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Solomon Islands Smallholder Agriculture Study

Volume 4
Provincial Reports



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January 2006

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Acronyms

AOA	agricultural opportunity area	m	metre
AusAID	Australian Agency for International Development	mm	millimetre
C	Celsius	NBPO	New Britain Palm Oil Ltd
CEMA	Commodities Export Marketing Authority	NBSI	National Bank of Solomon Islands
CFC	Christian Fellowship Church	NGO	nongovernment organisation
COM	Church of Melanesia	NIS	nut-in-shell
CPRF	Community Peace and Restoration Fund	PFN	People First Network
CRC	Christian Revival Church	PMN	Planting Materials Network
DAL	Department of Agriculture and Livestock	PNG	Papua New Guinea
DBSI	Development Bank of Solomon Islands	RAMSI	Regional Assistance Mission to Solomon Islands
DME	direct micro-expeller (coconut oil mills)	RCDF	Rural Constituency Development Fund
DSAP	Development of Sustainable Agriculture in the Pacific	RenBel	Rennell and Bellona Province
EU	European Union	RIPEL	Russell Islands Plantation Estate Ltd
FSP	Farmers Support Programme	ROC	Republic of China (Taiwan)
g	gram	RTC	rural training centre
GPL	Guadalcanal Plain Ltd	SDA	Seventh Day Adventist Church
HF	high-frequency	SDP	Smallholder Development Programme
ICPL	Isabel Coconut Products Ltd	SI	Solomon Islands
IDA	Isabel Development Authority	SIARTC	Solomon Islands Association of Rural Training Centres
ITTA	Improved Temotu Traditional Agriculture	SIG	Solomon Islands Government
KGA	Kastom Gaden Association	SIPL	Solomon Islands Plantation Ltd
kg	kilogram	UNDP	United Nations Development Programme
km	kilometre	UNESCO	United Nations Educational, Scientific and Cultural Organization
km ²	square kilometre	WPCL	Western Province Copra Ltd
LIC	Lauru Investment Company	WWF	World Wildlife Fund
LLCTC	Lauru Land Conference of Tribal Community		

CURRENCY CONVENTION

The currency used throughout is the Solomon Islands dollar (unless otherwise specified), with an exchange rate of SBD 1.00 = Aus \$0.20 in September 2004.

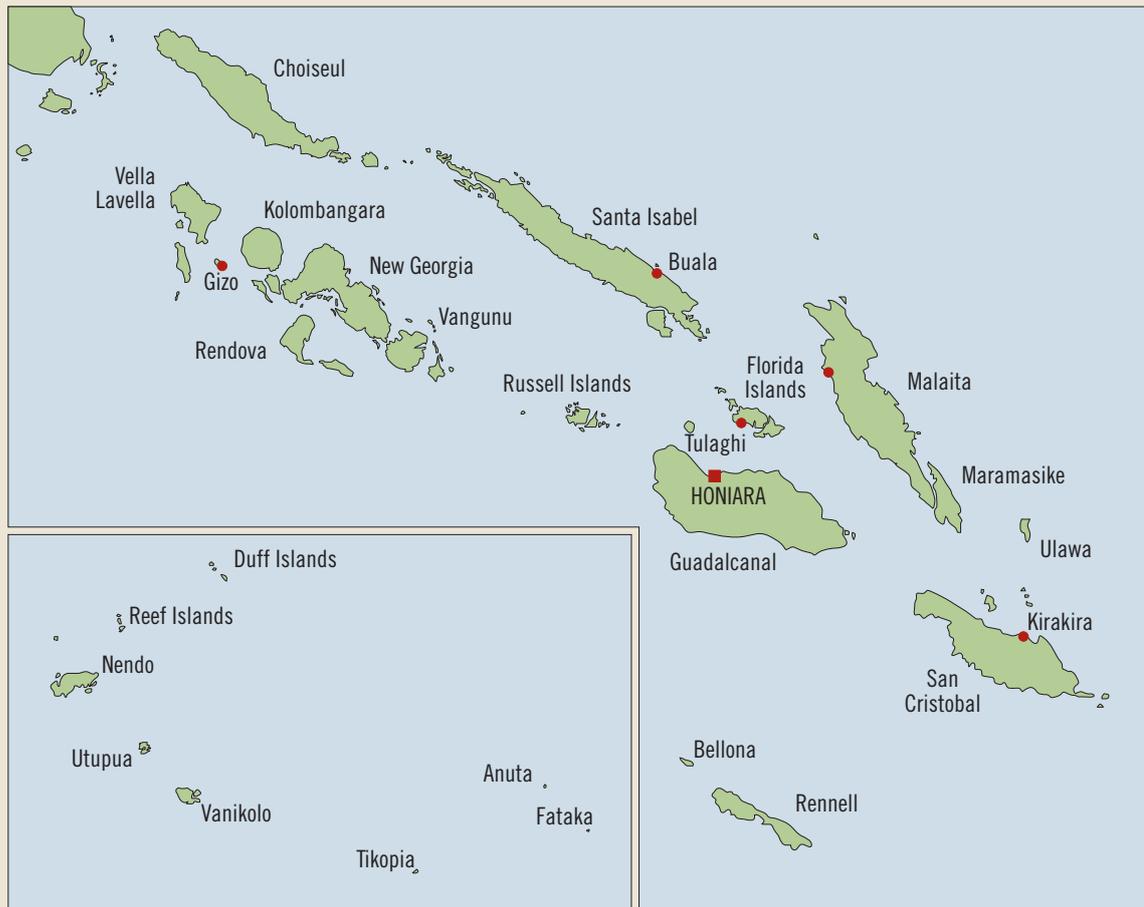


Figure 1 Map of Solomon Islands, showing the main island groups

Preface

THE SOLOMON ISLANDS SMALLHOLDER AGRICULTURE STUDY IS A SERIES OF FIVE VOLUMES WHICH DOCUMENT THE DEVELOPMENT OF RECOMMENDATIONS FOR A SET OF AGRICULTURAL INTERVENTIONS SUPPORTING BOTH SUBSISTENCE AGRICULTURE AND INCOME-GENERATING ACTIVITIES FOR RURAL COMMUNITIES IN SOLOMON ISLANDS.

The *Solomon Islands Smallholder Agriculture Study* is a series of five volumes which document the development of recommendations for a set of agricultural interventions supporting both subsistence agriculture and income-generating activities for rural communities in Solomon Islands (SI). It presents recommendations for the implementation of the study findings, as well as some of the background research that provides the rationale for their development.

The series is based on studies in SI from September to November 2004. The 13-person study team (see Appendix 1.2 for member biographies) consisted of: Matthew Allen, Mike Bourke (co-leader), Barry Evans, Ellen Iramu, Roselyn Kabu Maemouri, Andrew McGregor, Ben Mullen, Alice Aruheeta Pollard, Morgan Wairiu, Claudine Watoto and Stav Zotalis (co-leader). AusAID staff members, Geoff Fox and Nadira Mailewa, also contributed, and Sarah Goulding guided the process. Assistance was received from many people in SI. In particular, field staff of the AusAID-funded Community Peace and Restoration Fund (CPRF) facilitated the fieldwork in the provinces.

The studies were conducted in two phases:

- > Phase 1 involved a five-week study, which was undertaken from August to September 2004 in Brisbane, Canberra and Honiara by Barry Evans, with technical assistance from Mike Bourke and others. The report of this study has been included

in this series as Volume 5, *Literature Review: A Brief National Assessment of the Agriculture Sector*.

- > Phase 2 involved a comprehensive in-country study of the agricultural sector. The study was conducted over a period of five weeks in SI from September to October 2004. The team undertook visits to seven of the nine provinces in SI, and information on the remaining two provinces was based on interviews and information gathered during previous visits by some team members. This study was complemented by the work undertaken by Andrew McGregor (a marketing specialist) on marketing issues, which was completed in November 2004 (see Volume 3).

The smallholder agriculture study complements the work undertaken under the broader Australian program of assistance to SI, which focuses on interventions in the law and justice sector, machinery of government, economic governance, health and education sectors, and the community development sector, as well as small-scale interventions focused on promoting peace building.

Volume 1, *Main Findings and Recommendations*, draws on the findings of the two-phased study to present a series of recommendations for enhancing rural livelihoods in SI, including recommendations for interventions to implement the study. Appendix 1.1 provides a cost-benefit analysis by Andrew McGregor of the proposed recommendations, which includes a detailed analysis of returns to both labour

and land, as well as information on international market prices for current and potential export crops.

Volumes 2–5 contain considerable support material for the recommendations that are developed in Volume 1.

Volume 2, *Subsistence Production, Livestock and Social Analysis*, covers livestock issues (Ben Mullen), an overview of subsistence agriculture (Tony Jansen), and gender, social and cultural issues (Alice Aruheeta Pollard).

Volume 3, *Markets and Marketing Issues*, was written by Andrew McGregor and describes the detailed marketing analyses on which Volume 1 is based. In particular, Volume 3 provides justification for the recommended interventions that are detailed in Chapter 10 of Volume 1.

Volume 4, *Provincial Reports*, comprises individual reports on the constraints and opportunities for agricultural interventions in the nine provinces. They cover: Central (Matthew Allen, principal author), Choiseul (Matthew Allen and Ben Mullen), Guadalcanal (Mike Bourke), Isabel (Morgan Wairiu), Makira (Morgan Wairiu and Ben Mullen), Malaita (Mike Bourke), Rennell and Bellona (Barry Evans), Temotu (Morgan Wairiu) and Western (Barry Evans) provinces. Each provincial report was based on four to seven days of fieldwork per province, except for Choiseul and Temotu, which were based on interviews and other sources.

Volume 5, *Literature Review: A Brief National Assessment of the Agriculture Sector*, was written by Barry Evans and gives a broad overview and assessment of information on the agriculture sector in SI.

Volume 1 of this study was sent to a number of SI and Australian Government departments, several international development organisations and two academic referees for comments and review. The SI departments consulted were: Agriculture and Livestock, the Central Bank, and National Reform and Planning. The Australian Government departments were Finance, Foreign Affairs and Trade, and Treasury. Other agencies that commented on the draft document were the Asian Development Bank, European Union, New Zealand Aid and the World Bank. One academic referee was based in Australia, the other in the United Kingdom. The comments that were received have been incorporated in the final version where possible.

1 Central Province



Figure 1.1 Central Province

1 Central Province

1.1 SUMMARY

The islands of Central Province (see Figure 1.1) are located relatively close to Honiara, and this provides the population of the province with a significant comparative advantage in terms of access to fresh produce and export cash crop markets. The very large Russell Islands Plantation Estate Limited (RIPEL) copra and cocoa plantation in the Russell Islands, which employs 800–900 people, also provides an important market for both fresh produce and smallholder copra and cocoa.

The main sources of food and cash income vary between the different islands of the province. With the exception of RIPEL plantation employees, and the inhabitants of Tulagi, who are largely dependent on food purchased from stores and local markets, most people in the province obtain the bulk of their food from subsistence food gardens. Pana, sweet potato and yam are the most important carbohydrate food crops in the Florida Islands, while sweet potato, cassava and banana are the main subsistence staples in the Russell Islands.

For those people who have good access to Honiara, either by small boat in the case of Savo Island, or by regular shipping services for parts of the Florida group, the importance of fresh produce marketing is equal to or greater than that of copra production as the main source of income. For those who cannot easily access Honiara, particularly people in the Russell Islands and on southeast Small Gela and

north Big Gela, copra is the main source of income. In some areas, cocoa, small-scale timber milling, and the sale of bêche-de-mer, trochus and clam shells are also important sources of income.

In most parts of the province, land use intensity for subsistence gardening is low. However, there is high to severe pressure on the small offshore islands in the east and northwest of the Florida group, and moderate to high pressure on parts of Savo Island and on Buena Vista and Sandfly islands in the Florida group.

There is considerable scope to improve the livelihoods of people in Central Province through a range of targeted interventions, that build on the existing comparative advantages of the province. Interventions are recommended in the areas of smallholder cash cropping, fresh produce marketing and subsistence agriculture.

1.2 OVERVIEW OF FIELD VISITS

Roselyn Kabu and Matthew Allen conducted fieldwork in the province between Sunday 12 September and Saturday 18 September 2004. During most of this period, the team was accompanied by Godfrey Narasi, one of the two provincial Community Peace and Restoration Fund (CPRF) coordinators, and Eddie Hori, the Provincial Division of Agriculture Acting Chief Field Officer. In addition to holding discussions with a range of people at the administrative and commercial centres

of Tulagi and Yandina, the team visited villages and agricultural projects throughout much of the province, including Sandfly Island, southeast and west Big Gela, southeast and west Small Gela, north Savo, Loun Island, Maraloan Island and west and east Pavuvu. During village visits, the team held separate discussions with small groups of women and men, and visited gardens, copra dryers and other village enterprises. The team is grateful for the use of the CPRF boat, *Princess Jane*, with its competent and reliable captain and crewman.

1.3 INTRODUCTION

Central Province consists of the Florida group of islands in the east of the province, the Russell group in the west, and the small island of Savo, which lies between the two main island groups. The provincial capital is located on the very small island of Tulagi in the southwest of the Florida group. In 1999, the population of Tulagi was recorded as 1333 people.

The Florida Islands consist of the two main islands of Nggela Sule (Big Gela) and Nggela Pile (Small Gela), which are separated by a deep saltwater passage (Mboli Pass or Gela Passage), and the smaller islands of Sandfly and Buena Vista to the northwest. The Florida Islands are generally characterised by hilly interiors and flat coastal terraces. There are swampy areas and patches of grassland in parts of the coastal zones. The grassland areas, which are sometimes associated with a light *Casuarina* canopy, are particularly prevalent on Sandfly and Buena Vista islands, and have probably developed as a result of former over-intensive cultivation involving repeated burning. Much of the vegetation on Sandfly and Buena Vista islands consists of secondary regrowth. The total land area of the Florida Islands is about 391 km².

The Russell Islands consist of the main islands of Pavuvu in the west and Mbanika in the east, with a large number of small offshore islands to the east and northwest. The main islands are characterised by hilly inland areas (eroded volcanic cones) surrounded by large areas of uplifted limestone terraces. There are swampy areas in the northern parts of the two main islands. The township of Yandina on Mbanika Island is the administrative centre of the Russell

Islands and is also the headquarters and main industrial area of RIPEL. The plantation employs between 800 and 900 people, almost all of whom are from other provinces, particularly Malaita. The total land area of the Russell Islands is approximately 210 km².

Savo Island is a small dormant volcanic cone, fringed by a very narrow coastal terrace, which is widest on the northern part of the island. The coastal fringe is entirely planted to coconuts. Areas of shifting cultivation are mostly associated with dissected valleys that have volcanically-derived soils. Most of the vegetation on Savo consists of secondary regrowth. The total land area of Savo is around 31 km².

The Land Resources Study, conducted in 1974, identified 42 km² of 'agricultural opportunity areas' (AOAs) in Central Province, all of which is on Pavuvu Island in the Russell Islands. Much of this area, some of which is alienated and some customarily owned, is currently unoccupied and unused.

The climate of Central Province is wet equatorial, with the region experiencing approximately 3000 mm of rainfall per year. In the Russell Islands, Savo Island and the northwest part of the Florida group, rainfall is mostly derived from the northwesterlies during November to April. The climate in the southeastern part of the Florida group is influenced by both the northwesterlies and the southeasterlies, meaning that rainfall is spread equally between the seasons. Small boat travel in this area is difficult and dangerous during the southeasterly trade wind season (May to October) due to the rough seas. Villagers throughout the province mentioned that seasonality has become less reliable than in the past, and that dry periods have become longer in duration. Some people complained of current drought-like conditions, and there was some evidence of wilting garden crops, particularly sweet potato.

The 1999 population census enumerated a total of 21 577 people living in Central Province, comprising about 5% of the total population of Solomon Islands (SI). The average annual population growth rate between 1986 and 1999 was 2%, a significant decline from the 3.5% between 1976 and 1986. The

overall population density of the province averages around 35 people per km², which is more than twice the national average of about 15 people per km².

Most people in the province live in coastal areas. There is considerable variation in population densities throughout the province, with the most densely populated areas being Sandfly, Buena Vista and Mbanika islands, and southwest and west Big Gela. Savo Island is also densely populated, with an average density of 82 people per km². Large numbers of migrant settlers are found in the Russell Islands, particularly on Mbanika, and north and northeast Pavuvu, where many work for RIPEL. Most indigenous Russell Islanders live on the small, offshore islands and in the western and northwestern parts of Pavuvu. Anecdotal evidence suggests that Savo Island has quite high rates of temporary out-migration, with many people working in Honiara and some people resettling in other parts of Central Province, for example at New Savo village on eastern Pavuvu (on provincial government-owned land).

1.4 LIVELIHOOD STRATEGIES

The main sources of food and cash income vary between the different islands of the province (see Appendix 4.1 for a summary of these livelihood strategies). With the exception of RIPEL plantation employees, and inhabitants of Tulagi, who are largely dependent on food purchased from stores and local markets, most people in the province obtain the bulk of their food from subsistence food gardens. Pana, sweet potato and yam are the most important carbohydrate food crops in the Florida Islands, while sweet potato, cassava and banana are the main subsistence staples in the Russell Islands. Coconuts, fish, and fruit and nut trees are important sources of food throughout the province. In some areas where cash incomes are high, such as on Savo Island, people also eat significant amounts of rice and other imported foods.

In general, the main sources of cash income for villagers in the province are, in order of importance,

copra; the marketing of fresh food, fish, betel nut and tobacco; and the sale of bêche-de-mer, trochus and clam shells. In some areas, cocoa and small-scale timber milling are also important sources of income. The income derived from the sale of fresh produce, including fish, tends to be highest in areas where there is good access to the provincial centres of Yandina and Tulagi, or to Honiara. Fresh produce marketing is also important in areas that lack land suitable for coconuts, such as Buena Vista and Sandfly islands. It was reported that significant numbers of people from Savo Island work in Honiara, and it could therefore be assumed that remittances provide an important source of income for people on Savo.

It is important to note that about 80% of RIPEL plantation employees have been on strike since 17 June 2004, and plantation operations have effectively ground to a halt as a consequence. Plantation employees are currently surviving on savings, very limited food gardens, and the consumption and sale of fish and other marine produce. This situation has been compounded by the fact that some people who were displaced from Guadalcanal during the period of the ethnic tension (1998–2003) are still living with family members who work for RIPEL. Indigenous Russell Islanders living on the offshore islands are concerned about RIPEL employees and their family members harvesting marine resources (including fish, bêche-de-mer and trochus) from their customarily owned reefs, and have repeatedly complained to RIPEL management about this situation. The strike has also seen a dramatic reduction of sales at the fresh food markets at Yandina and Pepesala, and at the large cooperative-owned retail store and other smaller stores at Yandina. Furthermore, the industrial action has disrupted the docking and unloading of fuel shipments, meaning that there is currently no running water or electricity in Yandina.¹

¹ According to RIPEL employees, the closure of water and electricity supplies are deliberate acts of punishment on the part of the company's management.

1.5 SUBSISTENCE FOOD PRODUCTION

Pana (*Dioscorea esculenta*) and yam (*D. alata*) were traditionally the main staple food crops grown throughout the Florida and Russell islands. These two crops continue to have significant cultural and nutritional importance, and are exchanged at *kastom* ceremonies, such as weddings and funerals. However, pana and yam have been increasingly replaced by the New World (introduced) crops, sweet potato and cassava. This has occurred to the greatest extent in the Russell Islands and on Savo Island, where sweet potato and cassava are now the dominant staples, though both yam and pana continue to be cultivated as important secondary crops. In the Florida Islands, pana and sweet potato are of equal importance as primary staples, and yam and cassava are important secondary crops. Cassava is commonly planted around the edges of sweet potato and pana/yam gardens.

The main explanation given by villagers for the change in the staple crop inventory is that pana and yams are seasonal (they are generally planted in September to October and harvested between June and December), whereas sweet potato and cassava can be cultivated at any time of the year. Furthermore, sweet potato matures in 3–4 months, compared with 8–14 months for pana and yam. The adoption of the new crops has therefore evened out the supply of subsistence food over the course of the year. Another reason for the increased cultivation of sweet potato and cassava is that these crops are more tolerant of the lower soil fertility that results from declining fallow periods. This problem is worst in the Russell Islands, particularly on the small offshore islands, and on Savo.

Another important garden crop that is cultivated throughout the province is banana. In some places, such as Savo Island and the small islands in the Russell group, banana is the third most important food crop after sweet potato and cassava. Minor food crops grown in most parts of the province are taro (*Colocasia esculenta*), kongkong taro (*Xanthosoma*), swamp taro (*Cyrtosperma*) and giant taro (*Alocasia*). Villagers reported growing the yam species *Dioscorea bulbifera* and *D. pentaphylla*, but these were not seen in the gardens visited.

Among the leafy green vegetables, slippery cabbage (sliperi kabis) is notable by its absence. Villagers throughout the province stated that it does not grow well and, in some places, such as Sandfly Island and east Pavuvu, the small amount of slippery cabbage that was seen in gardens had been severely damaged by an insect pest. The main sources of leafy green vegetables are pumpkin tips, taro leaf, various bush greens including ‘sand paper’ (*Ficus* spp) and ferns, and kangkong (*Ipomoea aquatica*). Other vegetables grown include cucumber, tomatoes, corn, shallots, snake bean, green bean, capsicum and Chinese cabbage. Pineapple and watermelon are also cultivated in some areas.

A variety of indigenous fruits and nuts are eaten by people in the province. Cutnut (*Barringtonia* spp) is particularly prevalent, especially around village areas. Other nut trees include ngali nut, *Terminalia* and *Inocarpus*. The most common fruit trees are mango, pawpaw and Malay apple. Breadfruit is also eaten in some places. Sago palm is found near most village areas and is eaten in times of food scarcity. Most villages also have large groves of betel nut, and villagers cultivate the betel leaf vine.

Rice cultivation was introduced to Central Province by the Republic of China (Taiwan) (ROC) Agricultural Mission in the early 1990s. Funding support was given to agricultural extension staff, and farmers were provided with seeds, fertilisers, pesticides and tools. Two rice milling machines were installed: one at Tulagi and one on Savo. It has been reported that more than 20 farmers were cultivating rice in the late 1990s. According to provincial agricultural extension staff, this number has now declined to 10 farmers or fewer. The small quantity of rice that is still being produced is milled for household consumption. Extension staff believe that the province does not have enough flat land to support rice cultivation, and that farmers cannot meet the ongoing costs of pesticides and fertilisers. Pest and disease problems are also a major constraint.

Land use intensity varies widely across different parts of the province, and is related to both cropping practices and the availability of land. The measurement of land use intensity in some areas is complicated by the fact that villagers cultivate a parcel of land for several years, using relatively short fallow

periods and long cropping periods, before clearing a new area of gardening land from either virgin forest or very old secondary regrowth. This appears to be a common practice on Pavuvu Island in the Russell group and on Small Gela in the Florida group. In these areas, gardens are cropped for an average of two years and fallowed for two to five years, with fallow vegetation consisting of low woody regrowth, particularly of *Hibiscus* spp and *Macaranga* spp. This equates to an R-value of around 35.² However, in light of the cultivation practice mentioned above, the R-value should be adjusted downwards, to perhaps 15 or less. This is a relatively low level of land use intensity.

Land use intensity is highest on Sandfly, Buena Vista and Savo islands and the small offshore islands in the Russell group. In these areas, the average cropping period is two years and fallow lengths are two to three years. This equates to an average R-value of around 45, which is a reasonably high level of land use intensity. On Sandfly Island in the Florida group, villagers stated that the main constraint to subsistence agriculture is declining soil fertility caused by decreasing fallow periods. People are consequently being forced to garden in the unproductive grassland areas, which are only suitable for cassava, and to a lesser extent sweet potato. However, the majority of gardens are still made in areas of woody fallow vegetation. Some of the gardens visited were on quite steep slopes, up to 40° in inclination. In the dissected valleys of Savo Island, the natural soil fertility is quite high, and villagers are still getting quite good yields from their gardens in these areas. However, other villagers are making gardens on the eroded ridges, where there is clear evidence of poor yields.

The greatest land pressure occurs on the offshore islands in the Russell group. This shortage of gardening land is due to a combination of extensive coconut cultivation and population growth. For example, on Loun Island, mature coconut palms cover all parts of the island except for a narrow corridor of land through the middle of the island, which is used for gardening. Soil fertility in this area has declined to the extent that

even cassava is no longer growing well. Banana and imported rice are currently the main staple foods on the island. There is also a severe shortage of timber and sago palms, as evidenced by the large number of half-built houses and the use of coconut shells for cooking fuel. The situation on Maraloan Island is not as severe, but villagers there are nevertheless complaining of declining soil fertility caused by insufficient fallow lengths.

1.6 DOMESTICALLY MARKETED FOOD, FISH, FIREWOOD AND BETEL NUT

The marketing of fresh and cooked food, fish, and betel nut is an important source of income for people in Central Province, particularly women. There are regular markets at Tulagi, Yandina and Pepesala, and produce is also sold to schools, to the Maravagi resort (off the northwest coast of Sandfly Island) and sometimes to commercial fishing vessels currently operating in the province. Importantly, the close proximity of the province to North Guadalcanal means that some villagers also market produce to the main market, smaller 'road markets' and betel nut markets in Honiara. However, this is dependent on access to regular shipping services or other means of affordable transport, such as small boats. For example, people in the Russell Islands, where shipping services are unreliable, find it difficult to market produce to Honiara. People in many parts of the Florida group have good access to regular shipping services and frequently sell produce in Honiara. Savo Island (which is only 35 km from Honiara) has the best access to Honiara via small boat, and fresh food and betel nut are marketed on a daily basis.

The market at Tulagi operates every day of the week except Sunday. Facilities consist of a small open-air market house that has a corrugated iron roof, tables and benches. There are no running water or toilet facilities. Vendors pay a fee of \$3 to sell produce at the market. The team visited the market on the morning of Monday 13 September. There were 14 vendors, including four men. The market house

² The R-value is a measure of land use intensity, where the value is the number of years per century that land is under a crop.

was not large enough to accommodate all of the vendors, some of whom were selling their produce on the ground underneath a nearby tree. Most of the vendors were from villages on Big Gela, and had travelled to the market by dugout canoe. Travel times varied from one to three hours each way. These vendors said that they come to sell produce at the market once a week, and that they would return in the evening. A group of three women had come from Sandfly Island, having travelled by small boat. They come to the market about twice a month and generally stay until they have sold all their produce. Produce offered for sale included dry coconuts, banana, yam, eggplant, snake bean, tomato, ngali nut, cutnut, betel nut, betel leaf, mangrove clams, cassava 'pudding' and boiled eggs (the uncooked eggs had been purchased in Honiara).

Apparently, the market at Tulagi was much larger in the past. It has become smaller as a result of two changes. The first was the closures of the Solomon Taiyo Cannery and National Fisheries Ltd, both of which employed significant numbers of people in Tulagi. The second was the closure of the Tulagi National Bank of Solomon Islands (NBSI) agency, which was burnt down during the ethnic tension. The lack of banking facilities means that provincial public servants must travel to Honiara to get their pay, and tend to spend some of it at the Honiara market before returning to Tulagi. In addition to the main market on Tulagi, there is a very small open-air 'road market' opposite the Vanita Rest House, which operates on most days of the week.

