leaves at Bobota, possibly caused by whiteflies or virus

Sweet potato cuttings planted as a bundle at Faunalea.

Sweet potato cultivation at *Faunalea*

At Faunalea, in a steep garden overlooking the Kwaibaita River, sweet potato had been newly planted in shallow mounds.

The unusual feature here was that cuttings, old and new, were bundled, thrust into mounds and then trodden on (see photo below).

Inspection of the planting material from one mound found a total of 15 vines, many of which were rotting with thick cottony growth over parts of the stems, similar to A *rolfsii*.

The planting method was akin to composting and it is not surprising vines were decayed.

The woman who owned the plot was old and her methods may not be typical of this traditional village. However, as a related problem occurred at Jordan at the bottom of the valley, it is probable that variations on the multiple-vine planting technique are common in the area.

Sweet potato cultivation at Goikwalasinga

Interesting observations were made at Goikwalasinga village where yields were low in a garden about 3 1/2 months' old. One mound examined had only four medium sized roots that weighed 1kg and four smaller roots of 0.5kg.

From a discussion with women in the village it seems that young girls had planted the garden. They did not take cuttings before the time of first harvest, not all the cuttings were from terminal shoots and the mounds were too small.

Whatever the reasons, the people should test new ways of soil preparation and planting. They are clearing large areas for sweet potato and yields per mound are relatively low and the tubers misshapen (see photo below of roots in the kitchen).

Women in the village are already experimenting with different ways of planting sweet potato, including varying the numbers of vines per mounds, and are keen to test other methods.

Sweet potato cuttings bundled and planted into mounds at Faunalea

Misshapen sweet potato roots in a kitchen at Goikwalasinga

Taro (Aroids):

Taro — common, giant swamp, giant, kongkong

In many villages, especially in traditional communities, taro is the main cash crop; it is one of few options for people who want a regular, albeit small, income. People come to the villages where taro is grown and the money taken is used to pay for salt and, occasionally, kerosene, soap, rice, fish and noodle. In traditional hamlets, taro is still very much governed by custom. Growers are cautious about bringing in new varieties and fear the disease of taro, alomae.

My main interest is growing taro. No matter it's Sunday, I am still in my taro garden

...Old man from Bobota struggling to deal with alomae in his one potential cash crop — taro.

Alomae has drastically reduced the importance of taro in the traditional farming system of East Kwaio, as it has done in both lowlands and highlands elsewhere on Malaita. There has been similar destruction of the crop on the weather coasts of Guadalcanal and Makira in recent years. Taro was present in all the villages visited, but compared to the area planted to sweet potato, it was insignificant and the number of cultivars was small.

Slowly folding taro leaves, trapping the insects that spread the plant disease, Alomae, at the village of Jordan. The diseased plant will be taken away and burned.

The decline of taro

Even at Faunalea, the traditional hamlet above Jordan, Alomae was said to be present and the people had not sold taro from their gardens in recent weeks, even though taro (along with tobacco) is their most important source of income.

Taro is no longer an everyday food. Respondents at Faunalea said that they had eaten taro the previous week, but not during the past three days. Elsewhere, gardens of taro were seen on hillsides between Bobota and Goikwalasinga but it was not possible to check if Alomae was present. It was a concern of people at Goikwalasinga and those in nearby traditional villages.

People do not know how to manage Alomae:

- either they leave the diseased plants and take those that appear healthy to replant elsewhere
- or they pull up the diseased plants and leave them on the soil.

People have lost their traditional knowledge. Previously, diseased plants would be carefully removed, not left to die in situ. Today, gardens are no longer shrouded by forest, so the disease spreads easily between them. It is, however, possible to bring the epidemic under control with carefully applied cultural practices. These were demonstrated in all the villages visited, but more needs to be done.

Other aroids are also grown, albeit in small amounts: at Goikwalasinga, informants said that kongkong taro was present but often died. In some villages, for example, outside Deresaia, near Nammalaelae and at Bobota, there were swamps with kakake. Many bush hamlets do not have suitable swamps — particularly in the area west of Sinarangu.

Edu was said to be planted at Bobota, but none was seen. In traditional villages around Goikwalasinga, it was a recent introduction and said to rot.

Banana

Bananas are common in all villages but, interestingly, more varieties were recorded in Deresaia along the Kwaibaita River than elsewhere. Here there were seven, with two said to be especially suitable for children.

The main complaint was that although the fruits were abundant, there is nowhere to sell them, and so they are left to rot.

The plants were healthy, although people complained of scab moth.

Elsewhere, the situation was different.

The falling bananas of Bobota

At Bobota, there where only three varieties reported and, although plentiful within the village and in the gardens, many fall over when nearing maturity.

Examination of the plants found that they are easily removed and that the roots were rotten.

Symptoms are similar to those caused by nematodes, either the lesion nematode, *Pratylenchus coffeae,* or the burrowing nematode, *Radopholus similis* (see photo).

Longitudinal section of the root showed characteristic red and/or black patches and the stems had a choke-throat symptom, where young leaves failed to unfurl.

As yams were said to have similar symptoms it is likely that nematode is the cause and, of the two candidates, *Pratylenchus* is the more likely.

(above) Banana is common in all villages

(below) Pratylenchus damage to banana, Bobota

Cassava

Cassava is planted as a border around gardens or in patches within them.

The cultivars, My Life and theYellow Curry, were those mostly grown. There were four varieties at Bobota, more than elsewhere.

None of the villages reported problems in production, and plants seemed to be growing well, apart from:

- minor infestations of white peach scale, *Pseudaulacaspis pentagona,* which causes a white growth at the bottom of the stem that is often mistaken for fungus
- spider mites, probably *Tetranychus sp.*
- the coreid bug, *Amblypelta*, causing minor shoot-tip dieback.

Yams

There has been near total loss of varieties of both *Dioscorea alata* and *D esculenta*.

The reasons are hard to come by. One possibility is that people have lost varieties during movements to and from the coast. Many of the villages are new and people would have taken germplasm of all crops as they moved. However, in most coastal villages the number of yam cultivars is low and this could account for a similar low number in the bush.

There may be another reason, too. Yam, in contrast to all other roots crops, is propagated from the tuber. Tubers are heavy and less easily transported compared to vines of sweet potato, 'tops' of taro and stems of cassava, and they may have been lost as a result of repeated migrations in and out of the bush. Also, yams have to be replanted annually; it is rare to find feral plants. By contrast, planting material of cassava, sweet potato and taro, can always be found in abandoned gardens.

For *D alata,* but not for *D esculenta*, loss of varieties is also related to disease. The nematode infecting roots of banana is a pathogen of yam. The disease caused by the nematode was recognised by informants from photographs at Bobota and Goikwalasinga, and one small diseased tuber was found at Goikwalasinga.

The nematode reduces root growth, causes shallow, dry, tuber rots and sometimes results in the death of vines. Later, after harvest, it continues to invade the tuber and, in association with fungi, destroys the regenerative tissues beneath the 'skin', with resulting loss of planting material.

Yams were also said to be affected by lightning. This is reference to the sudden blackening of leaves, especially in the storm season. It is due to fungal infection by *Colletotrichum gloeosporioides*. High rainfall in the interior of Malaita would favour this fungus.

Wild yams

Importantly, wild yams, probably *D nummularia* and other species, are still retained. This is because they are natural components of the bush. They are not truly wild as people plant some types to ensure sufficient supplies in times of hunger.

They are an important reserve food, with four to five varieties consistently reported from all the places visited.

Varieties differ in time to maturity; for example, *Mute* takes four to six months, while *Tabina* can only be harvested every second year. Generally, wild yams are dug, harvested and the 'head' buried again. The same plant will produce repeatedly.

The sweet potato harvest

Agroforestry

A variety of fruit and nuts and other useful trees are planted in the villages and in the gardens. The diversity is similar to that documented for the weather coasts of Guadalcanal and Makira, but the number of plants in the villages is much fewer. This may be because the villages are relatively new or that fruits are undervalued in their importance for nutrition and health.

Commonly seen species were:

- guava
- citrus species (lime, orange, pomelo)
- banana
- sago palm
- Malay apple
- pineapple
- papaya
- carambola.

The nuts included:

- ngali
- cutnut
- and the ever-present betel nut.

Other trees included:

- coconuts
- kapok
- wild mango
- breadfruit, both planted and wild, in the villages and the bush.

At Bobota, there were four species of mushrooms collected from the forests and no doubt these are present elsewhere (see photos below).

Teak is becoming a common component of agroforestry, planted in land used for food gardens, without necessarily any thought to the long term effect on food production.

Typically, the compounds of traditional villages are clear of vegetation except for betel nut in more established settlements. Bananas, sago palms and many other trees and bushes are planted on the perimeter, outside the boundary fence.

Groves of planted nut trees are commonly found on ridges at the lower altitudes. At lower altitudes, too, coconut plantations are present and used for subsistence, while at higher altitudes attempts to establish coconuts have been unsuccessful and people supplement supplies by trading with the coast.

Edible mushroom

Intact forests contribute to livelihood

Forests are still extensive and contribute a great deal to livelihoods.

They provide building materials:

- timber
- bamboos
- palms for construction
- sago palms for thatch
- ropes for binding.

Other useful forest products include:

- materials for cooking and water storage
- medicines
- bush foods for regular and emergency consumption.

Forests also perform important environmental functions, including restoring soil fertility of gardens, reducing erosion, and protecting and regulating water catchments.

If forests are preserved they will remain a very valuable resource in the future.

(top & lower left) Bamboo

(below) Forests provide building materials: timber, bamboos and palms for construction

Leafy greens & fruits

Leaf greens are plentiful and many types are planted (eg., (Borneo cabbage, *Sauropus androgtnus*) or taken from the bush. These include ferns, both ground dwelling and climbing. In most places, sliperi kabis is no longer planted due to severe damage by the beetle, *Nisotra.*

At Deresaia, there are seven main greens consumed. In order of preference they are:

- kasume (tangele)
- baia
- takume
- sakwari (amou or sanpepa kabis)
- lale, kangkong
- lalaru.

Leafy greens in the village diet...
(top) ***Borneo cabbage*** *(Sauropus androgtnus)*
(centre & lower) Traditional greens with language labels
(below) Fern

New greens such as ute (above) are gradually replacing slippery kabis (below) as cultivated greens in gardens

There is a wild taro *(Colocasia)* that grows in swamps that has edible leaves. It is common in Jordan and Faunalea.

While a range of edible greens are available, their consumption is irregular and there are serious nutritional concerns about the lack of greens and fruits in the diet,, particularly those of infants and children (see nutrition section). However, pawpaw and pineapple are grown in the gardens.

New greens such as ute are gradually replacing slippery kabis as cultivated greens in gardens.:

Livestock

Cattle

The cattle project along the banks of the Kwaibaita River at Deresaia is impressive. It is well managed. There are some 150 animals rotated between four paddocks, with well-maintained fences.

Periodically, cattle are slaughtered to satisfy demand of buyers who come from Honiara. Each beast is sold for about SBD8000.

Those children who fail at school are employed to work on the enterprise. There were other cattle projects further up the river, although none as large as that at Deresaia.

Cattle operation along the flats of the Kwaibaita River at Deresaia.

Assistance undelivered

The families involved in the project at Deresaia have asked their provincial member to provide more fencing material as part of a long-promised cattle project. So far, they have not seen any assistance.

In the past, there was a promise to purchase milk at SBD40 a litre, but this did not materialise.

On the flats of the Kwaibaita River, cattle raising has been a very successful livelihood, much more so than in other parts of the country.

An evaluation of the project might provide useful indicators for the success of enterprises elsewhere.

Pigs

The importance of pigs cannot be overestimated. They are kept in all villages and are a major source of income, particularly among Christian families, being sold for bride price ceremonies and other feasts.

Care of pigs is a major preoccupation of women and girls. In traditional communities, pigs have very high cultural value, being sacrificed in rituals performed to satisfy supernatural ancestors. In these villages, pigs are sold for cash or shell money only when ritual needs have been met. In troubled times, more rituals occur and hence potential income is less. For example, at Faunalea, where there are food shortages, no pigs have been sold so far this year.

Disease prevalent

Pigs were healthy in Jordan, but at Faunalea in the hills above, 'cough-cough' was reported. This is likely to be swine influenza, perhaps, superimposed on an initial chronic parasitic infection and exacerbated by poor diet. A similar condition was reported from traditional villages around Goikwalasinga.

Pigs were also in trouble at Bobota, where some had become thin and died.

In some places, it is the gardens that are fenced rather than the pigs (see photo bottom right). For the most part the pigs are penned at night but left to range freely during the day.

In traditional villages, the pigs are kept inside the communal houses at night (see photos below) and allowed out during the day under the care of a minder.

In traditional villages, the pigs are kept inside the communal houses at night

Pigs have high cultural and economic value

At Faunalea, the pig pens run down the side of and inside the communal house. In the morning, sticks are removed from the pens and the pigs roam the forests until evening

Gardens that are fenced rather than the pigs

Pigs accommodated in a sturdy pen

Well made pig house.

Pig theft

There is the ever-present fear of theft.

Pig stealing appears to be well ingrained in Kwaio culture, done as much as a mark of a young man's right of passage as for any nutritional or monetary gain.

Young men prove themselves by their adeptness to steal and, previously, displayed rings fashioned from plant fibre to adorn their hair as proof of their skills: one per pig stolen. Dark nights, with rain to wash away footsteps, are best.

Nowadays, the Christian villages blame those of traditional faith as being the culprits. Who those of traditional faith blame was not said.

Travel to coastal market requires staying overnight . because of the threat of stealing. Whole gardens can be harvested. There is a culture of theft. *"You have to be a big man before you can grow pineapple"*

...Siofa team member from East Kwaio) — meaning, stealing is such a problem that unless you are a very influential person you would not attempt to grow easily stolen crops.

Pigs and village hygiene

Because pigs also range freely within traditional villages, there are hygiene issues with pig droppings around houses and even inside them.

Poultry

Chickens

Chickens were not common.

There were some healthy chickens at Deresaia where there was a chicken coop under a family house with chickens let out to range freely each day.

Some were present, too, at Jordan. at Jordan. At Faunalea, chickens were said to have died after a shaking disorder caused them to fall off their perches.

Ducks

Muscovy ducks were observed only at Deresaia. They were healthy and were in demand at local markets.

Given their adaptability to wet conditions, ducks could be a useful means of supplementing incomes and improving diets of those living in the bush.

Migration

Migration has had a major impact on bush communities.

Patterns are complex (Fig. 2), with people moving in and out of the bush, as well as between sites within it. Relocation of traditional hamlets is common. The strongest pattern of migration is to the coast to seek services — education, health and economic opportunities — but there is also a back-migration which has its roots in disputes and feelings of insecurity around land ownership and the desire to secure customary title.

For some, this back migration has proven successful as they now have certainty over their land.

A dream short lived

But for many, the dream has proved short lived. After living on the coast or in urban areas, it proves very challenging to return to the remote and difficult interior. Many families have returned once more to the coast or to towns after attempting to restart a life in the bush.

The main reason cited was the lack of services and the difficulty of earning money to meet basic needs. Many of these more educated and informed back-migrants feel frustrated in their attempts to develop their land and improve the lives of their people.

Lost opportunity

There was little evidence that much money or goods flows back to bush communities from Honiara-based relatives. Even if Honiara wantoks wanted to remit money, it is very difficult for them to do so, given the unreliable shipping, lack of communication, absence of banking services and the need for whoever brings the money or goods to walk for a day or two through rugged terrain to reach the village.

This is a lost opportunity. For some communities, out-migration of some members has not all been as unskilled labour. For example, two members of remote Bobota village are professional people with well-paid jobs in Honiara, but it is difficult for them to send money home. Sometimes they come for a short time at Christmas, and if Bobota people go to Honiara they stay with them.

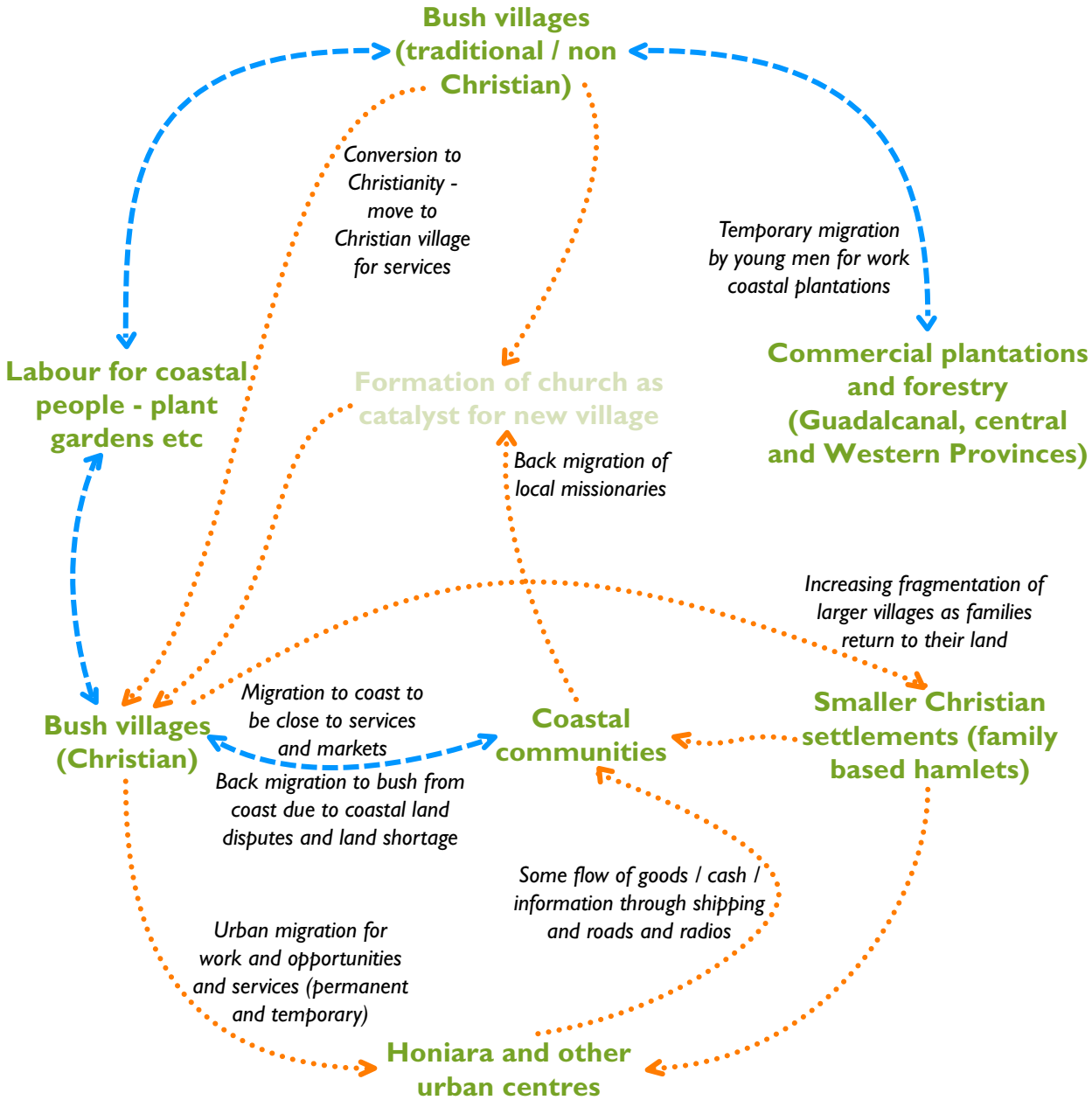


Fig. 2: Patterns of migration to and from the bush

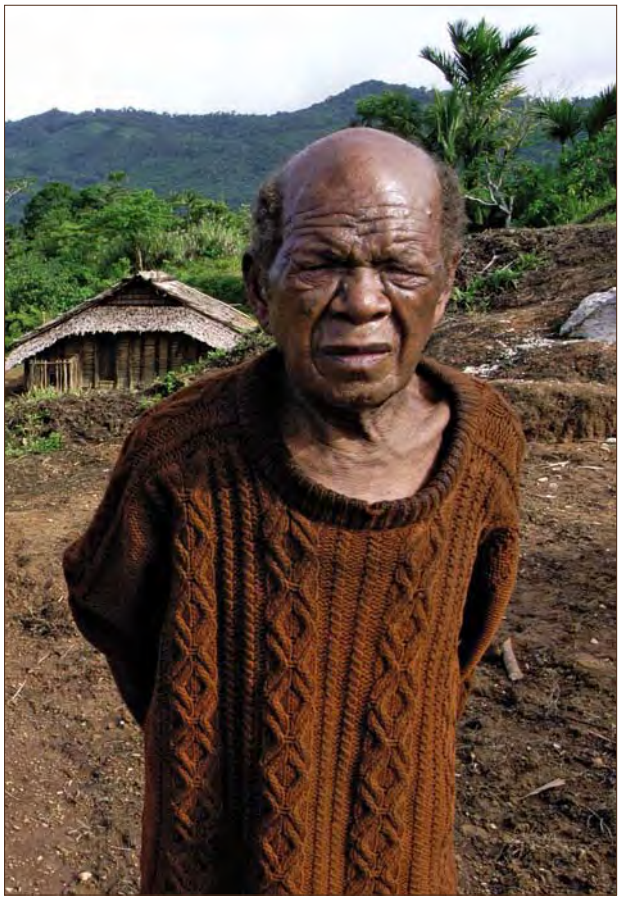
From traditional communities, out-migration has been mostly in the form on unskilled labour on plantations in Russell islands and the Western Province. This seems to have been a pattern for generations. But they find it very difficult to save and usually return after years away with little more than a few goods purchased from their last pay packet.