The Yandina market is about the same size as the Tulagi market, and operates for a couple of hours in the morning on Wednesdays and Saturdays. Like the Tulagi market house, it has a corrugated iron roof, tables and benches, but no running water or toilet facilities. Vendors pay a fee of \$2 to sell produce at the market. The vendors come from the offshore islands to the east and southeast of Yandina, from east Pavuvu and from as far away as west Pavuvu and the offshore islands to the west. Some vendors also come from RIPEL settlement areas, such as Sunlight, and from Yandina itself. Both fresh and cooked food are sold at the market. The team was not in the area for a market day, but according to various sources, including villagers

who sell produce at the market, sales have been adversely affected by the industrial action at RIPEL. The manager of the cooperative store at Yandina stated that over the past month or so there had been almost no local produce sold at the market.

Another small market in the Russell Islands is at Pepesala on north Pavuvu. This market also caters primarily for RIPEL employees and operates on Wednesdays and Saturdays. Most vendors are indigenous Russell Islanders from west Pavuvu and the adjacent small islands. Vendors generally travel to the market on foot or by dugout canoe, with travel times ranging from one to three hours each way. The most commonly marketed products are cooked foods, including fish, 'pudding' and vegetables. Betel nut and leaf and tobacco are also sold. Unsold produce is usually bartered among the vendors.

There is a small market on Savo Island, which operates on Saturday mornings. Produce is both sold and bartered. However, the most important fresh produce markets for people on Savo are in Honiara. Savo is only one to two hours travel from Honiara by small boat, and produce is marketed on a daily basis. The passenger fare is \$50 each way. Freight is charged according to the size of bags (ranging between \$10 and \$20), and averages around \$100 in total. Many people on Savo grow crops specifically for marketing in Honiara, particularly watermelon, capsicum, tomatoes, beans and cucumber. Root crops are only marketed when there is surplus to domestic requirements. Other important marketed products are betel nut and leaf, and seasonal fruits and nuts. It is thought that people on Savo make quite a lot of money from fresh produce marketing. One woman who was interviewed markets produce to Honiara twice a week, and, after purchasing kerosene, salt and rice, frequently has money left over which she deposits in her bank account in Honiara.

1.7 VILLAGE CASH CROPPING

1.7.1 COPRA

Central Province contributes a significant proportion of national copra production. However, the vast majority of this comes from the RIPEL operation.

According to statistics from the Commodities Export Marketing Authority (CEMA), the production of copra in Central Province in 2003 was 5650 tonnes, which was about a third of overall national production. Smallholder production in 2003 was 650 tonnes. However, RIPEL claims that it was purchasing around 100 tonnes of smallholder copra per month prior to the current industrial dispute, and it is likely that this production is not being attributed to smallholders in the CEMA statistics.

Copra is the main source of income for people in the Russell Islands (with the exception of RIPEL employees). It is also an important source of income for people on Savo, and the main source of income for villagers in southeast Small Gela during the trade winds season.

The CPRF has funded 26 copra drum dryer units for Savo, 11 of which are now operational; and 26 dryer units for the Russell Islands, 10 of which are operational. In the Florida Islands, CPRF has funded two trial 'Kukum Drier Units', one of which, at Vuturua Village, was visited by the team. In addition to the CPRF-funded dryers and dryer units, there are a large number of privately owned copra dryers throughout the province. For example, at Buka village on Loun Island in the Russell Islands, there are four operational CPRF-funded dryers (with another one under construction) and 15 privately owned dryers. However, here, as elsewhere in the province, villagers stated that they still need more copra dryers and that they are still finding it difficult to obtain drums. Indeed, smallholder copra production has much scope to continue to increase to pre-ethnic tension levels, when Central Province was producing between 1000 and 1600 tonnes of smallholder copra per year. In many areas, coconut groves were neglected during the ethnic tension period and still remain overgrown.

Marketing prospects for smallholder copra, following the deregulation of the industry, are generally good, with a number of copra buyers active in the province. However, there are some significant marketing constraints. The lack of roads is one of these. In addition, copra producers in some areas stated that they have no means of communicating with

buyers, and simply have to wait for them to come to the village. This creates problems with storage. For example, at Losiolen village in west Pavuvu, bags of processed copra were being stored on the beach under a flimsy cover of pieces of corrugated iron and sago palm.

Another current constraint in the Russell Islands is that RIPEL is not purchasing copra from smallholders because the industrial action has stopped shipment of processed copra and cocoa from Yandina, meaning that the company's storage facilities are full. Before the industrial action, RIPEL was purchasing approximately 100 tonnes of smallholder copra per month at \$1.25 per kg (dry copra only). Smallholder producers have to meet the transport and freight costs of bringing the copra from their villages to Yandina.

Aside from RIPEL, it appears that most of the copra buyers operating in the province are agents of Honiara-based copra exporters, particularly Tristar. The precise number of buyers is unknown, but it is probably in the region of three to five. These buyers only purchase dry copra, for which they pay \$1.10 per kg. The manager of the CPRF-funded Kukum Drier Unit at Vuturua buys green copra at \$0.45 per kg and dry copra at \$1 per kg. Between April and July 2003, he purchased 7023 kg of green copra and 7948 kg of dry copra. The manager reported that he had problems with cash flow (ie he would run out of money to purchase copra) and was attempting to negotiate a cash advance arrangement with the exporter in Honiara. His operation is also constrained by the small capacity of his boat, which can only hold six to eight bags at a time.

1.7.2 COCOA

Smallholder cocoa production is confined to the Gela Passage area, parts of Pavuvu Island and, to a lesser extent, Savo Island. However, in all of these areas, it represents only a minor source of income for villagers. In the Gela Passage area, there are two to three privately owned fermentaries and drying units, which farmers can access for a small fee.³ Fermentary owners also purchase wet bean cocoa.

³ According to the Chief Field Officer, there are a total of 32 ha of smallholder cocoa in Central Province, shared between 15 individual farmers. There are also four fermentaries. However, a farmer must have at least 2.5 ha of cocoa before they can qualify to operate a fermentary.

Several unlicensed dry bean cocoa buyers are also operating in the area. On Pavuvu Island, there are no local processing units and most cocoa is sold as wet bean to RIPEL, who were paying \$1.10 per kg, but have ceased purchasing since the industrial action. According to RIPEL management, the company was only purchasing very small quantities of cocoa. On Savo Island it was reported that very small quantities of cocoa are sun-dried and sold in Honiara.

1.8 PLANTATION CASH CROPS

The RIPEL operation is the only commercial plantation in the province. RIPEL purchased the plantation from Levers Pacific Plantations Ltd in 1995. The current ownership of the operation is as follows: land owners (25%), CEMA (20%), Central Province (20%), RIPEL employees (20%) and private investors (15%). The plantation consists of around 4500 hectares of coconuts and a further 800 hectares of cocoa, all of which are planted under coconuts. These plantings occupy virtually all of Mbanika Island, parts of northwest Pavuvu Island, and the two small islands in the channel between Mbanika and Pavuvu. RIPEL employs 800–900 people, including 6 managerial staff and 41 managerial support staff. Women make up around 45% of the workforce.

Before the industrial dispute, the plantation was producing 400–600 tonnes of copra per month and around 200 tonnes of cocoa per year. The company has a copra oil mill at Yandina, but has not been producing copra oil for some time because of the unsatisfactory crush margin.⁴ Before the strike, RIPEL was purchasing a significant amount of smallholder copra, and much smaller quantities of smallholder cocoa (see Section 1.7).

The industrial dispute has recently been through an arbitration process. The parties were ordered to reconcile, but it appears that the union is considering further legal action. The General Manager of RIPEL is confident that the dispute will be resolved.

1.9 SMALL-SCALE FORESTRY

Commercial logging operations are currently taking place in the central regions of Big Gela and around Roderick Bay in northwest Big Gela. Commercial logging took place in west Pavuvu up until 1999–2000 on both customarily and government-owned land. Some royalty payments were made to land owners around the Losiolen area.

Chainsaw-milled timber is being sold on a small scale by villagers in parts of Big Gela and Small Gela, most notably on both sides of the Gela Passage, where people have good access to regular shipping services to Honiara. The main species involved are rosewood, *Calophyllum*, *Vitex* and *Pometia*. Sawn timber is shipped to Honiara for sale to exporters, who pay \$2300 per cubic metre for rosewood. The freight cost for rosewood is \$350 per cubic metre. At Ghairavu village in west Big Gela, there are 10 chainsaws, which are apparently shared between families. Villagers stated that average sawn timber production per household is around three cubic metres per year.

1.10 LIVESTOCK

Most village-level households keep pigs and chickens. The average number of pigs per household is around two. Most pigs are kept in pens made from local materials, though some are tethered. Feeds include coconuts, fish and food scraps. Pigs are kept primarily for customary purchases, and are sometimes sold within or between villages. Pigs are very occasionally sold in Honiara, when people are desperate for money, and attract prices of \$300–\$1000, depending on the breed and size. One farmer on Savo Island was reported to have up to 100 pigs, which he sells in Honiara, but the team was unable to verify this. Village chickens are free range.

There are thought to be four European Union (EU) Micro Project-funded piggeries in the province. One of these is still being established (on Big Gela near Tulagi) and one has been operating since last year with six or seven pigs (at Polomuru on northeast Big Gela). The team was unable to obtain information on the other two.

⁴ The international market price for copra oil must be at least US\$500 per tonne before it is viable to crush copra.

RIPEL runs the only functioning commercial livestock operation in the province. The plantation has between 1500 and 2000 head of cattle, around 200 goats and a piggery. The company operates an abattoir and butchery, and all meat is sold locally. RIPEL is currently slaughtering off all of its pigs because of the industrial dispute.

Hakama Agricultural Training Centre keeps some pigs and cattle (see Section 1.12).

1.11 SOCIAL AND CULTURAL ISSUES

Generally speaking there are strong divisions of labour along gender lines. In subsistence agriculture, men are responsible for clearing the garden sites, while women are responsible for planting, weeding and harvesting. At Pokilo village on Savo Island, women are handling and using dangerous chemical pesticides without adequate safety equipment, and some complained of feeling physically ill after spraying their crops.

Among income-generating activities, fresh produce marketing mostly falls to women, although some men also participate. Fishing is regarded as men's work, as is copra production, although women frequently assist in gathering, de-husking and splitting the coconuts. Women often handle the money earned from income-generating activities, which is kept in boxes in their houses. In most cases, husbands and wives cooperate in spending the money, although men sometimes use it to buy beer. Money is usually spent on school fees and basic necessities, such as kerosene, salt, soap and clothes. Men tend to make key decisions about projects and other developments at the village level, but this is usually in consultation with women.

There appear to be land disputes in many parts of the province. They are most prevalent in areas where there is commercial logging or pressure on land. The indigenous Russell Islanders have a longstanding grievance concerning the alienation of their lands by the colonial government. They are also concerned about the over-exploitation of their reef resources by outsiders, particularly RIPEL employees and their family members. This situation has been compounded by the ethnic tension and the current

strike, both of which have led to increased levels of marine resource exploitation.

It is important to note that there are cultural values associated with root crop production in some areas. This particularly relates to pana and yam, which are produced not only for food, but also for use in customary exchanges, such as bride price ceremonies, and also in church festivals.

1.12 SUPPORT FRAMEWORK FOR AGRICULTURE

The provincial Division of Agriculture employs eight technical staff and three farm workers. The Tulagi-based technical staff consist of the Chief Field Officer, a livestock officer and one extension officer. There are also two technical officers based at Hakama Agricultural Training Centre (the manager and one extension officer), and two extension officers on Savo Island and one in the Russell Islands. The activities of all of these staff are heavily constrained by a lack of funding. According to the Chief Field Officer, there is generally no money to purchase fuel, meaning that the extension officers are unable to move around the province. The only funds that are available for extension activities are attached to specific donor-funded projects, such as CPRF copra dryers, ROC rice cultivation and EU Micro Projects (piggeries and honeybees).

The Hakama Agricultural Training Centre was established in 1986 under the EU-funded Rural Services Project, and was given some additional support in 1998 under the Farmers Support Programme (FSP). The centre is managed by provincial Division of Agriculture staff, under the auspices of the national ministry. Most of the centre's infrastructure and equipment are in a severe state of disrepair, and most income-generating agricultural activities have ground to a halt. Cocoa, copra, poultry, and horticultural activities have collapsed. The centre still maintains 12 cattle and a piggery that consists of two sows and one boar. In theory, piglets are sold to farmers. The last sale was of a single piglet in January 2004, for \$200. The centre cannot afford to purchase imported pig feed and is currently using wild taro.

Provincial agricultural staff claim that there is no funding available through the national ministry to hold training activities. The only training courses

that do take place are funded by donors. Last year there was a two-day teak farming workshop funded by CPRF, and earlier in 2004 there was a one-week rice farming workshop funded by ROC. The Provincial Government wishes to take over the centre and make it a rural training centre (RTC).

It appears that very few agriculture-related nongovernment organisation (NGO) activities are currently taking place in Central Province. A Japanese NGO, Asia Pacific Sustainable Development, has an extension officer (who originates from Savo) based on Savo Island. He is attempting to promote 'permaculture' and organic farming, and has apparently received \$7000 worth of tools through CPRF. He plans to cultivate horticultural crops for both sale and domestic consumption.

1.13 COMMERCIAL ENTERPRISES

RIPEL is the only large-scale commercial enterprise in the province. The National Fisheries Development operation in Tulagi closed down during the tension period, and the Solomon Taiyo Cannery moved from Tulagi to Western Province in 1988–89. Much of the infrastructure used by these two operations is still intact, including large sheds and wharves. Sasape Marina Ltd, a state-owned enterprise, runs a passenger and cargo ship, and is based at Tulagi. There are privately owned shipyards at Taroaniara on Big Gela and on Ghavutu Island near Tulagi.

Other enterprises in the province include the privately owned Vanita Rest House and the provincial government-owned Provincial Rest House, both of which are in Tulagi; a small scuba diving operation at Tulagi; the Maravagi resort off the northwest coast of Sandfly Island; and the RIPEL-owned Plantation Resort in Yandina. There are several other small businesses in Tulagi and Yandina, including trade stores (and a large cooperative store in Yandina), petrol depots and kai bars. There are also a large number of very small village-based businesses, particularly trade stores and fuel depots.

The following list of current business licence holders was obtained for the Russell Islands, including Yandina:

- > 1 trochus trader
- > 4 bêche-de-mer traders
- > 12 petrol vendors
- > 1 dry copra buyer
- > 26 cake vendors
- > 43 rural trade store operators
- > 1 ice-cream vendor
- > 4 block-ice vendors
- > 1 second-hand clothes vendor
- > 2 'video-showing' operators
- > 1 kai bar
- > 1 motel operator (RIPEL).

This list is thought to be unreliable, as the licensing system has broken down since the ethnic tension and the team heard many reports of unlicensed small business activities. Business licensees are meant to pay fees as stipulated in the Central Government Province Business License (Amendment) Ordinance 1998.

1.14 TRANSPORT AND TELECOMMUNICATIONS

There is only one functioning airstrip in the province, which is at Yandina. There are two scheduled flights a week on Tuesday and Thursday. There is a disused airstrip on Anuha Island off the north coast of Big Gela that used to service a resort that closed in the late 1980s.

There are currently three shipping services operating in Central Province. Sasape Marine Ltd runs a ship that carries passengers and cargo between Tulagi and Honiara. It operates on Monday, Wednesday and Friday. Another ship, owned by a man from the Reef Islands, services parts of north and northeast Small Gela and the Gela Passage. This ship also runs on Monday, Wednesday and Friday. Wings Shipping Company services Yandina through its once-a-week trip to Western Province. This ship is often quite full when it arrives at Yandina from Western Province, and is therefore only able to carry passengers, and not cargo, on to Honiara.

With the exception of Tulagi and Mbanika Island in the Russell group, which are well serviced by roads maintained by RIPEL, the state of road

infrastructure in the province is extremely poor. There are 31 km of roads in the Florida group, divided between southwest Small Gela and northeast Big Gela. However, according to local people, these roads are very poorly maintained and there are currently no vehicles operating in either area. The coastal road around Savo Island is also poorly maintained and has been destroyed in parts by coastal erosion. There are currently no vehicles operating on the island. The current cost of fuel in the province is \$8–\$10 per litre.

Tulagi has a telephone exchange, and some offices and private residences have telephones. Yandina is serviced by a satellite telephone network, which is very expensive at \$18 per minute. UHF radios are located at clinics and Provincial Government agriculture and fisheries centres (covering Yandina, Panuli on Savo Island, Tulagi, and Salesapa and Dende on Small Gela). There are post offices at Tulagi and Yandina.

There used to be an agency of NBSI in Tulagi, but it was burnt down during the ethnic tension and has not reopened. There are no banking facilities in the Russell Islands. The team was unable to ascertain whether the ANZ agency in Taroaniara is still operating. According to provincial officials, there are currently no functioning credit unions in the province.

1.15 PREVIOUS EXPERIENCE WITH AGRICULTURAL DEVELOPMENT

There have been many donor-funded agriculture-related activities in the province, most of which have not been very successful.

As mentioned in Section 1.12, the Hakama Agricultural Training Centre was established in 1986 under the EU-funded Rural Services Programme and was given some additional support in 1998 under the FSP. The centre's infrastructure is now very run down, income-generating activities have collapsed and training courses only occur sporadically under specific donor-funded activities.

The FSP also focused on coconut and cocoa expansion and rehabilitation, including assistance for processing units. The last round of funding

finished in 1999, and none of the processing units are currently operational. The ethnic tension and the collapse of CEMA adversely impacted on the success of this project. Other FSP activities in the areas of livestock (pigs, goats, chickens) and honey have also failed as a result of marketing problems and insufficient inputs from FSP. The one reported success story is duck breeding, but the team was unable to verify this.

As mentioned in Section 1.5, the ROC-funded rice project does not seem to be working, because of the lack of suitable land, pest and disease problems, and the ongoing costs associated with pesticides and fertilisers.

The current CPRF-funded assistance to copra dryer units appears to be working well. All of the completed dryers that were visited were being used, and this, coupled with the emergence of copra traders in the province, is stimulating the smallholder copra industry and encouraging farmers to rehabilitate their copra groves.

1.16 OPPORTUNITIES FOR RURAL LIVELIHOODS DEVELOPMENT

There is considerable scope to improve the livelihoods of people in Central Province. Potential interventions could increase both cash incomes and subsistence agricultural production in the face of declining soil fertility in some areas. Gains in subsistence production and efficiency would have significant benefits, both economic and for food security, because surpluses could be marketed and labour could be redirected to cash cropping and other income-generating activities. It is strongly recommended that interventions build on the pre-existing comparative advantages of the province, particularly its close proximity to the fresh produce and export commodity markets of Honiara, its large smallholder coconut resources, and the presence of RIPEL, which provides a readily accessible market for both fresh produce and smallholder copra and cocoa. Specific recommendations are detailed below.

1.16.1 SUPPORT FOR SMALLHOLDER CASH CROPPING

Copra is either the first or second most important source of income for rural people in the province. There is considerable scope to increase production to pre-ethnic tension levels and beyond.

Producers are still finding it difficult to acquire drums for copra drying units. Given the emergence of a significant number of copra buyers in the province, and the fact that RIPEL also purchases copra from smallholders, the lack of dryers is currently the main constraint to increasing production. People are very grateful for the CPRF assistance to copra producers, but unanimously voiced the need for more assistance, particularly with acquiring drums. It is recommended that continued support be given for the provision of drums for copra dryers.

Cocoa is a minor source of income for villagers in some parts of the province. There is considerable scope to increase production in the Russell Islands, particularly on Pavuvu Island, which has been identified as an AOA. Villagers on Pavuvu currently sell small quantities of cocoa to RIPEL. It is recommended that support be given to cocoa expansion on Pavuvu Island. RIPEL and the provincial Division of Agriculture could provide conduits for implementing this activity.

1.16.2 SUPPORT FOR FRESH PRODUCE MARKETING

Fresh produce marketing is a very important source of income for people who have good access to Honiara, either by small boat in the case of Savo Island, or by ship for parts of the Florida Islands. Access to Honiara could be improved through the construction of strategically placed roads to link producers with regular shipping routes. This is particularly the case on southeast Small Gela and the north coast of Big Gela. Both of these areas could be linked to the Gela Passage.

Fresh produce marketing should be enhanced through the provision of training and information on nurseries, pest control, the safe use of pesticides and other chemicals, and postharvest handling, storage and transport. Fresh produce marketing

could also be enhanced through the provision of new or improved varieties of horticultural crops, particularly fruit trees such as rambutan and durian. It is recommended that support be given for training and the dissemination of information, and new or improved horticultural crops.

1.16.3 SUPPORT FOR SUBSISTENCE AGRICULTURE

There is currently high to severe pressure on land on the small offshore islands in the east and northwest of the Florida group, and moderate to high pressure on parts of Savo Island and on Buena Vista and Sandfly islands in the Florida group.

It is strongly recommended that high-yielding varieties of sweet potato, yam (particularly of the species *Dioscorea alata* and *D. rotundata*) and banana be introduced to these areas to maintain production in the context of declining soil fertility. The provision of information, training and resources on soil fertility maintenance techniques is also recommended, subject to the availability of adequate technical knowledge in the SI context. In some areas, such as the small islands in the Florida group, villagers would also benefit from an awareness campaign addressing the dangers inherent in becoming dependent on copra as a sole livelihood strategy.

The introduction of new crops would also benefit villagers in areas where there is low land use intensity, through the creation of subsistence surpluses for marketing, and gains in labour efficiency.

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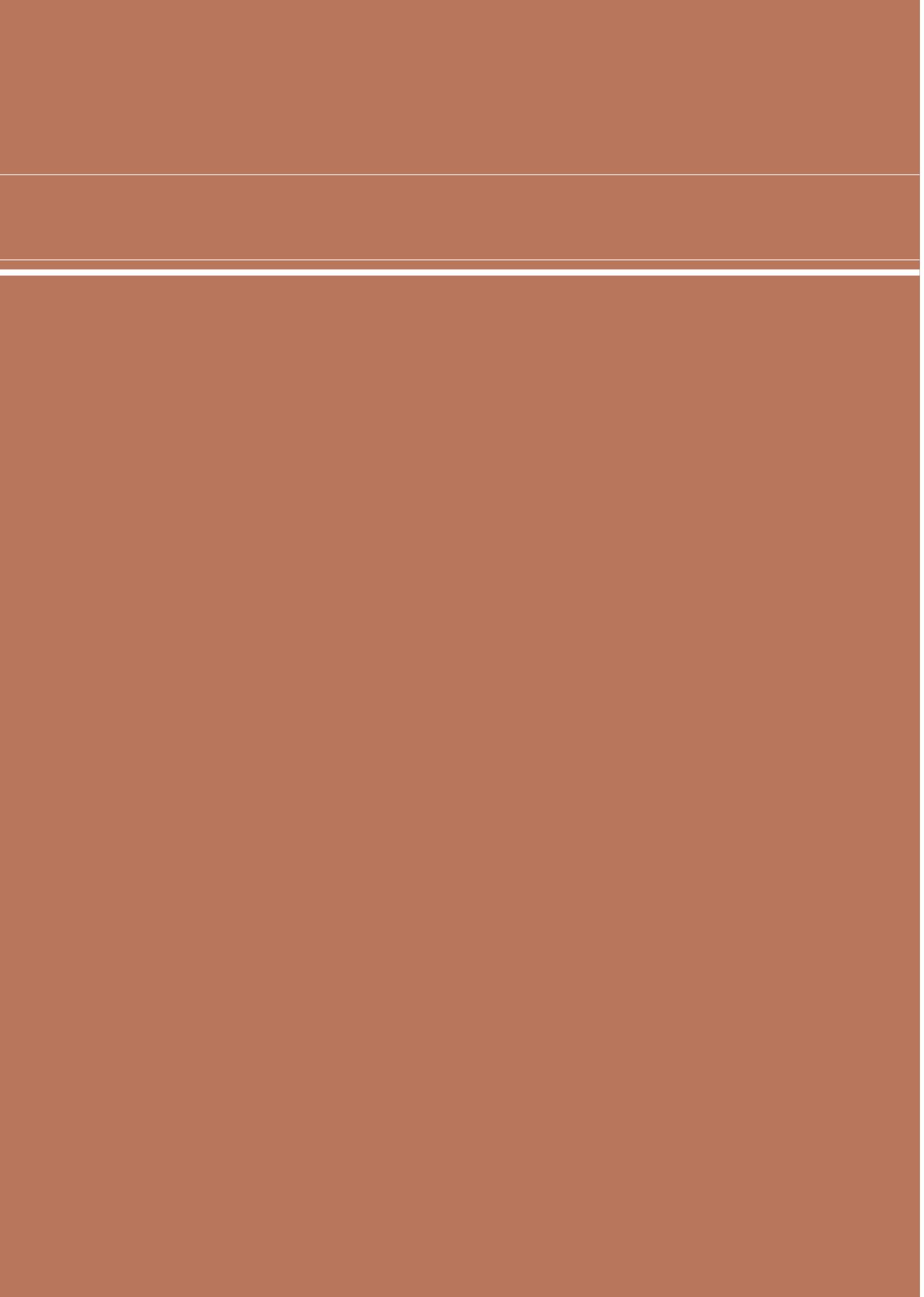
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1.18 PEOPLE CONSULTED

Agricultural extension officer	Pokilo village, northeast Savo Island
Agutu, Gabriel	Treasury Officer, Treasury Division, Tulagi
Channel, Peter	Extension Officer, Asia Pacific Sustainable Development, Sisiaka village, northwest Savo Island
Copra buyer	Pokilo village, northeast Savo Island
Farm worker	Hakama Agricultural Training Centre, Hakama, west Small Gela (Gela Passage), Florida Islands
Hori, Eddie	Acting Chief Field Officer, Division of Agriculture, Tulagi
Ishmael, Tavasi	Tavasco Small Farmers Vanilla Growers Association, Tulagi
Jansen, Tony	Adviser, Kastom Gaden Association, Honiara
Kande, Robert	Provincial Minister for Agriculture, Tulagi
Kemakeza, Mark	Premier of Central Province, Tulagi
Mae, Thomas	Senior Fisheries Officer, Division of Fisheries, Tulagi
Market vendors (men and women)	Tulagi market
Namo, Edward	Senior Provincial Administrative Officer, Yandina, Russell Islands
Narasi, Godfrey	CPRF Provincial Coordinator, Tulagi
New Year, Benjamin	Provincial Secretary, Tulagi
Nikae, Peter	Cooperative manager, Yandina, Russell Islands
Small boat operator	Pokilo village, northeast Savo Island
Su'unorua, Samuel	CPRF copra dryer manager and copra trader, Vuturua, southeast Small Gela, Florida Islands
Vasuni, Patrick	Provincial Minister for Health and Deputy Premier, Tulagi
Villagers (men and women)	Tumbila village, Sandfly Island, Florida Islands
Villagers (men and women)	Haleta village, southwest Big Gela, Florida Islands
Villagers (men and women)	Toa village, southeast Small Gela, Florida Islands
Villagers (men and women)	Ghairavu village, southeast Big Gela (Gela Passage), Florida Islands
Villagers (men and women)	Pokilo village, northeast Savo Island
Villagers (men and women)	Buka village, Loun Island, Russell Islands
Villagers (men and women)	Losiolon village, west Pavuvu, Russell Islands
Villagers (men and women)	Maraloan village, Maraloan Island, Russell Islands
Villagers (men and women)	New Savo village, east Pavuvu, Russell Islands
Villagers (men)	Kuila, Koela, Reko, and Ngerola villages, northwest and south Savo Island, interviewed at Sisiaka village
Villagers (women)	Sisiaka village, northwest Savo Island
Whiteside, John	General Manager, Russell Islands Plantation Estate Ltd, Yandina, Russell Islands
Yates, Neil	Manager, Tulagi Dive Shop, Tulagi