Old man from Baelalu village

He has practiced traditional beliefs all his life. He went to Guadalcanal (he calls it 'Solomon') after WWII when he was young. He worked on plantations there. Later, he worked in Choiseul and on plantations at Mamara and Lafulo in Guadalcanal.

He returned to the village to get married and never left the island again. He joined the Marching Rule (Maasina Ruru) movement and helped build meeting houses.

He feels sad that he cannot communicate or keep any contact with his friends from other islands and he knows he will never see those people again. His life in the village has been very lonely.



Bobota village once had more than 120 people but is now largely abandoned apart form one remaining extended family. Many dreams and hopes of development have risen and faded away in the bush.

Income generation & expenditure

There is a strong correlation between distance from the coast and income — the further away, the less earned.

Deresaia

At Deresaia, the families living aside the Kwaibaita River and farming the extensive river flats show considerable enterprise and entrepreneurship.

They have large pastures for cattle and cocoa plantations yielding 50-100kg wet beans per fortnight in season. For a small profit, sweet potatoes are marketed on the coast, being taken there on foot or in canoes.

Such is the size of their cattle and cocoa holdings that buyers come from Honiara.

Goikwalasinga

Goikwalasinga showed similarities to Deresaia, although in the bush.

It was still possible to earn money as the coast can be reached in two to three hours.

Here, people fulfil orders placed by coastal inhabitants and take vegetables, sliperi kabis, sweet potato and taro to market each Friday. There is cocoa in the next village and wet beans are sold to a drier 1 1/2 hours' away. People of traditional faith sell betel nut and tobacco.

Jordan, Bobota and Faunalea

Further inland at Jordan, Bobota and Faunalea cash is more elusive: distances to coastal markets are too far for regular attendance.

Jordan has a local market and cocoa has been planted with the intention of taking wet beans to Deresaia.

Taro is the main cash crop at Bobota. Three bags, each of 50 taro, provide a gain of SDB50, a relatively modest return to labour.

Other garden items sold at coastal markets include sugarcane, banana, sweet potato and sliperi kabis, perhaps once in a three to four month period. A few other commodities are made in these remote inland villages, even canoes, but demand is low (see Table 4).

The situation in the furthest inland areas is somewhat analogous to that at Masilana and Gwaiau further north, where taro is produced in remote mountainous areas, carried to the coast and sold in Auki and Honiara.

Household purchases

When people have cash, they buy:

- kerosene (up to one Schweppes bottle a night)
- noodle — one or two packets a week
- salt
- taiyo (canned fish) - buy it sometimes or buy fish from the sea
- sugar - SBD10/kg
- rice - SBD10/kg
- school fees: community high fees are SBD400/year

Community obligations in Christian villages appear to be greater than those in traditional villages. In some villages people pay a tithe to the church.

Services are usually much better in Christian villages, in part because they have access to church and government resources and due to their communal efforts. The villages are larger and the communities are well-organised.

Investing in shell money

One baniou (string of shell money) has equivalent value to 800 taro or one large pig, or cash of SBD600.

Making shell money, along with raising pigs, is one of the few means of creating wealth and savings in bush communities. Its ready conversion to cash makes it a very useful commodity.

Making shell money creates wealth

Table 4: *Main cash earning possibilities for the villages surveyed in East Kwaio*

Fertile flats along river, 3-4 hours to the coast (eg. Deresaia)	*Income (SBD)*	*Inland villages, 2-3 hours from coast (eg. Jordan, Goikwalasinga)*	*Income (SBD/item)*	*Inland villages, a day's walk to the coast (eg. Bobota)*	*Income (SBD)*
Cattle — might sell four times a year	2000-9000 per head	Cocoa	?	Wooden bowls	25-40 each
Cocoa	3 for 1kg	Sweet potato	3 for 10	Axe handles*	10
Vegetables in coastal market		Taro	10 for 10	Baskets	10-20
Kumera sold in coastal market	3 for 10kg bag	Tomato/peanut/ watercress	1-2 a bundle or heap	Lawyer cane	20 for 100 pieces
Pigs	600-1000	Pigs	200-300	Pigs	
Shell money (Baniou)	400-500	Sell labour to coastal people; eg. plant gardens of work in plantations or rice	20 a day in cocoa — less in garden	Betel nut	10c for 1
Pineapple	1 each	Cassava pudding in local market	2 for 1	Canoes	300-700
Banana	1-2 per hand	Exchange/barter fish for potato	non-cash	Walk to coast for market — vegetables	12/15
	6	Carry bags to sea side for others (labour)	10 a bag	Tobacco — main income source in traditional villages	?
Taro	2 per heap	Honiara market — those more organised can take multiple bags to Honiara on the ship from Sinarangu (few do this)	Very rare and difficult to make a profit	Taro at coastal market	50-60 per bag if all sold — often only half sold
Typical monthly income per household	50-100. then larger items around time for school fees	Coastal market — can sell shallots, watercress and other vegetables	Could earn up to 100 but it is very difficult to carry; usually make about 60	Some months have no income. Some might bring 10-20. If sell one axe handle = one packet of salt and one bottle of kerosene	10-60 per month
		Run trade store (one family)	Sell 60 packets of noodle a month		

Markets

The main markets are on the coast, but even these are not large.

Marketing goods further a field, to Honiara, for instance, is done occasionally, but shipping schedules are unreliable, so it is difficult to plan with any certainly.

The fare by ship is SBD90 to SBD160 one-way, so unless a farmers has a large quantity of produce, it is unlikely that the trip would be profitable.

This contrasts with bush villages of north Malaita and Central Kwara'ae where farmers can send taro to Honiara because of reliable road transport and regular shipping from Auki.

In fact, few people from East Kwaio go to Honiara for any reason. Even at Deresaia, a village with a relatively high per capita income, people do not go regularly.

One person was interviewed, who at 28 years of age was about to go to Honiara for the first time, and this was not thought unusual.

Links in a successful marketing chain

The Kwaibaita River valley has become a centre for cattle cocoa production.

Honiara-based buyers — cocoa exporters and butchers — come to this area to buy produce from local farmers. This has greatly improved local incomes and reduced the cost and risk of marketing.

Buyers come to this area because production is high and also because there is reasonable access — outboard motor canoe up the Kwaibaita River from Atori, where there is a road to Auki.

Health and nutrition

Health

The data for the health component of the assessment comes from interviews with nurses at Nammalaelae, Jordan and Atoifi Adventist Hospital, plus child health records that contain notes of illness and treatments and child weights on a weight to age graph.

Recent monthly reports from the aid posts were also copied.

Main illnesses

The main illnesses reported in interviews and from clinic records at Nammalaelae (Table 5) and Jordan are:

- malaria
- diarrhoea (especially in children)
- acute respiratory infections (ARI), including pneumonia, which are more common near rivers and at higher altitudes.

Data from child health records and interviews revealed six deaths in children:

- three in the first year of life
- one at one year
- two at seven years.

Three of these deaths were from ARI and one from cerebral malaria. There were two deaths of malnourished children at Atoifi Adventist Hospital this year.

Table 5: *Returns for Nammalalae and Jordan aid posts for July 2007*

Condition	Under 1	1-10 years	11+ years	Total
Suspected malaria	10 (9%)	45 (42%)	52 (49%)	107
	Under 1	1-4 years	5+ years	
Acute respiratory infection	Mild - 8	Mild - 2	Mild - 16	26
	Moderate - 3 Severe - 0	Moderate - 4 Severe - 3	Moderate - 10 Severe - 5	17 8
Fever	7	10	12	29
Diarrhoea	Non-dehydrated - 1 Dehydrated - 1	3 1	2 0	6 2 8
Ear infection	2	2	1	5
All cases	23	50	127	200

Malaria

Malaria is a bigger problem at lower altitudes and nearer the coast[2]. At Nammalaelae, which has a microscopist, the malaria tests for two weeks in July 2007 confirmed malaria in 70 per cent of suspected cases (*P falciparum* – 10; *P vivax* – 4; Negative – 6).

There are no bed mosquito net programs in the villages.

A new clinic is being built which will have a delivery room and a Registered Nurse to attend deliveries.

Acute respiratory infection

ARI (colds, coughs and pneumonia) are more of a problem in higher bush villages, especially the traditional ones, due to poor housing and indoor smoke pollution.

According to nurses at the Atoifi Adventist Hospital, most fevers of children in the high bush are due to ARI.

Riverside villages are also associated with damper, colder nights and hence more respiratory infections.

Diarrhoea

Diarrhoea is more common in infants and small children who are adapting to new foods.

The disease is caused by contaminated water, faeco-oral (hand-to mouth) contamination, risk behaviours (such as crawling and putting things in the mouth) and exposure to faeces.

Worm infection

Children often have intestinal worms.

Worm treatment is given routinely at Atoifi Adventist Hospital. Hookworm causes anaemia, which is common among bush women due to their hard work and blood loss from menstruation and childbirth.

Indoor smoke pollution from cooking fires contribibutes to the incidence of respiratory conditions. This is especially a health problem in traditional villages at higher elevations.

2 Malaria mosquitoes are Anopheles farauti (mainly coastal to 8 km inland) and A punctulatus (inland areas 8 km to interior. Coastal mosquito (A farauti) bites mainly in evening and again at dawn). Inland mosquitoes bite mainly in the middle of the night – hence mosquito nets can be particularly effective in bush areas. The warmth provided by nets would be welcome rather than a problem as it is on the coast. (MHMS Solomon Star 15/8/2007). With climate change, malarial mosquitoes will breed at higher levels. This may already be happening in Malaita as it is in high bush areas of Central Bougainville leading to many deaths of adults and children.

Health in traditional villages

Health conditions in traditional villages appear considerably worse than those of Christian villages.

In general, hygiene is more difficult to maintain in villages away from rivers, higher up the hillsides.

People in traditional villages are less healthy than others as they live in close proximity to animals that enter the kitchens and sleeping areas.

Families often sleep in the kitchen without beds or mats and there is high exposure to smoke.

The skin of many women and children appears to be ingrained with dirt, indicating less frequent washing.

Housing quality influences the health of families.

Family health conditions in traditional villages appear considerably worse than those of Christian villages. In general, hygiene is more difficult to maintain in villages away from rivers, higher up the hillsides.

People in traditional villages are less healthy than others as they live in close proximity with animals that enter the kitchens and sleeping areas.

Child & maternal mortality

There were seven still births recorded among 45 women from the Family Health and Child Health records.

This is hardly surprising given the difficult access to health services and high proportion of homebirths, most of which are unsupervised.

Of 114 births, where the place of birth was identified, 85 or 75 per cent were homebirths with most of the remainder delivered at Atoifi Adventist Hospital.

This is not necessarily a problem for uncomplicated deliveries but it is particularly dangerous in cases of obstructed labour and haemorrhage after birth (post-partum haemorrhage — PPH).

The aid post at Nammalaelae[3] has no delivery room and the nurse reported assisting some women to deliver in mosquito infested cocoa plantations.

Access to help is even more difficult in traditional villages where it is customary for women to deliver in isolation with a single helper.

The nurse at Nammalaelae reported one maternal death in Atoifi Adventist Hospital of a women who was 8 1/2 months pregnant and who had severe bleeding for two weeks. She was severely anaemic, but there was not enough blood at the hospital to restore her.

At Goikwalasinga, one mother had reportedly died from a PPH and the baby was fed with masticated solid food four days after birth.

Women respondents reported that there had been ten maternal deaths, which seems to be an extraordinarily high number. However, it is impossible to interpret this information without knowing the time over which the deaths were recorded and the population of the survey area.

3 A new clinic is being built which will have a delivery room and a Registered Nurse to attend deliveries

Water & sanitation

Water supply — piped supply needed

Despite plentiful water sources and rivers, piped water supplies are not common in bush villages although there is more evidence of them in villages from Bobota to Atoifi Adventist Hospital, especially those closer to Sinarangu.

Water is most often carried in bottles and containers and stored in the house. This limits the availability of water for washing food, eating implements, bodies and hands, particularly of children.

Poor hygiene increases the risk of diarrhoea, intestinal worms and skin infections. Scabies is common and there are signs of bakua (ringworm), but nowhere near the extent seen on the Makira or Guadalcanal weather coasts.

Sanitation — room for improvement

Sanitation is poor with rough hewn bush pit latrines with no covers or lids to limit smell and flies.

In riverine areas, the high water table make latrines difficult to build unless they are raised or on higher ground.

Elsewhere, shallow pit latrines are above water level and built on the edges of the villages. These are used by older children and adults, but not young children whose faeces are often highly infectious, particularly those with diarrhoea.

Bush latrines can easily be improved with better designs, hardwood platforms, bamboo ventilation pipes and lids.

(top) Water is stored in bottles and containers in the house, limiting its availability for washing people and implements

(lower) Design could improve bush pit latrines.

Health services

Considering the geography, difficult terrain, and small populations, health services are reasonably available and well supported by Atoifi Adventist Hospital. However, access to Atoifi is difficult in the event of a medical emergency and can take from 3 to 12 hours' walk or SBD300 for a boat trip from Nammalaelae. It may be too late for very sick children or women in labour.

The Atoifi Adventist Hospital conducts outreach clinics to four inland aid posts (but not Jordan) every two months. The health team includes a doctor, microscopist, nurses and nursing students who visit for two to three days. They provide treatments to outpatients, immunize children, and carry out health campaigns and awareness talks about nutrition, communicable diseases, HIV/STI, family planning and common illnesses (pneumonia, diarrhoea and water born diseases, diabetes). At night, the team presents assessments to communities and shows health videos.

The Atoifi Adventist Hospital survey information includes crops, housing conditions and medical conditions. Atoifi also provides drugs for the East Kwaio region. In contrast, government health services have never visited Jordan aid post.

Nammalaelae

At Nammalaelae, the nurse sees about 15 patients a day. It is well supported by Atoifi Adventist Hospital and satellite clinics with visits every two months. It has a good supply of medicines, a radio, fridge for vaccines (since April this year) and a part-time microscopist.

The AusAID Community Sector Program is funding a new clinic building. The clinic has no child health cards and children often only get them if they are taken to Atoifi Adventist Hospital for treatment or a mother delivers at the hospital.

Immunization levels are low because of the still influential and only recently converted grandmothers who adhere to kastom and often ignore the clinic when children are sick.

Jordan

At Jordan, there is a large aid post, built by the local community using bush materials, and with support from the local MP. Since April this year, the aid post has been getting vaccine supplies from Nammalaelae, although the last monthly report revealed that there were no vaccines available. No children were weighed that month. Thus, nutrition and preventive child health receive little attention. Adult malnutrition also appears to be a problem and there was evidence of anaemia.

Lack of support dispiriting

The nurse at Jordan walks to Atoifi Adventist Hospital and Auki for medicines. There are no visits from the Ministry Health and Medical Services (MHMS) or Atoifi and this lack of support and supervision is dispiriting[4].

Jordan is not considered part of the Atoifi Adventist Hospital catchment. MHMS does not appear to do outreach.

Reportedly, only one gallon of kerosene has been received and supplies of a backpack, raincoat and torch would improve the outreach program to the 12 villages — population 600 — in the catchment area. There is no malaria bed net program.

Bobota, Goikwalasisina poorly served

There are no health services near Bobota, where the nearest clinic is at Kafrumu two to three hours away, or at Goikwalasisina, where the nearest clinic is three hours away on the coast at Gonabusu, which has radio access to Atoifi Adventist Hospital hospital.

4 Jordan is not considered part of the Atoifi Adventist Hospital catchment; MHMS does not appear to do outreach.

Demographic issues

Population and family size data was available from clinics, Family Record Cards and some Child Health Records.

The proportion of children (up to 14 years of age) is very high at 45 per cent and 69 per cent if youth (up to 25 years) are included[5]. These figures would be higher still if combined with youth at school on the coast.

5 *Population data from Jordan and Sinefifi.*

Population pressure brings problems

This demographic pressure poses significant problems in larger villages, especially in coastal areas.

Harvests need to increase but larger families mean shorter fallows, reduced soil fertility and lower returns.

The size of families has a significant impact on how often families replant their gardens; it is easier to feed larger families through sweet potato production than other root crops that take longer to harvest.

Population pressure is not a significant problem in the more isolated, smaller bush villages inland, with just a few families and where land is plentiful and there are long fallow periods.

Charles, his wife and four children at Hobolo, an isolated hamlet, where they live with his three brothers (ex-Bobota) and their families. Charles has two older girls at school at Atoifi and is very anxious how he can earn enough to send his other children to school.

Information taken during the assessment showed that the number of children per family varied between one and two (usually to single and young parents) up to 11 for parents over 50 years of age.

Figures were as follows:

- average number of children — 3.82 (range 1-11)
- average interval between birth of children — 2 years 7 months[6]
- average age[7] of mothers — 33.6 years (range 16-50+; significant events were used to estimate ages when they were unrecorded and unknown)
- average age of mother at first birth — 19.5 years (range 13-25 years).

Women most commonly give birth for the first time between 18-22 years. The ages of mothers at first birth are reportedly decreasing and 28 per cent of mothers (whose ages were known) were 16 years or younger.

On average, the interval between births is two years and seven months, which implies that pregnancy occurs before the previous child reaches two years' old. Pregnancies that occur within 18 months of a previous birth pose greater stress for mothers and dangers for children's nutritional status, particularly if breastfeeding stops before one year of age.

Nurses at Jordan and Nammalaelae report that people are interested in having fewer children. However, there were only seven people using family planning methods other than condoms (10 users) at Jordan, and 11 family planning clients in Nammalaelae.

Male nurses are less effective as family planning proponents, particularly in provinces such as Malaita with strong cultural traditions.

6 *Information on the year of birth was often not written in health records.*

7 *Significant events were used to estimate ages when they were unrecorded and unknown.*

Child nutrition

Sources — Child Health Record

The Child Health Record or 'Bebi buk' (ie. 'baby book') is an invaluable source of information on nutrition. It contains a growth chart recording weight for age[8] plus notes on treatment, immunization record and birth history of brothers and sisters.

The book was used to gather data on nutrition and health of children for this assessment.

Sources — Family Health Card

The Family Health Card, which has been gradually introduced in Malaita, records the full birth history, family planning record, nutritional status of children under five years, their immunization record, and the number of episodes of illness in the past year.

These data (or limited versions of it) were available at the Nammalaelae clinic but not elsewhere. However, Family Health records for Deresaia and Nammalaelae were scrutinized and a summary made to provide some conclusions on child rearing, as follows[9].

Birth weight

The nutritional status of a mother is an important factor in determining the nutritional wellbeing of the infant at birth and is reflected in the birth weight.

In the National Nutrition Survey (NNS) 1989, 13-23 per cent of children were estimated to have low birth weight (less than 2.5kg at birth, although 20-35 per cent of children born in villages had no known birth weights).

Information on birth weight in the East Kwaio assessment was very limited because of the high proportion of home births in the bush areas and the fact that only 75 per cent of children had cards. If siblings are included, the Child Health Records show 17 of 30 (57 per cent) were born at home and 13 of 30 (43 per cent) born in hospital (usually at Atoifi Adventist Hospital) or at a clinic.