2 Choiseul Province

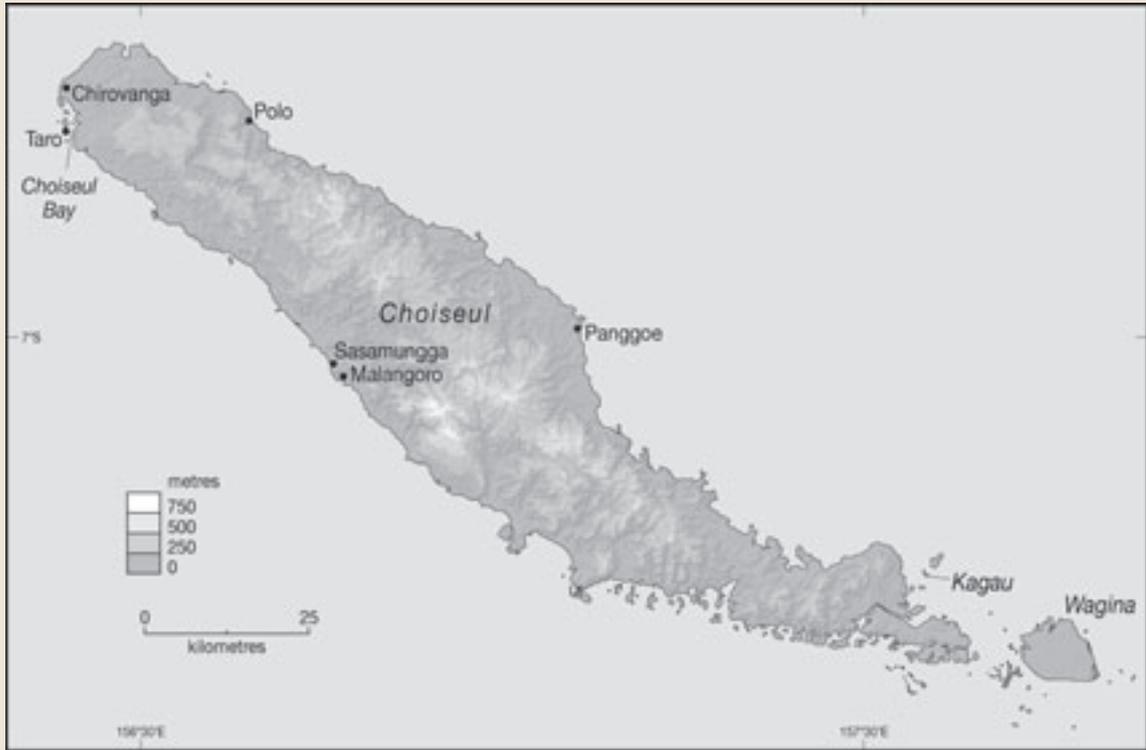


Figure 2.1 Choiseul Province

2 Choiseul Province

2.1 SUMMARY

Choiseul Province (see Figure 2.1) is situated in the northwest of Solomon Islands (SI), and lies close to the Papua New Guinea (PNG) island of Bougainville. The province is relatively undeveloped and has a low population density. However, the relatively high population growth rate in the province means that the population is expected to double every 23.5 years. With few exceptions, the people live on the coastal fringe and are engaged in subsistence farming. The staple crop is sweet potato, with banana, taro, yam, and vegetables also being important. Rice is the staple food where incomes are sufficiently high. Copra is the most common source of cash income, although royalties from commercial logging and income from small-scale sawmilling provide reasonably large amounts of money to some sections of the community. A Micronesian community is established on Wagina Island in the southeast of the province and relies on marine resources for subsistence and, in recent times, production of seaweed for cash income.

Limited shipping services and a negligible road system are significant impediments to agricultural development, along with continuing land disputes and difficulty in accessing technical and marketing information. Short-term opportunities to achieve widespread improvement of rural livelihoods through support of the copra industry exist, through provision of copra dryers, assistance to buyers and improved shipping. Small-scale sawmilling is

currently an important income-generating activity and may have potential to provide long-term sustainable benefits. This requires investigation. The cocoa industry has significant potential for income generation but requires a medium-term development program to rehabilitate existing, and establish new, plantations. Other commodities worthy of long-term development may include ngali nut and seaweed production. Royalties from commercial logging are currently distorting the opportunity cost of labour in some wards, and programs to encourage long-term resource management planning are required.

Choiseul Province has a large number of nongovernment organisations (NGOs) with an agriculture focus. Provided these organisations can work collaboratively, they offer an important mechanism for the delivery of assistance programs. Extension staff from the Department of Agriculture and Livestock (DAL) and the Kastom Gaden Association (KGA) could be engaged to provide technical assistance in development programs.

2.2 OVERVIEW OF FIELD VISITS

A team consisting of Matthew Allen (agricultural consultant, Canberra), Ben Mullen (livestock consultant, Brisbane) and Ellen Iramu (DAL agricultural scientist, Honiara), gathered data on Choiseul Province through a combination of face-to-face interviews with Honiara-based representatives of Choiseulese communities and organisations; telephone interviews with

organisations based in Choiseul; and written sources. The team allocated one week for a field trip to Choiseul, but was prevented from undertaking the visit because of a succession of flight cancellations. The team has attempted to piece together a coherent and accurate overview of livelihoods, constraints and opportunities within the province, and regrets not being able to meet directly with the premier and other members of the Provincial Assembly, and the villagers of Choiseul.

2.3 INTRODUCTION

The province of Choiseul comprises the island of Choiseul and a large number of smaller islands, the most densely populated of which are the provincial capital, Taro, located at the western end of the main island, and Wagina, at its eastern end. The total land area of the province is 3300 km², of which Choiseul Island contributes 3208 km². Wagina Island contributes about 86 km². The island of Taro has a land area of less than 1 km².

The average annual rainfall generally ranges from 3000 to 4000 mm. Mean annual rainfall in the Taro area is 3300 mm (based on the 25-year period 1975–2000). The data indicate that the wettest months tend to be August to November, but all months are wet, averaging between 190 and 330 mm. Generally speaking, the western and eastern ends of the province, including Taro, Choiseul Bay, Polo, Bosarae and Wagina Island, have no dry months, receiving both northwesterly and southeasterly monsoons. In contrast, areas to the west of central Choiseul, including the Sasamunga and Senga regions, receive rainfall predominantly from the northwesterly monsoon that blows from November

to April. Significantly higher rainfall is received in the mountainous regions around Mt Maetamba to the east of central Choiseul, where more than 5000 mm of annual rainfall is reported.

Soils are highly variable, as with the other large islands of SI, and range from moderately fertile to mildly toxic (as a result of high concentrations of heavy metals). Significant swampy areas occur around Choiseul's extensive coastline and can be either tidal, typically in in-filling lagoons dominated by mangrove vegetation; or freshwater, generally in the lower reaches of certain rivers. Mangroves dominate the vegetation in the lagoon systems of the southeast and around Choiseul Bay in the west. Until recently the island's substantial forest reserves were largely untouched, but extensive logging operations are now rapidly extracting timber.

The natural environment offers a range of unique or spectacular opportunities for ecotourism that have attracted the attention of various environmental groups. Apart from its visually beautiful coastline of bays, headlands, small islands and littoral forests, Choiseul boasts rare examples of forests growing on karst limestone, turtle hatcheries, saltwater crocodile habitats and unique forests adapted to concentrations of heavy metals that would normally be toxic.

The Land Resources Study conducted in 1974 reported that Choiseul Province possessed relatively limited agricultural opportunity areas (AOAs), primarily because of the steep topography (Wall and Hansell 1974). The study identified 153 km² of land as having potential for significant agricultural development, which is only 4.6% of the province's total land area (see Table 2.1). The AOAs are on the northwest tip of Choiseul Island, around Panggoe on the north coast, and on Wagina Island. Significant

Table 2.1 Agricultural opportunity areas, Choiseul, 1974

AGRICULTURE REGIONS	AREA (KM ²)	LAND SUITABILITY
Poroporo	24	Tree crops, pastures, cultivation where soil depth allows
Pemba	40	Tree crops, pastures, limited cultivation
Pacho	29	Coconuts, cultivation, pastures
Gharghara	28	Tree crops, pastures
Wagina	32	Coconuts, cocoa, tree crops, pastures, limited cultivation

Source: Wall and Hansell (1974)

Table 2.2 Land area and population density by island, Choiseul, 1970 and 1999

ISLAND	LAND AREA (KM ²)	POPULATION DENSITY, 1970 (PEOPLE/KM ²)	POPULATION DENSITY, 1999 (PEOPLE/KM ²)
Choiseul	3207	2.3	5.6
Wagina	86	8.0	16.9
Taro	1	^a	440.0
Total	3294	2.4	6.1

Notes: Data were generated from Wall and Hansell (1974) and 1970 and 1999 census data
^a Figure for Taro Island was not available in 1970

areas of land suitable for small-scale cropping exist, but were not included in the study because they do not occur as contiguous large parcels. Such areas are highly suitable for subsistence or small-scale cash crop production.

The people of Choiseul Province are primarily Melanesian (93% of the population), and there is relatively limited inward migration from other islands. By contrast, the island of Wagina in southeast Choiseul is populated by Micronesians, relocated from the Phoenix Islands of Kiribati in 1963. A limited amount of integration with Melanesians has occurred, primarily by way of marriage of mainland women into the Wagina community. A significant number of Choiseulese, including Micronesians, work in Honiara and pass on money to their communities.

Choiseul Province has a population of 20 008 people, representing 4.9% of the country's population (1999 census). Population growth from 1986 to 1999 was 3.0% per year, higher than the national average of 2.8%, and indicating a doubling of population every 23.5 years. Approximately 44% of the population is under the age of 15.

The average population density for the province is 6.1 people per km² (1999 census), much lower than the national average of 14.8 people per km² (see Table 2.2). There is considerable variation in population densities throughout the province, with Taro Island having extremely high population density, Wagina Island having moderate density, and the southeastern-most ward of Choiseul Island (Kirugela ward) having very low density, at approximately 1.9 people per km².

2.4 LIVELIHOOD STRATEGIES

There are three major livelihood strategies employed by the people of Choiseul Province. These are the root crop and copra production-based strategy of the bulk of the mainland people; the cash income and food purchasing strategy of paid workers in the provincial capital and other major centres; and the marine resource-based strategy of the Micronesian community that lives on Wagina Island. Importantly, the root crop and copra-based strategy has been disrupted in some areas by the dramatic increase in commercial logging in the province over the last two to three years. This has seen an increasing dependence on incomes from royalty payments, much of which is used to purchase imported food. The heavy dependence on income from logging concessions is of concern, as this revenue stream will be short-lived and is nonrenewable in the short to medium term.

The staple root crop for the mainland people is sweet potato. Secondary staples are banana and cassava, and other important crops include taro, yam and pana. Fish is the primary protein source, and more than 80% of Choiseul households are engaged in fishing. Rice is now considered to be a primary staple in some areas. This has occurred primarily as a result of income from logging concessions, small-scale sawmilling and, to a lesser extent, copra.

The wage-earning communities are located primarily in the provincial capital, Taro, and in the subcentres of Malangoro in the Sasamunga region, Panggoe in the north central region, and Paqobiru in the northwest region. Wage earners buy fish, root crops and vegetables from local markets, and rice and luxury items from numerous trade stores. Taro wage earners have few options to produce subsistence

crops, because there is very limited land available on Taro Island and they have recently been barred from establishing gardens on the adjacent mainland.

The Micronesians of Wagina Island are seafaring people who base their livelihoods on marine resources. Fishing is the most common and enduring activity, and fish is the staple food, together with coconut and purchased rice. At present, approximately 60% of the population is involved in seaweed production. Other marine resources exploited by the Micronesians are *bêche-de-mer*, trochus and turtles. Root crop and vegetable gardens are tended by a small percentage of the people, and surpluses are sold locally.

2.5 SUBSISTENCE FOOD PRODUCTION

With the exception of Wagina Island, subsistence food gardens provide the bulk of carbohydrate food and green vegetables for the majority of people in the province. However, there are very high levels of imported rice consumption in some areas. This is particularly so in places where people are currently receiving royalty payments associated with commercial logging activities. Small quantities of rice are produced and consumed locally, but only in areas that have good access to one of the three Republic of China (ROC) Taiwan-funded rice milling machines in the province. These are currently located at Choiseul Bay, Sasamungga and Kumanibae (which is south of Panggoe on the north coast of the mainland).

Taro (*Colocasia esculenta*) was previously the most important crop grown on Choiseul Island, and it continues to have significant cultural value. However, sweet potato is now the dominant staple crop grown throughout the province. Other important crops include banana, cassava, taro, yam (*Dioscorea alata*) and pana (*D. esculenta*). There are some minor regional differences in the crop inventories of Choiseul Island. The most notable of these is that cassava is not grown on the northwest coast, whereas in most other areas it is the second or third most important crop. Swamp taro (*Cyrtosperma*) and sago are important foods on the southeast coast, which is characterised by areas of swamps and mangroves. Sago is processed and stored until needed.

The primary sources of protein for people in the province are fish and other marine organisms such as crabs, shellfish and turtles. These are eaten on a daily basis, as are coconuts. Slippery cabbage and a large variety of bush ferns are the main leafy green vegetables consumed in most areas. An insect pest of slippery cabbage was reported on the northwest coast of the mainland. Other vegetables grown include cucumber, tomatoes, corn, shallots, snake bean, green bean, capsicum and Chinese cabbage.

As mentioned previously, the people of Wagina Island have a strong marine orientation, and most people do not cultivate food gardens. Fish, coconuts and imported rice are the staple foods on the island. Those who do practise agriculture cultivate sweet potato, taro, cassava and yam, some of which is sold to the majority of people who do not have food gardens.

Rice cultivation appears to be most common in the areas surrounding Panggoe on the northern part of Choiseul Island. Here, rice cultivation has been financially supported by ROC and is being actively promoted and facilitated by two local NGOs — the Senga Farmers Association and the Northeast Constituency Farmers Development Centre. These NGOs are currently competing with each other for access to funding and infrastructure (see Section 2.12).

Significant groves of ngali nut trees (*Canarium* spp) occur throughout Choiseul and have a high level of cultural significance. The Choiseulese ngali nuts have particularly thin shells and a high percentage of kernel (26% by weight), making them ideal for processing for both culinary and commercial purposes (see Section 2.9). Cutnuts (*Barringtonia* spp) are found in villages throughout the province.

Land use intensity is difficult to gauge in the absence of field observations. However, on the basis of interviews conducted with people who have a good knowledge of agriculture in the province, it would appear that land use intensity is generally low. Cropping periods range from one to two years and fallow lengths range from five to ten years. Moreover, villagers frequently clear new garden sites from areas of virgin forest or very old secondary regrowth.

Based on this information, R-values⁵ are estimated at around 10–15, which represents a very low level of land use intensity.

In contrast, there are pockets of higher land use intensity in areas surrounding the large village settlements of Choiseul Bay, Panggoe and Sasamungga. At Panggoe, it is reported that fallow lengths are as low as two years, and that some people practise continuous cultivation (though it is unclear if this relates only to the rice cultivation system of the area, which involves the continuous rotation of rice with peanuts or sweet potato). In the case of Sasamungga, there has been some movement of people to a resettlement area established on legally registered customary land in the Kolombangara river basin region to the northwest. The number of people involved is unknown, but the primary motivating factor is said to be the increasing shortage of gardening land in the Sasamungga area.

2.6 DOMESTICALLY MARKETED FOOD, FISH, FIREWOOD AND BETEL NUT

The distance of Choiseul Province from Honiara, coupled with the unreliability of shipping services, means that fresh produce is mostly marketed within the province. The main markets are at Taro, Sasamungga and Panggoe. The market at Sirovanga, on the northwest coast of Choiseul Island, is also said to be quite large, and apparently attracts buyers from amongst the public servants living at Taro. There are several smaller markets operating throughout the province, including on Wagina Island.

The market at Taro operates from Monday to Saturday and caters for the predominantly wage-dependent population of the island. The number of market vendors ranges from 10 to 20. The open-air market house was built in 2002, and consists of a corrugated iron roof over two long wooden benches. Market vendors come from villages throughout the northwestern tip of Choiseul Island, with the catchment area stretching as far as Numa on the southern side. Vendors travel to and from the market in dugout canoes and small outboard motor-powered

boats. Commonly marketed products are root crops (particularly sweet potato), a wide range of vegetables (including slippery cabbage, capsicum, tomatoes, green bean, Chinese cabbage and shallots), peanuts, and betel nut and leaf. Fresh and cooked fish are also sold at the market.

The market at Sasamungga consists of four small open-air market houses, all of which have corrugated iron roofs and wooden benches. Each market house can accommodate four or five vendors. Some vendors sell produce on the beach adjacent to the market area. The market operates three days a week, though a limited amount of produce is also sold on nonmarket days (with the exception of Sundays).

The Panggoe market operates on Mondays, Wednesdays and Fridays. There are generally between 30 and 50 vendors, most of whom are women. Market facilities consist of a corrugated iron roof and a long bench upon which produce is displayed. Products sold include fresh and cooked fish, root crops, local and exotic vegetables, ngali nut (between October and December), pineapple, peanuts, cassava pudding, cakes made from imported flour, and betel nut and leaf. (Betel nut is also sold around the village on a daily basis.) Most vendors travel to and from the market on foot or by dugout canoe.

A butchery has recently opened in Taro with European Union (EU) Micro Project support, to supply meat to the local wage-earning community. The project is struggling at present because it is very difficult to source pigs and chickens on Choiseul. The manager has attempted to address this situation by importing frozen meats from Honiara. This has not been completely successful, because it is difficult to obtain meats from Honiara due to the limited supply and high demand within the national capital. There is potential to sell three pigs per month through the butchery, with additional sales at Christmas and other times of celebration. Linkages need to be made with KGA and EU piggery and chicken projects to develop a regular supply of local product through the butchery. The establishment of EU-supported small-scale broiler projects has the

⁵ The R-value is a measure of land use intensity, where the value is the number of years per century that land is under a crop.

potential to ensure an irregular, but relatively large, supply of meat chickens in Choiseul, providing these can be frozen for staggered sale.

2.7 VILLAGE CASH CROPPING

2.7.1 COPRA

Smallholder copra production is the main source of income for most people in the province. Between 1998 and 2000, Choiseul Province was consistently producing around 2500 tonnes of copra per year, all of which was supplied by the smallholder sector. There was negligible production in 2001 and 2002 due to the collapse of the Commodities Export Marketing Authority (CEMA) and disruptions associated with the ethnic tension. By 2003, production had increased to about 890 tonnes. An analysis of the national population census and CEMA copra production figures indicates that some households earned up to \$1500 from the sale of copra in 1999. The province-wide average was around \$570 per household. Smallholder copra production is mostly confined to the northwest tip of Choiseul Island, where the coastal fringe has been extensively planted to coconuts. People on Wagina Island state that they do not have enough coconuts to produce copra and are, in any case, fully engaged in marine-related income-earning activities.

The post-deregulation prospects for marketing of Choiseul's copra are generally good. Several copra buying points have been recently established along the north coast of Choiseul Island and at Choiseul Bay, and there are also a number of village-based buyers operating on the north coast. The current price for dry copra ranges from \$1 to \$1.10 per kg. On the north coast, there are buying points and storage facilities at Zorokana (which is operated by the Zorokana Community Association), Lukuwaru (which is a family-owned venture) and Lulemekelo (which is also family-owned). These facilities have been established through various combinations of private, CEMA and Rural Constituency Development Fund (RCDF) funding. The buying points at Zorokana and Lukuwaru are currently purchasing copra and have storage capacities of 1500 and 1000 bags respectively. The operators

of the Lulemekelo buying point have completed construction of a storage shed, but need seed money to commence purchasing.

Two organisations are currently purchasing copra in the Taro/Choiseul Bay area: the Northwest Choiseul Producers Cooperative Federation and the Luru Investment Company (LIC). The latter organisation, which is owned by a number of Choiseul-based community associations, has leased part of the CEMA buying centre facilities at Choiseul Bay, including the copra-oil mill, which is partly owned by the commercial arm of the Provincial Government (the Choiseul Investment Authority). The mill has recently produced 20 drums of coconut oil, which is to be sold to Solomon Soap. The processing capacity of the oil mill is 2000 tonnes of copra per year, which equates to 1000 tonnes of coconut oil. The LIC also leases a storage shed with a capacity of around 1000–1500 bags. The Northwest Choiseul Producers Cooperative Federation leases a copra storage shed with a 2000-bag capacity.

Potential copra producers on Choiseul Island are still finding it difficult to acquire drums for copra dryers. For many, the cost of rejected 44-gallon drums is prohibitive because of the high freight cost. Drums can be purchased in Honiara for \$8 each, and the cost of freighting them back to Choiseul is \$14 per drum. Given that people on Choiseul use the 'half-cut' method of drying, which does not require the use of a steel mesh bed, the availability of drums is thought to be the main constraint to the construction of drying units.

Despite significant recent progress, Choiseul's copra industry remains constrained by a shortage of copra dryers, the inadequacy of the island's road system and shipping services, and a lack of seed money for buyers to amass copra in the regions on behalf of traders. The interrelated issues of production, trading and shipping must be addressed simultaneously in order to increase the production, sale and export of smallholder copra from the province.

2.7.2 COCOA

Cocoa was planted in the province in the early 1980s, mainly on the northwestern tip of the mainland and in the Kolombangara river basin area. However, the

lack of buyers has been a continual constraint and, except for a brief period in the 1980s, cocoa has never been a significant source of cash income in the province. The geographically dispersed nature of cocoa plantings and the lack of roads have been the main disincentives for cocoa buyers, who have tended to focus their activities on the more easily accessible cocoa resources of Guadalcanal and Malaita. Despite this, it appears that some buyers are gradually starting to purchase cocoa in the province. There are said to be two or three buyers operating on the northwest tip of Choiseul Island and another two buyers on the southern side of the island.

Cocoa grows very well on some parts of Choiseul Island, despite its relatively high rainfall, and could potentially become an important smallholder cash crop. Marketing is currently the main constraint, and one possibility for overcoming this would be for the province to access the significant cocoa marketing network that is found on the adjacent island of Bougainville in PNG.

2.8 PLANTATION CASH CROPS

There is one very small foreign-owned coconut plantation on the northwest tip of Choiseul Island. However, according to CEMA statistics, there has been no plantation copra production in the province since 1997, and the quantities that were being produced before then were negligible.

2.9 SMALL-SCALE FORESTRY

A large number of small-scale sawmilling operations are now in operation throughout the province, in addition to the 14 large companies extracting timber. Choiseul was expected to take over from Western Province in 2005 as the nation's largest supplier of round logs. The small-scale operators primarily cut rosewood (*Pterocarpus indica*), but also vasa (*Vitex cofassus*), *Pometia pinnata* and *Calophyllum inophyllum*. Timber is sold off the beach as 'cubic' (cubic metre of rough-sawn timber) to merchants based in the provincial capital, various subcentres, and Honiara. Both royalties from commercial logging and sales of cubic are currently injecting large amounts of cash into

the Choiseul economy, although income from the former will be short-lived, because timber is not being harvested on a sustainable basis. Moreover, it is argued by some that these royalty payments are acting as a disincentive for people to engage in small-scale cash-earning activities.

Most of the farmer support groups in Choiseul (see Section 2.12) are engaged (or plan to become engaged) in activities that offer local communities alternatives to timber royalties. Despite the widespread granting of concessions, there are still significant forest areas that have not yet been signed to commercial logging companies. Farmer groups are providing information regarding the short-term benefits, but long-term negative impacts, of unsustainable commercial logging. They are proposing strategies to ensure long-term, community-wide benefits from sustainable small-scale sawmilling. A study of the impact and sustainability of small-scale sawmilling is urgently required.

A resource study conducted in the 1990s found that the varieties of ngali nut trees on Choiseul Island have the highest nut-to-shell ratio in the country. Moreover, ngali nut trees are prolific on Choiseul, as a result of their high cultural importance. There is considerable interest among people in northeast Choiseul in the production of ngali nut oil. An oil processing unit was installed at Kapoka (near Panggoe) in 2002, but has never been used and currently requires some new components. The processing unit was funded by local people, with technical support from the World Wildlife Fund (WWF). An Australian-based buyer (Peter Hull), who would be prepared to purchase up to 1000 litres of oil per year, has been identified. The reasons this project has stalled are unclear.

2.10 LIVESTOCK

Choiseul Province has relatively few livestock resources. According to the 1999 census, only 28% of households own pigs, a much lower figure than the national average of about 50% of households. Interestingly, de Frederick (1971) reported Choiseul as having the lowest numbers of pigs in the country in his 1970 study. Pig numbers are highly

susceptible to the timing of census data collection, and it is possible for customary ceremonies to cause substantial, but temporary, reductions in numbers. On Choiseul, as elsewhere throughout SI, pigs have high cultural significance for bride price, dispute settlement, and cultural and religious ceremonies, and they attract high prices when sold. Choiseul has significant populations of native pigs, including the agouti (striped) pigs that were once common throughout the archipelago, but are now only found in more remote locations. There are also large numbers of wild pigs that are regularly hunted with the assistance of dogs.

Pig production systems include the free-range system, the slatted floor system, and the large earth-yard system. The slatted floor system is generally based on a bamboo floor with a fence of close-placed bamboo or posts of local timber. In contrast to the situation on Malaita, where slatted floor systems are mostly used by the 'salt water people' (see Chapter 6), on Choiseul, they are most common in interior bush areas. The KGA is supporting improved production of local pigs, based on the knowledge of successful local pig producers. Such producers achieve much higher weaning percentages than average through improved sow management, improved quality and quantity of local feeds, and better hygiene for disease control. There is a large, informal market for weaners and porkers throughout the year, and particularly for Christmas and Easter feasts.

Approximately 42% of households in Choiseul Province own chickens, close to the national average. The EU has supported several broiler projects. These are based on batches of 100–150 hybrid chicks, housed in conventional iron-roof sheds and using imported feeds. A combination of high costs, unreliable shipping, a lack of processing facilities and unreliable markets make the long-term viability of such projects, which depend on the supply of hybrid chicks and feeds from Honiara, doubtful. The KGA has taken a different approach, using locally available materials for shed construction, locally available feeds, local chickens and improved management, to produce both eggs and meat. This work is being conducted in the Sasamungga area. With training, EU Micro Project owners could adapt their sheds to a similar production system.

2.11 SOCIAL AND CULTURAL ISSUES

The indigenous people of Choiseul have close cultural and social ties with the neighbouring island of Bougainville in PNG. They are also very proud of their social, cultural and religious heritage, as evidenced by the widespread support for the cultural and spiritual programs of the Lauru Land Conference of Tribal Community (LLCTC) and the large number of well-organised and active NGOs on the island (see Section 2.12). It is also said that Choiseul people have a great amount of respect for their traditional leaders. In Honiara, there is an informal association of Choiseul elders called *Turituri Kaji*, which brings together senior public servants and Members of Parliament to discuss and advise on matters pertaining to the welfare and development of Choiseul. This association has been described as the Choiseul 'think tank'.

The status of women in Choiseul appears to be different from that in other provinces in the sense that women are very active in politics and in decision making at all levels. Women from Choiseul are widely regarded as articulate and outspoken, and this may be related to their relatively greater access to educational opportunities.

As in other parts of SI, there are strong divisions of labour along gender lines, although this differs between Choiseul and Wagina islands. On Choiseul Island, women are primarily responsible for gardening and fresh produce marketing, and men are responsible for copra production and small-scale timber milling. Women dominate inshore fishing and reef harvesting activities, but offshore fishing is an exclusively male activity. The situation on Wagina Island is somewhat different. There, men are reported as being responsible for all aspects of both terrestrial and marine resource exploitation, while the female domain is primarily domestic and includes activities such as the weaving of pandanus mats.

An important social issue in the province is the relationship between indigenous Choiseul people and the Micronesian settler community on Wagina Island, with both groups conceding that the relationship is problematic. The people of Choiseul have long resented the alienation of Wagina Island, and believe that the Wagina people have a way of

life that is destructive to the marine environment. Members of *Turituri Kaji* have described an undercurrent of social conflict between the two groups, with some believing that the Wagina issue is a ‘time bomb’ for Choiseul Province. The elders concede that resettlement elsewhere in SI is not practical, and their preferred option is for integration of the two communities through intermarriage. However, most intermarriages to date have seen Choiseul people move to Wagina, rather than Wagina people moving to Choiseul.

2.12 SUPPORT FRAMEWORK FOR AGRICULTURE

In addition to the provincial Department of Agriculture, there are a significant number of local NGOs that are involved in the promotion and facilitation of agricultural and other income-generating activities in Choiseul Province. Collectively, these NGOs have much greater coverage and influence than the Department of Agriculture. KGA has been active in the Sasamungga area since 1997.

The Department of Agriculture has its headquarters at Taro, where two extension staff are based. There are also two extension officers at a demonstration farm at Choiseul Bay, and one at each of the provincial substations of Panggoe and Sasamungga. The national DAL entomologist is currently based near Sasamungga, where he has a demonstration farm and runs a small NGO called the Family Epicentred Sustainable Ecological Farming System Outreach Program.

The most influential of the Choiseul NGOs is the LLCTC. It was formed in 1981 and has its headquarters on Sipizae Island in Choiseul Bay, with a service office in Honiara. The LLCTC has a broad mandate, ranging from customary law and genealogy to environmental conservation and support for copra trading. It also has a very active women’s program. The administrative structure of the LLCTC covers the entire area of Choiseul Island, through a system of 12 ‘working areas’, each of which has its own ‘working committee’. Although Wagina Island is not included in this structure, part of LLCTC’s mandate is to facilitate ongoing dialogue with the people of Wagina. Accordingly, Wagina people are invited to

participate in the annual LLCTC conferences, and the next conference will be held on Wagina Island. Importantly, the LLCTC is said to be more influential than the Provincial Assembly.

The LLCTC operates the Lauru Rural Training Centre (RTC) at Kolombangara, although the teachers are paid by the national government. The centre caters for year-six ‘push-outs’ and has 30–40 students per year. The one-year syllabus focuses on vocational training, covering areas such as carpentry, agriculture and leadership. The LLCTC women’s program is planning to establish a second RTC exclusively for young women. The proposed syllabus would be tailored to the specific circumstances of Choiseul Island. Another LLCTC program focuses on support for the smallholder copra industry through partnership and dialogue with the Provincial Government and the LIC.

The Lauru Indigenous Natural Resource Owners Trust Board (the ‘Trust Board’) is another NGO with a Choiseul-wide focus. This NGO has only been recently established, and is in the process of drawing up a development plan. An Australian Business Volunteers adviser has been recruited to assist in this process and was expected to commence work in mid-October 2004. Development activities will focus on the forestry, agriculture, fisheries and tourism sectors. First priority will be given to the agricultural activities that are currently being facilitated by the Family Epicentred Sustainable Ecological Farming System Outreach Program (see above). The Trust Board recently organised a one-week vanilla-farming workshop at Choiseul Bay, which was supported by the Pacific Forum Secretariat and the Community Peace and Restoration Fund (CPRF). A vanilla specialist was brought in from Vanuatu, and about 100 people, representing every ward in the province, attended the workshop.

There are two agriculture-focused NGOs operating in the Panggoe area. These are the Northeast Constituency Farmers Development Centre, which is based at Kumanibae; and the Senga Farmers Association, which is based at Panggoe, but also has demonstration farms in the adjacent wards of Susuka and Kerepangara. Both of these NGOs are primarily focused on rice production and it appears that they have been competing for access to an ROC-funded

rice mill and sources of funding (particularly through the RCDF). The rice mill has recently been moved from Panggoe to Kumanibae.

There are several NGOs operating in the Sasamungga area, including the Babatana Farmers Association and the Lauru Federation of Farmers Association. Both of these NGOs have been established very recently and the team was unable to acquire any information about their activities.

KGA has been running agriculture and livestock programs at Sasamungga since 1997 and currently has a field officer based in the area. The livestock program has focused on small-scale pig and poultry production, aimed particularly at youth. This program finished in June 2004, but may be continued with support from Oxfam. (See Volume 2, Chapter 2 for more information concerning KGA's livestock activities.) The agriculture program has been run in close collaboration with the Sasamungga hospital and has focused on improving child nutrition through the promotion of sup-sup gardens. These gardens are specifically for leafy green vegetables and are planted close to houses for easy access. Previously, green vegetables were planted a very long way from the village area, and this was thought to be contributing to poor nutrition, particularly for children. Apparently the sup-sup garden model has been widely adopted by villagers in the area. KGA is also demonstrating alley cropping techniques, involving the nitrogen-fixing tree *Gliricidia sepium*.

2.13 COMMERCIAL ENTERPRISES

The largest commercial enterprises on Choiseul are logging companies. Their numbers have risen dramatically with the depletion of timber sources in Western Province, and 14 companies are now logging the timber-rich forests of Choiseul. Numerous small-scale sawmilling businesses are also operating. (There were 15 licensed operators in 1999, but more are thought to be operating now.) In 1999, these small-scale sawmills injected more than \$3 million into the local economy, but their sustainability and ecological impact require urgent assessment.

Lauru Coconut Production Ltd was a joint venture between CEMA and the business arm

of the Provincial Assembly that operated a copra mill in Choiseul Bay, until it closed down as a result of the ethnic tension and the collapse of CEMA. The mill has been leased by the LIC and has recently bought copra from farmers to produce high-quality coconut oil under contract for Solomon Soap. The future of the mill remains uncertain, but LIC hopes to continue oil production using locally purchased copra.

Taro Island has in excess of 10 trade stores, and there are trade stores in most villages around the province. The 1999 census reported 373 trade stores in that year. Some of these trade stores also buy copra for sale to the agents operating in Choiseul. A butchery has recently been established at Taro.

The Taro Consumers Cooperative Society is an agent for the National Bank of Solomon Islands (NBSI) and is the only banking facility in the province. There are no microcredit schemes currently operating in Choiseul Province. The Provincial Assembly issues licences for a wide range of microbusinesses, such as hawking, fish selling, boat transport, fuel sales, cooked food stalls, and bakeries.

2.14 TRANSPORT AND TELECOMMUNICATIONS

Regular air services fly from Honiara to Taro (Choiseul Bay, west Choiseul) three times a week, and to Kagau Island in southeast Choiseul once a week. These services are regularly delayed or indefinitely postponed, because the outer islands are the first to be struck off the flight list when aircraft are in high demand. A third airfield at Tangibangara in east Choiseul has not been used for several years because of a land dispute.

The primary shipping service for the province is the MV *Lauru 1*, operated by a business arm of the Provincial Assembly. The MV *Lauru 1* takes cargo and passengers around Choiseul on a weekly basis, alternating its route from clockwise to anticlockwise. Despite this attempt at fairness, villagers towards the southeast of the island complain that the ship has few supplies and little cargo space available by the time it reaches their locations. Swift Shipping previously operated out of Choiseul Bay, but now operates out of Western Province. It makes only irregular visits to Choiseul.

The MV *Tomoko* used to run a passenger service between Choiseul Bay and Western Province, but this has not operated for several years. Honiara-based timber merchants regularly charter boats for the specific purpose of purchasing sawn timber off the beach around Choiseul. Several ships irregularly work the Choiseul–Gizo–Honiara run, but are more expensive and take longer to deliver freight than Honiara direct services.

The road network is extremely limited. There is a limited road system of approximately 25 km from Kolombangara to Sepa in the Sasamungga region. Some logging roads have been built in the northwest, but these deteriorate rapidly once logging finishes. The logging road from Chirovanga to Choiseul Bay is serviceable, but requires upgrading. This is a high priority, given the relatively large areas of land with agricultural potential in the northwest.

The current cost of fuel in the province is \$8–10 per litre. There are often fuel shortages in the province caused by the infrequency of shipping services. The demand for fuel is very high. For example, it is not uncommon for one of the two main fuel depots at Taro to sell 40 000 litres of fuel over a period of two to three weeks. The depot often runs out of fuel well before it is resupplied.

Telephone and facsimile services are available at Choiseul Bay and Sasamungga. The People First Network has recently installed email facilities at Sasamungga, Wagina and Panggoe. These facilities are reasonably reliable at present. There is an extensive network of two-way radios around the province, with radios at hospitals, health clinics, schools, church missions and DAL stations. Agencies of the Postal Corporation are operated by churches and other businesses at 17 locations throughout the province.

2.15 PREVIOUS EXPERIENCE WITH AGRICULTURAL DEVELOPMENT

Considerable development effort has been expended in promoting copra production over the past 40 years, and this has been largely successful. Approximately 63% of households sold copra in 1999 and, although production declined dramatically through the tension, it is now increasing again.

The same success cannot be claimed for cocoa, which can be grown successfully, but has not become an important commodity. For nearly two decades, there were no cocoa buyers in the province. Although buyers are currently re-establishing businesses, the previous experiences have turned many farmers against cocoa, and a systematic redevelopment plan is required to restart the sector. Close links with neighbouring Bougainville, with its vibrant cocoa production and marketing sector, may be of some benefit. The use of port facilities at Noro needs to be investigated.

Recent interest in rice, chilli and vanilla has been relatively short lived. There is still a small amount of rice production in the Panggoe region, heavily supported by ROC and the Agricultural Extension Service. About 4 tonnes of rice were produced last year and taken to Honiara for milling. Given the inputs required in terms of labour, seed, fertiliser, insecticide and milling, the long-term viability of rice is highly doubtful once the ROC subsidies are removed. There is a strong market for chillies from the Solomon Taiyo fish cannery in Western Province, but production has not been great. This may be a problem of poor information flow. The consultant who recently delivered a short course to Choiseulese farmers commented on the initial unrealistic expectations of farmers from vanilla. Local vanilla has been unproductive because of lack of agronomic and processing knowledge. The absence of seasonality in rainfall also makes Choiseul unsuitable for vanilla, which requires a dry period.

Cattle projects have been unsuccessful on Choiseul, as they have been elsewhere in SI. This has been due largely to the promotion of inappropriate production systems, and to long-running land disputes. The large market of nearby Bougainville would appear to make cattle production an attractive proposition for Choiseul. However, the lack of a breeding herd, poor transport infrastructure and the absence of cattle production skills among the local population make the establishment of a cattle industry a significant challenge. There may be some potential to promote small-scale tethering systems to supply local markets.

2.16 OPPORTUNITIES FOR RURAL LIVELIHOODS DEVELOPMENT

2.16.1 MARKETING

Marketing problems are a major constraint to development on Choiseul. However, marketing arrangements could be improved through provision of:

- > an information system to facilitate sales of commodities, including copra, cocoa, timber and other produce, so that farmers know what they should be getting paid, and can more rapidly respond to supply and demand
- > additional regular shipping services for farmers at long distances from the major market centres
- > upgrading of the Chirovanga to Choiseul Bay road, to facilitate marketing of produce from this important AOA.

2.16.2 COMMODITIES

There is considerable scope to enhance the production and sale of smallholder cash crops, particularly copra. The following recommendations are made for each main commodity:

- > Copra – Support to the smallholder industry must simultaneously address the interrelated issues of production, trading and shipping. Bottlenecks are currently occurring at all three levels. Supply of drums to the most disadvantaged farmers through the existing buyers' network would allow increased production. Trading should be enhanced through the provision of one-off small grants to carefully selected individuals to enable them to commence copra purchasing. These grants should be accompanied by training in small business management and quality control. The small grants and training initiatives should draw upon the considerable experience of CEMA and CPRF for the selection of appropriate candidates and the provision of technical training. It is further recommended that enhanced production and trading activities be closely coordinated with other donor-funded activities in the shipping sector, in order to meet the increasing demand for freight.

- > Cocoa – A major rehabilitation program is required, addressing sales, agronomy and processing. The potential for accessing the considerable cocoa marketing network of Bougainville should also be investigated.
- > Subsistence crops – Supply high-yielding, and pest- and disease-resistant varieties of sweet potato, yams, taro, bananas, corn and other vegetables. Supply training in the use of pesticides. Provide technical information on food security in the context of pest and disease control, declining soil fertility and declining garden yields.
- > Livestock – Provide technical and logistical assistance in small-scale livestock production and marketing, particularly for local pigs and chickens. Make use of the KGA approaches to improving production.
- > Tree crops – Restart the ngali nut industry. Investigate potential products from cutnut.
- > Marine produce – Investigate the sustainability and ecological impacts of the exploitation of fisheries and marine resources (seaweed, trochus, bêche-de-mer, fish).
- > Small-scale sawmilling – Investigate the sustainability, ecological impacts and community-wide benefits from sustainable small-scale sawmilling.

2.16.3 DELIVERY MECHANISMS

Choiseul has a strong network of RTCs and NGOs which could be used to deliver interventions to improve livelihoods. The RTCs, and possibly other institutions such as the Sasamungga hospital, could be used to evaluate and bulk up new planting materials for wide distribution. Where capacity exists, RTCs and NGOs should be engaged to run short courses for adult village groups in the use of pesticides, financial planning, microprocessing of local vegetables and small livestock production. These should be based on real life examples, rather than theory.

The RTCs should be supported to provide assistance to postgraduate students who have returned to their villages. This would include follow-up visits by RTC staff and provision of appropriate tools to establish small businesses.

2.17 WRITTEN SOURCES OF INFORMATION

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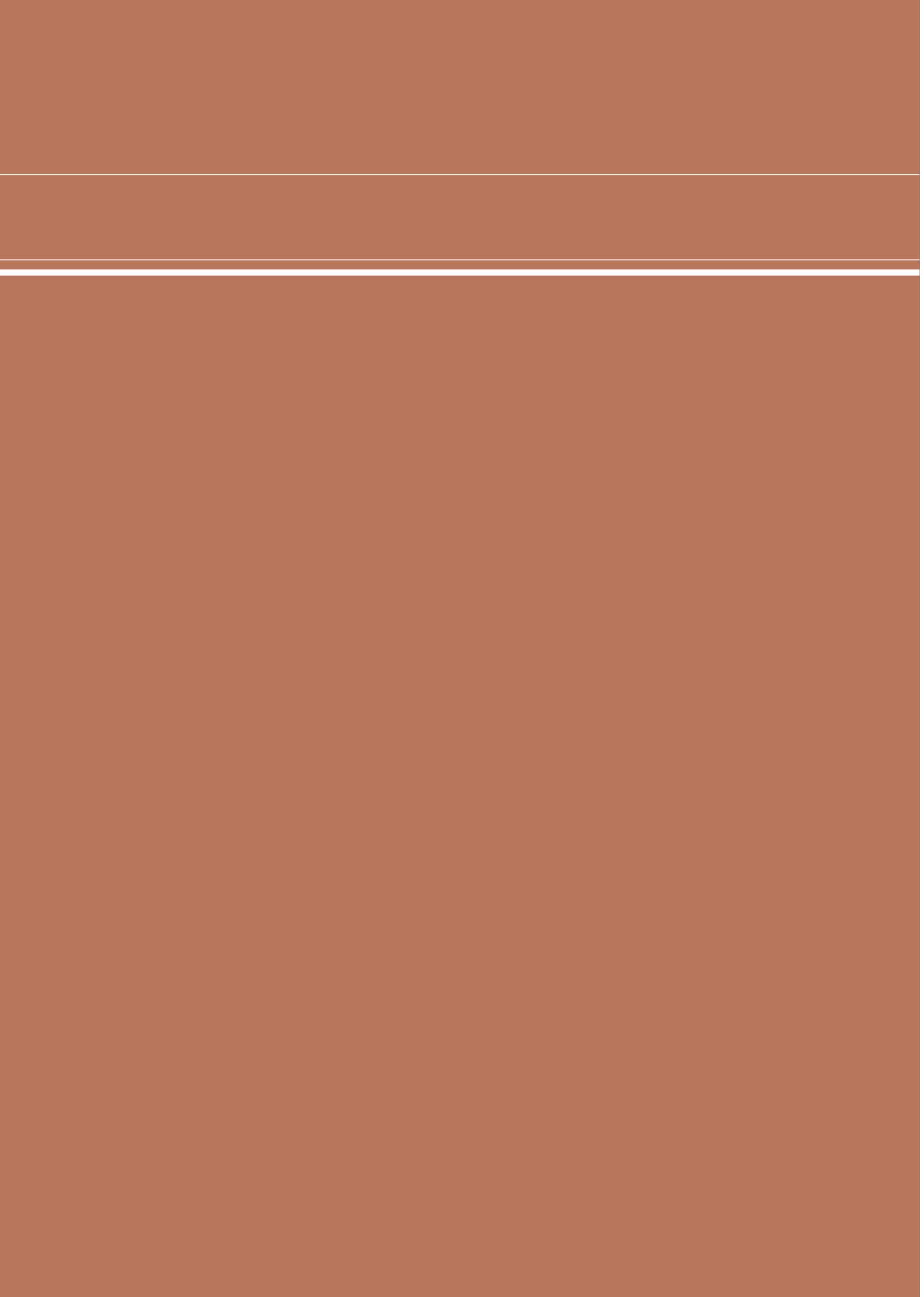
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2.18 PEOPLE CONSULTED

Boseto, Pauline	Chief Planning Officer, Health and Social Services, Department of National Development and Planning, Honiara
Galo, Lesley	Northeast Constituency Farmers Development Centre, Honiara
Jansen, Tony	Adviser, Kastom Gaden Association, Honiara
Kabu, Roselyn	Manager, Kastom Gaden Association, Honiara
Keqa, Barnabas	Senior Livestock Adviser, Department of Agriculture and Livestock, Honiara
Likaveke, Steve-Daniel	Permanent Secretary, Department of Forests, Environment and Conservation, Honiara
Liloqula, Ruth	Permanent Secretary, Department of National Development and Planning, Honiara
Nemaia, Andrew	Department of Tourism, Honiara
Pelemo, Moses	Commodities Export Marketing Authority
Piliki, Moses	Director of Environment and Conservation, Department of Forests, Environment and Conservation, Honiara
Pitakala, Simeon	Lauru Land Conference of Tribal Community, Honiara
Pitakele, Morris	Lauru Land Conference of Tribal Community, Honiara
Pitamana, Jeffrey	Chairman, Lauru Land Conference of Tribal Community, Honiara
Poloso, Noel	Chairman, Lauru Indigenous Natural Resource Owners Association Trust Board, Honiara
Qaloboe, Franklin	Director of Planning, Department of Agriculture and Livestock, Honiara
Tabepuda, John	Lauru Land Conference of Tribal Community, Honiara



3 Guadalcanal Province



Figure 3.1 Guadalcanal Province

3 Guadalcanal Province

3.1 SUMMARY

Guadalcanal Province consists of Guadalcanal Island and some small adjacent islands, with an area of 5310 km² (see Figure 3.1). The national capital, Honiara, is located on the north coast, as is the international airport. The population of the province, excluding Honiara, was 60 275 people at the time of the 1999 census. This represented 17% of the national rural population. About one-third (18 920 people) of the population resided on the remote and disadvantaged Weather Coast, on the south side of the island. The physical environment of Guadalcanal displays marked extremes, with the island boasting the two highest peaks in the Solomon Islands' (SI) rugged mountains, but also a large and highly productive area in the north, known as the Guadalcanal Plains. This region is unique in SI from an agricultural perspective, because it has a significant area of flat land, fertile soils, and an adequate, but not excessive, rainfall (2000–3000 mm per year, with a distinct drier period each year). In contrast, the physical environment of the Weather Coast is difficult for agricultural production, with excessively high rainfall (about 5000 mm per year), steep topography and infertile soils.

These physical differences between the Weather Coast and the rest of the island translate into large differences in villagers' welfare, physical infrastructure including roads, health and education services, and potential for improvement. Villagers and others throughout Guadalcanal were severely

impacted by the ethnic tension of 1998–2003, and these effects continue. A significant number of people, particularly immigrants from Malaita Province, left the province in 1999–2000. Some have now returned to North Guadalcanal, along with new migrants, following the partial restoration of the provincial economy and the opportunities for employment offered in Honiara.

The main economic activity on the Weather Coast is subsistence food production, with sweet potato as the staple food. Food supply tends to be disrupted in the wettest months (May to September) each year. This is particularly marked in years when the rainfall is especially high, as happened in 2004. There is very limited cash income, and few opportunities for earning cash. A little copra is now being produced on the Weather Coast and small quantities of betel nut are sold into Honiara.

In contrast, there is much more economic activity on the north coast, and in other locations with access to Honiara. Subsistence food production is important, with the main crops being sweet potato, cassava and banana. The main sources of cash income for villagers and settlers are sales of fresh food and animals at Honiara market and other locations, and copra and cocoa production. There has previously been significant agricultural development in North Guadalcanal, both smallholder agriculture and large-scale estate development. The latter includes production of copra, cocoa, rice, cattle and oil palm.

There are only limited opportunities for the development of agriculture on the Weather Coast because of the environmental limitations, but it is suggested that some of these opportunities should be pursued because of the extreme disadvantage suffered by the villagers. There are many more options for development in North Guadalcanal, including further production of fresh food for the domestic market, and production of cocoa and other crops, including vanilla and ngali nut.

3.2 OVERVIEW OF FIELD VISITS

A three-person team spent eight days in Guadalcanal Province in September 2004. Three days were spent on the Weather Coast, two days were devoted to visits to villages and institutions on the north coast; and three days were devoted to conducting interviews in Honiara. The team was Mike Bourke (agricultural consultant, Canberra), Claudine Watoto (AusAID office, Honiara) and Ben Mullen (livestock specialist, Brisbane). This report is written by Bourke, with Mullen contributing the section on livestock. The Guadalcanal Community Peace and Restoration Fund (CPRF) team provided logistic support. Bourke and Watoto travelled by helicopter to the Avuavu area on the Weather Coast, and on foot to four villages in that area, by canoe to villages in the Talise and Kolina/Isuna areas, and by helicopter back to Honiara. A day trip was made by Bourke and Watoto by road to villages west of Honiara as far as the Visale area. Mullen visited some institutions in and near Honiara, and villages as far as the East Tasimboko area on the Guadalcanal Plains.

The time devoted to this province is inadequate for a province that contains major differences in environment, economy and livelihood possibilities. Field coverage of the remote Weather Coast was just adequate, but there was insufficient time for the more complex northern side of Guadalcanal Island. Because of the significant differences between the Weather Coast and the rest of the island, especially locations with easy access to Honiara, the Weather Coast will be treated separately in this report.

3.3 INTRODUCTION

Guadalcanal Province consists of Guadalcanal Island and some small adjacent islands, mostly in the east. Guadalcanal is 160 km long and 45 km wide in the centre. The land area is 5310 km². The island consists of five distinctive physiographic regions. The first is a northwest to southeast trending mountainous spine, lying close to, and parallel with, the southern coast. The mountainous areas contain steep-sided valleys and peaks as high as 2330 m (Mt Popomanaseu) and 2450 m (Mt Makarakomburu). (The highest peak in Australia is 2228 m.) The area of this region is 2240 km². Immediately north of the southern mountains is an east–west aligned band of ridges and hills (the Central Hills) with an area of 1440 km². These merge northwards to the Northern Foothills, which have an area of 620 km². Further north are the Northern Plains of Guadalcanal. They extend from the Lungga River in the west (just east of Honiara) to Kaoka Bay in the east, with an area of 460 km². The final region is the North Western Volcanic Area (540 km²), which occupies the northwestern corner of the island.

The Guadalcanal Plains are unique in SI. They offer a combination of fertile soils, a gentle topography, and a climate with adequate, but not excessive, rainfall, with a distinct drier period each year. Most of the island is covered with tropical forest, except for the plains, which are dominated by large areas of natural grasslands. The 1974 Land Resources Study identified six ‘agricultural opportunity areas’ (AOAs) on the island, with a total area of 746 km². All are located on the northern side of the island, with the plains being the largest at 337 km² (45% of the AOAs). Most land on the island is nonregistered customary land (83%), and 10% is registered alienated land, with most of the balance being owned by the central government (4%) and other private owners (2%).

Most of the population lives on or near the coast of the island or on the northern plains, with some villages in the Central Hills, south of Ruavatu near the Mbokokimbo and Nggurambusu rivers. People live and practise agriculture as high as 800–1000 m in the Central Hills.

The climate is equatorial, with a mean maximum temperature of 30–31°C, and a minimum of 20°C

(August) to 23°C (December). There are large variations in both total rainfall and its seasonal distribution on the island. The mean annual total is about 2000 mm from Honiara to Tetere on the north coast, and about 5000 mm on the south coast. The estimated mean annual rainfall in the mountainous interior is about 8000 mm. The seasonal rainfall distribution also differs markedly on the island between the northwest and the south coast (the 'Weather Coast' — named for the high rainfall and the unimpeded impact of the southeast trade winds, which blow from about May to September each year). For western North Guadalcanal, as far east as about Tetere, the wetter months occur in November to April. In contrast, the wettest months on the south coast and eastern Guadalcanal are May to October. Part of the northeast region, centred on Ruavatu, receives rainfall throughout the year.