8 *Weight for age is the most widely use of all nutrition indicators to assess individual and community nutrition skills. If plotted regularly on the growth chart, it provides information of current and chronic malnutrition i.e., thin (wasted) and short (stunted) children.*

9 *Many of the family health records were incomplete on ages of mothers and children, which reduces the usefulness of the data. Nurses could be taught how to calculate ages from signifier events such as Independence (1978), Cyclone Namu (1986), fall of the Ulufa'alu government (2000), arrival of RAMSI (2003).*

Low birth weight (LBW) leads to under weight children in the first year of life, although many babies will catch up with breastfeeding on demand in the first six months of life, if there are few episodes of illness.

From the birth weight information collected:

- two had low birth weight (less than 2.5 kg)
- two were borderline (2.5 kg)
- three had birth weights greater than 2.5 kg.

The nurse aide at Nammalaelae also mentioned two babies, born at 1.7kg and 1.8kg, plus another born at Atoifi Adventist Hospital with a very low birth weight of 1.2kg.

It appears that LBWs are common, which may be due to a variety of causes including malaria, heavy work loads, anaemia, limited diet and smoking.

Child mortality

LBW is associated with higher mortality in the first month of life (perinatal period) and first year of life (infant period), but there is insufficient data on weight and mortality to detect any relationship[10].

Despite the often incomplete sibling information history in the Child Health Record and Family Health Records, we recorded six child deaths from 45 mothers (one in nine or 11 per cent of mothers had experienced the death of a child).

There were:

- single deaths at 3, 6, 8 and 12 months
- two deaths at 7 years
- three of the deaths were from ARI.

The nurse at Nammalaelae also mentioned two deaths of children (at two months and one year) from pneumonia or severe ARI) and one death (at two years) due to malaria.

It is likely that infant mortality is higher than the national average due to the distance from medical facilities, but the data were insufficient to confirm this.

10 A world wide study (Pelletier et al. 1995) calculated that 53% of child deaths are associated with malnutrition, including low birth weight.

Breastfeeding practices

Breastfeeding is critical for infants and young children who suffer heavy infection loads during the weaning period (usually after one year).

Infants who are exclusively breast fed for the first four to six months of life and who continue breastfeeding after one year of age have significantly lower rates of diarrhoea and ARI in the first two years of life.

No data were collected when breastfeeding had finished for a particular child. However, information from 24 hour child feeding recall showed that nine of 21 mothers were still breastfeeding, three of whom were exclusively breastfeeding, one as late as five months (a young mother with her first child).

Breastfeeding is unlikely to continue beyond two years. One important reason why women stop breastfeeding is that they become pregnant again. This highlights the relationship between frequency of childbirth and the nutrition of mother and child. Frequent pregnancies put young children at risk due to early weaning and inadequate child care.

Key findings: breastfeeding Solomon Islands survey 1998

Solid foods are often introduced early, at 2-3 months of age

- in Malaita, traditional practice included giving solid masticated food soon after birth
- exclusive breastfeeding for the first four to six months of life and partially for the first year of life has been calculated to save two million deaths a year (worldwide):
  - » breastfeeding has major benefits if continued to two years
  - » breastfeeding lowers the risk of infectious diseases
  - » breastfeeding lowers the chance of mothers becoming pregnant again
  - » breast feeding often stops at 12 months in Honiara
- mothers do listen to health workers' advice on breast feeding and weaning food

Weaning problems

Weaning means introducing and getting children accustomed to food other than breast milk.

Introducing easily mashed and digested foods such as sweet potato and pawpaw is sufficient for a month or two,, but a wider range of foods is needed.

Supsup (coconut milk mixed with root crops, greens and sometimes fish) is an ideal way to introduce a range of foods in a tasty way.

Mothers of children with Child Health Records were asked what types of food their child had eaten the previous day (Table 6).

Fruits and vegetables

Sweet potato and pawpaw, mixed with coconut milk (supsup), were mentioned in one third of the cases. Apart from sweet potato and pawpaw, there were few children receiving fruits and vegetables.

Animal protein

Animal sources of protein (fish and eggs) were not mentioned.

The inclusion of an egg every day or two in the diet of children, particularly underweight children, would rapidly improve nutritional status.

Eggs are particularly easy to mix into weaning foods and to prepare as clean snacks when mothers are in the garden.

Eel fish, prawns and shell fish from rivers are available, but not often eaten.

Bananas are plentiful and there are several varieties.

Other food sources mentioned as occasionally available, but not included in diet recall included wild yams, sago, mushrooms, grubs (wawa), ngali nuts, breadfruit, pomelo, pineapple and limes.

It is common for mothers to start feeding infants too early. Our limited data shows that foods are introduced commonly at two to three months, reflecting cultural practices and failure of health messages about exclusive breastfeeding for the first six months.

Table 6: *Types of food eaten by children in the past 24 hours in four villages in East Kwaio*

Food	Goikwalasinga	Bobota	Jordan	Deresaia	Total
Sweet potato	4	5	8	1	18
Pawpaw	4	1	7	1	13
Milkl	2	2	5		9
Supsup	1	4	2		7
Kabis	1	2	2		5
Coconut			3		3
Rice					3
Banana			1	1	2
Taro			2		2
Egg					0
Fish					0

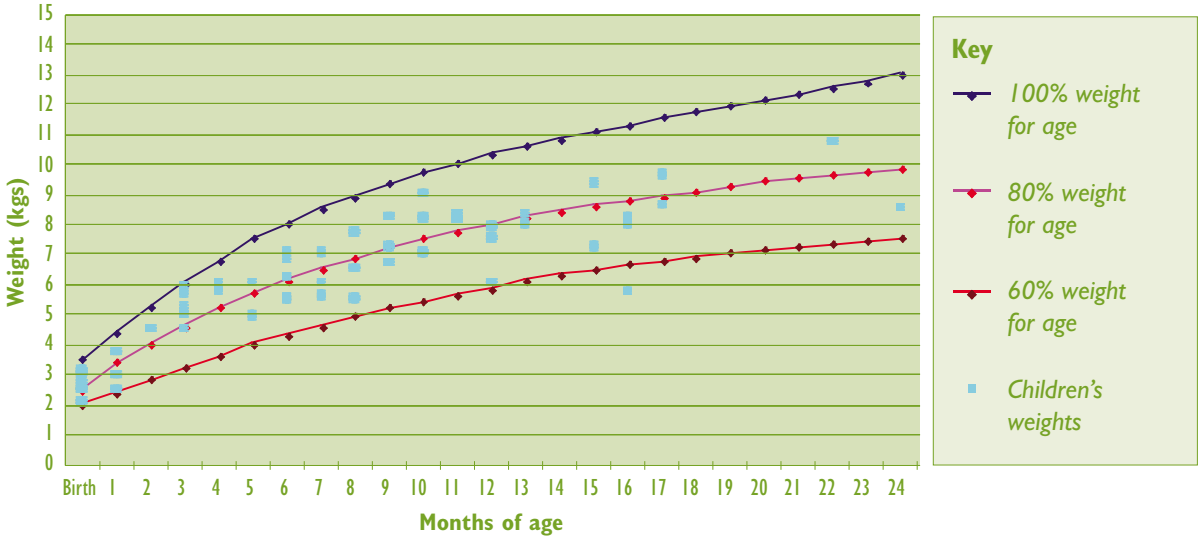
(Right) This 2 yr old child became severely malnourished (below the 60% nutrition line). Her mother introduced her to solid food when she was 1-month-old. Now she eats only twice a day, mainly dry kumara and pawpaw, with vegetables if available.

In her 2nd year of life, she had 12 clinic admissions for illness, including malaria (four times), ARI (three times) and diarrhoea (three times).

There are almost three times as many children below 80 per cent weight for age[11] at age seven months to two years compared to children six months and under (see Fig. 3 below and Table 7 on page 61). The 80 per cent median line is the cut off point for underweight. A child is considered moderately malnourished if the weight is below 80 per cent of the median and severely malnourished if the weight is below 60 per cent of the median.

Overall, half the children's weights were below the 80 per cent weight for age standard.

11 The 80% median line is the cut off point for underweight. A child is considered moderately malnourished if the weight is below 80% of the median and severely malnourished if the weight is below 60% of the median.



Kwaio children weight for age

Fig. 3: Weight for age of 21 East Kwaio children from their Child Health Records and the Road to Health growth charts or yellow pages (clinic treatment notes). The graph shows the 80% median line which is the standard used to define malnutrition

The rate of malnutrition in children over six months (62 per cent) is double what might be predicted from the 1989 NNS which showed 31 per cent of children aged between nine months and two years were malnourished, with a peak of nearly 40 per cent malnutrition in children aged 12-15 months.

Overall, the rate of malnutrition is double the 1989 NNS prevalence of moderate malnutrition (between the 80 per cent and 60 per cent line) with 23 per cent of children from birth to four years underweight for their age.

Paediatric admission data for 1990 also showed that 25 per cent of all children admitted to hospital are malnourished. Anecdotal data from Atoifi Adventist Hospital estimates that one in three children admitted to the children's ward is malnourished.

Clinic data on children attending child welfare (immunization) clinics at Nammalaelae show 25 per cent malnutrition, similar to the national average in 1989 (see Table 8 below).

However, this type of clinic data usually underestimates malnutrition because children often do not continue to come for weighing once immunizations are complete. The data also show that children continue to be underweight past two years.

Table 7: *Malnutrition (below 80% of weight for age) in children from East Kwaio a) six months and under and b) seven months to two years.*

Category	Below 80% weight for age	Above 80% weight for age	Total
6 months and under	7 (39%)	11 (61%)	18
7 months to 2 years	20 (62%)	12 (38%)	32
Total	27 (54%)	23 (46%)	50

Table 8*:*

Number of children with malnutrition recorded at Nammalaelae clinic, July 2007

Category	Under 2 years	2-4 years	Total
>80%	2	1	3/36 (8%)
<80%	5	4	9/36 (25%)

Causes of underweight

The levels of underweight children in this small survey may be higher than normal for three reasons:

- children with Child Health Records are more likely have been issued with a card at Atoifi Adventist Hospital and, therefore, more likely to have a history of clinic and hospital admissions;
- their weights are more likely to have been taken when they were sick, especially at admission before treatment started;
- children with Child Health Records are more likely to have been borne to mothers referred to Atofi Adventist Hospital for delivery due to complications during pregnancy; these children are more likely to have low birth weight and this biases the sample towards underweight children, especially those in 6 months and under category.

Despite these caveats, it is likely that because of the limited diets for weaning children, malnutrition is a significant problem that adds to the risk of illness and mortality in children.

Malnutrition damages the development of children's potential, particularly brain development.

Children who are underweight have much more sickness and a higher chance of dying (more than 2.5 times higher).

If a child is underweight for long enough, the child will became permanently stunted, and many bush people are short of stature.

Education

Access to education, like access to clinics, is determined by proximity to the coast. As there are very few schools in the bush, children from inland areas have little chance of an education unless they leave their villages.

Children at Deresaia

Children at Deresaia go to school at nearby Nammalaelae. Those at Jordan are fortunate for a remote village as there are government primary school teachers and community supported assistants.

Children at Bobota

Children at Bobota do not attend school. Some parents do not want them to leave the village in order to obtain an education, and few do.

For a short time, from 1998 till 2003, the village had three Fijian teachers, but after a dispute with the church the teachers left. This caused great social disruption, with three families returning to the coast and others establishing new villages in the bush.

Other villages

At Goikwalasinga, there is a kindergarten.

Interestingly, parents of children in the traditional community at Faunalea want their children to receive an education. They send them to the school at Jordan, which has tried to accommodate the needs of these children in keeping with their traditional customs.

First school for the hedens

"My people are illiterate and forgotten by government. Education will be a new tool for them and they are going for it".

Charles Unamani and his brothers returned to his remote tribal homeland after decades away and established a school at the new Christian village of Jordan in 2005. They obtained some government assistance to start a Christian settlement.

His vision is to educate his people so they can go to high school and be able to look after themselves and their families.

The school now has over 100 students and three government and three community-supported (supported by 637 people in 14 local communities) teachers — many of them traditional — in an area where there has been little education before.

Running the school has proved challenging for Charles, despite a long career in other schools in Malaita. He has three groups of students that need different approaches — those who have attended school before and are literate, those from traditional villages who are going to school for the first time, and recent converts to Christianity with very basic education.

The school attempts to accommodate those of traditional belief, although the children are required to join Christian education classes.

The traditional communities have strongly supported the school and accept the changes that will come as their children are educated. They have agreed they will not make compensation claims against the school when taboos are broken, eg. mixing boys with girls.

Charles is thinking of starting a school cocoa plot to teach the students about this new cash crop and one of the few opportunities in the area to earn money.

Other training

There is only one rural training centre (RTC) in the area, St Mark's at Atoifi. It takes 20 students per year, male and female, but this is far less than the number of young people who are interested to attend.

Residential training will never provide opportunities for more than a minority (less than 10 per cent) of school leavers.

Community-based (non-residential) centres, including farmers' schools, that can provide short courses on a variety of livelihood topics, are far more likely to provide opportunities, and not just for young people.

Some women's centres, such as that organised by Onyx Oifalu at Olomburi, also provide training opportunities for women.

APHEDA is working with over 30 community learning centres, through its Community Learning for Action Network project, to promote short courses on livelihoods and village technology, including sustainable agriculture.

Gender & youth

In Christian villages, people said that there was considerable equity between the sexes. Men helped more these days, whereas before "men carried a bush knife and women everything else!"

Observation showed that women still have busy days: taking care of the house, children, planting crops, weeding and harvesting, collecting and carrying firewood and feeding the pigs. In addition, there are community days, in both Deresaia and Jordan, when women and men tend the areas around the clinic and the school.

Traditional division of labour

As was expected, there is strict division of labour between men and women in the traditional villages. Also, there appeared to be a disproportional sharing of work between women and men: women did more work and were more socially constrained than their counterparts in Christian villages.

It was said that if women wanted to rest during the day, then that was acceptable: they could work in the morning and evening. Men collected and carried their own firewood.

Taro for men — food sharing disparity

Greater disparity is apparent over sharing of food in traditional communities and this raises health issues as discussed above.

Food goes first to men, and men and women cannot share the same food; in order to share, there has to be two items. In addition, some varieties of food crops — taro, for instance — are strictly for men.

Women are also deprived of some sources of protein. They raise pigs but rarely eat them and in some villages it was said that chickens were not allowed, as they trespassed into sacred places.

Fish was also a food unavailable to women, however, it was only taken every one or two months even by men, so probably would make little difference to female nutrition even it was allowed.

Where there are primary schools, girls as well as boys attend. However, as elsewhere in Solomon Islands, boys often get preferential treatment when it comes to secondary education. They, more often, are the ones who go to school. The girls stay at home to do the routine work or, in some cases, get hired as labourers. There are exceptions. For instance, the eldest children of an informant from Hobolo village were girls and both are going to school at Atoifi.

Young girls and women are involved in cocoa husbandry at Deresaia, collecting ripe pods and taking the wet beans to the buyers. For this they are paid SBD20/day. In general, at Deresaia, Bobota and Goikwalasinga, the youth are well organised. They are interested in cultivating cocoa, betel nut and tobacco and they help their mothers feed the pigs and grow crops in the gardens.

Young men, too, seemed to be fairly active and productive in the bush compared to many young men and boys in coastal villages.

They appeared keen and able to work and contribute to productive activities. Most appeared to be fairly satisfied with village life in the bush. The youth at Goikwalasinga, for instance, said that they have no desire to go to Honiara. They go to the coast every Friday to sell goods at the market.

Nowhere were there reports of alcohol abuse or other anti-social activities involving young men that are common in many coastal villages.

Roselyn's Story

Roselyn was born in a very poor traditional village.

Both her sisters died when she was young because her mother did not have basic knowledge of childcare and there were no clinics nearby to help.

She almost died like her sisters. Her aunt, from a nearby Christian hamlet, took her away from her mother and nursed her back to health.

Roselyn went to school briefly, but found living away from the village too difficult and her family could not afford the fees.

Her aunt worried about the influence of the coastal people on her adopted daughter, so she came home and has had no formal education since.

Roselyn works hard to help her aunt and still visits her mother in the traditional village, although sometime she is afraid of their beliefs and that they will make her smoke tobacco!

She is a 'new soul' in the church, having been converted from the 'hedens'.

For the future, she is waiting for her mother to tell her the time to get married '... then finis nau'.

She has never been to Auki or Honiara, although she sometimes visits the coast.

(above) Young men seem to be fairly active and productive in the bush compared to many young men and boys in coastal villages.

(below) Boy from traditional village.

Energy

Modern forms of energy can contribute significantly to improving rural livelihoods.

Energy is strongly linked to a country's Human Development Index (UNDP 2006). Energy, in addition to more conventional inputs such as capital, land and labour has been recognized as an essential resource for economic development (Bagnaut 1994; DFID 2002).

Most Solomon Islanders have very limited access to modern forms of energy. In the Malaita bush, the majority (perhaps 99 per cent) of households have none. Here, the number without access to modern energy is even higher than Sub-Sahara Africa (92 per cent — IEA 2007).

The benefits of modern energy

The benefits arising from access to electricity can be enormous for those on extremely low incomes. This is largely due to the improved returns on education and opportunity costs from time saved, the lower cost of lighting and improved productivity (UNDP/ESMAP 2002a).

There are other potential benefits:

- increased scope and effectiveness of health services;
- the promotion of alternative productive activities leading to increased lifetime earnings
- improved public safety (UNDP 1989; Fitzgerald et al. 1990).

Access to modern forms of energy also provides a tangible sign of development as evidenced by the strong focus on rural electrification using home made picohydros by bush communities in Bougainville during the crisis.

Lighting

When night falls, many households in the bush stay dark.

Kerosene and kerosene lamps for lighting are a luxury that few can afford. A trickle of kerosene reaches highland village, much less than is used for an average Solomon Island rural household. It is an indicator of the level of poverty in the bush.

Traditional hamlets use bamboo for lighting as they can rarely afford to buy kerosene and many do not have kerosene lamps.

Kerosene and salt were the two priority items if cash is available and kerosene makes up a large portion of household expenditure in low income households.

The solar battery charging at Deresaia village is just one instance of people realising the economic gain and improved quality of life from having access to electricity.

Kerosene prices

The unit cost of kerosene is SBD7 per litre in Honiara for a drum. Jordan and Derasaia households were paying the more than SBD13 a litre because they purchase kerosene in small Schweppes bottle at SBD4-5 each. Because of the cost of kerosene, households at Bobota can only purchase one Schweppes bottle every 1 or 2 weeks.

If they had the capital outlay, it would be better to collaborate and buy a battery charger and then spend the SBD5, they now spend on kerosene recharging the battery.

The batteries provide longer hours of light of a better quality for the same cost.

Solar power in the bush

At Nammalaelae, John has a 40-watt solar panel system used to recharge the batteries of the other four households at a cost of SBD5 each.

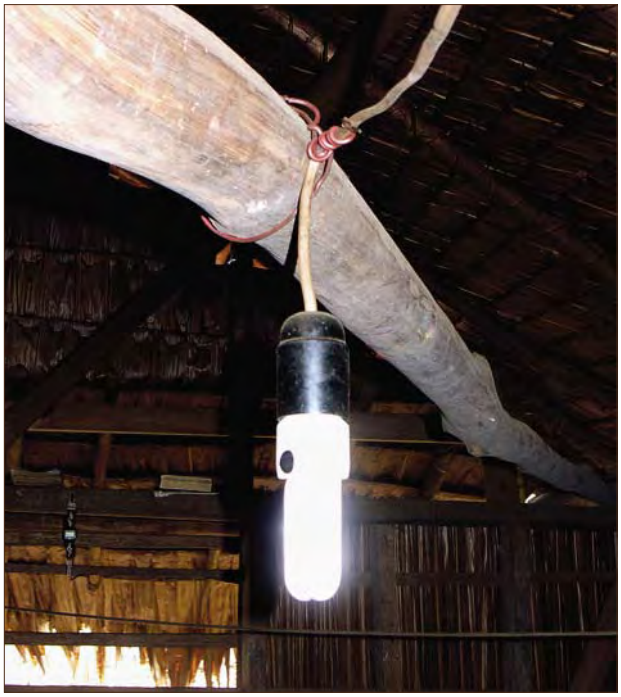
The system appears to work very well: the five households use one or two light bulbs and each recharge lasts one and a half weeks.

The system costs SBD3500 in Honiara now, although John bought his for SBD1700. Bulbs last for five to seven months.

If there are two days of rain the battery gets low, but otherwise there are no problems.

None of the other villages has solar power.

At Goikwalasinga, people had heard of a man with a solar battery charger on the coast at Sinarangu and see lighting as something that could really improve their lives.



Solar charged, battery powered light at Nammalaelae

Fuel

Biomass in the form of fuel wood is the only source of energy for cooking in bush villages.

This is similar to the situation in many developing countries where biomass accounts for 90 per cent of household energy consumption (IEA 2007).

Food is cooked over open fires or in the motu (hot rocks heated with wood). In Christian villages, aluminium pots are used for cooking while, in traditional villages, it is bamboo sections sealed with leaves and placed in the fire — the food is steamed.

Biomass in the form of fuel wood is the only source of energy for cooking and would account for almost all household energy consumption in bush villages.

Kitchens can be a health hazard

The smoke from cooking in open fires, without adequate ventilation, can lead to serious health problems (Ezzati & Kammen 2002; Smith 2006).

The impact is most severe on women and children due to their increased exposure to the smoke (Dasgupta *et al.* 2004; Warwick & Doig 2004), as kitchen and living areas are often combined (see photo).

Indoor smoke is a major issue across Solomon Islands, but more so in highland villages given that families often sleep in the kitchen to keep warm. The result is a high rate of ARI.

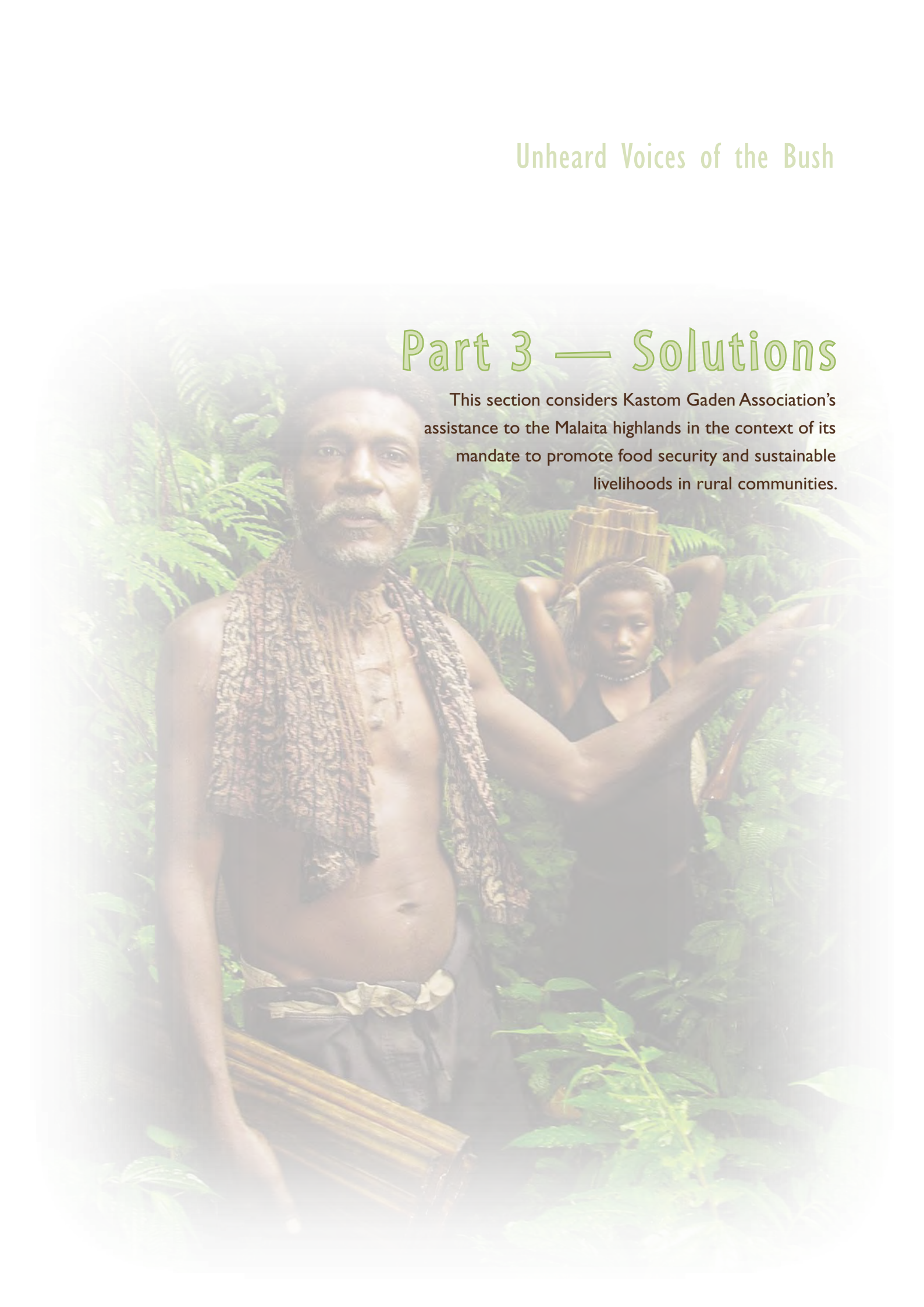
Collecting wood takes time

Women and children are most often responsible for collection of firewood. It is time consuming and competes with educational, social and productive activities.

For example, twice a month at Bobota, women walk about 2km to collect firewood, carrying heavy loads back to the village. In one month, it was estimated that these women spend 16 hours collecting, cutting and transporting firewood.

For women, this is a large part of their routines, although it is less than half the time of some rural households in India, where wood fuel collection was found to take 37 hours per month (UNDP/ESMAP 2002b). It reflects the fact that firewood is still abundant in the Kwaio bush.

Smoke from cooking in open fires, without adequate ventilation, can lead to serious health problems, especially for women and children due to their increased exposure to the smoke.



Part 3 — Solutions

This section considers Kastom Gaden Association's assistance to the Malaita highlands in the context of its mandate to promote food security and sustainable livelihoods in rural communities.

Strategies for the Bush

Kastom Gaden Association currently manages a number of projects of potential benefit to the regions and peoples investigated during this assessment

The projects are:

- Sustainable Livelihoods for Isolated Areas Project (SLIRAP)
- Searem Nui Plant Long Gaden
- Sustainable Livelihoods for Rural Youth
- Farmer Attachment Program
- Feeding Village Poultry

These projects have much to offer and the recommendations here are a guide to their intervention.

The recommendations are also mindful of two comprehensive reviews of the natural resource sector in recent years:

- *Solomon Island Agriculture Smallholder Study*, which looked at food and cash crop production
- *Agriculture and Rural Development Strategy* (ARDS), including the Rural Development Project.

ARDS recognised the need for improved service delivery, inclusive growth and improved natural resource management.

Agriculture must address threats to production — such as declining soil fertility, pests and diseases and increasing vulnerability to external factors like increased rainfall — if sufficient food is to be produced throughout the year to sustain the needs of a fast growing population.

Above all, communities need to earn cash if they are to invest in new technologies.

These are difficult challenges in light of weaknesses in public sector support to agriculture.

Agriculture by itself not enough

To improve the livelihoods of people in the rural area in ways that are economically, socially and environmentally sustainable (*Solomon Island Agriculture Smallholder Study*), improvement to agriculture alone will not be sufficient.

Foremost, people need:

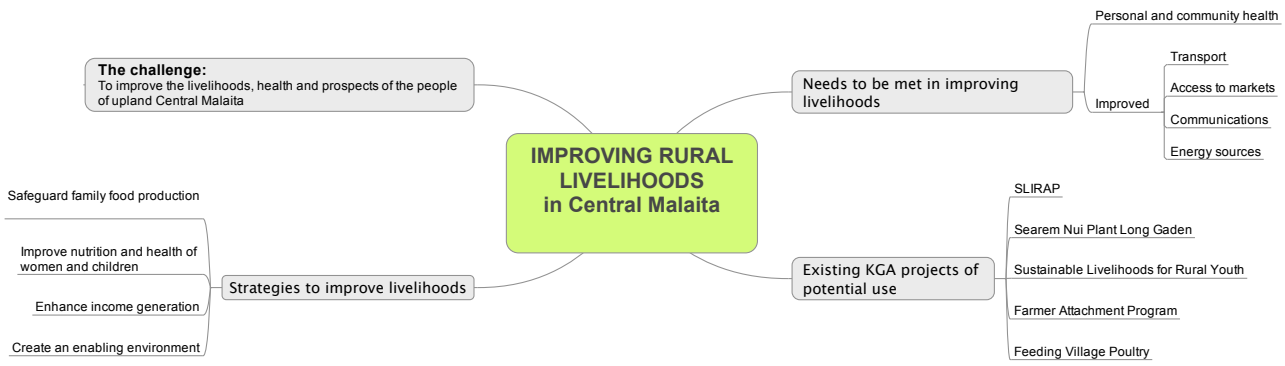
- to remain healthy
- improvements in transport
- improved market access
- improved communications
- improved forms of energy.

These are necessary if agriculture is to develop.

The strategies

Four main strategies are proposed:

1. Safeguard family food production
2. Improve nutrition and health of women and children
3. Enhance income generation
4. Create an enabling environment



Strategy 1: Safeguard family food production

Stop alomae disease destroying the taro crop

The loss of taro is felt keenly by people of Kwaio and Malaita highlands, even though this loss began several generations' ago.

The spread of taro leaf blight in the early 1950s came as a shock, traditional people believing that it was another retribution for the Bell incident[12]. Many varieties would have been lost as those more susceptible to the disease failed to mature corms of acceptable size.

It was in the mountains that cooler conditions slowed the disease. Here, the more blight resistant taro still survive, although they are under constant threat from alomae, a virus disease. That some varieties show resistance to taro leaf blight was seen at Bobota, where variety *Ketobona*, with dark red at the base of the petiole, had relatively small lesions confined by yellow margins, some with centres that had dropped out. This is in contrast to the large spreading lesions on varieties that are susceptible.

12 *The murder of the district officer at Sinarangu Harbour in 1927.*

Reinforce village agriculture by planting disease resistant varieties

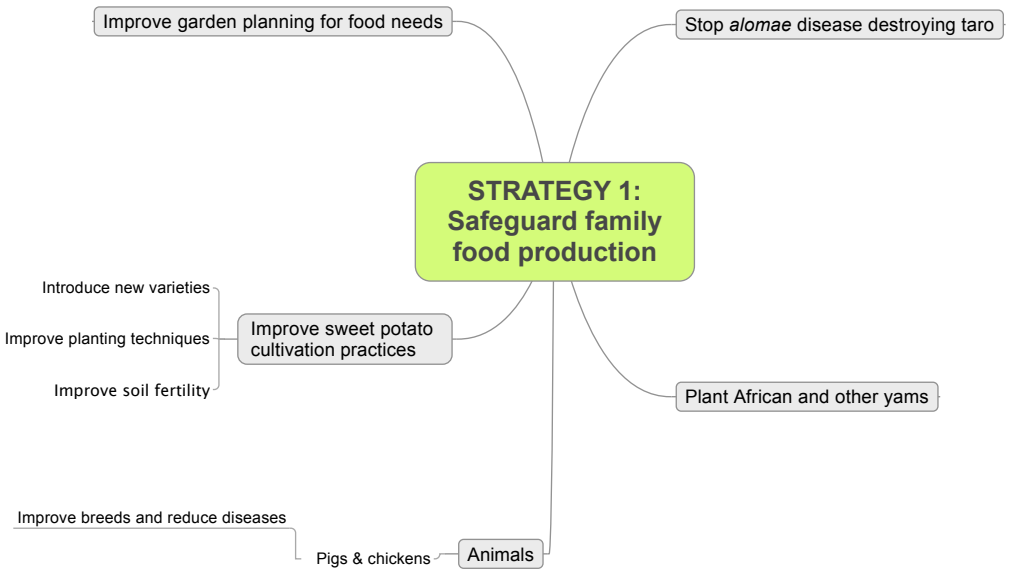
There are other varieties that are grown elsewhere on the island that also have reasonable resistance to the disease when grown in the highlands: *Binalofu* is one and has become the commercial taro of Masilana, Gwaiau and others villages in highlands north Malaita.

This and other popular varieties from the north should be introduced to Kwaio.

Another possibility is to introduce the taro leaf blight resistant varieties that have been bred in Samoa and Papua New Guinea. Some of these are already in Honiara, having been introduced by MALD as pathogen-tested tissue cultures from SPC, Fiji. However, it is premature to do so before their reaction to alomae is known.

Alamoe the greatest threat

The advent of taro leaf blight may have been the beginning of the demise of taro in Solomon Islands, but it is alomae, a lethal disease, that is now the greater threat to attempts to resurrecting production.



Management of Alomae should be the focus of future actions. Such attempts are important for three reasons:

1. Taro is particularly suited to the highland environment, far more so than sweet potato which is not well adapted to high rainfall, especially in East Kwaio highlands where it is estimated to be 6000mm per annum
2. Reliance on a single crop, in this case sweet potato, is not advisable, even if it were adapted to the area. Farmers need to be able to call upon a number of staple food crops at different times of the year, and within each one there needs to be a large number of varieties. The narrowing of both the number of crops and the number of varieties has reached a stage that threatens food security. In most villages, there is dependence on at most four or five varieties of sweet potato.
3. Taro is an important cash crop for highland villages and, in some places, sales of taro are the only source of cash.

Alomae was encountered in every garden visited and nowhere did growers know how to stop its devastation.

Awareness about the disease — how it spreads and how it can be controlled — is needed.

Action to stop alomae

An extension leaflet produced by KGA and DAL has already been written in English and translated into the Tobaita language of north Malaita; now it should be translated into Kwaio.

Afterwards, KGA should organise visits to the area, identifying people to train who, in turn, would train others about the disease and its management.

A similar program has started in north Malaita. Johnson Ladota, a member of the survey team and leader of the Masilana Seed Centre, is visiting villages, Christian and traditional, giving people information about the disease and, most importantly, holding practicals on its control using cultural practices. Johnson is well placed to undertake a similar program in Kwaio. Village trainers (Christian and traditional) should be identified who would go to Masilana for training. At a later date, Johnson should re-visit Kwaio for follow-up training and to report on progress.

Improve sweet potato cultivation practices

The introduction of new varieties, planting techniques and the maintenance of soil fertility are issues that need urgent attention.

Introduce new varieties of disease resistant sweet potato

As mentioned, the number of varieties of sweet potato in the villages is low: no more than ten among which only four or five dominate.

People recognise that over time varietal performance declines and this is the reason why they are always looking for new ones to test. Instead of people looking for new varieties, they should be supplied with them

A germplasm collection of sweet potato exists at Gwaunafiu Farmer School under the care of Lionel Maeliu. The collection consists of those long grown on Malaita, plus some new ones from Papua New Guinea and other Pacific Island countries brought in via SPC.

Some are 'old' Solomon Island varieties. The latter are selections from a national collection assembled by MALD in the 1980s and tested on the Guadalcanal Plains and at Fote, Malaita.

SPC has varieties from the highlands of Papua New Guinea and these, too, should be tested in Kwaio as they may be more adapted to a cooler environment. The varieties of interest are *Habare*, *Markham*, *Naveto* and *Wasamia*[13].

Introduction will be easy

Introducing new varieties to East Kwaio villages will be relatively easy. Gwaunafiu is nearby and on a bush track from Kwaio to Auki. People going for alomae training at Masilana, for instance, could take cuttings from Guaunafiu on their return and establish nurseries in their villages for distribution of planting material to others.

A subsidiary genebank at Deresaia is another possibility, which could be established under contract. Lionel Maeliu could provide the monitoring and further back up necessary.

KGA needs to liaise with MALD to introduce the highland varieties, some of which are being 'cleaned' of virus in Australia. They will later be made available through the ACIAR project, reducing pest and disease related yield decline in selected PNG sweet potato production systems.

Improve sweet potato planting techniques

Planting techniques at Jordan and nearby Faunalea need to be examined in more detail. Why is it necessary to plant so many cuttings in one mound? There was also an example of poor planting techniques at Goikwalasinga that was put down to inexperience.

For sweet potato, it is very important to:

- prepare the ground properly,
- take cuttings from young, vigorously growing plants
- use tip cuttings
- avoid overcrowding to ensure that roots have the necessary space to develop.

13 *Not all these are with SPC at the present time, but efforts are being made to obtain them.*

Soil erosion of sweet potato mounds at Deresaia

Practical demonstrations are necessary and can best be done through a series of attachments/workshops at Gwaunafiu. Priority should be given to Jordan/Faunalea residents.

Improve soil fertility

It is very likely that low soil fertility, unusual planting techniques and poor yields are interrelated.

At Jordan on the depleted raised river terraces, this is definitely the case. If people are planting large numbers of sweet potato cuttings per mound to ensure that some survive, it may be because intensive cultivation has resulted in an increase of soil pathogens.

The areas where people were planting up to 20 cuttings in a mound appeared to be intensively cropped with fallow periods of one to two years.

In some gardens, ferns were dominating the fallow,, possibly the result of burning the vegetation before planting and intense cropping.

Introduce legumes into the cropping cycle

The best way to improve soil fertility in these intensely cropped river terraces is to introduce legumes into the farming system as managed fallows.

Legumes are needed now at Jordan where people complain of land shortage, and may be needed at Deresaia in the future.

Members of KGA have experiences that can be shared.

There are good demonstrations at Gwaunafiu on the use of *Mucuna* and also *Gliricidia* to improve organic matter content of soil in a relatively short time.

Cowpea has also been used with good result in other places in Solomon Islands and this, too, can be tested in Kwaio.

At Gwaunafiu, *Mucuna* is being used together with vetiver grass, planted for reasons of soil and water conservation on frequently cropped, steep, hills. It is a remarkable demonstration and shows the potential of the legume and grass to transform laterite soils into those that can sustain food crops within a relatively short time. *Gliricidia* leaves have high nitrogen content (about 4 per cent) and make excellent mulch.

Plant African and other yams

Elsewhere in Solomon Islands, African yams have been bulked and distributed by KGA projects, SLIRAP and Searem. They have made a considerable impact.

It is interesting how a 'foreign' yam species (*D rotundata-cayenensis*) has been accepted so quickly and against a national trend. Local yams are disappearing in most places.

The African yam yields well and has acceptable taste. It is hardy, without the pest and disease problems that afflict the traditional types.

Replicate the success on the weather coasts

Large amounts of planting materials have gone to the weather coasts of Guadalcanal and Makira in order to reduce the 'time blong hungry' (the 'hungry' time of food shortage between harvests) of both these places.

In order to hasten the otherwise slow multiplication rate of yams, a rapid propagation method using very small planting pieces or mini-sets has been demonstrated to good effect.

African yam has the potential to improve food supplies in East Kwaio, too. Multiplication should be done at Gwaunafiu and continued there over several years until sufficient has been provided.

Multiply disease resistant local yams, too

In addition to African yam, planting material of local yams (*D alata*) that are resistant to a disease known as lightning — in which the leaves turn black rapidly during periods of intense rain — should also be provided.

There are several candidates, and SLIRAP has been multiplying yams collected from the Guadalcanal Plains, including an introduced variety known as *Kinabeyo*. These, too, can be bulked at Gwaunafiu.

Pana a possibility

Pana (*D esculenta*) offers another opportunity to overcome the 'time blong hungry'. Planting material can be obtained from PMN contacts in Ngella, which is probably the foremost area of yam diversity in the country.

Members of the network should be asked to advise on suitable varieties for Kwaio and to multiply them under contract. A visit to Kwaio by yam experts from Ngella (already members of the PMN network) is another possibility that is strongly recommended.

Improve garden planning for food needs

Mention has been made about the dependence on sweet potato: it is bringing problems.

There is a 'time blong hungry' in several villages between June and August and at this time people forage for wild yams and/or they harvest kakake, if they have swamps where it can be grown.

Problems arise when sweet potato is planted in the wettest moths of the year — January, February and March, and harvested six months later. Hungry times probably occur later in the year, too, as July to September are also months of heavy rain.

Alternative crops

In some villages, people did not relate weather patterns to yields of sweet potato and so they are not prepared when excessive rainfall results in crop failure several months later.