Mean annual rainfall at Henderson airport, just east of Honiara, for the period 1975–2000 was 1850 mm, with a range from 1170 mm (in 1992) to 2840 mm (in 1976). The wettest period of the year is December to March, when the mean monthly rainfall is 200–300 mm. The driest period is June to October, when the mean monthly rainfall is 70–100 mm. A long rainfall data series is also available for Tenavatu, to the east of Henderson airport, for the period 1950–75. The mean for that period was 2180 mm, with December to March having a mean monthly rainfall of 225–350 mm, and June to September receiving a mean monthly rainfall of 90–110 mm. The study team were not able to access any long-term rainfall records for the south coast, but Wall and Hansell (1974b) give tentative rainfall figures of 4000–6000 mm per year.

While the rainfall requirements and tolerance of extremes vary from crop to crop, a working figure for the southwest Pacific region is that a mean annual rainfall of 1800–2500 mm is optimal for agricultural production, and a mean annual rainfall of more than 4000 mm is excessive. For many crops, growth is likely to be reduced where mean monthly rainfall is less than 100 mm. However, this varies according to the crop, the moisture-holding capacity of the soil and the actual rainfall pattern in any given year.

From an agricultural perspective, there is, on average, a five-month period when plant growth

is likely to be somewhat reduced by lower rainfall in the Honiara area. On the Guadalcanal Plains to the east and inland, rainfall rises and the drier period is less pronounced. This is good from an agricultural perspective. In contrast, the very high rainfall experienced on the south coast, in east Guadalcanal and in the interior of the island is too wet for good agricultural production. During periods of extended high rainfall, growth of many crops, particularly sweet potato, but also cassava, banana and cocoa, is adversely affected. These conditions were experienced on the Weather Coast from about February to September in 2004, when the estimated annual rainfall was 8000 mm.

There is much variability on the island in soils and their fertility. It is sufficient to note here that the soils on the steep hills on the south coast are very infertile. In contrast, many soils on the Guadalcanal Plains are quite fertile. However, there is considerable variation, even over relatively short distances.

The total population of the province was 109 382 people at the 1999 census, with 49 107 people in Honiara (SIG 2002). The rest of the discussion in this report refers to the 60 275 people (in 1999) who were not living in Honiara. Most of these live in rural villages, although some live near Honiara and have a more urban than rural lifestyle. The rural population is 17% of the total SI rural population, and is similar in size to that of Western Province (62 700 people), and about the half the population of Malaita Province (122 600 people). In 1999, there were 18 920 people living on the Weather Coast (defined here as extending from Wanderer Bay Ward to Birao Ward). Thus, just under one-third (31%) of the provincial rural population lives on the extremely disadvantaged Weather Coast. To put this in context, this population is comparable to the entire provincial populations of Temotu Province (18 900 people in 1999), Choiseul (20 000 people), Isabel (20 400 people), and Central (21 600 people), and much more populous than Rennell and Bellona Province (2400 people).

The rural population grew very rapidly, at 4.3% per year, for the inter-census period 1976–86. For the next period (1986–99), the growth rate had dropped to 1.5%. This is because of the exit of a very large number of migrants from other provinces in 1998 and 1999. There was a further large outflow

of people in 2000, after the census was conducted in November 1999. Since the Regional Assistance Mission to Solomon Islands (RAMSI) force restored security in mid-2003, some people who fled rural Guadalcanal have returned, and others have come to the island seeking employment. Thus, it is not possible to estimate the 2004 population or the growth rate. However, Honiara and the surrounding rural areas remain an attractive destination for migrants from Malaita and other islands. This is because of the possibility of marketing food in Honiara market, the economic activity associated with the RAMSI presence in Honiara, and the attractive agricultural environment. If production at the former Solomon Islands Plantation Ltd (SIPL) oil palm plantation resumes, as is planned for early 2005, this is likely to result in a further influx of migrants to rural Guadalcanal.

3.3.1 IMPACT OF THE ETHNIC TENSION

The ethnic tension that affected SI between 1998 and 2003 has had a profound impact on many people in the province. This is not addressed in detail here. Many people on the Weather Coast fled the fighting and moved inland or nearer to Honiara. On the north coast, much economic activity collapsed, including the closure of the SIPL oil palm plantation, the closure of the Gold Ridge mine, the abandonment of many expatriate-owned plantations, and the collapse of a small tourist industry. Many facilities deteriorated or have been destroyed, and delivery of services has been severely affected. Many migrants left the province, particularly those from Malaita. Security was restored by the RAMSI force, from July 2003 onwards, but the economic, social and demographic impacts continue in all parts of the province.

3.4 LIVELIHOOD STRATEGIES

Guadalcanal has three distinct zones. The first is the plains and the northwest area, which is characterised by a seasonally dry climate, and where people have reasonably good access to markets and services. The second is the northeast of the island, where the rainfall is less seasonal in distribution, and people have poorer access to markets and services. The third

is the Weather Coast, where excessively high rainfall and steep topography limit agricultural potential; sea transport is constrained by the terrain; and people suffer multiple disadvantages. In the following discussion, the first two zones have been combined into North Guadalcanal, but the distinction is retained for the Weather Coast.

3.4.1 WEATHER COAST

The main strategy for most people on the Weather Coast is subsistence food production. This is derived from food gardens, coconuts, fishing and some fruit and nut trees. Sweet potato is the staple food, and cassava is also important. Before the disruption associated with the ethnic tension, some copra was produced and sold. However, cash income is currently minimal; very minor amounts are derived from the sale of copra, betel nut and fresh food, but most people are effectively outside the cash economy. As a chief (Silverio Tovulava) in Buburua village said when the study team asked about agriculture: 'Agrikalsa hemi mainly for kaikai nomoa becos staka problems tumas long side bilong marketing' (Agricultural production is mostly for subsistence food only, because there are many problems in marketing other produce).

3.4.2 NORTH GUADALCANAL

There is some variation in livelihood strategies, depending on access to Honiara market and local resource endowment. Subsistence agriculture continues to provide most food for most villagers, with food coming from gardens, coconuts, other fruit and nut trees and some fishing. The main garden foods are sweet potato, cassava and banana. However, consumption levels of imported food, particularly rice and flour-based foods, are high for many people. Cash income is derived from the sale of fresh food (and other produce including betel nut and firewood) into Honiara, and from copra and cocoa. Two typical Guadalcanal Plains livelihood strategies are illustrated in Boxes 3.1 and 3.2 below.

BOX 3.1 RIDLEY VARAKIA AND DUDLEY SEKE, MARKET GARDENERS, NGUVIA VILLAGE, GUADALCANAL PLAINS

Ridley and Dudley have been farming a 3.5-hectare area of customary land to produce organic fruit and vegetables for the past few months. They also produced crops before the ethnic tension, but had to abandon the operation for several years. Crops planted are watermelon, peanuts, sweet potato, corn, cucumber and beans. They use compost made from chicken and pig manure, mill run, copra meal, rice bran, rice husks, fish meal, Solbrew waste and whatever else they can get for free or at very low cost. Compost ingredients are mixed, left for one to two weeks, and applied to the soil. Legume crops are rotated with non-leguminous crops. Grass leys of up to one year are used, in addition to composted manures, to restore fertility. A tractor and plough are hired to prepare land. It is often difficult to obtain a tractor when one is needed, so Ridley and Dudley want to purchase a two-wheeled tractor so that preparation can be done on time. However, they still need to earn enough money for this.

Income from each 2000 m² block is about \$5000–6000 per year. Produce is sold both locally and into Honiara. Fresh water was a problem for seedling preparation, but a well has been dug by hand, with the water at 2.5 m below ground level. Ridley and Dudley want to start up a chicken production unit to provide additional income, and manure for cropping. They would appreciate assistance in any of their ventures.

BOX 3.2 ESTER BOSAMETE, SWEET POTATO PRODUCER WITH A PIGGERY AND CHICKENS, JUDEA VILLAGE, GUADALCANAL PLAINS

Ester lives with her family in a house built from permanent materials. Her father and sister live about 100 m away. Ester's father used to work for Solomon Islands Plantation Ltd, and built much of the infrastructure for their house upon retirement. The family's primary source of income is from several large sweet potato gardens, which produce substantial surpluses that are marketed into Honiara. The family also produce cabbages, banana, peanuts, watermelon, tomatoes and pawpaw for sale at market. Grass fallows of about one year's duration follow two to three crops. They also produce cutnuts (*Barringtonia procera*), coconuts, banana, mango and guava for domestic use.

The piggery is a permanent structure with a concrete floor, iron roof and pens constructed from Marsden matting and timber. Ester's family is currently feeding 13 crossbred pigs. One boar and a couple of sows will be retained for future production. Pigs are fed local feeds, including cooked sweet potato and leafy greens. Sometimes they are fed mill run and fish meal. The pigs have continuous access to water through automatic drinkers. All of the family are involved in feeding. Moderate growth rates are achieved. Pigs are sold to local villagers at about seven months for \$500 for a 45–50-kg pig. This indicates a reasonable growth rate of about 225 g per day. The family occasionally purchases day-old broiler chicks from Vuvula hatchery to fatten with purchased feeds. The economics are reasonable according to Ester, and she may repeat the exercise in the future.

3.5 SUBSISTENCE FOOD PRODUCTION

3.5.1 WEATHER COAST

Sweet potato is the most important food crop, cassava is also important, and some bananas are grown. Minor staple foods include taro, pana, yam and swamp taro. Fruit and nuts include ngali nut, cutnut, oranges and pineapple. Greens eaten include self-sown ferns, slippery cabbage and sandpaper cabbage (*Ficus copiosa* leaves). The land is fallowed to restore soil fertility after gardening; tall woody regrowth is the most common fallow vegetation type, but sometimes short woody regrowth fallows are used (this indicates a shorter fallow period and the fallow vegetation is less than 10 m high). Fallow periods range from 3 to 20 years, with 10-year periods probably typical. Land use intensity is generally not high, although it can be moderately high in some villages. Fallow vegetation is sometimes burnt, as is usual in shifting cultivation systems, but is often not, particularly in the wettest period of the year. Sweet potato, and sometimes cassava, is planted in mounds 30–40 cm high.

Garden food is often scarce during the wetter months (May to September), and shortages are particularly pronounced in very wet years (such as 2004, when it rained more or less continuously from early-mid-year to September). There was little garden food in any of the locations visited in September 2004. In particular, sweet potato had failed to form tubers, and villagers attributed this to the excessively wet conditions. Their analysis was correct, because waterlogged soil interferes with tuber initiation. Cassava yields were also affected, and banana fruits were rotting and being damaged by banana scab moth. The problem was particularly severe in the Talise area, where there was very little sweet potato, cassava or banana. People there were surviving mainly on dry coconuts, ferns, leaves of sandpaper cabbage, the aerial parts of a self-sown yam (*Dioscorea bulbifera*) and a little sago (which is not normally eaten on Guadalcanal, but which somebody knew how to process for starch). The food situation was unlikely to improve before the end of 2004, when newer plantings of sweet potato would commence bearing and the rainfall declined.

3.5.2 NORTH GUADALCANAL

Significant amounts of rice are eaten on the north coast. The main garden staple foods are sweet potato, cassava and banana, and other staples include taro, yam and pana. Other foods include breadfruit, ngali nut, cutnut, pineapple, pawpaw, orange, watermelon, slippery cabbage, eggplant, snake bean and peanuts. Betel nut is commonly grown. Fallow vegetation is typically low woody regrowth or grassland. Land use is not particularly intensive, but this was not assessed adequately, with only limited field visits to gardens. A major problem is pig damage to gardens, now that villagers do not have guns or rifles, following the improvement of security. Wild pigs, which were previously kept under control by hunting, now cause considerable damage to gardens distant from villages. Consequently, people continue to use land near the villages for their gardens, and are not using potential sites further away.

3.6 DOMESTICALLY MARKETED FOOD, FISH, FIREWOOD AND BETEL NUT

3.6.1 WEATHER COAST

There is very little food, firewood or betel nut sold on the Weather Coast. A few small markets exist in some locations, but the quantities of food and other items sold are very small and returns are minute. Near Avuavu, where women can sell a little food at a market at the Provincial High School, a woman might sell \$5 worth of food on a good day, but sales of only \$1–2 per market day are more typical. At locations with better access to Honiara, commencing in the Duidui ward and extending to the west coast, people sell betel nut into the Honiara market, but they are unable to cover the high transport costs incurred for themselves and shipping (no middlemen are involved) unless betel nut is in scarce supply in Honiara and prices are high. When the supply from the north coast and other islands is good, it is impossible to recover transport costs. People living in southwest Guadalcanal have somewhat better access to Honiara, and sell more betel nut there.

3.6.2 NORTH GUADALCANAL

In marked contrast to the Weather Coast, the people of North Guadalcanal have very good opportunities to sell food and other products in and near Honiara. There is a large and well-organised food market in Honiara, a betel nut market at Kukum on the eastern side of the town, and a smaller mixed market at White River on the western edge of the town. There are also numerous smaller markets that operate in villages, settlements, teaching and health institutions, and roadsides. In 1997, the Village Resource Survey recorded 18 marketplaces in the province, but this is almost certainly a gross underestimation of the number that operate (Ministry of Finance 1997).

The main marketplace in Honiara is well organised, with significant quantities of fresh garden food, processed food, animal foods and nonfood items offered for sale. Vendors pay \$3 per day each to sell items there. Between 0700 and 0900 on Saturday 18 September, there were 558 vendors operating (counting each family group as one vendor). They were selling fresh food (425 vendors), processed foods (35 vendors), various nonfood items (77 vendors) and foods of animal origin (21 vendors). The most common items on sale were sweet potato, banana, coconuts, fruit (including pawpaw, mango and citrus), various green vegetables, other vegetables (including pumpkin and capsicum) and nuts, particularly ngali nuts. Also offered for sale were significant quantities of cut flowers, coconut oil, locally made jewellery, processed foods (especially popcorn and baked or fried flour-based foods), chickens, fish and other seafood. The majority of sellers (approximately 80%) were women, although this was difficult to assess because many vendors operated as family groups.

The quantity offered by each vendor was significant. It is clear that the Honiara market is a major source of cash income for people living in North Guadalcanal, who are often settlers from other islands, as well as for people living in other provinces, including Central Province and Malaita. Sellers are not simply disposing of incidental extra food from their subsistence gardens, but marketing food is an important part of their livelihood strategy. Notable by their absence from Honiara market were

temperate climate vegetables, such as round cabbage, dwarf beans, broccoli and certain fruits. The absence of some fruits may be partly seasonal; however, there are a number of fruits that could readily be sold, but are not currently offered for sale. The roadside market at White River on the west side of Honiara is smaller, but still significant. At about 1600 on Saturday 25 September, there were 81 vendors selling betel nut, cigarettes, and 20 types of fresh food.

3.7 VILLAGE CASH CROPPING

3.7.1 WEATHER COAST

There is very little cash cropping on the Weather Coast of Guadalcanal, and cash incomes are very low. One Honiara-based company (Solomon Tropical Product) has commenced buying copra again. In a number of communities, a few men have rebuilt copra dryers and have started to produce and sell some copra. However, marketing remains a major constraint for most villagers. Shipping is very irregular, there are no middlemen operating, and most people cannot afford the fare and freight charges to transport copra to Honiara for sale, even if they had access to a copra dryer. A little cocoa has been planted, but pods are severely affected by black pod disease and there is little potential production. No cocoa has been sold from this area for some years.

3.7.2 NORTH GUADALCANAL

Both copra and cocoa are produced and sold in North Guadalcanal, with copra produced by more households than cocoa is. In 1999, most copra (60%) was transported for sale by truck, and most of the rest (39%) by canoe with an outboard motor. After the collapse of copra exporting in 2001 and 2002, the industry revived, and in 2003, 3314 tonnes of copra were produced in the province, which represented 23% of national production. This is comparable with the proportion produced in the mid-1990s, when Guadalcanal Province provided 23–26% of total production. The 2003 figure (3314 tonnes of copra) is less than total provincial production before the ethnic tension, but it is comparable with village (smallholder) production. The mean for smallholder

copra production for the period 1994–98 was 3300 tonnes per year. Thus, it seems that copra production from villages is almost as high as it was before the collapse of marketing arrangements in 2001 and 2002, as some of the current production will be coming from the former plantations.

North Guadalcanal is the most important cocoa-producing region in SI. No statistics are available on provincial production levels, but it is known that the main producing regions are North Guadalcanal, north Malaita, Makira and Isabel, with very minor amounts from Western and Choiseul provinces. With production in 2003 at near-record levels, it is highly likely that there has been a revival of cocoa production in North Guadalcanal.

3.8 PLANTATION CASH CROPS

In the past, there has been substantial investment in plantation tree crops on the Guadalcanal Plains. The main crops were coconuts, cocoa and oil palm. Levers Solomon Ltd and other companies planted significant areas to coconuts for copra production, and to cocoa, in the 1970s. Most plantations have now been abandoned and the trees have been taken over by local landowners. They harvest some coconuts for copra making and cocoa, but inspection (from the roadside only) suggested that the plots were not being maintained.

Guadalcanal Plain Ltd (GPL) planted significant areas of rice on the Guadalcanal Plains in the 1960s and 1970s. The development of rice as a dryland crop was set back by armyworm (*Spodoptera litura*) and by the brown plant hopper (*Nilaparvata lugens*), when rice was grown as paddy. Serious insect problems, the highly mechanised production practices and the fact that yields did not meet projections meant that the enterprise was unlikely to succeed financially. Hence, there was little incentive to re-establish the plantings after the destruction caused by Cyclone Namu in 1985. There are no indications that the lessons from the GPL rice production of the 1960s and 1970s have been noted in the current enthusiasm for growing rice in SI.

SIPL operated a major oil palm development on the Guadalcanal Plains until production was halted with the ethnic tension in 2000. SIPL had 6000 hectares

under oil palm, managed as a plantation, with no smallholder component. It was the second largest source of export income for SI before the ethnic tension. The palms are still intact, but most of the physical infrastructure has been destroyed. It is reported that approximately US\$17 million is required to rebuild the infrastructure and get the plantation and factory operating again. The land leases have been challenged by local landowners and there is a history of labour issues, including the unwillingness of local landowners to have workers from Malaita return to work on the plantation. New Britain Palm Oil Ltd (NBPO) is interested in restoring production, but no decision has been made on selling to NBPO, and a number of significant issues still need to be overcome before production of palm oil could recommence.

3.9 SMALL-SCALE FORESTRY

There is little or no small-scale forestry on the Weather Coast and little information was gathered on this topic on the north coast. In one community visited (Lathi village, just east of Honiara), villagers were earning some money from the sale of timber. The main timber species being cut were *Vitex*, *Calophyllum* and rosewood, for which villagers received \$900–1200, \$800–1000, and \$2000–2600, respectively, per cubic metre of rough-sawn timber (locally referred to as ‘cubic’). Local transporters charge \$600 for a two-cubic metre load in a small, three-tonne truck into Honiara, obviously an expensive freight charge. The villagers know how to cut timber accurately, but do not know how to determine volume, and are susceptible to deceit from buyers in Honiara. There is a clear role for the Forestry Department or other training organisations (such as a rural training centre, RTC) to teach this basic skill. Some teak has been planted at various locations along the north coast. Some is growing poorly, because it is exposed to spray and has been planted on steep land with shallow soil.

3.10 LIVESTOCK

3.10.1 WEATHER COAST

Pigs are commonly maintained in all villages. A number of five pigs per household was quoted in two communities, but this is likely to be a maximum or an ideal rather than an average. Pigs are fed mainly on coconuts, including sprouted nuts, and they are also given kitchen scraps, pawpaw and some other garden foods. Pigs remain very important in custom ceremonies, such as feasts, bride price payment and funerals. They are very occasionally butchered, and the meat sold at local markets. Free-ranging chickens are common in most villages visited. A small herd of cattle was noted in one community east of Avuavu, but it is not known if other small herds still exist on the Weather Coast. The remainder of the livestock section refers to North Guadalcanal only.

3.10.2 NORTH GUADALCANAL

The majority of the nation's livestock products are consumed in Guadalcanal, and Honiara is the major market for sales of domestic livestock. Before the ethnic tension, SI was almost self-reliant in pig and poultry meats, and supplied a substantial percentage of its requirements for beef and table eggs. This supply was produced by a combination of small-scale and medium-scale production units, predominantly in Guadalcanal, Malaita, and Central Province. The majority of the units based on Guadalcanal were destroyed or abandoned during the tension. Production is gradually being restored, but is still well short of pre-ethnic tension levels. Low input–low output livestock production in villages, predominantly of pigs and chickens, has continued throughout Guadalcanal and is important for customary purposes, as a supply of protein, and for irregular cash income.

The demand for pigs in Honiara is in the order of 100–120 porkers per week and purchasers have trouble obtaining sufficient animals. Village sales and purchases of pigs are also substantial and may be in the order of 100 pigs per week, although no accurate figures are available.

Pigs are purchased by Sullivan's Butchery, two smaller butcheries, the larger hotels, including the Mendana, the King Solomon and the Honiara, supermarkets and several restaurants. Sullivan's Butchery is a major purchaser and currently has a requirement for 50 porkers per week, and occasionally up to 70 per week, but can currently only buy 30 per week. It pays \$18–20 per kg for carcasses less head, feet and intestines. The higher price is paid for lean carcasses, which sell very quickly. Carcasses of crossbred pigs of 25–40 kg are preferred. Native pigs are not purchased, as these are generally over-fat. Sullivan's has no kill floor. Pigs are bush slaughtered, packed on ice and delivered to the butchery for further processing. Other butcheries and restaurants purchase in a similar manner. Most pigs are currently sourced from Malaita. Sullivan's has obtained a list of European Union (EU) pig Micro Project recipients, and intends to follow these up to ensure future supplies.

There are currently no medium- to large-scale broiler farms in SI. A large volume of chicken meat, as whole birds and cuts, is imported into Honiara each week, and frozen, whole chickens retail for \$45–55 each. A significant number of small-scale broiler farms exist, producing about 1000 birds per batch. Vuvula Poultry Ltd, currently the only operating hatchery, reports sales of about 150 000 broiler chicks per year, down from 300 000 chicks per year before the ethnic tension. The majority of these would be sold to small-scale Guadalcanal farmers at \$8 per bird.

The EU has supported 10 broiler units of 100–150 birds. The primary limitations to the viability of broiler production are the cost of feed, currently \$138 per 40 kg, and the ability to sell broilers in a timely manner. Broilers should be sold at six to seven weeks of age, and late sales quickly reduce economic returns. Occasionally, coccidiosis and fowl pox cause serious losses. These are generally environment-related diseases, and can be controlled with appropriate management and feeding. It has been long established that hybrid broilers cannot be economically raised on local feeds of low nutrient density; economic viability requires well-formulated, high-density feeds that produce daily gains of 35–40 g per bird per day.

There is considerable local interest in the use of local and dual-purpose birds for broiler production using local feeds. The development of improved village systems has advantages in that little direct cash outlay is required for feeds, and production is staggered, with regular sales of small numbers of birds. The Australian Centre for International Agricultural Research is currently in the process of negotiating a project with the Department of Agriculture and Livestock (DAL) and local nongovernment organisations (NGOs) to investigate local feed sources for semicommercial chicken production.

Several commercial hatcheries and broiler and layer farms were operational in peri-urban Honiara before the ethnic tension, but all were destroyed. There are currently no commercial broiler farms, and only one commercial layer farm. Tong Corporation's layer farm purchases day-old chicks from Vuvula Poultry in batches of 2300. The chicks are raised on a wood-shaving litter system. In the hatchery, they are vaccinated, debeaked at eight days and again at 10 weeks, and moved into cages at 15 weeks. The farm has four sheds, with approximately 1800 birds per shed, producing 85 dozen eggs per day. There is little seasonality in egg production, being so close to the equator, and hens rarely moult. Hens are kept for 20–24 months, depending on egg production, before being sold locally for \$25 per bird. Layer hens sell very easily because of their low price compared with broilers. Mortality is 15–20% per year.

Before the ethnic tension, there was large-scale importation of table eggs from Papua New Guinea (PNG), New Zealand and Australia. Table eggs continue to be imported, but in smaller quantities than previously. The EU has supported seven layer projects of 300–500 birds each. Day-old layers can be purchased from the Vuvula hatchery for \$17 per bird. As there are no parent flocks in SI, the eggs are imported from New Zealand and Australia. The viability of these layer projects is limited by the high cost of feeds and difficulties in the timely marketing of medium numbers of eggs.

Some support agencies are investigating the potential for egg production using local, imported dual-purpose or crossbred birds, fed with either locally available feeds or a combination of local

and imported feeds. There is considerable interest among local farmers. Importation of table eggs is continuing to meet the shortfall in supply, but there is considerable potential for demand to be met by small- to medium-sized layer units. These will become more economical if high-quality stock feeds are once again produced locally.

Considerable expense and effort was invested in the development of the beef cattle industry in SI over a 30-year period from the mid-1950s to the mid-1980s, and cattle herds were maintained under coconuts on some plantations. However, there is little evidence of this investment today. The Livestock Development Authority herd at the Dodo Creek Research Station was stolen or dispersed during the ethnic tension. Approximately 200 head of cattle were relocated to Gizo, and this herd could form the nucleus of a rebuilding program.

Russell Islands Plantation Estate Ltd (RIPEL) has been unable to process cattle through its abattoir because of a long-running industrial dispute. The abattoir in Honiara was badly damaged during the ethnic tension and there is currently no facility, of significant capacity, to slaughter cattle in Honiara. Sullivan's Butchery currently imports 18 tonnes of CL85 beef from Vanuatu each month, although there is regular difficulty in filling this order because of strong competition for Vanuatu cattle from live export markets. For example, it was only possible to import 12 tonnes of beef in October 2004. The Honiara market has a requirement for about 25 tonnes per month.

Small cattle herds are still evident on the Guadalcanal Plains, and these will probably grow over time. With targeted support, a beef industry based on one or two medium-sized production units, and any number of small-scale production units, is likely to be highly viable. It is well established that the para and guinea grass pastures of the Guadalcanal Plains have the capacity to produce high-quality grass-fed cattle, suitable for high-value Honiara markets. Current prices in Honiara outlets are very high, with low-quality cuts retailing for around \$80 per kg and high-quality cuts retailing for \$200–280 per kg. Tethering of smallholder cattle has become widespread since the ethnic tension, as a method of protecting stock against theft and to prevent stock from damaging gardens, and this practice should be encouraged.

In villages throughout Guadalcanal, livestock production continues as it has for decades. Village chickens forage freely, and slowly grow to slaughter weight with no input from their owners. Eggs are rarely collected, but probably supply much-needed protein for the village dogs. Any eggs that are located are normally left for brooding hens to hatch, to ensure future supplies of chickens. Chickens are given away, sold live to other villagers, or eaten locally. The 1999 census suggests that 40% of households on Guadalcanal keep 'other livestock', which would be predominantly chickens. The potential for increasing production from village chickens will be linked to access to markets and information. Low-cost systems based on improved dual-purpose breeds and local feeds have considerable potential, but are unlikely to be adopted for subsistence purposes alone.

Pigs are penned, tethered or graze freely around the villages of rural Guadalcanal. The 1999 census report suggests that 58% of Guadalcanal households keep pigs. There is little input into village pig systems, despite the customary significance of pigs. There is considerable potential to improve the productivity of village pigs using a combination of genetic improvement through crossbreeding and the use of selected locally available feeds and byproducts. Again, improvements are unlikely to be adopted unless there is access to markets either locally or in Honiara.

3.11 SOCIAL AND CULTURAL ISSUES

Social and cultural issues are not addressed for Guadalcanal, as this is a complex topic in the province, especially because of the marked geographic contrasts. There was insufficient time to gather meaningful information during field visits given the high level of diversity.

3.12 SUPPORT FRAMEWORK FOR AGRICULTURE

In common with the rest of SI, there is very limited support for agriculture in the province. All villagers that the study team spoke with, reported that they receive no support for their agricultural production, and that this is one of the things that they most commonly seek. There are 13 staff in the Guadalcanal

provincial section of DAL, three of whom are female. Before the ethnic tension, there were 30 staff in the province, and DAL maintained 13 field stations throughout Guadalcanal. The main stations were at Marau, Avuavu, Lambi and Mbabanakira. Most stations have now been abandoned. The remaining staff are mostly living in their own villages, with a few living on the stations and others in Honiara. There is virtually no extension or any other work being done by field staff, although all continue to draw their pay, according to the DAL Chief Field Officer for the province. It is likely that the collapse of DAL support for agriculture commenced well before the ethnic tension.

3.12.1 WEATHER COAST

There is almost no support for village agriculture on the Weather Coast. There is one DAL officer posted there, but villagers report that he devotes his time to conducting his fishing business, and provides no assistance to them. The Turusuale Community Based Training Centre at Avuavu includes agriculture as part of the curriculum; it opened in 2004. There are four staff, all working as volunteers at this stage, and they are training 25 students (15 boys and 10 girls). The centre has taken over the adjacent abandoned DAL Research Division Field Experiment Station plots of rambutan and mangosteen. The Kastom Gaden Association (KGA) is providing some support to the training centre for processing fruit into jam and other prepared food. To date, one batch has been made and sold.

3.12.2 NORTH GUADALCANAL

There are six RTCs operating in North Guadalcanal, all with an agricultural component to their curriculum. Three are operated by the Catholic Church and three by the South Sea Evangelical Church. The Don Bosco Technical Institute also provides some limited agricultural training. This institution is focused on industrial skills for the urban area, but is in the process of developing a small RTC at Tetera which will focus on agriculture. The Divit RTC currently has 51 female students who are working towards a two-year certificate. Agriculture is incorporated into the curriculum, with

the focus on poultry, pigs, vegetables and honey. The principal would very much like some assistance on technical matters, in particular teaching of students and training of the staff.

3.13 COMMERCIAL ENTERPRISES

3.13.1 WEATHER COAST

Aside from a limited number of canteens in some villages, there are no commercial enterprises on the Weather Coast. There are no banking facilities. Prices in the canteens are very high, even higher than on other islands that are more remote from Honiara. For example, in September 2004, 20-kg bags of imported rice were being sold in village canteens for \$120–130. This can be compared with the retail price in Honiara of \$78–85 for the same product at this time.

3.13.2 NORTH GUADALCANAL

There are numerous commercial activities in and near Honiara. These and other activities in the rural areas on North Guadalcanal were not surveyed, but it was noted that most activities, apart from village canteens, are concentrated near Honiara.

3.14 TRANSPORT AND TELECOMMUNICATIONS

3.14.1 WEATHER COAST

Transport is a major constraint to development on the Weather Coast. There is no longer a functioning vehicle road. There are three airstrips, at Marau, Avuavu and Mbabanakira, but none is currently useable by aircraft because of deterioration of the runways. The ship MV *Atebimo* operates irregular services to the Weather Coast, as do some other vessels. There are no wharves or sheltered anchorages on the coast, so shipping is very dependent on weather conditions, especially when the southeast trade winds blow in May to September.

The Weather Coast Road between Marau and Avuavu was constructed in the late 1960s, and was upgraded in the early 1980s. The road has since deteriorated,

with bridges damaged or destroyed. The road itself has been damaged by floods and landslips and is overgrown in places. It cannot be used by vehicles for most of its length, although there are some short sections, such as immediately east of Avuavu, which are still useable.

Telecommunications are limited to two-way radios in various locations, such as the Turusuale Community Based Training Centre near Avuavu. The RAMSI police posts at Avuavu and Isuna have radio and satellite telephone available for their own use. An email centre, with a computer and short-wave radio, was opened at Avuavu in September 2004; power is supplied by a solar panel. The centre is operated by the People First Network (PFN), a project of the Rural Development Volunteers Association. Use of the centre is likely to increase steadily, but will be limited for most villagers, because the people that they wish to contact rarely have access to email facilities.

3.14.2 NORTH GUADALCANAL

There are international wharf facilities in Honiara. There are reported to be approximately 320 km of road in North Guadalcanal, although many stretches are in a poor state of repair. The main trunk roads are the East Road (79 km) and the West Road (69 km). The former runs east from Honiara to Aola, but is in very poor condition beyond Ruavatu. The West Road runs west from Honiara to Lambi and is now in reasonable condition.

3.15 PREVIOUS EXPERIENCE WITH AGRICULTURAL DEVELOPMENT

3.15.1 WEATHER COAST

There have been only limited attempts to provide agricultural development on the Weather Coast. This has concentrated on supporting copra production, with some attention to cocoa planting.

3.15.2 NORTH GUADALCANAL

Much attention has been given to promoting agricultural development in North Guadalcanal over

the past 100 years. This has been for production of export village cash crops, including copra, cocoa and spices, and estate production of copra, cocoa, cattle, rice and oil palm. The development efforts are not reviewed here, but a short summary is given for copra, cocoa, cattle and rice.

Large-scale planting of coconuts for copra production began on the Guadalcanal Plains in 1901, and many estates reached their maximum planted area by 1917. There was much destruction of coconut plantations during World War II, due to fighting and construction of military installations. Commercial operations resumed in 1950, and cocoa was promoted as a smallholder cash crop from the mid-1950s onwards. Considerable effort was made to develop a cattle industry in Guadalcanal in the 1970s and early 1980s, but these efforts were only partially successful, with many projects collapsing by the early 1990s (See Volume 2, Chapter 2 for details). The Commonwealth Development Corporation established commercial oil palm plantings on the Guadalcanal Plains in the early 1970s and production from these continued until it was halted by the ethnic tension in 1999. Rice was grown on a commercial basis by Guadalcanal Plain Ltd from 1965 until 1985.

3.16 OPPORTUNITIES FOR RURAL LIVELIHOODS DEVELOPMENT

3.16.1 WEATHER COAST

Because of the extremely high rainfall, there are only limited opportunities for agricultural development on the Weather Coast. Nevertheless, there are some, and it is very important that agricultural development be addressed there. This is because agriculture provides the only real option for cash income generation for most villagers, aside from migrating to North Guadalcanal. The following opportunities have been identified:

- > Improving food security; in particular, by providing new varieties of a number of important food crops that have been selected for desirable characteristics. Such varieties of sweet potato, cassava, banana, taro, yam and maize are available from PNG.

- > Supporting copra production by providing materials; and supporting the purchasing and shipping of copra by local entrepreneurs.

3.16.2 NORTH GUADALCANAL

There are many opportunities for agricultural development in North Guadalcanal, although at times these are constrained by significant problems of access to land and labour. The constraints that apply throughout SI operate here; in particular, the poor state of road maintenance, the lack of relevant information for agricultural producers, and a lack of other support. Nevertheless, the proximity of Honiara means that these constraints can be overcome more readily than for many other locations in SI. The following opportunities have been identified:

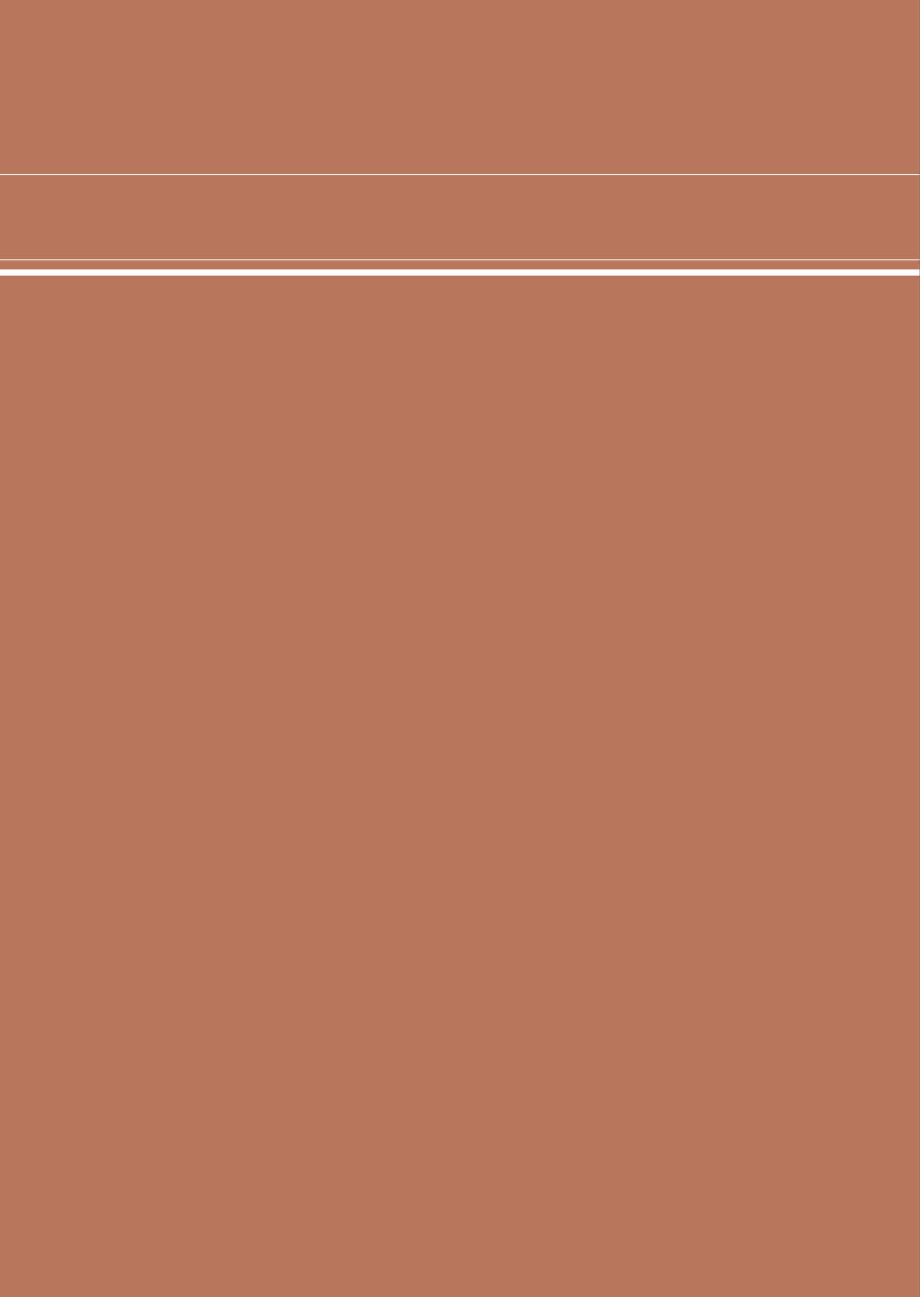
- > Improving the quality and quantity of fresh food supplied to Honiara market and to other consumers in Honiara. This can be achieved in a number of ways, such as by providing planting material of crops that are not commonly grown, or of improved varieties of crops; and by providing advice, training and written material on production, handling and sale of fresh food products. An example of a crop for which superior varieties are available is mango; and mangosteen is an example of a crop that is not currently grown for sale, but that would find a ready market in Honiara. Temperate-climate vegetables, such as potato and dwarf bean, form another group that some producers could be helped with; and commercial growers could be trained in out-of-season production of pineapple.
- > Assisting cocoa producers, particularly by providing improved planting material, based on SG2 hybrids bred at the Cocoa and Coconut Institute in East New Britain in PNG, for replanting and rehabilitation; training growers on rehabilitation techniques; and providing written material on rehabilitation and production techniques.
- > Supporting the sale and processing of crops that are not usually grown or marketed for processing or sale in SI, such as ngali nut, vanilla and other spice crops.

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3.18 PEOPLE CONSULTED

Aloatu, Celestine	Principal, Turusuale Community Based Training Centre, Avuavu
Amasia, Sister Concilia	Principal, Divit Rural Training Centre, Visale
Anderson, Jerry	Deputy Principal, Turusuale Community Based Training Centre, Avuavu
Anea, Peter	Haimarua village
Balekana, Atu	Don Bosco Technical Institute, Honiara
Boa, David	Sughu village
Boli, John	Lathi village
Boni, Josh	Dova village
Bosamete, Ester	Judea village
Cappelli, Fr Luciano	Don Bosco Technical Institute, Honiara
Edward, Kampion	Haimatua village
Jack, Selestine	Ngalachulu village (and other villagers)
Kelly, Mia	World Vision, Honiara
Kepo, Stephen	Sughu village
Keso, Moses	Lathi village
Keso, Peter	Lathi village
Kilua, John	Dova village
Kimbo, Johnathan	Fruit grower, Diodio area
Laku, Fred	Chairman of Board, Turusuale Community Based Training Centre, Avuavu
Lavu, Francisca	Buburua village
Lenda, John	Dova village
Naomi, Jessie	Sughu village
Nikawaka, Zacharia	Don Bosco Technical Institute, Honiara
Olivera, Matthew	Haimatua village
Palatoga, Olive	Haimatua village
Paslisu, Maysalyn	Sughu village
Pastis, Ngomgot	Sughu village
Pesu, Reuben	Kolina village (plus 24 men, 24 women, 44 children at meeting)
Ramo, Jemuel	Temboka village (and family)
Seke, Dudley	Nguvia village
Soku, Dominic	Buburua village
Tabussasi, Waeta Ben	Premier, Guadalcanal Province, Honiara
Tangesia, Timothy	Lathi village
Tara, Volan	Dova village
To'orumae, Joseph	Chief Field Officer, Guadalcanal Province, Honiara
Toma, Greenta	Provincial Coordinator, CPRF, Guadalcanal Province, Honiara
Tovulava, Silverio	Buburua village (and six other villagers)
Tsumia, Walter	Dova village
Uro, Eliza	Provincial member, Visale area (and 55 other villagers)
Varakia, Ridley	Nguvia village
Veke, Michael	Lathi village



4 Isabel Province

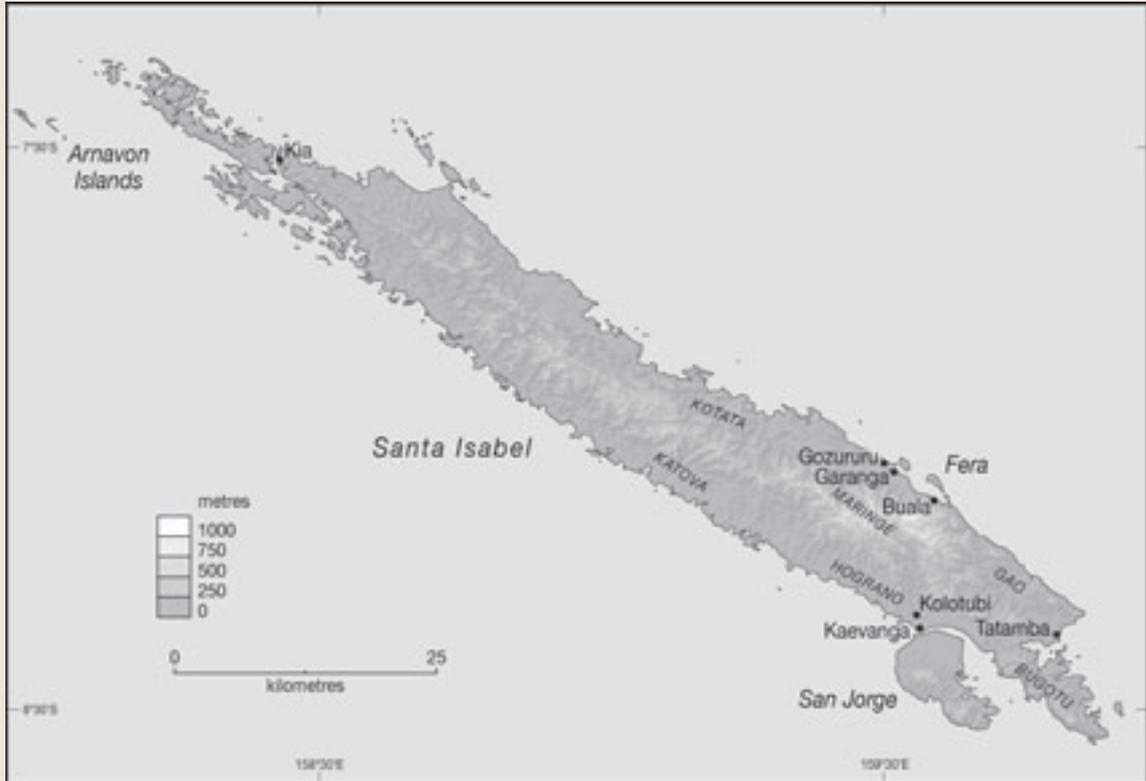


Figure 4.1 Isabel Province

4 Isabel Province

4.1 SUMMARY

The province of Isabel (see Figure 4.1) is predominantly rugged and mountainous, and the lack of roads is a major constraint to development of its main areas (including Santa Isabel and San Jorge islands, the islands of the western part (Kia), and the Arnavon and Ramos island groups). The people live predominantly on the coastal fringes, with the exception of Hograno and Maringe districts where there are inland villages. They are engaged in subsistence farming, with sweet potato and taro as the main staple foods. Copra is the primary source of cash income, although wages, cocoa, fish, livestock, small-scale sawmilling, and logging royalties are locally important sources of cash.

The lack of market access, due to inadequate road infrastructure and insufficient ship loading facilities, is a major constraint to development. The Department of Agriculture and Livestock (DAL) extension program is under-resourced, and its lack of effective support for general agriculture is a further serious constraint.

There are local opportunities to support rural livelihoods through assistance to activities currently being undertaken in the province. These include supporting the renewal of copra and cocoa dryers, improving production from subsistence crops, developing improved subsistence-level and semi-commercial livestock production, and supporting village-level microprocessing of kava, and culinary

products from local foods. Benefits from these activities to most villagers will depend on access to information and markets, which will involve appropriate inputs from existing institutes like the Agricultural Extension Service, the rural training centres (RTCs) and locally active nongovernment organisations (NGOs), such as the Mothers' Union.

4.2 OVERVIEW OF FIELD VISITS

A team consisting of Morgan Wairiu (agricultural consultant, Honiara), Stav Zotalis (Regional Assistance Mission to Solomon Islands (RAMSI) Rural Livelihoods Adviser, Honiara) and Alice Pollard (gender, social and cultural issues specialist, Honiara) spent a week visiting Isabel Province in September 2004. The team was accompanied throughout by Ben Devi, and joined by Felistas Legunau at Buala; both are coordinators of the AusAID-funded Community Peace and Restoration Fund (CPRF) based in Isabel. Their support in arranging field visits and meetings is gratefully acknowledged. The team travelled by boat from Jejevo village in Katova district in the southwest, through Hograno, Gao/Bugotu districts, and on to Garanga RTC in Maringe/Kokota. At Hograno, the team travelled by road to meet with inland villagers and communities. The region within the Kia and Havulei (northwest and central eastern) part of Isabel was not visited. Information on these areas was obtained from interviews with Provincial Assembly and government staff, NGOs and local businessmen,

available literature and past provincial visits by one of the team members (Morgan Wairiu).

4.3 INTRODUCTION

The province of Isabel consists of the main island, Santa Isabel, San Jorge, many small islands in the western part (Kia), and the Arnavon groups and the Ramos to the east. The total land area is 4156 km². Santa Isabel consists mainly of steep-sided mountain ranges dissected by river valleys, which often contain alluvial flood plains. Mangrove and freshwater swamps are common in some areas. Most of the island is rugged and mountainous. The average annual rainfall is around 3000–4000 mm, with no dry months on average.

Soils are of volcanic origin and are of highly variable depth and fertility. In the interior of the island, soils range from moderately fertile to fertile, and are of slightly acid to neutral pH. Coral-derived calcareous soils occur along the coastal terraces and plains. The Land Resources Study conducted in 1974 reported that Isabel Province lacked significant areas of agricultural potential, the primary barrier to agriculture being the steep topography (Wall and Hansell 1974). The study recognised 90 km², or 2.3%, of the total land area on Isabel as being ‘agricultural opportunity areas’ (AOAs), suitable for agricultural development (see Table 4.1). It has been estimated that 87% of AOAs remain unused. The lack of roads leading to a wharf is a major constraint to development of these areas.

Isabel Province’s population at the time of the 1999 census was 20 421 people, living in 3336 households, with an average household size of 5.6 people (SIG 2002). The province accounts for 5% of the

country’s population. Forty-two per cent of the population are under 15 years of age, which makes the dependency ratio 46.4%. This means that 46.4% of the population are dependent on the remaining population for their economic needs. About 98% of the population live in villages, while only 2% live in Buala, the capital of the province.

The annual population growth rate from 1986 to 1999 was 2.6%, substantially lower than for the preceding decade, when the growth rate was 3.2%. At the current growth rate, the population will double in 25 years. The average population density for the province is five people per km², lower than the national average of 14.8 people per km². Population density is generally highest in readily accessible locations where basic services are provided. Gao/Bugotu and Maringe/Kokota districts have population densities of 13.9 people and 11.5 people per km², respectively, while Hograno/Kia/Havulei has 2.2 people per km².

The province’s population is almost exclusively located on the coastal fringes, except for Maringe and Hograno districts where there are inland villages. Housing is predominantly constructed from bush materials (87% of houses) and about 80% of the population is engaged in subsistence farming and fishing.

The Church of Melanesia (COM) is the dominant church on Isabel (98% of the population), with a small number of Seventh Day Adventists, a new Pentecostal church, and a Christian Revival Church (CRC) at Buala. The COM provides significant services to communities by way of schools, RTCs, trade stores, two-way radio communications and other facilities. In some cases, the churches are the regional centres for marketing.

Table 4.1 Agricultural opportunity areas, Isabel Province

NAME OF AOA AREA	AREA (KM ²)	LOCATION
Kilokaka	26	Hograno district
Susubona	21	Hograno district
Kaipito	16	Hograno district
Koisisi	16	Hograno district
Titiligama	10	Gao/Bugotu district

Source: Wall and Hansell 1974

4.4 LIVELIHOOD STRATEGIES

The livelihood strategy based on subsistence production of sweet potato and taro is prevalent throughout much of the province. A wide range of additional activities are undertaken to supplement the diet and provide cash income. Other crops, such as slippery cabbage, shallots, peanuts, tomatoes and leafy vegetables, are grown for home consumption, with surpluses sold at local markets. Copra production is the most widespread source of cash income, whereas other sources are situation specific. These include cocoa, chickens, pigs, sawn timber, coconut oil, betel nut, kava, honey and marine products.

Betel nut is widely grown by households for both domestic use and sale at the domestic market. In 1999, 78% of 3336 households were involved in production and marketing of betel nut. It is sold at almost all market outlets on Isabel. Prices at Kaevanga, Tataba and Buala markets range from \$0.10 to \$0.50 per fruit. Villagers from the Kolotubi area supply the Honiara market, where a 20-kg bag can be sold for around \$100 to \$150. Fresh ngali nut kernel is sold at local markets for \$1.00 per packet. Green coconuts are also sold regularly and pineapples are very popular at the markets when in season. For inland villages, kava is fast becoming an alternative income earner. Buyers at both Kolomola and Buala purchase kava stem chips for \$40 per kg and roots for \$30 per kg.

For those with cash income, consumption of store-bought food, such as rice, noodles, tea and flour-based products (biscuits, ring cake, buns), is often significant.

Apart from agricultural products, small handicrafts and locally woven mats made from pandanus leaves provide income to some communities. Surpluses from smallholder rice farms are also sold for cash in the villages.

In general, rural cash income is low for most people in Isabel, but is somewhat greater for those living near and in Buala, where people have access to wage incomes.

4.5 SUBSISTENCE FOOD PRODUCTION

Taro and sweet potato are the most important food crops in Isabel Province. According to the 1999 census, about 92% and 79%, respectively, of 3336 households produced taro and sweet potato for home consumption (SIG 2002). Taro varieties cultivated include kongkong taro (*Xanthosoma*), swamp taro (*Cyrtosperma*) and giant taro (*Alocasia*). Minor staple food crops are cassava (*Manihot esculenta*), pana (*Dioscorea esculenta*) and yam (*D. alata*). Other important food sources are coconut, fish, and other marine foods. Banana, slippery cabbage, Chinese cabbage and other vegetables such as beans, tomatoes, eggplants and shallots are also grown. Exotic leafy vegetables, such as pak choi, are rarely grown because seeds are not available. The main local green vegetable grown is slippery cabbage, which is being severely attacked by insect pests. The most common food-producing trees are ngali nut (*Canarium* sp) and cutnut (*Barringtonia procera*). Ngali nuts are readily available, but are seasonal and are harvested once a year. Fruits such as mangoes, pineapples, oranges and local apples are in good supply but are also seasonal. The seasonality of these crops strongly affects the family's meals. When these fruits are not in season, family nutrition and health suffer. Imported rice and flour-based foods and local canned tuna are significant in the diets of some villagers.

Land use is very intensive in the vicinity of Buala and around the Maringe district because of the very limited flat coastal land. Fallow vegetation is generally low, woody regrowth, with the highest shrubs no higher than four to five metres. Fallow periods range from one year or less in villages around Buala to two to four years in Kolomola. Typically, people produce two crops of sweet potato before land is fallowed. Around Buala, population growth has resulted in shortened fallow periods and extension of the cropping period, with a consequent decline in soil fertility and drop in crop yield. On the fertile alluvial flood plains of the Kolotubi area, years of continuous sweet potato cultivation have not affected yields.

Natural events, such as high, prolonged rainfall, and floods, can have a great impact on yield and overall production in food gardens. A recent flood

(a few days before the team's visit) at Kilokaka had caused considerable damage to food crops. Heavy commercial logging, causing excessive run-off from the steep slopes, may have exacerbated the severity of floods in this area. There are reported to be a number of major pest and disease problems, causing damage to sweet potato and taro tubers and the leaves of slippery cabbage.

Firewood is obtained from land under fallow, and regrowth under coconut plantations.

Rice is becoming an important food in most rural households, and thus smallholder rice growing is being promoted through the Republic of China (Taiwan) (ROC) Agriculture Technical Mission. However, production is heavily subsidised, requiring external inputs, including direct funds for agricultural extension staff visits, equipment and seed, fertiliser, chemicals and milling machinery. Rice mills in Isabel are located at Buala and Kaevanga. The rice is generally consumed within the producing households and surplus is sold locally. The rice crop is increasingly subject to insect attack, especially during the second and third crops. The dependence on external inputs (chemical, mechanical and technical) makes it difficult for most smallholder rice growers in Isabel to maintain their production. Substantial resources have been directed at rice production for the last six years.