The loss of yam/pana, but particularly taro, has exacerbated the situation. People should be encouraged to plant a range of crops whose harvests will span the time when food is likely to be in short supply. Those crops that do not have pests and disease problems should be the first choice: kongkong taro is a candidate and so is edu. A few plants of each were present at Deresaia, Bobota and Goikwalasinga, however people should grow more. If there is excess, kongkong taro can be processed as chips.

In addition, KGA has been providing planting material of edu to villages on the weather coast of Guadalcanal. A similar distribution, coupled with an awareness programme, is necessary in East Kwaio.

Banana a potential solution

People should be encouraged to plant more bananas, both as potential for chip making and to forestall times of hunger. If additional varieties are required, advice should be taken from Dorothy Tamasia, Bagohane, Central Bauro Highlands, Makira, who has a large collection of highlands bananas. A visit from her, perhaps in the company of a PMN member from Ngella to advise on yams and pana, would be immensely valuable.

There is also a need to provide more information on the nematode that infects banana, as seen at Bobota. This is the same nematode that affects yam. A leaflet has been printed and this should be distributed and translated into the Kwaio language, if necessary.

With changing climate and the likelihood that parts of Solomon Islands will receive increased rainfall, contingency planning of this kind will become more and more important.

Pigs & chickens — improve, reduce diseases

Pigs form the major income source for many of the bush people. Free-range pigs are generally healthy, although in some traditional villages pig diseases were reported. Basic training in pig health and management would benefit remote villages.

Additionally, the introduction of pens with raised floors, similar to those of coastal Malaita could be useful to reduce the risk of theft. Most pigs are stolen during the day when they are free-ranging. More-intensive rearing with pigs permanently contained in pens would provide greater security.

Traditional pig pen — part of communal family house in traditional village.

Chickens

Chickens can be managed to provide regular supplies of eggs for family consumption and/or for sale. They have the potential to make an important contribution to household protein intake.

This is probably more important in the bush than it is in coastal areas, given the high rates of underweight children. Those interested in making this change could be trained at Gwaunafiu in intensive poultry management. There, a model system has been established and there are a number of successful young poultry farmers.

The training could include regularising egg production and how to improve survival rates of chicks to increase flock size.

The reported taboos around raising chickens in traditional villages needs confirmation.

Summary of recommendations to safeguarding family food production

Food crops	• translate the leaflet Alomae *Lethal Disease of Taro* into the Kwaio language (possibly, the leaflet on yam dry rot, too)
	• develop a program of action using trainers from north Malaita to train people in the Kwaio villages to act as 'information brokers', knowledgeable about alomae disease and its control, who can then teach others
	• include in the program information about taro leaf blight, using local varieties to demonstrate differences in resistance to the disease; and introduce taro varieties from north Malaita that are commercially popular
	• Support Gwaunafiu Farmer School to: » maintain a sweet potato genebank of local and overseas varieties » provide training to the "information brokers" in sweet potato cultivation techniques and maintenance of soil fertility (use of legumes, mulches, etc) » multiply African and selected local yams, including pana from Ngella » provide training on planning food production to avoid 'time blong hungry' » monitor to determine impact of program.
	• contract local experts from Ngella to advise on yams and pana and from Makira highlands to advise on banana varieties suitable for Kwaio bush (multiply at Gwaunafiu)
	• carry out awareness program on need to improve diets, especially the need to increase consumption of vegetables and fruits. Link to supsup garden and nutrition improvement programs
	• establish Searem-type bulking plots (sweet potato) with contracted group at Deresaia
PMN open pollinated vegetable and green manure seeds	• Gwaunafiu Farmer School and Atoifi Adventist Hospital should become distribution points for PMN seeds, receiving membership payments and providing basic services to members.
	• Masilana Seed Centre to continue testing and bulking seed of highland vegetable varieties
	• exchange and sharing of highlands-adapted, open pollinated, seed through a highlands network to be established under SLIRAP
Livestock	• train people at Gwanafiu Farmer School in:
	• pig management, especially how to diagnose diseases and also treat and prevent them though improved pen construction and nutrition
	• intensive poultry management, to increase flocks rapidly as well as to have regular supplies of eggs for household use and sale. Investigate the problem reported at Faunalea

For all these attachments there should be two intakes — one from Christian villages and one from traditional villages, with both covering the different geographic zones and both having reserves spaces for men and women separately.

Strategy 11: Improve nutrition and health for women and children

Improve nutrition

There is a shortage of variety in people's diets in all villages visited; in particular, there is a lack of vegetables and fruits. People in Deresaia, for instance, were eating dry sweet potato alone.

There are vegetables in the gardens, including tomatoes, shallots, beans, etc., but the amount is insufficient to be included regularly with meals.

There is need for people to understand the importance of vegetables and how to cook them so that their nutritional content is not lost and they have an attractive taste with out the need for flavoured noodles that are an unnecessary drain on local incomes.

Lack of leafy green nutrients

The loss of *sliperi kabis* due to damage by *Nisotra*, a chrysomelid beetle, is of concern because of the high iron content of this leafy green and the fact that most women are anaemic. Some other greens are used, for instance, taro leaves; *kasumae,* a fern growing on the banks of the rivers; and there are ferns and other edible leaves in the bush. At Jordan, there were large patches of watercress. None of these appear to be used extensively in any of the villages visited.

The general impression was that people had few vegetables in their diets, and those that were grown were often sold at markets in order to earn desperately needed cash.

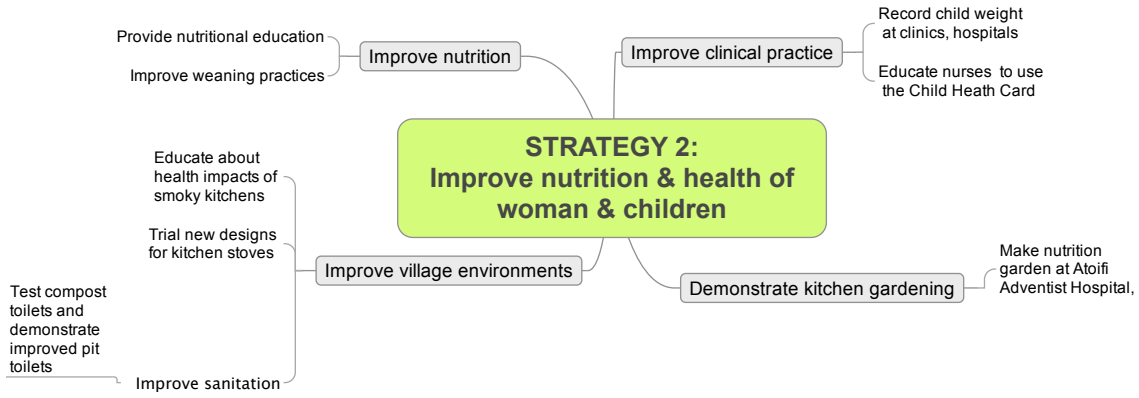
This feeling was confirmed from discussions with nurses at the Atoifi Adventist Hospital. At the same time, the small amounts of cash earned is often being spent on noodles and rice which are of very limited nutritional value.

In particular, there is a need to make mothers aware of the importance of foods high in vitamin A. The vitamin has a very important role in child health and survival. It increases resistance to infection, particularly ARI, diarrhoea, and blindness by protecting the linings of the respiratory and digestive systems as well as preventing eye diseases.

In 1991, a vitamin A deficiency survey showed Malaita as one of the areas of highest risk. The food recall carried out during this assessment showed that children are receiving vitamin A primarily from pawpaw. This is insufficient. Other foods which are very high in vitamin A that could be used in the bush include:

- leaves of cassava, sweet potato, pumpkin and *sliperi kabis*
- roots of carrot
- fruits of pumpkin
- fern and wild mango would also provide vitamin A levels similar to those of pawpaw
- orange fleshed sweet potatoes also have a role to play.

More awareness of the benefits of these foods is required.



Nutritional education needed

There is need for an awareness program on nutrition and health issues. People need to know the nutritional value of leafy greens and other vegetables and how to cook them.

Ideally, this could be done through a partnership between KGA and the health services at Atoifi Adventist Hospital. Nurses can be trained to carry out regular infant growth monitoring and at the same time provide practical advice to mothers at maternal clinics about how to plan and cook a balanced meal as well as how to grow the ingredients close to the home for ease of access. A similar program in the Sasamunga area of Choiseul was able to reduce the number of underweight infant by 50 per cent over two years.

There is also a need to make vegetable seeds available. At Bobota, for instance, people said that they did not have seeds to plant: they had lost them. Thus, there is an opportunity for the KGA Planting Material Network to assist.

Mothers need to be aware of the importance of food high in vitamin A, which is very important to children's health

Improve weaning practices

Limited and inappropriate foods, not feeding often enough and poor weaning practices (ie. stopping breast feeding too early) all contribute to malnutrition in children.

Difficulties include:

- lack of knowledge
- underutilisation of available food resources
- reduced soil fertility
- competition between food and cash crops, limiting the availability of foods
- in some villages, pressure on the land resource.

In the bush villages, there are many kinds of fruits and green vegetables[14] (although sliperi kabis cultivation has been severely reduced because of attack by *Nisotra*, there are alternative sources of green vegetables such as ferns and leaves of root crops.). There is also the potential for egg and fish protein, to supplement the diet based on root crop.

The need is to provide people with information on the correct weaning procedures, the crops to grow and in some cases, how to improve their production. and prepare them for consumption.

14 Although sliperi kabis has been severely because of attack by Nisotra, there are alternative sources of green vegetables such as ferns and leaves of root crops.

Parents need to know the nutritional value of leafy greens and other vegetables, and how to cook them

Improve clinic practices: *skelem pikinini* and use the growth chart

Children are not being weighed often enough due to the distance from clinics.

The recommended schedule is monthly in the first year, every two months in the second year, and every three months in the third year.

The Child Health Record is now too expensive (SBD12) whereas in 1989, at the time of the NNS, the Bebi buk was much cheaper and widely available. Then, 92 per cent of children had cards, compared to 76 per cent of children in the present assessment.

Even if children had the Bebi buk, the growth chart showed they had not been weighed when they came to the clinic. Even when children were weighed, the weights are not recorded on the growth chart. Without the chart, it is impossible to assess a child's nutritional status or risk of malnutrition unless the malnutrition is so severe that there are clinical signs.

Nurses, health workers and parents often do not appreciate the relationship between malnutrition, sickness and death. Recording children's weights regularly, and when they present for treatment at the clinic and hospital, is one of the most important ways to detect malnutrition, alert health workers and parents to the risks, and to take remedial action.

Failure to weigh led to undiagnosed malnutrition

At Jordan, one card of a child who was the 7th born in the family had only one weight plotted on her Road to Health chart when she was three-months' old.

When she was six-months' old, she was treated at Atoifi Adventist Hospital for malaria and severe ARI (pneumonia). Her treatment notes showed her weight was 4.9 kg, but this was not recorded on her growth chart. She was well under the 80% median line at an age when breastfeeding should have given her a normal weight.

She was also a high risk child due to the fact that her mother already had six children and there was a history of TB in the family.

She was weighed at the hospital once more and again this was not recorded on the growth chart. She was seen twice at the aid post but not weighed. As a result, her malnutrition remained unnoticed and continued until she was 3-years' old.

The Child Health Book is the most valuable document for the child, mother and health services. It should be affordable and used. The weighing scale is mightier than the stethoscope!

The experience of KGA at Sasamunga, Choiseul, is relevant to the situation in East Kwaio. Some of the key findings (see *The Sasamunga Growth Monitoring Program – lessons learned* – Attachment 3) on gardening and nutrition can be found in the KGA manual, *Household Gardening Skills*. (download from www.kga. org.au).

Improve village environments

Sanitation is a problem in many bush villages. There is need to demonstrate new approaches and then raise awareness on the health implications of uncovered toilets.

Indoor smoke pollution is a major contributing factor to the high rates of ARI, which is the major health issue in the bush.

At the same time, collection of firewood and its inefficient use is one of many burdens on women's time.

There is a need for research and trials on new models of more efficient and less-smoke-producing stoves/fires, ie. an improved village kitchen model for the bush.

This is an area with great potential across Solomon islands.

Summary recommendations: improving nutrition and health

- link agriculture and nutrition through clinics and hospitals
  - KGA should work with nursing students[15] and outreach teams on improving soil fertility, growing different varieties of root crops and greens, accessing seeds and planting materials, pest and disease control, establishing kitchen gardens, etc
  - introduce Sasamunga nutrition approaches, including a hospital garden for in-patients and their relatives at Atoifi Adventist Hospital, kitchen gardens, demonstrations by nurses, regular weighing of infants and use of nutrition materials (including recipes in local languages)[16]
  - nutrition education for paediatric and maternity ward patients, including showing nurses how to use the Child Heath Card as a record and teaching tool
- improve feeding patterns for children (quality and quantity), emphasising exclusive breastfeeding for the first six months, delaying the introduction of solid foods
- record children's weights when they present for treatment at the hospital and clinic (and fill in the *Road to Health* graph
- test compost toilets and demonstrate improved pit toilets made from local materials at Gwaunafiu Farmer School
- tell people about the dangers to their health from continuous smoke inhalation; demonstrate new types of stoves
- basic population growth awareness should be included as exercises in KGA village workshops.

15 Nursing students have their own small gardens and would be interested in practical improvements

16 Household Gardening Skills Manual, KGA (printed by SPC)

Strategy 11: Enhance income generation

As in the other isolated areas studied, and elsewhere in Solomon Islands, people need cash but obtaining it presents formidable challenges.

In East Kwaio, the environment is not conducive, in the most part, for commercial crop production. Populations are small and dispersed and access to roads, sea and potential markets is extremely difficult. There are possibilities, albeit limited, and these are discussed in this section.

Not only is the pursuit of cash important, but so, too, is saving what little is earned by reducing expenditure on foods of little nutritional value.

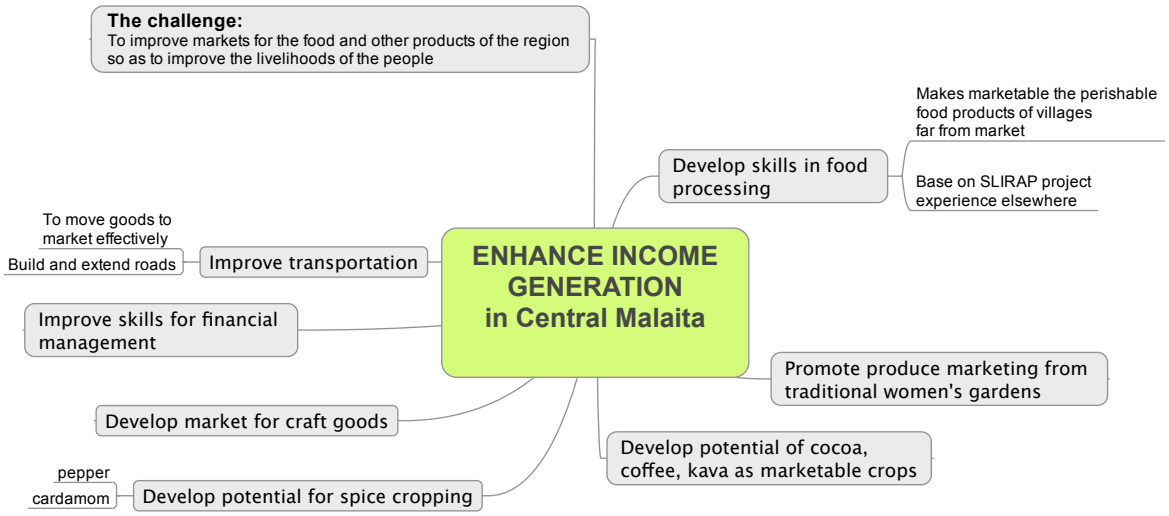
There is also a case for using local products, instead of purchasing them, where possible.

Develop skills in food processing

The manufacture of chips from a variety of food crops has been one of the great successes of the SLIRAP project in a number of locations, including the Central Baelelea and Central Kwara'ae highlands.

There is considerable potential to introduce the technology to East Kwaio. For instance, at Deresaia, banana fruit go unused and are left to rot in the gardens because there is no market for them. There is an irony here, that at Deresaia food is left to rot and less than a days' walk away people go hungry at certain times of the year.

In distant Bobota, making taro into chips would reduce the burden of carrying heavy loads of corms to the coast at the same time increasing their value.



Possibilities in taro processing

The experience of Masilana shows that it can be profitable to convert taro into chips where there are no reliable opportunities to access urban markets for the sale of high value fresh taro. That is, if inputs of oil and plastic bags are well managed.

In addition, the taro becomes a less perishable and lighter product easier to carry to the coast.

In East Kwaio, there may be opportunities to sell chips at Atoifi and at coastal secondary schools as well as Auki and Honiara. SLIRAP has a trainer in food processing at Gwaunafiu, so it would be relatively easy to provide the instruction needed in Kwaio villages.

There are potential outlets for chips at the markets at Atoifi and through Farmer Fresh in Honiara, if transport constraints can be overcome. If producers in the bush use commodities that are not readily available for processing on the coast — taro, for instance — then they should be able to maintain market share without competition. Use of sweet potato for chips, by contrast, may be more problematical.

Jams and conserves

Making jam might not seem a likely occupation for communities in the Kwaio bush, but pineapples are grown and so is a local *Rubus* species (*alagaugau*), whose prickly stems bear red fruit similar to blackberry, except for colour. Similar fruits are commonly sold in markets in Port Vila, Vanuatu, and are popular.

If lightweight pouches can be obtained as containers, rather than glass jars (or plastic jars which have proven to have ineffective seals for preservation), and sufficient fruit exists, jams and conserves from the 'redberry' might find a market in Honiara.

Promote produce marketing — traditional women's gardens

Women from traditional villages maintain their own gardens for use when they are menstruating or confined during childbirth. They are allowed by custom to sell produce from these gardens. This provides an opportunity to supply women with planting materials of staple crops and vegetable seeds that are in demand at local markets.

The prickly stem of the wild redberry or bush raspberry (Rubus species)bears red fruit similar to blackberry, except for colour.

Such an exercise will need to be done in conformity with traditional customs; preferably a person of traditional faith would be recruited as an extension agent. How this can be done will need to be explored but, when asked if it was possible, people from traditional villages felt that such women could be trained to take on the role.

It may be possible, and more practical, to recruit assistance from nearby Christian villages where there are less restrictions on the movement of women. Many women from these villages are related to those of traditional faith.

The issues of discrimination, prejudice and fear between the two groups will need to be considered in what ever strategy is adopted.

Cocoa, coffee and kava

Cocoa is a major cash crop at Deresaia, on the banks of the Kwaibaita River where it is still navigable. It is also being grown on the steep hills in the upper reaches of the river at Jordan, and in the villages around Goikwalasinga.

At Deresaia, is was first planted a decade ago and is well maintained. Sales of wet beans are high in the season.

At the other places the crop is relatively new and has yet to bear.

As the rainfall is high, the black pod fungus, *Phytophthora palmivora*, is likely to be severe, even though *Amelonado* is the variety grown. Regular removal of the diseased pods will be necessary to keep yields at a reasonable level.

Training needed

Training in maintenance of the crop is needed. It would benefit growers at Deresaia who have not received instruction since 1997 when they went to Dala Training Centre before they planted the crop.

It would also be useful at the other places to ensure that growers understand cocoa husbandry at an early stage of crop development.

Training should be carried at Deresaia so that women and young girls can take part, as they do maintenance and harvesting. It may then be possible to use those trained to assist other villages.

The potential for coffee

There is enough evidence from Guadalcanal and Isabel to surmise that coffee is a crop of potential in highland areas.

Trial plots should be established in East Kwaio in villages above 600 metres. People from other areas can be contracted to give training and provide seeds.

Kava set to grow

The regional market for kava is expanding, with increasing sales to Fiji and New Caledonia. At present, much comes from Vanuatu, with only small amounts from Solomon Islands.

As it is likely that there will be future demand for the crop, Solomon Islands should increase production. Trial plots in East Kwaio should be established.

Spice crops

Pepper

Pepper and cardamom are recommended for the weather coasts of Guadalcanal and Makira, and KGA has been identifying sources of seed.

Pepper has not previously been planted in Solomon Islands, but it is grown in Vanuatu and grows well there. It is likely to grow well in Solomon Islands, too, and as there is a buyer in Vanuatu interested to buy from Solomon Islands, it should be promoted.

Pepper is also grown in Fiji and in Pohnpei, Federated States of Micronesia, where rainfall is about the same as in East Kwaio.

Seed will be obtained from Keravat, Papua New Guinea, to establish experimental plots.

Cardamom

Cardamom was planted at Fine Water near Masilana in the 1970s, but harvests were not sustained after the closure of Dala Research Station.

If seed can be obtained (Isabel is a possibility) then, as with pepper, trial plots should be established at various sites in the Kwaio bush.

Craft market outlets

Axe handles and wooden bowls are made at Bobota, and even canoes, although getting them to the coast is a major undertaking. It shows the determination of people to earn money. Finely woven baskets from tree bark fibre are also made.

For all these products, marketing is the problem. There has also been a decline in demand of the baskets locally as people switched to synthetic materials.

There is an opportunity to market handicrafts in Honiara, if ways can be found to get them there and if a reliable retailer can be found.

Improve skills for financial management

Financial literacy is poor in all villages in the Kwaio bush and a similar situation was noted on the weather coast villages of Makira.

In the report, *Extreme Living, Extreme Need* (download from www.terracircle.org.au) it was said that there was a need to explain the difference between simply selling a product and planned marketing, including financial management, income and expenditure, profits and losses and how to construct and maintain a simple balance sheet.

It also suggested that people should be taught the advantages of combining and coordinating sales, having an

agent to do the selling and making bulk purchases of supplies and equipment.

The collaboration of taro growers at Masilana is a good example of cooperative marketing and should be explained to farmers on attachments at Masilana Seed Centre.

Save money, spend wisely

Today, money often goes to buy foods that are thought to give status. These are frequently imported foods with little or no nutritional value or, worse, are high in sugar. Twisties, noodles and coffee mix are obvious examples.

People should be encouraged to save, or spend what little money they have on more nutritious and beneficial commodities.

Basic budgeting training should teach families how to calculate what they are spending on store food and how this money might be better put to other uses such as school fees.

If households were able to reduce the expenditure they make on unnecessary foods as well as those of poor nutritional standards, such as noodles, and were able to save this money, they could mobilise significant resources for education and other investments.

Cocoa is a major cash crop at Deresaia and it is grown at Jordan and Goikwalasinga.

Summary recommendations: income generation

Food processing	▪ introduce methods of making chips from root and tuber crops — taro, kongkong taro and banana in particular — and selling through Farmer Fresh in Honiara.
	▪ investigate the possibility of making jam from a wild *Rubus* species growing in the bush and, if it has potential, encourage its propagation and cultivation; a trial plot should be established at Gwaunafiu.
Produce marketing — traditional women	▪ investigate potential ways to assist women from traditional villages to market vegetables and food crop staples from their gardens; use their gardens as an opportunity to introduce new varieties; women from traditional villages should be identified who could train others.
Cash crops	▪ training in cocoa management is needed and should be given at Deresaia, encouraging women and youth to take part, as they manage the crop; extending the training to villages in the bush is necessary — there are established plantings and those about to bear fruit. KGA should liaise with MALD and CEMA.
	▪ trials plots are needed of the following, taking germplasm from Isabel or Guadalcanal: cardamom, above 600m; *arabica* coffee and kava.
Crafts	▪ a few items are manufactured which have potential for sale in Honiara: axe handles, finely woven baskets and shell money, but it is limited; outlets for these should be investigated; value chain workshop for crafts from the three isolated areas of SLIRAP is one option to facilitate improved linkages between producers and markets.
Financial skills	▪ training in financial management should be incorporated into the curricula of all KGA training courses; this should include balance sheets, basic principles of marketing and ways of saving money by using local products.

Savings from NOT purchasing store food

The example below would apply to the higher income bush households, such as those at Deresaia or to those people with employment, such as teachers and nurses. This does not factor in the loss of opportunity in using time and money in more productive ways.

Rice: 140 per bag x 2 per month
= SBD280

Noodles: 1 carton per month
= SBD90

Taiyo: 3 cans per month
= SBD33

One family: SBD4,800 per year.

In the case of a village of eight families, this amounts to SBD38,400 per year.

This does not factor in the costs and time that could have been utilised in other ways of carrying produce down to coast for marketing and the money that is spent there.

A sign of income wasted on noodle purchases

Strategy IV: Create an enabling environment

You ask us questions about big things, but we have never seen them here. No one recognises our needs.

...Deresaia elder.

We are like a child when it comes to knowing who might help us here — we have never seen the government or anyone else from outside in this village.

...Bobota elder.

We try and make the water (of our efforts for development) run down to reach the sea coast. Will that river run dry or will it reach the coast? We don't know. But no matter, we still go ahead and try our best

...John from Bobota.

If livelihoods are to improve for those living in the bush, it will be because of improved subsistence and (mostly) cash crop earning possibilities.

Suggestions have been made above, however these are unlikely to have a long lasting impact on livelihoods unless supported by policies and investments that promote an enabling environment, such as better access to transport, information, education and health.

In this respect, the bush areas are no different to the weather coasts of Guadalcanal and Makira, or anywhere else in Solomon Islands except, perhaps, that the challenges are even greater: isolation is extreme. Whereas ships occasionally visit the weather coasts and there are remains of roads, the majority of bush villages remain cut off from the outside world.

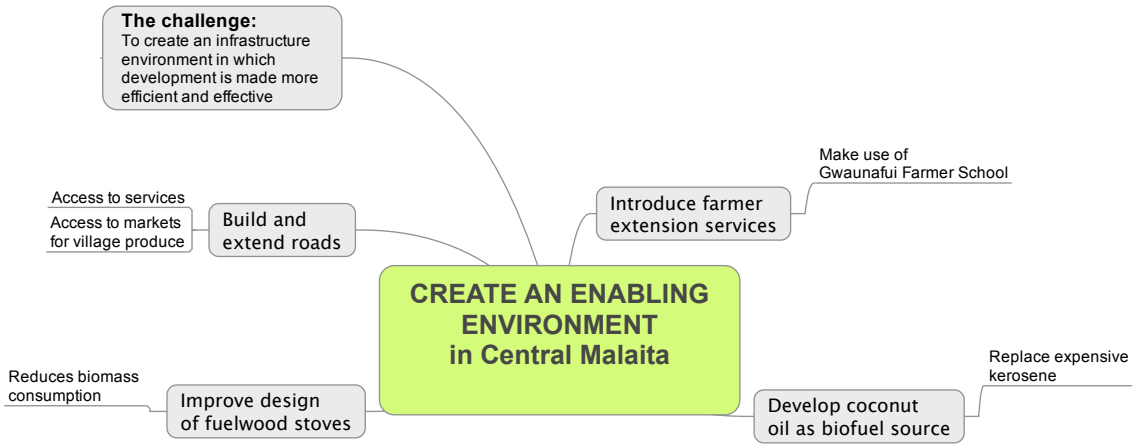
Agriculture extension services

There are no agriculture extension services in East Kwaio; neither government nor NGO. Farmers have for so long operated without help that they saw little use in asking for it. Even at Goikwalasinga, only two and a half hours from the coast, no one has visited. The feeling of the people is 'las foa kam long bus'[17].

Who here goes to Auki, and who from Auki would ever come here? Even if we went to their office, it would be just to hear stories, but not for anything to be done or change. So, we don't bother to go.

...Comment on agriculture services from Bobota

17 *Do not want to visit the bush.*



Under the circumstances, the best way to provide assistance to communities in East Kwaio bush is to put them into contact with the Gwaunafiu Farmer School. There is much to see and learn from Lionel Maeliu. It is also not too far away. It is on the road to Auki and there is a radio.

Courses can be arranged and instruction given around demonstrations on the use of legumes as managed fallows for soil improvement, new varieties of food crops, improved livestock management for pigs and poultry, planning to avoid 'times blong hungry', etc.

There is also the possibility of longer-term attachments, two to three months or whatever is required.

Short courses or attachments can be very cost-effective. The trainees would be expected to train others on return to their communities, backstopped by the Gwaunafiu Farmer School as an on-going program of agricultural support to the bush, providing information and materials as required (see Attachment 4 for tentative program).

Support would be expected to come from KGA, government and other organisations that have an interest in agricultural extension.

Under this program, it is envisaged that activities would be organised specifically for people from traditional villages as their needs are distinct, those of women in particular. The program has yet to be defined but it is possible that it will establish a network of trained women to distribute planting materials and information. Such a network would be composed of those in isolated Christian and traditional villages as well as nurses in clinics and hospitals.

Energy

Solar power systems charging small batteries to provide lighting work well, but for most people the capital outlay is too large.

Those in the bush interior even find the price of kerosene prohibitively expensive and difficult to access, so families rarely have lighting for more than two or three nights a week.

Coconut oil as fuel

Where coconuts grow, and that is in most villages, albeit slowly at higher altitudes, coconut oil can be extracted and used for lighting. Recently, a coconut oil lamp has been developed by Kokonut Pacific in Honiara and needs to be trialled widely.

Reducing the amount of money spent on kerosene would be worthwhile as it is by far the greatest drain on family income.

For those with greater resources there is the possibility to use coconut oil to operate diesel generators. These can provide energy for single households or operate a mini-grid for an entire village.

One litre of coconut oil (2500 units of energy) from 10-12 coconuts could power two lights for approximately six hours a night for a week.

Such a system would allow power tools to be used. A family at Jordan made furniture using electric tools, but only when visiting a coastal village where the tools were stored. There is a waterfall at Jordan and this might have powered a picohydro.

Improved stoves fuel efficient

Improved stoves can reduce biomass consumption by more than 50 per cent, thereby reducing labour requirements and dependence on firewood, allowing people to give more time to other activities.

Importantly, better stove designs, including the provision of chimneys, can reduce the effects of indoor smoke (Baris *et al*. 2006), and should be tested first at Gwaunafiu and Masilana.

Coconut oil lamp

Roads

This assessment provides stark evidence that distance from a road and/or a seaport is directly related to poverty.

The single greatest need of people in the bush, who are among the poorest-of-the -poor in Solomon Islands, is a road. This was said time and again in all the villages visited.

roads have the greatest potential to transform people's livelihoods

The difference that a road makes for bush villages can be seen clearly in Central Kwara'ae. The road from Auki to Busurata has transformed people's lives. It has created market opportunities and extension services from government and NGOs have responded with information, planting materials and training.

Without the road, people would be in the same state as they are at Goikwalasinga. If there is doubt about the impact of the Busurata feeder road then a socio-economic study should be done.

Road promise unfulfilled

The road across the island from Dala to Atori was built in 1974, or thereabouts. From there, it went south for 14km along the coast and then inland to the north bank of the Kwaibaita River, only four kilometres from Deresaia.

Later, in the mid-1990s, it fell into disrepair and now it is 18km away. Repairs and extension of the road further into the Kwaibaita River valley has been promised by successive politicians for 20-30 years but it has never materialised.

Apart from the Atori cross-island road, and its extension along the coast and the road to Busurata, no new roads, main or feeder, have been built on Malaita since independence. Only maintenance of existing roads has been done.

Given that roads have the greatest potential to transform people's livelihoods, the lack of investment in them is difficult to understand. Perhaps it is because of the cost of maintenance in high rainfall areas such as Malaita. It is certainly true that maintenance is a problem, but there have been few attempts to involve communities in road upkeep. If communities willingly assist with school and clinic maintenance on a voluntary basis, perhaps they might consider assisting a roads program. After all, it will be to their benefit.

Road would reduce waste, increase income

The valley of the Kwaibaita River has considerable agriculture potential.

At present, harvests of food crops, surplus to family needs, are left to rot as there are no markets to sell them. Extension of the Atori road south along the coast and into the valley, would provide an economic boom for communities that currently have few options for development.

Further extension into the valley, above 600m, would open up vast areas of the hinterland where a number of near-temperate vegetable and cash crops could be grown, including *Brassica* species, carrots, onions, *Arabica* coffee and cardamom. It would also create tourist possibilities in a very beautiful area with a unique culture.

The Bougainville model

A recent road project for gravelled feeder roads in Bougainville cost approximately AUD$50,000 per kilometre for a new road, including the construction of some Bailey bridges and approximately AUD$30,000 for refurbishing an existing road[18] (20).

Based on this, estimates have been made for roads into East Kwaio (see Table 9). There are considerable variables including operational and mobilisation costs that increase the costs of a small road program compared to one that was operated long term.

Picohydro electricity, like this unit in Bougainville, holds potential as an energy source for remote villages.

18 Source Peter Lunch, managing director Pelena Pty Ltd (www.pelena.com.au), based on rough estimates of a current feeder road construction for a micro hydro project in North Bougainville 2007.

Table 9: Road construction costs on Malaita, based on construction of feeder roads in Bougainville.

Location of the road	Cost (AUD)	Km
Rehabilitate Atori to Kwaibaita River road	390,000	13
Kwaibaita River road to Nammalaelae	200,000	4
Upper Kwaibaita River to Busurata feeder road	700,000	14
Kwaibaita River to highlands west of Sinarangu	700,000	14
TOTAL	*1,990,000*	*45*

An additional $1.5 million for bridges and unforeseen costs gives a generous estimate of AUD3.5 million and East Kwaio could be transformed from an economic and social backwater languishing behind the rest of Solomon Islands, and a breeding ground for discontent, into a progressive part of the country well connected to markets and producing a wide range of products for the market.

No other form of investment would transform people lives in a similar way. With roads, people would be able to access education, health and agriculture services.

Further economic development on Malaita would be stimulated if there was a two lane feeder road around the island — approximately 163 km (estimated at AUD$100,000 per km) — with eight to ten feeder roads, similar to that to Busurata, adding an extra 140 km of road (AUD$7 million at $50,000 per km).

The cost would be in order of $AUD23.3 million dollars. Spread over ten years and with a trust fund established for maintenance, adding about 20 per cent of the initial cost, this amounts to AUD$2.8 million per year.

Such a sustained effort would transform Malaita Province by creating agricultural opportunity in highland areas for the production of temperate and other cash crops, open up highly productive river basins where produce currently rots without a market and allow the delivery of services and opportunities into rural areas, stimulating many more benefits that can only be guessed at present.

Communication

Communication services are very limited in highland Malaita. Most radios, for instance, are located on the coast, although some are at clinics, providing contact with the outside world, if people can afford to use them. At Nammalaelae, use of the clinic radio costs SBD5, while nearby, a private radio charges SBD20 a call.

Radios do not exist further inland. At Bobota, the nearest radio is at St Mark's Training Centre on the coast, at least sevenhours' walk away. There is a radio at Gounabusu — the closest one to Goikwalasinga and the traditional hamlets nearby, but it is too far away to be considered useful.

There has never been a radio in any traditional village and none have been offered by government or NGOs. They are not part of a network, in contrast to Christian villages, which receive support from their churches, so it is very difficult for them to access basic services in their remote locations.

Creating a radio network between the communities (remote traditional and Christian) would help a great deal to improve people's lives and sense of well being. It would break the isolation the communities feel and in times of need, for instance, provide a way of obtaining assistance.

In Faunalea village, people were hungry and resorting to wild yams from the forest; they had no one to whom they might ask for help. In fact, it did not occur to them that they might do so.

The location of radios through KGA programs is best left till later, after people have completed courses or attachments at Gwaunafiu. Those farmers showing the most interest and innovation might be selected to host a radio as part of an expanding bush network.

Atoifi Adventist Hospital has Telekom services, public phones and even internet access for staff, but as yet it is out of reach of the mobile phone network. When it comes, it will help enormously with communications on the coast, but is unlikely to create impact in the bush even if access is made available. Costs would be too high at present rates.

Education

Some villages, such as Deresaia, have primary and junior secondary schools nearby. Children have to cross dangerous rivers when they are in flood, but, for the most part, access is relatively easy.

Other villages in the bush are so remote from primary and secondary schools that families either migrate to the coast or children board, adding to the cost of their education.

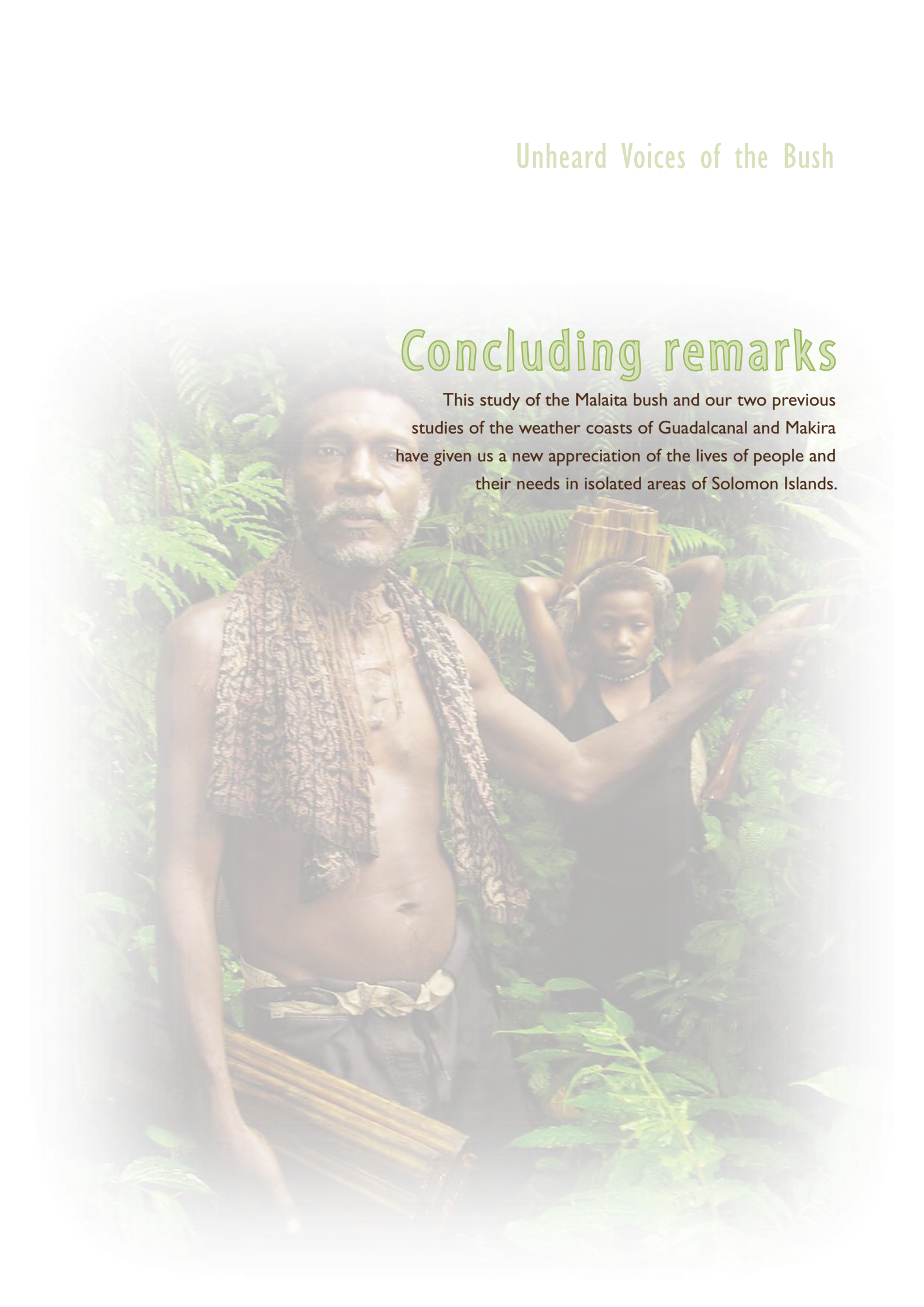
There can only be one conclusion: there is a need for more schools in the bush. If there were, people of all religious persuasions would send their children to them and this would stop the slow drain of people from the hinterland to crowded coastal settlements. In fact, it would create a back migration as people want to be on their ancestral lands.