The Isabel Development Authority (IDA), the business arm of the Isabel Provincial Government, operates an 8.7-hectare commercial rice farm at Garanga, with ROC assistance (\$20 000 operating capital, fertiliser, chemicals and threshing machine). This farm is the only fully operational commercial rice farm in the country. Due to low yields (one tonne per hectare) and high labour costs, it is making a loss. The management has scaled down operations to a few rice blocks, and most of the rest has reverted to bush. Despite this setback, IDA management is still keen to grow rice to use its husk (rice bran) as a source of feed for its proposed small livestock enterprise. No economic analysis has been carried out, and it is doubtful whether this use of locally formulated feed will be economical.

The main constraints to subsistence food production include:

- > limited flat land so that most gardening takes place on marginal steep lands (soil fertility problems)
- > pests and diseases (eg insect damage to slippery cabbage, and taro beetle damage to taro corms)
- > distance to gardens
- > use of old or traditional tools (digging sticks) because of nonavailability of modern hand tools like hoes and mattocks
- > lack of improved crop planting materials.

4.6 DOMESTICALLY MARKETED FOOD, FISH, FIREWOOD AND BETEL NUT

Three formal markets exist on Isabel: at Buala, Kaevanga and Tataba, all situated along the coast at the main ports of call of MV *Isabella*.

Primary products sold at the Buala market, in decreasing order of volume, were sweet potato (several varieties), taro (several varieties), banana, bread (as buns), shallots, ngali nuts, tomatoes, green coconut and melons. Approximately 12 vendors sell at the market, which is conducted six days a week (not Sundays). On days where MV *Isabella* calls at Buala, which is usually twice each week, the number of market vendors can increase to 40–50 vendors. Chickens and pigs were reported to be sold irregularly. Fishermen sell skipjack tuna and other reef fish on a daily basis to two fish retail outlets in Buala.

Kaevanga and Tataba markets operate on a weekly basis and rely on selling produce to passengers travelling on MV *Isabella*. Produce sold at these markets is similar to that sold at Buala.

Several villages reported conducting informal markets for the sale of produce, although the markets suffer from a lack of cash within the purchasing communities.

Some local food products, including fruits and vegetables, are sold at logging camp markets. Fish and shells are also sold at these markets. Most camps allocate two days a week for villagers to bring their produce. Box 4.1 shows how these markets have been used by one villager.

BOX 4.1 CLARE AT THE LOGGING CAMP MARKETS

Clare is from Furona in Katova District. She spends most of her time gardening, and at times has surplus garden produce. Previously, she found it difficult to sell the surplus because of limited domestic markets. This situation changed when logging companies came to Katova and Hograno districts. Although Clare does not support logging, the markets at the logging camps allow her an opportunity to sell her garden produce and fish, so she can earn enough income to meet her immediate needs, such as school fees, soap, kerosene and clothes. She sells sweet potato and cassava pudding, fresh fish, and fruits, such as guava, carambola, malay apple and sugarcane. She also weaves mats to sell. There are two logging camp markets at Gorighole and Zazao, and she goes to them on Wednesdays and Saturdays. Sometimes Clare's husband accompanies her to the market to help paddle the canoe and sell their produce. On days when fewer vendors come to the market, she can earn \$100–300, but when there are more market vendors, she earns about \$50–80.

Pigs and chickens are sold irregularly through formal markets wherever they exist, and informally between individuals, throughout Isabel. Stock is usually sold live, but occasionally pigs are slaughtered and sold as meat. Local weaner pigs sell for about \$100 each. Larger pigs sell for up to \$300 each. Local chickens sell for around \$15–20 each. Naturally, chickens and pigs are also used for household consumption.

Marketing garden produce has become an economic activity used to earn additional cash for meeting basic household needs. While there is a need for cash in the rural communities, cash is not identified as a necessity for survival. It is seen as a means to provide basic requirements, such as school fees, kerosene or soap, or food such as tea, rice, sugar, noodles, tinned fish or meat and some local foods and fish. Cash also allows some families to build permanent (iron-roofed) homes and purchase motorised canoes. Introduction to cash is also slowly opening up women's skills in the art of marketing. Isabel women have lacked confidence in marketing, which is often associated

with public shame. Marketing at the limited outlets available in Isabel is seen as an empowering tool, helping to shift women's mindset from the private domain to include the public domain as well.

4.7 VILLAGE CASH CROPPING

4.7.1 COPRA AND COCONUT OIL

Copra is the most important source of cash income for rural coastal villagers. In 1999, income from copra was \$409 per Isabel household, ranking them third after Choiseul and Western provinces, where income was \$533–570 per household. Most (73%) of the total copra produced (1897.5 tonnes) was delivered by traditional or outboard motor canoes to Commodities Export Marketing Authority (CEMA) buying centres and points. The rest was transported by truck and other means. In 1999, about 74% of 3336 households harvested coconuts (mainly in the form of copra) for cash income. Copra production in Isabel almost stopped in 2001 and 2002 because of financial problems experienced by CEMA, and the impact of the ethnic tension, but production picked up again in 2003 after the national government privatised the copra industry. Production of copra in 2003 was 230 tonnes, up from a record low of 51 tonnes in 2001 (see Table 4.2). Most copra dryers were privately financed.

Not all nuts produced from current coconut stands in Isabel are processed into copra; some are used for subsistence food or animal feed or simply left to rot or grow wild. There is a surplus of coconuts available to sell for copra or oil production. Isabel Coconut Products Ltd (ICPL), which is owned by the Isabel Development Authority (IDA) and CEMA operated a copra-crushing mill at Gozururu plantation from March 1999 to February 2001, processing 80 tonnes of copra a month. It crushed CEMA's copra on credit and sold the oil to Russell Islands Plantation Estate Ltd (RIPEL) at Yandina. Because of its cash flow problem, CEMA was not able to purchase any more copra for ICPL to crush. ICPL did not have its own capital to purchase copra when CEMA stopped and, as a result, it stopped crushing copra. The crushing mill is still well maintained and, once copra is available, it will resume operation.

4.7.2 COCOA

Cocoa is another important source of cash income for villagers, mainly in cocoa-producing areas, such as Kia, Baolo, Kolomola, Kolotubi, Susubona and Samasodu. In 1999, around 47 tonnes of cocoa were produced. In 2000, cocoa production dropped because of low prices, the ethnic tension and poor shipping. A price increase in 2002–03 resulted in increased production. There are a number of fermentaries in areas where cocoa production is high, mostly owned by smallholders. It was evident that there is considerable interest in cocoa production as a result of the high prices in recent years, although new cocoa plantings and rehabilitation of existing stands are needed.

Some cocoa stands seen in the Kolotubi and Kolomola areas are in poor condition, and there is little evidence of replanting. Many blocks require rehabilitation. Tasks include removing undergrowth, improving shade management, pruning, and replacing dead trees. Much of the existing stock seems to be old and in need of replanting.

There is potential to expand cocoa production on Isabel. However, the high rainfall of over 3000 mm per year means that production will always be limited by disease and other problems.

4.7.3 HONEYBEES

The Solomon Islands (SI) honey industry increased from about 300 hives in the early 1990s to 2500–3000 hives by 1996–97. The number of hives declined during the ethnic tension, but has been building up, with the support of two Canadian University Service Overseas volunteers based in Auki, after the United Nations Development Programme (UNDP) supported two workshops on honey production in Isabel. The total number of hives in the province is not known, but honey provides a modest income to a number of households in Isabel.

4.7.4 KAVA

Kava is fast becoming an alternative income earner. Buyers at both Kolomola and Buala purchase kava stem chips for \$40 per kg and roots for \$30 per kg. Kava is sold locally at both Buala and Honiara. Box 4.2 gives some examples of the way in which kava production is developing.

BOX 4.2 GIDEON'S 'SOLO POPULAR KAVA' PRODUCT

Gideon operates a small kava processing and packaging unit at Kolomola. With a small amount of financial support from his brother in Honiara and the Member of Parliament for his constituency, he went on a one-week work attachment to 'World Popular Kava' in Fiji. With his newly acquired skills and knowledge of kava mixing and packaging, he set up his processing unit 'Solo Popular Kava', in 2003. At first he did not have the capital to buy kava from other growers, so he processed his own, from his garden, using family labour. Now he is buying from other growers at \$40 per kg for stem chips and \$30 per kg for roots. His sale of processed kava is steadily increasing, especially at the Honiara market. He supplies 200 packets (20 kg) per week, by MV *Isabella*, to Honiara. His retail outlet in Honiara is Hograno Rural Development Enterprises. Recently, he has received requests from six other retail outlets in Honiara to supply them.

Lucy Bola, a teenage schoolgirl from Baloala village, Kolomola, told the visiting team that she had just sold her kava stem chips and roots to 'Solo Popular Kava', and got \$200. She is excited and is going to expand her backyard kava plot after school hours.

Table 4.2 Smallholder and plantation copra production (tonnes), Isabel, 1994–2003

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Smallholder	1672	1854	1497	1158	2360	1892	1597	51.4	100	230
Plantation	277	137	171	54	292	117	89	0	0	0

Source: CEMA records

4.8 PLANTATION CASH CROPS

All plantations have been returned to control of the Isabel Provincial Government, but they are given little attention. The only managed plantation is the coconut and cocoa plantation at Gozururu, which the Provincial Government has transferred to IDA management. IDA is now producing copra, and rehabilitating 34 hectares of cocoa plantings. From February to September 2004, IDA produced around 49 tonnes of copra for sale at Honiara.

4.9 SMALL-SCALE FORESTRY

Small-scale sawmilling, using chainsaw mills, is currently common in most regions around Isabel, but can be short lived. Only rosewood (*Pterocarpus indica*) is purchased by buyers, and the resource is limited and already fully exploited in some areas. The timber can only be milled within the immediate vicinity of the beach, as it must be carried there by hand for transportation. Shipping milled timber is difficult from all but the best cargo loading sites.

Kolomola community planted 37 hectares of mahogany (*Swietenia macrophylla*) in the early 1990s, but growth has been suppressed by vines and shrubs because of a lack of regular maintenance. There is also a growing interest in teak (*Tectona grandis*), as a result of high teak prices on the international market. Kilokaka community has planted 1000 teak trees, with assistance from the Foundation for the People of the South Pacific International/Solomon Islands Development Trust ecoforestry unit, and is interested in planting more. However, there has been no proper market analysis, or consideration of the logistics required to transport the teak logs or timber.

4.10 LIVESTOCK

With the exception of a few communities of Seventh Day Adventist faith, most families on Isabel keep pigs. The 1999 census showed that 59% of Isabel households did so (SIG 2002). Numbers kept vary from village to village, and range from 1 to 20, but 3–6 pigs per household is most common. Pigs have customary significance and are used for important feasts and payment of debts. Pigs are also sold within and between communities. Pigs were traditionally kept in bamboo-walled pens, but today many pigs forage freely. This creates disputes, as pigs invariably damage gardens. Assistance with resources, such as fencing wire, and technical training in basic husbandry are required to improve piggery management. Traditionally, pigs are fed coconuts, food scraps and garden waste. A diet high in coconuts, and lacking high-quality protein, often results in over-fat native pigs.

In the past, there were a number of cattle herds on some plantations, including Gozururu. Despite strong donor support for this industry in the past, it has not been successful because of the absence of infrastructure, the lack of market access, and the lack of skills in cattle husbandry and management among local farmers.

Chickens are kept by almost all households, mainly for domestic consumption, but sometimes for sale. Many chickens forage freely and are not well fed and, as a result, their growth rate is slow. Recent donor support, especially from European Union (EU) Micro Projects, has funded about eight broiler and layer projects in the province. Day-old chickens and feed have to be purchased from Honiara, making it a very costly income-generating activity. Some broiler projects in the past have failed because of high feed and transport costs, and the inability of the local

market to absorb whole batches when they reach six weeks of age. Additional feeding after six weeks incurs extra costs to the farmer.

4.11 SOCIAL AND CULTURAL ISSUES

In Isabel, women dominate the gardening domain. They are responsible for food production, as well as firewood collection, family chores, childcare, community work, income generation, Mothers' Union activities and church activities. The women's role in agriculture includes all processes from selecting a suitable site for gardening to searching for forest vegetables and preparing food. Women also search the coastal reefs and mangroves for marine resources.

Women and men jointly participate in some cash-generating activities, especially in copra making; rice farming; and cocoa, coffee, kava, and betel nut production. The women's participation in the cash economy has come about in response to the increasing demands for school fees and other basic needs that have to be met by cash. The workload of women has increased, as they are now responsible for both subsistence and cash-generating agriculture. At the same time, the men's load has decreased.

While the introduction of cash cropping and development have led to some negative impacts on the livelihood of the rural people, cash also provides benefits. These include the ability to meet the family's basic needs, especially school fees, household utensils, kerosene, soap, improved housing, transport and health. Cash also contributes to communal projects, such as church and community activities, including the building of churches, community halls and Mothers' Union halls. It also enables the community to upgrade school and health facilities. Access to cash provides food security in both the short and long terms particularly during times of natural disasters and poor crop yields.

4.12 SUPPORT FRAMEWORK FOR AGRICULTURE

Overall, the support framework for agriculture in Isabel is poor. Virtually no information or support is provided by DAL staff, and there was a general sense that even trying to get any help was a waste of scarce money for transport to Buala.

There are 10 DAL extension field staff in the province (nine men and one woman). Four officers are based at Buala, while the rest are stationed around the province. There is no government support for DAL staff in the province, except for payment of their salaries. Currently, they are only involved in donor-funded activities: the ROC-funded rice/vegetable program; EU Micro Project-funded agriculture projects; and, recently, CPRF copra and cocoa dryers. Extension officers provide technical assistance to rice growers and monitor EU Micro Projects. They also assist in dryer design for CPRF-funded copra and cocoa dryer recipients. Staff will only visit farmers if they have fuel and are paid a travel allowance, and when these are not available, staff only travel to villagers to visit donor-funded projects.

The Women in Agriculture Extension Service Program, funded under the New Zealand Agency for International Development, lapsed in 1998. During the period of its operation, Isabel women received agriculture training in the areas of vegetable and fruit growing and marketing. The training programs improved the vegetable component of family diets, and built confidence in the area of marketing, allowing women to participate in the public domain.

Two RTCs in Isabel, Kolaero and Garanga, teach life skills (including English and mathematics) and agriculture, and Garanga also teaches mechanics and carpentry. Garanga is mostly supported by student fees, the COM, provincial government grants, and EU funding through the Solomon Islands Association of Rural Training Centres (SIARTC). Kolaero is new (two years old) and is solely supported by COM. The RTCs vary in their capacity, but overall they are a potential valuable resource for training, for distribution of planting material, and as buying centres. They need help with generating income from agriculture, with food production for students, and with upgrading the skills and knowledge of teaching staff.

4.13 COMMERCIAL ENTERPRISES

Nine commercial logging companies operate in Isabel. The provincial business licence fee for logging is \$100 000 per year (most fees had not been collected in 2004), and small royalties are paid to the owners of the logged land. In 2000, Isabel was the second largest exporter of logs, after Western Province, with an export volume of 111 070 cubic metres, valued at US\$8 372 103 and representing 21% of national logging revenue.

An agent for the National Bank of Solomon Islands (NBSI) is available at Buala, but deposits are low, and cash is often not available for withdrawals. In the absence of banking facilities in the rural areas, rural saving scheme initiatives, such as cooperatives and credit unions, have been identified as alternatives. A total of 25 credit unions were operating, but most have failed. Success stories, such as the Kolutubi Co-operative Society and the Savings Club (canteen) in the Buala community, prove that such schemes could work in the community with the right attitude and good management. Titus Vuru of the office of the Diocese of Isabel confirmed that women are the main active supporters of saving schemes. He reiterated that the motto 'To save rather than to loan' should be the key message for the rural communities and that many credit unions have failed because of management problems and emphasis on loans rather than savings. People joined the schemes to obtain loans rather than to save money.

The Mothers' Union of the Diocese of Isabel and the Provincial Government operate rest houses at Buala.

4.14 TRANSPORT AND TELECOMMUNICATIONS

There is a total of 113 km of roads in Isabel Province, 87 km of which are in the Hograno/Kia/Havulei district (70 km are logging roads), 3 km in Allardyse, 6 km in Susubona, and 17 km in Kolotubi. The potentially productive land is in Kilokaka, Kaipito, Koisisi and Titiligama and is not served by any roads. Poor infrastructure, such as lack of proper roads, wharves, marketing facilities and regular shipping, make marketing difficult. The weekly shipping service provided by the MV *Isabella* is inadequate to carry the marketable resources produced in Isabel.

The MV *Isabella* operates a weekly service, but its capacity is very limited. It travels three routes each week: Honiara–Buala–Kaevanga–Buala–Honiara; Honiara–Kaevanga–Buala–Honiara; and Honiara–Kia–Honiara. All trips originate from Honiara. Commercial cargo vessels visit other parts of the province irregularly, but producers cannot rely on this service. Ships are often chartered for specific trips, such as fuel deliveries. Wharves and jetties are located at Buala, Tataba, Kia, Kaevanga and Susubona.

Solomon Airlines operates a twice-weekly service to Fera airstrip at Buala on Mondays and Thursdays. With only two planes in its current fleet, the flights are rarely on schedule, and there are frequent cancellations. This is very difficult for the travelling public, especially those doing business.

Several government and NGO offices and private businesses in Buala have telephones and email. Solomon Telekom installed public phones in certain areas around Buala, and provides a fax service for the public. The UNDP project is in the process of establishing limited email facilities for the public on a user-pays system. Sigana village has a People First Network (PFN) rural email station. A large number of two-way high-frequency radios operate at schools, churches and missions, RTCs, and agriculture extension officer locations across the province.

4.15 PREVIOUS EXPERIENCE WITH AGRICULTURAL DEVELOPMENT

There has been considerable experience with agricultural development over many decades in Isabel. In particular, there has been support for copra and cocoa production, which has been generally successful, and for cattle raising, which has not.

The Smallholder Development Programme (SDP) and the Farmer Support Programme (FSP), financed by EU STABEX funds, previously provided financial support to the provincial DAL extension service, with budgetary, logistical and training support. The programs also provided direct support, with labour subsidy, tools, fertilisers and dryer parts provided to village producers. When the funding ceased in 2000, the extension support from DAL also ceased.

The copra oil mill at Gozururu, which was owned by IDA and CEMA, ceased operation in February 2001.

The AusAID-funded CPRF operates from Buala. It provides funding for a range of community services, including schools, clinics and water supply. The main input into agriculture has been funding of 15 copra dryers. The CPRF staff have received assistance from DAL extension staff in identifying recipients, and designing and costing dryers. The CPRF provides an excellent vehicle for support for agriculture in the province, provided specialist technical assistance is provided to support field staff. One possible source of expertise is DAL extension staff.

4.16 OPPORTUNITIES FOR RURAL LIVELIHOODS DEVELOPMENT

The lack of regular and reliable transport services is perhaps the most significant barrier to development in the province. The road system is poorly developed. Sea transport is available, but is expensive. Improvement in the transport system would facilitate getting all produce to existing markets in Isabel and Honiara.

Other ways in which agricultural development could be supported include:

- > improving food security by providing advice on pest and disease control, halting declining soil fertility and declining garden yields, and supplying improved planting materials
- > rehabilitating and replanting cocoa trees, and providing copra and cocoa dryers
- > assisting the production of copra and direct micro-expelled coconut oil
- > providing technical assistance for developing improved subsistence-level and semicommercial livestock production, particularly local pig and chicken production and distribution
- > providing advice to villagers on production, packaging, transport and marketing of fresh food for sale locally, and support for processing of foods and kava
- > upgrading facilities at the Kaevanga, Tatamba and Buala town markets

- > training and building the confidence of women in the arts of marketing and business development and management
- > providing support for the RTCs: financial; to train teaching staff; and to support graduates conducting hands-on training in their villages and undertaking income-generating agriculture activities
- > providing housing for DAL extension staff at appropriate locations in the province and providing fuel and allowances for farm visits (currently five officers have no housing and are living in their home villages).

Village-based farmers were uniformly of the opinion that aid should be delivered to individual families rather than community groups, with care taken to select appropriate beneficiaries; aid should not pass through national and provincial government systems; and it should be delivered as small-scale assistance over an extended timeframe rather than as large-input, short-term projects.

4.17 WRITTEN SOURCES OF INFORMATION

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4.18 PEOPLE CONSULTED

Auzare, Antusa	Butterfly farmer, Kilokaka
Auzare, Thompson	Chairman Kilokaka Village Committee and Zazao Environment Resources Organisation
Bola, Lucy	Baloala village, Kolomola
Daoleni, Hon Dick	Jejevo village representative and also provincial member (Katova)
Devi, Ben	Provincial Coordinator, CPRF, Isabel
Ene, Edson	Provincial Secretary, Isabel Provincial Assembly
Habu, Hon James	Premier, Isabel Provincial Assembly
Hokoto, Janet	Women's Agriculture Extension Officer, Buala
Kale, Gideon	Manager, Solo Popular Kava, Kolomola
Leguhavi, Hon Jason	Provincial Member, Kolomola
Legunau, Felistas	Provincial Coordinator, CPRF, Isabel
Longamei, Michael	Manager, Kolotubi Cooperative Society, Kolotubi
Marau, Henry	UNDP Project Chiefs Desk Officer
Mazini, Dudley	UNDP Project Sustainable Livelihood Officer
Nindi, Alex	Copra buyer, Buala
Pryor, William	UNDP project coordinator, Buala
Saenemua, Annie	Provincial President, Mothers' Union
Sikapu, Andy	IDA Agriculture project coordinator and ICPL mill manager, IDA, Buala
Supa, Leslie	Village Chief, Kilokaka
Tewani, James	Chief Field Officer, Agricultural Extension, Department of Agriculture and Livestock, Buala
Tugunau, Hon Peter	Provincial Minister for Agriculture and Poro community
Vahimana, Hezekiah	Field Officer, Agriculture Extension, Department of Agriculture and Livestock, Kolomola
Vuru, Titus	Credit Union representative and Savings Club, Buala

COMMUNITY MEETINGS

Jejevo Village

Jejevo Community Village, Katova district (40 men and women, including youth)

Members of the Diocese of Isabel Mothers' Union (80 women)

Kilokaka Village

Kilokaka Community (8 men and 10 women)

Kolaero RTC, Susubona

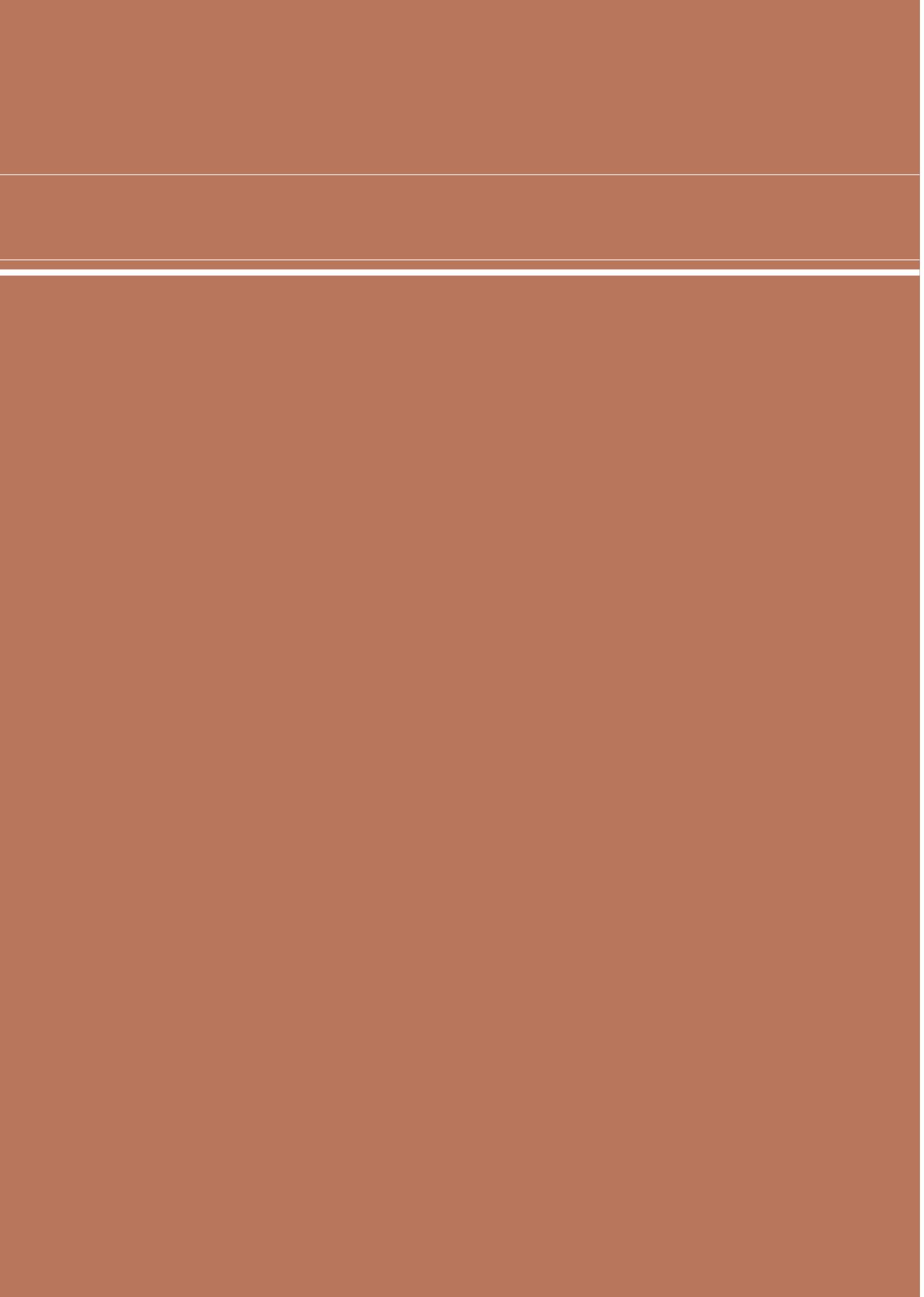
Fr Maneghehe Hugo, Principal
Mrs Maneghehe, Teaching Staff
Students (3 male and 12 female)

Kolotubi Village

Kolotubi Community

Garanga RTC

Pogo Albert Snr, Principal
Pogo Albert Jnr, Mechanic teacher



5 Makira/Ulawa Province



Figure 5.1 Makira/Ulawa Province

5 Makira/Ulawa Province

5.1 SUMMARY

The province of Makira/Ulawa (see Figure 5.1) comprises nine islands with a total land area of 3230 km². Makira, formerly known as San Cristobal, is the largest island, covering approximately 3100 km². The province has significant areas of land with agricultural potential, but remains largely undeveloped. The people live predominantly on the coastal fringe and are engaged in subsistence farming, with sweet potato and bananas as the staple foods. Copra is the primary source of cash income. Wages, cocoa, fish, livestock, microprocessing, small-scale sawmilling, remittances and logging royalties are locally important sources of cash.