Summary recommendations: create an enabling environment

Extension services	▪ Develop a special training and support program at Gwaunafiu and Masilana dedicated to farmers from bush communities. Quotas and specific intakes for men, women and young people will be included as well as separate intakes for Christian and traditional communities. An affirmative action policy will be used to ensure that those from traditional communities are given high priority.
	▪ KGA to facilitate the development of a PMN highlands bush network. This network will share information and resources on current programs in Malaita and elsewhere, and conduct advocacy on roads and other service delivery issues, including: » a socio economic benefit/impact study of the Busurata feeder road. » the appointment of a facilitator to develop communications between the partners. » arrange annual meetings to exchange experiences, innovations, planting materials, etc. » make links with Bougainville highlands. » develop a database of experts and contract their services to share their experiences and knowledge, e.g., Dorothy Tamasia, Makira highlands for banana germplasm; Lionel Maeliu Gwaunafiu Farmer School, Johnson Ladota, Masilana Seed Centre, etc. » provide radios to isolated communities, traditional and Christian, as part of a highlands network. The choice of locations will depend on people's willingness to assist others after training at Gwaunafiu Farmer School
Energy	▪ Improve access to information about modern forms of energy and their costs: KGA should develop partnerships with commercial enterprises in Honiara to make information about solar charging systems and coconut oil powered diesel generators and lamps available to rural people.
	▪ Gwaunafiu and Masilana should be sites testing improved stoves, made from locally available materials, for greater efficiency and smoke reduction.

Concluding remarks

This study of the Malaita bush and our two previous studies of the weather coasts of Guadalcanal and Makira have given us a new appreciation of the lives of people and their needs in isolated areas of Solomon Islands.



The weather coasts and the mountainous highlands

Guadalcanal and Makira — the weather coasts

In our last report, *Extreme Living, Extreme Need* (August 2006), we compared the two weather coasts of Makira and Guadalcanal. There are many differences in geography and culture between the flat coastal strips of the weather coasts and mountainous highlands bush but there are also many similarities, including:

- weather patterns with a double 'wet' and extremely high rainfall of more than 5000mm annually, which bring floods and landslides
- limited land for agricultural development due to the mountainous terrain
- declining fallow periods and soil fertility because of rapid population increase — new technologies are needed to sustain agricultural production
- subsistence food production dominated by sweet potato but vulnerable to failure
- banana as an important staple food crop, although vulnerable to disease in some places, and an interest in processing
- taro and yam that are suffering from disease epidemics and loss of germplasm
- cash economies dominated by cocoa and pigs,although both have severe disease constraints and are in need of improved management; marketing of cocoa is difficult
- a wealth of leafy greens and similar foods taken from the bush in times of hunger (but which are often ignored in normal times)
- isolation and the lack of essential services, such as education and health and remoteness from markets, are major constraints to development.

Divisions signify difference

Differences in livelihoods emerge from divisions within the highland areas.

People of traditional faith are worse off in terms of standards of living than Christians. There is no social safety net such as that provided by churches for those of traditional faith, but they too want better access to clinics, schools, information and markets.

Standards of health, particularly for women and children, appear particularly poor. It is likely that there are higher rates of infant, child and maternal mortality than elsewhere in Solomon Islands due to the interaction of malnutrition and lack of access to health services.

Isolation justifies intervention

As with the weather coast assessments, we argue that highland areas are special cases. Their extreme isolation requires special attention and specific interventions to improve people's livelihoods. The challenge is to find ways to deliver the assistance required.

Some interventions can come from the activities of the Kastom Gaden Association under its Sustainable Livelihoods for Isolated Areas Project.

In 2005, KGA formed a Weather Coast Discussion Group to bring together specialists interested in the advancement of the Guadalcanal coast from national and provincial government, development assistance agencies, NGOs and donors. Several meetings provided valuable exchange of information on activities to avoid duplication, to advance ideas, for collaboration and for advocacy. An email list was established and this continues to provide contact between members. Reports of the meetings in the local media helped to create a broader awareness of the needs and the challenges that lie ahead.

There is now a wider understanding that the weather coasts are a priority and there have been some improvements, in Guadalcanal in particular. KGA has supplied planting materials of food crop staples, carried out training in food processing and organised diversity fairs. Airports have

reopened at Avuavu and Mbabanakira, the Avuavu Distance Learning Centre has been established and a preliminary assessment has been made of the Kuma to Marau road, with the possibility of a feasibility study for its extension to Aola.

A number of national studies and strategies on agricultural and rural development also describe the needs of the weather coasts, for instance:

- the Solomon Islands Smallholder Agriculture Study
- the Agriculture and Rural Development Strategy and its part implementation through the Rural Development Project;
- the AusAID Community Sector Strategy.

These acknowledge the hardships faced by people of the weather coasts as well as those of the bush, and that more needs to be done to help them.

Initiatives focus on bush populations

KGA has focused on highland bush communities in Guadalcanal, Isabel and Makira. In 2002, it formed a highlands network to link the communities on those islands and bring together people to share information, ideas and planting materials. With support from the Melanesia Farmer First Network and the Planting Material Network, a meeting was held in Makira with representatives from the four islands.

Livelihood strategies in all these islands are similar, but sufficient differences exist that made the meeting a valuable sharing experience.

For instance, information was given on:

- the banana collection on Makira
- taro and yam pests and diseases on Malaita
- coffee and kava development on Isabel — crops that are of interest to Guadalcanal
- unique methods of sweet potato and yam cultivation on Guadalcanal that avoid slash-and-burn practices
- cocoa and fruit and nut species that are of interest to all.

It is evident from the MFFN meeting and from the three assessments — Guadalcanal, Makira and Malaita — that the isolated communities of these areas would really benefit from regular communication so that they can share their knowledge and experiences. This would not only lessen their isolation but would also broaden the highlands network. KGA is already well positioned to provide the secretariat to the network, using the Weather Coast Discussion Group as a means of coordinating agencies, including churches, in assisting isolated communities.

National, provincial governments and the donor community will need to engage more effectively with isolated areas if development is to occur or the pace of development increase.

Without services, disadvantage increases

Our reports have repeatedly captured people's feeling of isolation and of being forgotten. Time and again, people have told us of their need for roads and/or sea transport:

- on Guadalcanal, it was repair of a road long-abandoned, as it was on Malaita, as well as a feeder road into the bush
- on Makira, it was a plea for regular shipping.

Everywhere, people said they had the skills and the incentives, but without access to services and markets, progress was impossible.

Roads and ships are expensive to build and maintain in this difficult geography. Governments and donors need economic justifications for their decisions. All that is known. But on the grounds of equity and long neglect, these isolated areas are crying out for better services.

Without improved services, disadvantages will only increase and, as recent civil disturbance in Solomon Islands has shown, frustrated communities are ignored at a nation's peril.

We urge all NGOs, donors and government to join with us to use these assessments as a springboard to develop multiple strategies to work with isolated communities, to create opportunities for basic development and a better life.

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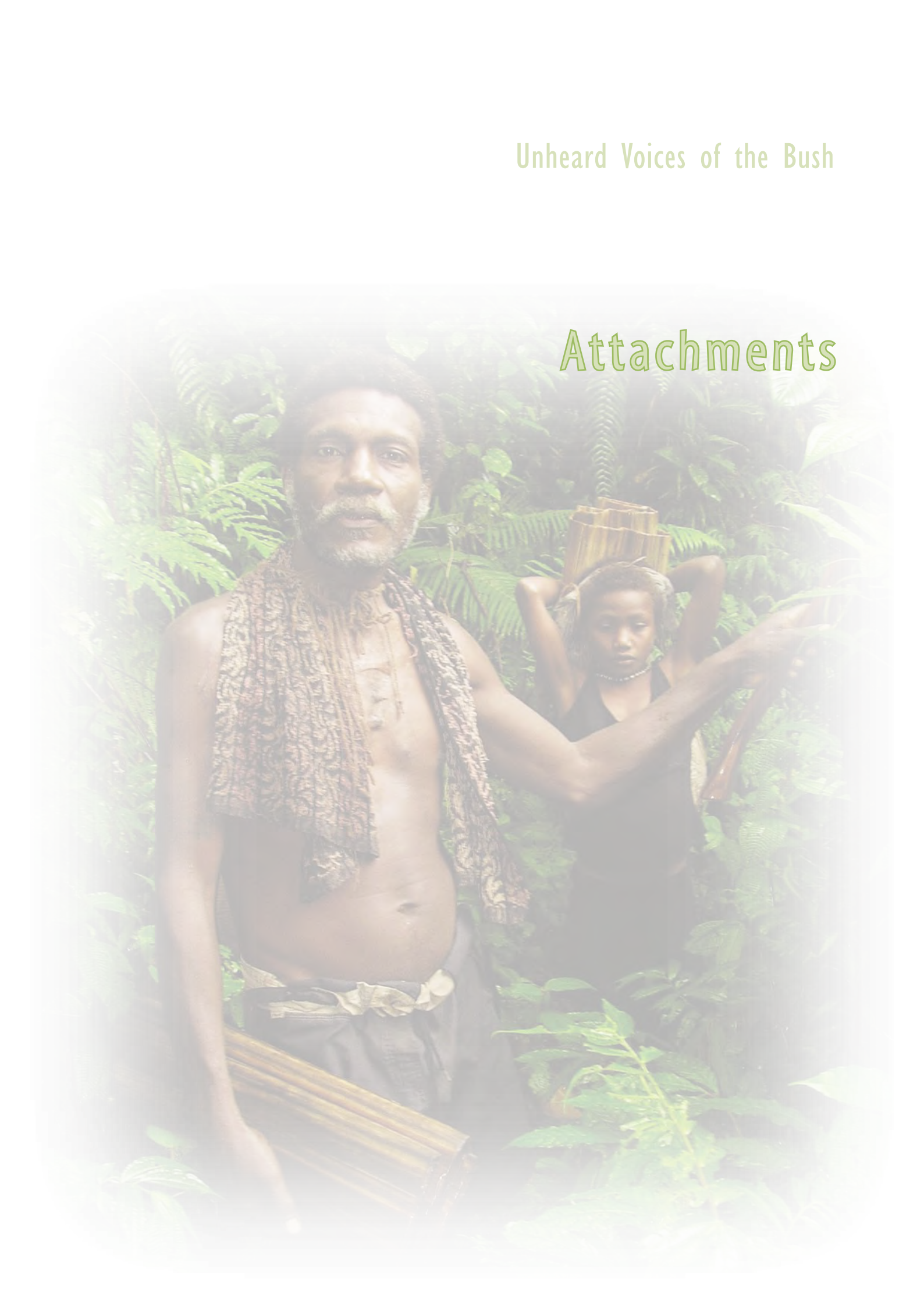
Attachments



Attachment 1

The team

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Onyx Oifalu	Local area and women's issues specialist

Energy recommendations were adapted from information provided by **Andrew Mears**, who joined the weather coast assessment.

Attachment 2

Village summaries

Village: *Deresaia*

Setting	▪ is a lowland village in a wide river valley with extensive terraces and low hills. The soils of the river flood plain are very fertile. The Ricarica and Kwaimbaita rivers border the community's land and form the boundary between Kwara'ae and Kwaio districts ▪ has a population of 29 occupying eight households spread over two small hamlets ▪ was settled in 1969 when the people moved from the bush after conversion to South Seas Evangalical Church; one family converted to Seventh Day Adventist in 1985 ▪ has had little contact with agriculture extension services in recent times; the last visit was before the tensions (ie. pre-2000); families have had cattle since the 1980's ▪ has a community secondary school and clinic nearby, at Nammalaelae ▪ is 6-7 km from the nearest coast ▪ It takes three hours to walk to the nearest market ▪ Cyclone Namu flooded the area destroying gardens and many houses. Winds stripped most vegetation.
Livelihoods *Food crops:*	▪ sweet potato (5-6 varieties) makes up 80-90% of the garden area with very high yields of up to 4kg per mound — 20t/ha ▪ cassava (2 varieties) — banana (many) — kongkong taro (1) — yam (2) — pana (2) ▪ kakake, which is used in times of food shortage ▪ many greens and abundant fern — especially kasumae along the banks of the rivers ▪ some edu ▪ on the river flood plain three crops are planted in succession, then there is a 3-year fallow ▪ bush gardens near the village (ie. in long fallow on sloping land) in which only one crop is planted before the land is left to fallow ▪ for emergencies, four types of wild yams are taken from the bush; these can be harvested about once a year ▪ there is little *sliperi kabis* in the gardens; even small plants (about 30cm high) are heavily attacked by *Nisotra* ▪ some taro was seen scattered at the borders of the garden, but the disease of taro, alomae, is present.
Cash crops: Cocoa:	▪ families have individual cocoa plantations ranging from 450-1000 trees, they are very productive and with a fairly diverse canopy of betel nut, ngali nut, timber trees (akwa), coconut, sago palm and firewood trees. In one plantation, cocoa is planted under coconuts ▪ residents received training in cocoa cultivation in 1997 at Dala ▪ six pods (var. *Amelanado*) from Dala were the seed stock for all the plantations ▪ the cocoa is well managed ▪ young girls sometimes labour in the plantations for SBD20/day and sell wet beans for SBD3.20 kg (the current price, but this varies); they might harvest 50-100 kg fortnightly during the season, selling to anyone with a drier; the dried beans are then sold to either Arania or Purple Investments — two companies from Honiara whose agents come to this area and buy directly from the growers ▪ generally, a household goes to market at least once a fortnight.
Market sales:	▪ sweet potato, pineapple, banana, dry and young coconuts, cooked food (cassava pudding) are sold in local markets from 3 hours to 5 days travel distant (Malaone, Atoifi and one other) ▪ sweet potato sells for SBD3 for 10 kg, ▪ alternatively, the sweet potatoes are transported by canoe, for little profit — 4-5 bags in a canoe at a cost of SBD2 per bag (ie. SBD15 income minus SBD10 expenses = SBD5) ▪ taro has a high price in the markets but there is little production in Derasaia ▪ pineapples are a good source of income in season.

Pests & diseases	▪ sisi (*Nisotra*) on sliperi kabis is a major problem ▪ Alomae has led to taro decline and is no longer a significant crop in the gardens ▪ some scab moth on bananas ▪ 'lightning' *(Colletotrichum)* is a fungal problem on yams, which limits production ▪ other than these, there are no major pest and disease problems.
Agroforestry **Livestock**	▪ there are extensive cattle enterprises at Deresaia and at other places along the river ▪ at Deresaia, 150 head are rotated among four well-fenced and maintained paddocks.
Pigs	▪ pigs are the number one source of income ▪ each family has a large pig house with raised floors and 6-10 cross-bred pigs in 5-10 pens ▪ the pigs appear to be healthy, well managed and cared for and produce 8-12 piglets per litter, with most surviving ▪ the pigs are free to range in fenced areas ▪ people claim that pigs do little damage pigs to gardens ▪ women feed the pigs with root crops from their gardens twice daily.
Poultry	▪ every family has free-range chickens that are occasionally sold for meat, although the eggs are only rarely eaten ▪ ducks and a tilapia pond are new, but well managed.
Fish	▪ the river is used for fishing, mostly for tilapia introduced in recent years and which are flourishing (whether there has been any negative impact on local species remains unknown) ▪ fish have been declining in the river ▪ it is said that people use pesticides to kill fish ▪ fish from the sea and mangrove fruits are exchanged for sweet potato, banana, leaf taro and kasume.
Forests	▪ a large number of akwa (*Pometia*) trees have been preserved in the cattle paddocks ▪ the villages in the area are fairly bare, with few fruit trees ▪ Breadfruit, ngali nut and wild mango grow nearby ▪ erosion along riverbanks appears serious, especially where gardens and plantations are present ▪ the community has reserved a large area of forest close to the village, which is kept for building materials and other uses.
Overall wealth	▪ shell money is in use ▪ most households earn SBD50-100 per month, sometimes up to SBD200 ▪ one person operates a solar battery charger that supports five families; the charge lasts 1½ weeks when used for lighting and costs SBD5 ▪ fear of sorcery prevents people from showing signs of wealth or development. Houses are mainly of leaf with only two having iron roofs, even though these families have made a lot of progress compared to the average in the area ▪ there is a fear of 'poison' — the village is on an ethnic boundary.

Overall health

- the main health problems are:
  - malaria
  - diarrhoea
  - Acute Respiratory Syndrome (ARI)
- there is a high level of asthma in heathen villages due to poor housing and indoor smoke inhalation
- approximately one maternal death and three child deaths occur in the area each year
- sanitation is very poor; toilets are not covered and the water table is high
- the clinic is 2km away (at Nammalaelae) and is well supported with a good supply of medicines by the Atoifi Adventist Hospital
- the majority of babies are born at home, although there are cases of births in the cocoa plantations and in the traditional villages, women give birth in their separate houses
- access to Atoifi Adventist Hospital is difficult in medical emergencies. It costs SBD300 for the boat trip
- there are only 11 family planning clients in the area
- at least one malnourished child was noted. Problems develop at weaning, from 6 months onwards.

Youth

- poor management of money
- some opportunity to earn income from market and cocoa.

Gender

- men and women generally work together in the well-organised families
- men and women work together on the cattle project
- women and girls feed pigs
- youth (especially girls) work for income in cocoa plantations
- men work at the school and clinic (on Thursdays), while women have mothers' clinic day
- water is a problem, the water supply washed away in flood and people had to re-dig holes along the river edge.

Issues

- coconut could be used as a kerosene substitute by low income households in the area
- cocoa plantations are a breeding site for mosquitoes
- financial literacy is poor, there is a need for better management of money, spending and budgeting
- market access and transport is a **major issue**. Road would have a very high potential to transform livelihoods in this area
- very high agriculture potential — e.g., extremely high sweet potato yields
- a lack of variety in vegetables — not many tomatoes, beans, etc
- people eat dry potato all the time in a poorly balanced diet, this is complicated by loss of *sliperi kabis*. some attempts are being made to grow replacement greens
- training needed on cooking – more vegetables in the diet. No hunger here – harvests observed to rot in gardens
- need to explore value adding opportunities — eg. sweet potato chips
- no interactions with government agencies and little access to information
- women do not have good understanding of seasonal patterns
- women play a big role in cash crop production
- generally, gender roles are balanced, for food production, at least
- not much store food is consumed
- jealousy and fear of sorcery is a problem, people consequently live simply so as not to bring attention to themselves — Kwara'ae is associated with strong sorcery and kastom power
- there is a need for legumes to restore agricultural soil fertility and for crop rotation on river flats
- there will be land shortage as there is not much space to expand, but this is compensated for by a productive environment
- timber trees have been reserved for future use.

Village: Jordan

Setting	▪ is a village beside a steep river valley with narrow flats, probably some 200m above sea level ▪ a waterfall with a 20-30m head is found across the river ▪ consists of seven houses of 8 families with others in close proximity, eg Sinafiofi (5) and Belheni (4), making a combined population of 65 ▪ Faunalea, a traditional village, is situated at the top of the nearby ridge and other scattered traditional hamlets exist nearby ▪ there is a primary school and aid post, both opened in 2005 by the SSEC church ▪ rainfall is high, especially in the middle of the year; the weather pattern being similar to the weather coast, with two periods of wet. The hungry time is June to August ▪ unlike Deresaia, the river does not flood the flats and replenish their fertility, as the valley is deeper here.
Livelihoods *Food crops* Crops	▪ sweet potato (9 varieties) dominates food production and is planted throughout the year ▪ taro is mainly planted to mature in December and is second in importance followed by cassava, banana, kongkong taro ▪ yam/pana are rare with no Vanuatu (African) yams ▪ tomatoes, shallots and lima beans are grown, although not in large amounts ▪ one family has a large plot of watercress ▪ wild yam — mute — is common in the forest and is currently being eaten (during August), indicating food shortage.
Cropping	▪ there are two to three gardens per household; some families have riverside and bush gardens, some only riverside ▪ **on the river flats**: short fallows (1-6 years) of secondary vegetation cleared and burnt, mounds made and planted to 10-20 cuttings of sweet potato. Some people are experimenting with fewer cuttings! ▪ **in the bush**: especially those of the traditional families, bundles of sweet potato vines are planted in each shallow mound. ▪ the fallow period is reducing, both along the river and in the bush ▪ soil fertility is in rapid decline along the river flats which are rarely replenished by floods.
Cash crops	▪ there are three cocoa growers with between 500 and 2000 young (non-bearing) trees under bush shade; the plan is to sell wet beans at Nammalaelae ▪ there are no coconuts grown; they are bought at the rate of 10 for SBD5 from people further down the river, or are bartered for
Market sales	▪ there is a small local market in the village every Thursday where two or three women sell food crops: beans, kabis, watercress as well as cooked food such as pudding and taro which might bring SBD10 to each person ▪ betel nut is occasionally sold in coastal markets, but these are far away.
Pests & diseases	▪ Alomae is a problem on taro ▪ *sliperi kabis* is absent because of the beetle, *Nisotra* ▪ rots occur where many sweet potato vines, old and new, are planted in a mound.
Agroforestry	▪ wild breadfruit and ngali nuts are planted ▪ there are a number of fruit trees in the village, such as pomelo, lime and others.
Livestock	▪ diseases of livestock present: » in the traditional villages pigs die from diarrhoea and 'cough-cough' » chickens are said to shake and fall down. ▪ pigs are healthy in Jordan, where there are 30 or so. Healthy poultry were observed in villages — about 14 at Jordan ▪ other considerations affecting livestock: » stealing is a problem; everywhere stealing is a cultural challenge for young men » roosters sell for SBD20 and hens for SBD10 » people do not eat eggs.

Forests

- a large area of bush exists and some is reserved
- there is lawyer cane some 40 minutes from the village
- firewood is 15 minutes walk; 30-40 pieces weighing about 4kg is enough for one week; the amount is carried in 4-5 journeys
- some river fish are sold at market
- eels are present but hard to catch.

Overall wealth

- sources of wealth:
  - pigs are in high demand and are the main source of cash, with prices from SBD200-400
  - ngali nuts are an important, seasonal income source
  - baskets are (rarely) sold, bringing SBD10-20
  - shell money is made
  - there is a local market and vegetables — sweet potato, cabbages of various kinds, pineapple as well as taro and cassava — are sold by two to three women who might earn SBD10 a week
- cash economy:
  - people have little cash, they:
    - give SBD20 per year to the school (average SBD10 per month), buy new clothes once or twice a year
    - pay for kerosene SBD50/gallon or SBD10 per litre at Atoifi and SBD4 for a Schweppes bottle full
  - the traditional village buys rice and salt, albeit occasionally
  - teachers and the village nurse contribute to the local cash economy by buying local produce and goods in the store
  - compensation claims can be a big expense.

Overall health

- nutrition is very poor:
  - there are greens in the gardens but people do not adopt a balanced (mixed) diet
  - not enough fruits and vegetables are eaten
  - pawpaw and sweet potato is fed to infants before they are ready; in one case, feeding of infants started at one month
  - small children are left in villages while mothers go to distant gardens
  - there is less concern (or ignorance) about children's health
  - the nurse is not addressing family planning or nutrition
  - according to the children's records, 8 out of 30 were underweight; the problem starts at weaning.
  - routine malaria treatment means other causes of illness are missed.

Gender

- gender roles are more imbalanced compared to Deresaia, with women having greater workloads
- the community is well organised with Tuesday and Thursday set aside as community days for cleaning around the clinic and school, respectively
- women and men are occupied with garden work, feeding pigs and tending cocoa
- on Sunday, everyone attends church
- women carry water
- men cut firewood and women carry it to village (sometimes women cut smaller trees); this is usually done once a week.

Issues

- traditional communities are the poorest of the poor in the country, they:
  - are discriminated against
  - have no access to services
  - lack access to information
  - are feared, increasing their isolation.
- consequently, traditional communities have a much lower quality of life
- other issues:
  - sweet potato management and production — there is a double wet season leading to sweet potato crop failure
  - alomae disease of taro
  - health and nutrition — visits by health workers are needed
  - gender issues/workloads of women
  - livestock problems
  - very low cash income
  - stealing of pigs.

Village: *Faunalea*

Setting	▪ Faunalea is situated on ridge above the Kwaibaita River ▪ the village has a pig fence around it and the traditional layout of communal house, women's house and men's custom house ▪ pigs are living in the communal house, in pens that intrude into the living space ▪ the houses are without floors and people sit and probably sleep on the unlevelled ground ▪ there are few signs of modern amenities, eg. no pots and very few clothes.
Livelihoods	▪ Similar to Jordan.
Food crops	
Cash crops	▪ Tobacco and pigs as the main sources of income. ▪ Betel nut is sometimes taken to Auki or to coastal markets.
Pests & diseases	▪ Same as Jordan
Agroforestry	▪ Same as Jordan.
Overall wealth	
Overall health	
Gender	In Christian villages, people said that there was considerable equity between the sexes. Men helped more these days, whereas before "men carried a bush knife and women everything else!" Observation showed that women still have busy days: taking care of the house, children, planting crops, weeding and harvesting, collecting and carrying firewood and feeding the pigs. In addition, there are community days, in both Deresaia and Jordan, when women and men tend the areas around the clinic and the school.
Issues	▪ No access to government or other services. ▪ People are eager to learn about agriculture and they are collecting new planting materials and experimenting, but with very little access to outside knowledge. ▪ There is a need for special approaches to accommodate cultural mores. ▪ Residents are the poorest of the poor — a forgotten people never previously visited. ▪ There is no education other than children going to school at Jordan. ▪ Women's and children's health.

Village: Bobota

Setting	▪ An isolated village high on a ridge (estimate 800 plus metres altitude) with 23 people in five families. Bobota is above the Kwaibaita and Waiaha Rivers ▪ The nearest school is 12 hours away (so no one goes to school) and the nearest clinic is at Atoifi.
History	▪ Originally, the village was a traditional community. In 1967, people went to the coast and converted to Christianity. In 1982, they went back to the village. Their motivation in doing this was to settle on their own land where they had primary rights through the male line. ▪ In 1998, three Fijian teachers came to the village and started a school. They left after a dispute with the church. ▪ In 2003, some of the families went back to the coast and two families founded two new villages in the bush. The main factors for the move to the coast were isolation, the desire to educate the children and to be in proximity to a clinic/hospital and market. ▪ There has been no contact with agriculture extension services.
Livelihoods *Food crops* Crops	▪ the main food crop is sweet potato of which14 varieties, with 6 in the gardens, were observed ▪ other crops are: » taro (6 varieties) » cassava (4 varieties, with 2 in the gardens) » banana (9 varieties, with 5 in the garden) » yam (2 varieties).
Other crops and influences	▪ there are five types of wild yam in the bush ▪ the root crop edu is present ▪ families have plots of kakake in highland swamps ▪ *sliperi kabis* is no longer grown because of *Nisotra*; instead, people use taro leaves and Borneo kabis as vegetable greens ▪ people said they have lost the seed of other vegetables (eggplant, tomato, bean, snake bean)
Agricultural practices	▪ the fallow period is about 10 years ▪ sweet potatoes are grown on small mounds made with a digging stick; growth is slow because of the relatively low temperature compared with the coast; first harvests are made at 4-6 months ▪ pumpkin and melon grow poorly (they 'die') ▪ June, July, August is 'time blong hungry', when food is in short supply.
Cash crops	▪ taro are sold on the coast with 3 bags each of 50 taro bringing a profit of SBD150, however, people have sold little recently because of the presence of alomae affecting the crop productivity ▪ pigs are raised, but in the last 3 years many have been stolen or have died from disease, pigs free range during the day ▪ Other commodities sold are: » lawyer cane (100 for SBD20) » canoes » axe handles (SBD10) » wooden bowls (Doaka) » baskets — a declining market now being replaced by synthetic products ▪ taro, sugarcane, banana, sweet potato and pineapple are marketed every 3-4 months, especially when people want coconut, fish, salt and kerosene. They do not market during the 'time blong hungry' ▪ cocoa is grown and more will be planted and taken to Deresaia to be sold as wet beans. ▪ people from the traditional hamlets sell betel nut and tobacco at Atoifi ▪ there is out migration — temporary (eg. to Kolombangara for work) and permanent (return to coast or Honiara).

Pests & diseases	▪ disorders include: » major problems with yam (burua), which is probably caused by *Pratylenchus* » banana plants falling over in the wind and being infected with *Pratylenchus* in the village; the same is said to occur in the gardens » watermelon and pumpkin not growing well, although the cause was not diagnosed » corn being eaten by the birds » the presence of *Riptortus* on lima bean and *Amblypelta* on cassava.
Agroforestry	▪ the following are present in agroforest associations: » ngali nut » a-quasi » breadfruit » inkori » four types of mushrooms » pumpkins » papayas » guava » citrus » coconut » other bush foods » firewood, which is quite far, about 2km, and is collected every 2 weeks; women cut and carry.
Livestock	▪ livestock is affected by disorders ▪ pigs are kept, but they become thin and die ▪ many young poultry die; there were only three chickens in the village.
Fish	▪ There are fish in the river but the people do not have the equipment to harvest them and it is too cold to dive; there are no lines and hooks. ▪ Shellfish and prawns are taken from the river while in many other places they are disappearing.
Forests	▪ there is plenty of timber ▪ sago palm is present ▪ at present, the village is planting 1000 teak trees ▪ there is minor (but common) damage by leaf roller insects.
Overall wealth	▪ wealth is available in the form of: » shell money » pigs (a traditional source of private wealth) » taro ▪ the community has relatives in Honiara, one of whom is a lawyer, the other a police officer. Little support comes to the village.

Overall health	▪ people look well although women are having children at an increasingly early age ▪ family planning advice is absent.
Gender	▪ women take care of the home ('man buys woman for house') ▪ men make axe handles ▪ burden of work falls on women ▪ young boys are well organised and do a lot of the work — more than in coastal areas ▪ none of the youth go to school. In fact, it is said that parents do not want their children to go to school although they did when the village school was run by the Fijians ▪ there is concern over the influence of coastal life and food on their children.
Issues	▪ very small and dispersed populations ▪ distance to services and markets ▪ diseases of food crops, with little understanding of them ▪ loss of pigs due to diseases, stealing, free ranging ▪ loss of vegetable seed ▪ sweet potato planting and the number of cuttings per mound, especially ▪ dependence on sweet potato at wet times of year when the crop is vulnerable to failure ▪ small mounds of sweet potato might contribute to low yields ▪ no money for education and other needs ▪ the health impacts of cooking fire smoke in the house — an 'everywhere' issue ▪ traditional families short of food (looking for wild yams in the bush and people at Bobota also eating wild yam) ▪ sanitation and water supply ▪ lack of a women's group ▪ the divide between traditional and Christian families and villages ▪ youth (Christian and traditional) are interested to come to Gwaunafiu Farmer School for attachment training ▪ people manage well and have their own strengths and self-reliance, but their future is uncertain. ▪ there is opportunity for marketing crafts.

Village: Goikwalasinga

Setting

- located in a steep sided valley but still high in the bush, Goikwalasinga is three hours from the coast
- there are three households living in four houses, making a total of 40 people. One house has a corrugated iron roof
- there is a school about one hour away, at Nanakinamae, and the village has a kindergarten with 10 children
- the nearest clinic is on the coast at Gonabusu, where there is also a radio
- Goikwalasinga has a water supply but sanitation, in general, is poor
- there are many traditional hamlets nearby. The road from Bobota passes through seven of them.

History

- the village was founded in 1987, but a split occurred and some families moved away.
- cyclone Namu destroyed all the houses and people 'scattered' at this time.

Livelihoods

Food crops

Crops — planted and currently unplanted

- sweet potato is the dominant crop, with 9 varieties; yields are said to be good, in general, although plants take 6 months before the roots are ready for harvest
- wild yam, with 4 varieties grown and harvested up to four times a year, especially in time blong hungry
- *sliperi kabis* is available in reasonable quantity compared to other villages visited
- taro consists of 8 remembered varieties of which only 4 are presently grown
- yam, of which a total of 8 are remembered but none presently grown
- pana, with none presently grown.
- in a nearby traditional villages, there are:
  - 5 different varieties of taro
  - 10 varieties of sweet potato
  - 6 varieties of banana
  - 4 varieties of cassava.

Agricultural practices

- gardens on the hills around the village are owned by traditional families and planted to taro
- yields are highest in May and June and lowest in July and August
- the fallow period is 4-5 years
- small swamps are used for growing kakake
- in one garden inspected, a large area was planted to sweet potato but yields were low: after 3½ months only 1-2 kg was obtained (although it was said that the garden was planted by young girls)
- there is no evidence of hunger at present — kitchens are full of cassava and sweet potato, unlike previously visited villages.

Cash crops

- The market:
  - sweet potato brings10 for SBD3 and taro 10 for SBD10 on the coast
  - sliperi kabis is sold
  - cocoa said to be planted at the next village (by 10 people) with two selling in Honiara
  - traditional communities sell pigs for income and shell money.
- at the coastal market people might earn SBD6 weekly
- a small quantity of rice was grown for the first time last year.

Pests & diseases

- pests and plant diseases present included:
  - sweet potato and taro hornworm
  - leaf folder on *sliperi kabis*
  - bananas with, possibly, nematode and scab moth
  - an unobserved problem concerning edu and kongkong taro.

Agroforestry

- the following were present:
  - sago palm
  - some ngali nuts
  - orange
  - guava
  - Malayan apple
  - carambola
- the forests are a source of housing materials, medicines and other products.

Livestock Pigs	▪ pigs are the main source of wealth in the area ▪ many are kept for eating at customary feasts, for sale and to exchange for shell money ▪ four were observed in the village ▪ are vulnerable to stealing, a major hazard to their husbandry ▪ are also susceptible to 'cough-cough', probably caused by swine influenza ▪ each family has about five pigs that are fenced. One family places its pig in the house at night to protect it from stealing.
Poultry	▪ one chicken was observed in the village ▪ it was said that chickens were not kept in traditional hamlets, due to customary restraint, possibly because they roam freely and in the wrong places!
Fish	▪ there are fish in the river, but the people do not have the equipment to make use of them, and it is too cold to dive (ie. no line and hooks) ▪ fish are traded from the coast, once or twice a month at most ▪ in traditional villages, women are not allowed to eat some fish and women cannot share food with men ▪ shellfish and prawns are taken from the river; in many other places they are disappearing.
Energy	▪ kerosene is used for household lighting and supplements the fuelwood used for cooking, the primary energy source: ▪ one Schweppes bottle of kerosene costs SBD4 and lasts for less than one week ▪ kerosene is used for a short time each night ▪ families might spend one to three nights a week without light.
Overall wealth	▪ in the traditional societies fish, salt and kerosene are purchased ▪ people in the traditional hamlets do not market food crops on the coast because it is contrary to their customs ▪ betel nut and tobacco are sold by the youth — they may make as much as SBD100 a month from the sales ▪ people from the coast order foodstuffs, creating a major source of income that brings in at least SBD40 a week per person ▪ traditional societies have started to buy noodles as a replacement for saltwater fish and the 'food' is developing a similar status as elsewhere in the country ▪ 'Protein politics' is present — eg. if only one fish is available it would be given to men in the traditional villages — there is no sharing — it's men first!
Overall health	▪ some underweight children ▪ children are weened early on sweet potato and pawpaw ▪ in traditional hamlets, most babies are born in the bush, ten mothers died in delivery in one year (needs confirmation).

Gender

- **sharing of food**
  - in the traditional hamlets, women and men cannot eat some foods together.
  - if food is shared between men and women, there must be two entire items; for instance, a sweet potato cannot be shared and neither can one coconut. Only if there are two can they be shared. First food goes to men.
- **sharing of work**
  - there is considerable equality of work in the gardens and this is so in both Christian and traditional villages — in the latter, people work in the gardens in the morning and evening but if there is need to rest, then rest is taken.
  - a women's task revolves around duties in the kitchen and garden as well as collecting firewood and water
  - youth (four boys and two girls were interviewed) are interested in cocoa, betel nut and tobacco — most have been to school. They prefer to be in the village, rather than in Honiara, and help with the work in the gardens and feeding the pigs — on Friday they go to the market on the coast.
- **traditional communities:**
  - have less communal commitments and more time for gardening and, perhaps, more time for rest
  - do not have access to education or to a clinic, except at Atoifi
  - men collect and carry their own firewood
  - women have their own huts and gardens, using them when they are menstruating or delivering children; they can sell produce from these gardens, providing an opportunity to earn cash; women should be targeted to improve their nutrition
  - overall, there are conflicting reports whether gender workloads differ between traditional and Christian communities.

Youth

- youth who are not at school are involved in village food production and cash cropping — only two boys and two girls are going to school in the area
- Youths enjoy being at home and feel content.

Issues

- alomae disease of taro and the lack of yams
- banana may have a problem with *Pratylenchus*
- health and nutrition
- education for women and youth
- pig disease ('cough-cough') in the traditional villages
- limitations for traditional communities selling produce, but a window of opportunity for women to sell from their confinement gardens
- traditional communities are interested in planting vegetables.

Masilana comparison

Setting	• higher population pressure in some parts of the north Malaita bush.
Livelihoods	• significantly more taro grown in Masilana area than in the Kwaio region bush • July and August is also a time of heavy rain, but in Masilana people do not experience food shortage. The period until harvest of sweet potato varieties is not known.
Food crops	
Cash crops and incomes	• incomes are higher in Masilana because there is access to a road, allowing people to market taro in Honiara (although it is still very difficult to carry loads to the road). Most families market every week, unlike Kwaio communities • in Masilana, marketing is better organised; people help each other take taro to the road and they have developed local markets.
Pests & diseases	• Alomae is major problem, but some progress is being made with management, following KGA training.
Forests	
Overall wealth	
Overall health	
Issue	• main issue is the need for a road for market access and services.

Attachment 3

Sasamunga Growth Monitoring Program — lessons learned

The Growth Monitoring Program was an initiative between the Sasamunga Primary Health Care Unit and Kastom Gaden Association.

At the beginning of 1996, 25 per cent of children in the Sasamunga area were malnourished (below 80 per cent line). Most of the underweight children over one year were seriously malnourished. Children were classified as follows

- children who were only 0.5kg underweight and could easily reached the 80 per cent line
- children who were 0.5-0.99kg underweight and had moderate difficultly reaching the 80 per cent line
- children who were 1kg or more underweight and had serious difficultly reaching the 80 per cent line

Reasons for underweight in children

- low birth weight babies (10 per cent of children born at Sasamunga Hospital)
- not getting enough food
- not enough vitamins and minerals in their diet
- food taboos for mothers and children (such as not eating fish or drinking coconut milk)
- mothers stop breastfeeding before two years
- underweight children are often sick and treated with anti-malarial medicines and antibiotics

Other factors contributing to the problem of underweight children

- weighing of children often stops once children have completed immunization (often by one year of age); underweight children are not diagnosed during the period when they are most at risk
- children are hardly ever weighed when they come for treatment
- weights of children are not put on the growth charts in the baby books
- parents are not aware how to read the growth chart and it is not explained by nurses; it is an important educational and diagnostic tool
- mothers spend much time going to their gardens which are often far away
- mothers do not know how to feed children when they are sick to prevent them losing weight, or if they do lose weight how to put on weight later

Recommendations

- growth monitoring is a priority for preventing illness and death[19]
- growth monitoring needs special emphasis in clinics and hospitals
- health workers and nurses need to be properly trained in growth monitoring
- special attention is needed for sick children and underweight children who come to clinics
- nutrition education materials should focus on promoting three mixed (food group) meals and three healthy snacks a day for children
- more emphasis should be made on promoting foods high in vitamins and minerals
- improving nutrition and gardens (including small vegetable gardens close to the house) should be done in concert
- creating a hospital garden for feeding patients and teaching relatives is a direct way to improve nutrition and gardens for children at risk of malnutrition and their families.

19 In a follow-up study of 13 child deaths in Choiseul in 1996, children who were malnourished and low birth weight were at increased risk of death

Attachment 4

Training Program for Gwaunafiu Farmer School

An attachment program at Gwaunafiu should include separate quotas for the following groups:

- young men and women from Christian villages in East Kwaio and East Kwara'ae
- young men and women from traditional villages in East Kwaio.

The period of training would be dependent on discussions with the target group and what was seen as appropriate.

All attachment should include a number of follow up visits that would form the start of local networks in Bush Kwaio and Kwara'ae.

A similar program should be considered for Masilana Seed Centre, North Malaita.

SLIRAP, also, should consider extending the training at Gwaunafiu to bush communities of Guadalcanal, Isabel and Makira.

Type of training	Gwainifiu - existing capability	Training & support from KGA Burns Creek	Other capacity building needed
Collection and sharing of root crop planting materials including new vars. of African yam and cassava.	✓		
Alomae management	✓		
Improving soil fertility — legumes, mulching and use of animal manure	✓	✓	
Intensive piggery management (in raised floor housing)	✓		
Demonstration of compost toilets and improved (covered) pit toilets			
Nutrition and mothers health			✓
Improved cooking methods for mixed meals and flavour — without noodles			✓
Seed saving and seed propagation	✓	✓	
Improved kitchens and trials of fuel efficient and smokeless stoves.			✓
Food processing — root crop and banana chips, jams and chutneys	✓	✓	
Financial management — basic record keeping			✓
Exposure to taro group marketing model	✓	✓	
Improved local chicken management, including eggs for home consumption	✓		