Lack of market access, due to inadequate road infrastructure and insufficient ship loading facilities, is a major constraint to development. The limited ability of the Department of Agriculture and Livestock (DAL) to support general agriculture, due to funding shortages, is a further serious constraint. There are local opportunities to support rural livelihoods through assistance to activities currently being undertaken in the province. These include support for renewal of copra and cocoa dryers, improved production from subsistence crops, development of improved subsistence-level and semi-commercial livestock production, and support for village-level microprocessing operations involving production of virgin coconut oil, ngali nut products, and culinary products from local foods. The equity with which benefits can be delivered will depend

on access to information and markets. While roads, bridges, wharves and shipping are beyond the scope of the current investigation, interventions to improve regular information delivery can be developed. These should involve appropriate inputs from the Agricultural Extension Service, the rural training centres (RTCs) and locally active nongovernment organisations (NGOs).

5.2 OVERVIEW OF FIELD VISITS

A team consisting of Morgan Wairiu (agricultural consultant, Honiara), Ben Mullen (livestock consultant, Brisbane) and Ellen Iramu (DAL agricultural scientist, Honiara) spent a week visiting Makira/Ulawa Province in September 2004. The team was accompanied throughout by Evalyn Kahia and Harold Parisuri, coordinators from the AusAID-funded Community Peace and Restoration Fund (CPRF), based in Kirakira. Their support in arranging field visits and meetings is gratefully acknowledged. The team was based in Kirakira and travelled by road to communities and institutions in the immediate vicinity and as far as Waimapuru, and by boat as far as Marou Bay in the northwest, and to Manivovo in the southeast. Apart from the southeastern end, the southern coast was not visited. Nor were the islands of Ulawa, Ugi and Three Sisters (Olu malau), Santa Ana and Catalina, and other small islands that are included in the province. Information on these areas was obtained from interviews with Provincial Assembly and government

staff, NGOs and local businessmen. The report from a recent DAL mission was used to provide information for Santa Ana Island.

5.3 INTRODUCTION

The province of Makira/Ulawa comprises nine islands with a total land area of 3230 km². The largest island, Makira (formerly known as San Cristobal), is 140 km long and between 12 and 40 km wide, and has a northwest–southeast orientation. Makira consists of a narrow coastal plain leading up to undulating hills and occasional terraces and, ultimately, steep central ridges that run the length of the island with elevations of up to 1200 m. Ulawa is the second largest island in the province, with a land area of 65 km². The islands of Ugi, Pio, Three Sisters, Santa Ana and Santa Catalina cover a combined area of about 85 km².

The average annual rainfall is 3600–4000 mm, with no dry months. There is a tendency towards higher monthly rainfall from May to October in the southeast, and from November to April in the west of Makira, whereas the central region around Kirakira has high rainfall throughout the year. Up to 8000 mm of annual rainfall is reported in the mountainous regions of the southeast. There are approximately 20 major river systems, the majority and largest of which flow north.

Soils are highly variable in depth and fertility. In the interior of the island, soils range from moderately fertile to fertile, and are of slightly acid to neutral pH, whereas coral-derived calcareous soils occur along the coastal terraces and plains. Smaller islands are coral atolls, sometimes with central volcanic uplifts. Freshwater swamps occur along the lower reaches of several of the major river systems. The Star Harbour

region has extensive areas of saltwater lagoons, with mangroves as the dominant vegetation.

The Land Resources Study, conducted in 1974, reported that Makira Island was lacking in significant areas of agricultural potential (Wall and Hansell 1974). The primary barrier to agricultural potential was the steep topography. Erosion is a continuous process on these slopes, both under crops and in natural forest systems. There is some argument that erosion processes should not be checked, as weathered topsoil is removed and this exposes less-weathered, more fertile, subsoil. However, as fallow periods become increasingly shorter, the need to reduce erosion becomes greater. Terracing, retaining of contoured forest strips and other measures to prevent land slips and surface wash should be undertaken to prevent eventual exposure of bedrock.

The Land Resources Study identified 200 km², or 6.5% of the total land area in Makira Province, as being ‘agricultural opportunity areas’ (AOAs), suitable for agricultural development. These AOAs are the Hada and Heuru land systems in the northwest of the island, with 97 and 73 km² of land area, respectively, and the Harigha land system in the southeast, with 30 km² land area. The western side of Ulawa Island has 28 km² of AOAs, mainly suitable for coconut palms because of limited soil depth and highly calcareous soils. Many small areas of agricultural potential exist along the river basins and on dissected plateaux on Makira Island, but these were omitted from the original analysis because of their small size. The Agriculture Division of the Ministry of Planning increased the AOAs to include these areas of Makira Island (see Table 5.1). The Heuru and Arosi plateaux are reportedly ideal for onion production, and today a range of vegetable and nut crops are grown, including peanuts, shallots,

Table 5.1 Agricultural opportunity areas, as amended by Makira/Ulawa Province Agriculture Division, 1980

AGRICULTURE REGIONS	AGRICULTURAL OPPORTUNITY AREAS
Arosi (west Makira)	Heuru, Hada and Arosi plateaux, and Wainaraha basin
Bauro (central Makira)	Aupare, Waihara, Waihaoru, Maghona and Ravo basins
Wainoni East (north-central Makira)	Wau and Warihito basins
Star Harbour (northeast Makira)	Nanutu, Wairaha, Harigha and Matangarighi basins
Ulawa Island	Haraina plateau

Table 5.2 Land area and population density by island, Makira/Ulawa, 1976 and 1999

ISLAND	LAND AREA	POPULATION DENSITY 1976 (PEOPLE/KM ²)	POPULATION DENSITY 1999 (PEOPLE/KM ²)
Makira/Three Sisters	3100	3.6	7.9
Ulawa	65	28.6	43.3
Ugi/Pio	42	13.3	29.1
Santa Ana	12	66.6 ^a	119.5
Santa Catalina	6	66.6 ^a	145.4
Total	3224	4.6	10.0

Source: Wall and Hansell (1974)

^a Figures for Santa Ana and Santa Catalina were not separated in 1976

cucumbers and melons. The lack of a wharf, and road infrastructure leading to a wharf, are major constraints to development of these areas.

The population of Makira/Ulawa Province is predominantly Melanesian, with a small population of Polynesians (1.7% of the population) that migrated from overpopulated Tikopia to West Bauro in the early 1970s. The ingress of people from other islands of Solomon Islands (SI) is common along the north coast, and has occurred through intermarriage. Out-migration to Honiara and elsewhere is particularly prevalent from the densely populated Santa Ana and Santa Catalina islands.

The Makira/Ulawa provincial population at the time of the 1999 census was 31 000 people, living in 4926 predominantly single-family (98.6%) households (SIG 2002). The province accounts for 7.7% of the country's population. Forty-two per cent of the population is under 15 years of age. The annual population growth rate from 1986 to 1996 was 2.8%, substantially lower than for the preceding decade, when the growth rate was 3.6%. By extrapolation, the current population (2004) would be 35 600 people and will double every 25 years.

The average population density for the province is 10 people per km², lower than the national average of 14.8 people per km². Exceptions are the small islands of Santa Ana and Santa Catalina, where land area is under considerable pressure (see Table 5.2). Population density is generally highest in readily accessible locations where services are well provided. For example, density in the Central Bauro ward, which includes the provincial capital of Kirakira, is 64 people per km², whereas population density

at Star Harbour South in the remote southeast is 0.2 people per km².

Throughout the nine islands of the province, the population is almost exclusively located on the coastal fringe. Exceptions occur on Makira, where a few isolated villages are established on the leeward side of the central area, where arable land does not exist on the coast. Population is also concentrated on the northern side of Makira Island.

Housing is predominantly constructed from bush materials (87% of houses), and about 80% of the population is engaged in subsistence farming and fishing.

The Christian faith is followed by most people in the province, with the Church of Melanesia (COM) (48.4%), the South Seas Evangelical Church (24.7%) and the Roman Catholic Church (21.1%) being the dominant churches. The Seventh Day Adventist Church is followed by several villages in the Arosi area. The churches provide significant services to their communities in the form of schools, RTCs, trade stores, two-way radio communications and other facilities. In some cases, the churches become regional centres of marketing.

5.4 LIVELIHOOD STRATEGIES

There are three basic livelihood strategies used in Makira/Ulawa Province, based on sweet potato and bananas, remittance income and fish, and cash from wages.

The livelihood strategy for the predominant rural population of Makira is based on subsistence production of sweet potato and banana. Banana

production reduces the risk of food shortages in very wet years when sweet potato crops fail. Crops such as slippery cabbage, shallots, peanuts, tomatoes and leafy vegetables are also grown for home consumption. Surplus foods are sold for cash at local markets. A wide range of additional activities is undertaken to provide further cash income. Copra production is the most widespread source of these, whereas other sources are situation specific. These include the sale of cocoa, chickens, pigs, microprocessed foods, sawn timber, ngali nut oil, coconut oil, betel nut, fish, bêche-de mer and trochus shell.

The livelihood strategy of the residents of Santa Ana and Santa Catalina islands is based primarily on remittance money from family members working in Honiara, for the purchase of rice and other foods from trade stores. Rice is supplemented with locally caught fish and subsistence vegetables. Additional activities to augment remittance money are similar to those listed above for the sweet potato and banana livelihood group.

A third livelihood strategy is that of the wage-earning households based around the provincial capital and substations. These households buy root crops, fish, meats and other items from their local markets, and rice, tinned fish, biscuits and luxury foods from trade stores. Commonly, some production of root crops, bananas, vegetable and tree crops is undertaken in the home garden, or in land close to the town.

5.5 SUBSISTENCE FOOD PRODUCTION

Sweet potato (*Ipomoea batatas*) and banana/plantain (*Musa spp*) are the most important food crops in the province, holding equal status as staples. Their cultivation dominates food gardens on Makira. In 1999, 96% and 95% of the province's households produced sweet potato and banana/plantain, respectively, for home consumption. Minor staple food crops are cassava (*Manihot esculenta*), pana (*Dioscorea esculenta*) yam (*D. alata*), kongkong taro (*Xanthosoma*), swamp taro (*Cyrtosperma chamissonis*) and giant taro (*Alocasia*). Other important food sources are coconuts, fish, and other marine foods. The main green vegetable grown is slippery cabbage (*Abelmoschus manihot*), but it is being severely

attacked by insect pests. Other leafy vegetables such as giant ferns, kasume and amau are harvested from the wild. The most common food-producing trees are ngali nut (*Canarium sp*), cutnut (*Barringtonia procera*), pawpaw, mango, breadfruit and Malay apple when in season. Betel nut and betel pepper are widely grown and consumed, or sold at the domestic market. Imported rice and flour-based foods are significant in the diets of some villagers.

Land use is quite intensive in the vicinity of Kirakira township in central Bauro, but is less intensive in other areas. The fallow vegetation is generally low, woody regrowth, with trees and shrubs growing to a maximum height of four to five metres. Typically, people harvest two crops of sweet potato before land is fallowed. Sweet potato is often intercropped with banana, either on the garden edges or at random throughout the plot. In some cases, banana is planted as the sole crop. Fallow periods range from one year or less in villages around Kirakira to two to four years in Marou Bay and Tawaroga. Around Kirakira, and on outlying islands (Santa Ana, Santa Catalina), population growth has resulted in shortening of the fallow period and extension of the cropping period, with consequent declines in soil fertility and crop yield. Reasonable yields of sweet potato and other crops were being maintained in other areas in Makira.

Natural events, such as prolonged periods of high rainfall and floods, can have a great impact on yield and overall production of food gardens. This situation occurred in east Makira in early 2004, and resulted in temporary shortages of root crops. Insect pests were reported to seriously damage sweet potato tubers and taro corms, and the leaves of slippery cabbage.

Firewood is in plentiful supply, and is obtained from land under fallow and regrowth under coconut plantations.

Rice is becoming an important food in most rural households, and smallholder rice growing is being promoted on Makira under the Republic of China (Taiwan) (ROC) Agriculture Mission. Production is, however, heavily subsidised with external inputs. Assistance to villagers takes the form of direct funds for technical support from agricultural extension

staff, equipment, seed, fertiliser, chemicals and milling machinery. Three rice mills are currently operating in Makira. The rice is generally consumed within the producing households and surplus is sold locally. The rice crop is increasingly subject to insect attack, especially during the second and third crops. The dependence on external inputs (chemical, mechanical and external technical inputs) makes it difficult for most smallholder rice growers in Makira to sustain their production. Substantial resources have been directed at rice production for the past six years. It is claimed that there are 30 hectares under rice cultivation, although the actual figure is likely to be much less, as many fields are fallow or producing rotational crops.

The main constraints to increased production of subsistence foods are:

- > limited flat land, so that most gardening takes place on marginal steep lands with soil fertility problems
- > pests and diseases (eg reducing yields of slippery cabbage and taro, and other crops)
- > declining yields, especially of sweet potato, on outlying islands and around Kirakira
- > distance to gardens, which increases travelling time and makes transporting produce difficult
- > use of inefficient tools (such as digging sticks) because of nonavailability of modern hand tools like hoes and mattocks
- > a lack of seed or vegetative material for production of vegetables, vanilla etc.

5.6 DOMESTICALLY MARKETED FOOD, FISH, FIREWOOD AND BETEL NUT

Three formal markets exist on Makira, all situated along the central part of the north coast. The major market is located at the provincial centre, Kirakira; a second is at the national secondary school at Waimapura, and a third is located at the RTC and secondary school at Pamua.

The primary products sold at the Kirakira market, in decreasing order of volume, were sweet potato (several varieties), cooking and ripe bananas (several varieties), bread (as buns), snake beans, shallots, ngali nuts and cutnuts, tomatoes, aubergine and

melons. Approximately 50 vendors were selling, and the market is conducted six days a week (not Sundays). At lunchtime, five to eight vendors sold cooked fish and sweet potato (fish and chips). Fisherman sold skipjack tuna, and occasionally reef fish, on most afternoons during the week. Chickens and pigs were reported to be sold irregularly.

Waimapura and Pamua markets operate on a weekly basis and rely on sales of produce to teachers and students at the Waimapura and Pamua schools. Produce sold at these markets is similar to that sold at Kirakira.

Several villagers reported conducting informal markets for the sale of produce, although these markets sometimes suffer from a lack of cash within the purchasing communities. One village in Star Harbour reported that their market had been disbanded during root crop shortages (due to excessively wet weather) earlier in the year and that the market had not reopened yet. Cash income from copra, cocoa and other commodities sold is the key to having these markets function effectively.

Although cash income from betel nut is lower than for copra and cocoa, betel nut is widely grown by households for both domestic use and sale at the domestic market. In 1999, 52% of households were involved in production and marketing of betel nut. There are no production data available, but it was evident that new planting and production is increasing. The domestic market for betel nut is also expanding, due to an increase in the number of people now chewing betel nut. Betel nut is sold at most informal and formal market outlets on Makira. Price at Kirakira market ranged from \$0.10 to \$0.50 per fruit depending on supply and demand. Betel nut is occasionally sold into the Honiara market where a 20-kg bag can be sold for \$100–150.

Shelled ngali nut and cutnut are sold at Kirakira market for \$1 per packet. When the Warihito nut press was operating, it purchased ngali nut fresh kernel for \$10 per kg from villagers in Bauro and Wainoni districts. The nut press stopped operation in 2002 because of lack of funds to purchase fresh kernels. Villagers from Tawaroga in Star Harbour often sell sago palm and rattan to Santa Ana and Santa Catalina villagers. Home tobacco (savusavu)

is becoming popular, and is sold in most markets and amongst villagers. A bundle of dried and rolled tobacco can be sold at Kirakira market for \$50.

LIVESTOCK MARKETING

Kirakira butchery was established in the 1990s by the provincial government. Since May 2004, Moses Oli, a young local entrepreneur, has leased the butchery, which had not been functioning for several years. During this period, there was no outlet for locally produced cattle, a factor contributing to the failure of the local beef industry.

Beef is the most prized meat, because it is the least available within the villages. Makira is known to produce good-quality beef, largely because of the ample supply of para grass pastures left from Livestock Development Authority days. There is a ready market for all classes of meat. The major problem is accessing cattle, as few are left in the area close to Kirakira. Currently, Moses travels up to 20 km to purchase stock. Cattle are killed and gutted on farm, and then taken in quarters to Kirakira for butchering.

Pigs are purchased at six months of age, predominantly from European Union (EU) project support recipients. Locally fed pigs yield poorly, being over-fat due to their predominantly coconut-based diet. There are now five piggeries in the area, not all fully operational yet. There may be an oversupply on the market once all of these come on line. There is a considerable market for live pigs, but the extent to which this will account for this extra production is unknown.

The processing of chickens through the butchery is done as a service more than as a commercial operation. Broilers are purchased from EU operations and sold as chicken pieces. Local chickens are often purchased in relatively large numbers (up to 50 chickens) from individual farmers wanting cash, and are sold frozen. Local broiler farmers are worried about the demand for their product, as the viability of their enterprises, which depend on imported chicks and feeds, declines rapidly if the birds have to be maintained beyond seven weeks.

The development of commercial livestock production on the island is likely to rest with the development of the butchery to supply meat into Honiara. This will require a boat with freezer capacity. Moses believes that a shipper will provide this service once sufficient demand exists. Negotiations are already under way with the slaughterhouse in Honiara to provide pork.

Pigs and chickens are sold irregularly through formal markets wherever they exist, and informally between individuals, throughout Makira. Stock are usually sold live, but occasionally pigs are slaughtered and sold as meat. The butchery in Kirakira would like the Provincial Government to make this process illegal, because of sanitary issues and to protect the butchery market. Local weaner pigs sell for about \$100 each. Larger pigs sell for up to \$300 each. Chickens sell for around \$25 each. The capacity for markets to absorb production is limited, especially away from the major centres, where money is not readily available. Naturally, chickens and pigs are also used for household consumption. Pigs have additional customary significance.

5.7 VILLAGE CASH CROPPING

5.7.1 COPRA AND COCONUT OIL

Copra is the most important source of cash income for rural coastal villagers. In 1999, income from copra was \$346 per household, fourth after Choiseul, Western and Isabel provinces, where income was \$410 to \$570 per household. Most (54%) of the copra produced was delivered by traditional canoes or canoes with outboard motors to Commodities Export Marketing Authority (CEMA) buying centres and points. The rest was transported by truck and ship. This reflects the extremely limited road system in the province. In 1999, 72% of households harvested coconut (mainly in the form of copra) for cash income. Copra production in Makira stopped in 2001 and 2002 because of financial problems experienced by CEMA, and impacts of the ethnic tension. During this time, most copra dryers rusted and became unserviceable. Production picked up again in 2003 after the government privatised the copra industry. Production in 2003 was just over 1000 tonnes, up from a record low of 112 tonnes in 2002. Sufficient

numbers of copra dryers were repaired, using private finance, to support production requirements, but many remain unserviceable.

Fewer than half of the nuts produced from current coconut stands in Makira are processed into copra, the rest being used for subsistence food or animal feed or simply left to rot or grow wild. There is potential for this surplus to be sold for copra or oil production. Five direct micro-expeller (DME) coconut oil units are currently being established in Makira. Two are now in operation, and a further two are under installation, at Tawani village, central Bauro. One is ready to be installed at the COM plantation at Waimapuru. The virgin oil from the DME units is sold to Kokonut Pacific Solomon Islands in Honiara, and exported to Canada. Current production is 35–40 litres per unit per day, and oil is sold at \$10 per litre. The demand for coconut oil is likely to increase at the provincial level if mini-grid electricity schemes funded by the World Bank are initiated. These run on coconut oil, and will provide electricity for village lighting requirements and small industrial developments.

Honiara-based company Tristar have recently recruited six buying agents in the region from Star Harbour to Marou Bay and Ugi Island. These buyers are currently paying \$1.10 per kg cash up-front for copra and have reported strong interest from producers.

5.7.2 COCOA

Cocoa is another important source of cash income for villagers, mainly in west and east Bauro, Arosi and Wainoni areas. In 1999, around 84 tonnes of cocoa were produced, which accounted for 14% of total national production for that year. In 2000, cocoa production dropped to seven tonnes due to the low world market price, the ethnic tension and unreliable shipping. A price increase in 2002–03 has resulted in increased production. Fermentaries have been built where cocoa production is high, and are generally owned by smallholders who buy cocoa wet beans (\$5 per kg) in addition to processing their own cocoa. It was evident that there is considerable interest in cocoa as a result of the high prices in recent years, and new plantings were

being established on newly cleared lands in Wainoni, and east and west Bauro. Several cocoa exporters are active in Makira/Ulawa Province. Exporters are paying province-based cocoa buyers up-front for purchase of dry beans. This has rapidly reinvigorated cocoa production on Makira.

Some older cocoa plantings seen in the Wainoni and west Bauro areas were in poor condition and require rehabilitation. This would require removal of undergrowth, improved management of shade, pruning, and replacing of dead or old trees. There is potential to expand cocoa production on Makira. However, the high rainfall of more than 3000 mm per year means that production will always be limited by disease and other problems. Any replanting should be done with clones from the Papua New Guinea Cocoa and Coconut Institute in East New Britain, which are more tolerant of high-rainfall conditions.

In the 1989 survey, it was reported that the mean tree-crop holding size per household was 1.77 hectares, but this has increased over the years, as evidenced by the young cocoa plots observed in almost all villages visited (Mackay 1989). This has come about through government Smallholder Development Programme (SDP) and Farmers Support Programme (FSP) programs that promoted coconut and cocoa expansion and rehabilitation from 1989 to 2000, as well as the increase in cocoa prices in the 2002–03 period.

5.8 PLANTATION CASH CROPS

Large commercial coconut plantations previously operated in Makira at Waimamura and Waimarae on Three Sisters Islands (previously owned by Levers Solomons Plantation Ltd). In 2000, these plantations produced 12 tonnes of copra, but production ceased during the ethnic tension. All plantations were subsequently returned to control of local landowners, and all copra and cocoa is now produced by villagers. The only managed plantation in operation is the Diocese of Hanuato'o (COM) 72-hectare plantation at Waimapuru, where both copra and cocoa are produced. Soon they will be installing a DME unit to produce virgin coconut oil.

5.9 SMALL-SCALE FORESTRY

Small-scale sawmilling, using chainsaw mills, is currently common in most regions around Makira but is often short-lived, for the following reasons:

- > sawn timber can only be cut within the immediate vicinity of the transport links, as it must be hand-carried to these links for shipping to Honiara
- > only rosewood (*Pterocarpus indica*) is purchased by buyers, and the resource is limited, and already fully exploited in some areas
- > shipping of milled timber is difficult from all but the best cargo loading sites; small timber volumes, poor loading sites, rough weather and irregular shipping result in weather damage to sawn rosewood that lies on the beach awaiting transport (one farmer indicated that he had started using weather-damaged rosewood in his copra dryer).

5.10 LIVESTOCK

The 1999 census suggests that 56% of Makira/Ulawa households keep pigs, although the figure will be higher over a year, when delays between off-take and restocking are taken into account (SIG 2002). The primary exceptions are the households, concentrated along the north coast of Arosi, of Seventh Day Adventists, who are forbidden to keep pigs.

Elsewhere, numbers vary from village to village and range from 1 to 20, but are commonly 3–6 pigs per household. Pigs have cultural significance and are used for important feasts, bride price, funerals and to pay debts. Pigs are also sold within and between communities, sometimes without cash payment.

Pigs were traditionally kept in bamboo-walled pens, but today many pigs forage freely. This creates a constant source of disputes, as pigs invariably damage gardens. Small black or mottled native pigs and crossbred pigs (a mix of native and European breeds) are kept. On the north coast, crossbred pigs are very common, but native pigs are still kept on the weather coast. Wild pigs are common throughout Makira, and their presence limits the planting of root and other crops where surveillance is difficult. Traditionally, pigs are fed coconuts, food scraps and garden wastes. Their

reproduction and growth rates are moderate at best. Many farmers attribute the over-fat condition of native pigs to the breed; however, it is simply a function of the large quantities of coconut and a lack of high-quality protein in their diet.

An EU Micro Project has funded three small-scale piggeries on Makira. These consist of an iron-roofed shed over a concrete floor with 10 pens. The project supplies 10 weaners to be fattened for early income generation, as well as six sows and a boar for medium- to long-term production. The stock is of crossbred origin and is sourced in Malaita. Feed for the first cycle of production comes from Honiara as a commercial mix. The recipient must first construct the shed and facilities before receiving the pigs and feed. The project also gives training in pig production systems. Long-term viability will be determined by the extent to which locally available feeds can be used, because of the poor reliability of supply and high price of feeds from Honiara. Box 5.1 illustrates one family's experience of running such a piggery.

BOX 5.1 CHARLOTTE AND MOSES – SMALL-SCALE PIGGERY

Charlotte and Moses started an EU-funded piggery at Manibena in late 2003. They fattened and sold their weaners as porkers of 60+ kg liveweight into Honiara. Freight was \$90 per head, and they received \$20 per kg carcass weight (about \$800 each) on sale of the pigs to the Honiara butchery. Four of their sows have recently produced a total of 30 piglets, one of which died. Some of the piglets will be sold locally as eight-week-old weaners, for \$200 each. The rest will be fattened and sold as porkers, either locally or into Honiara. The cost of imported feed from Honiara is the main impediment to profitability, and Charlotte and Moses intend to investigate local feeds. They also wish to undertake a financial analysis of the project to determine the profitability of different feeding and selling systems.

There are several small herds of cattle on Makira Island. Smallholder cattle herds of two to five head are generally tethered, whereas larger herds, owned by missions and schools, graze in fenced paddocks. Management is generally, but not universally, poor. Inbreeding is obvious in some herds; however, at least one good-quality crossbred bull is available at Boro'oni. With a small amount of assistance from DAL extension staff, the small cattle industry could be reinvigorated, and could provide meat for local requirements and for the butchery in Kirakira.

There has been a large herd of feral cattle on the Three Sisters Islands since the Levers plantation went into liquidation several years ago. These cattle regularly damage food gardens and, therefore, pose a risk to food security. A program of trapping and barging to Honiara for slaughter may be possible, depending on the degree of wildness of the cattle. Alternatively, adult cattle could be shot and butchered, and calves yarded for tethering and distribution.

Village chickens comprise the bulk of the poultry in the province, and about 50% of households own chickens. These are raised in the typical zero-input village system as a source of occasional meat or cash. At least one broiler farm was established through the EU Micro Project program, based on hybrid chicks imported from Vuvula hatchery in Honiara, and imported feeds. Fortunately, the Kirakira butchery can handle reasonable numbers of birds, by freezing for staggered sale. It will not be economically viable to continue using imported chicks and feeds. Future production will need to be in dual-purpose systems (meat and eggs), based on local chickens and predominantly local feeds.

5.11 SOCIAL AND CULTURAL ISSUES

The people of Makira/Ulawa Province have a strong cultural heritage, and social and community obligations take precedence over commercial activities. Most farmers engage in a range of livelihood activities. For this reason, there is an apparent lack of commitment to certain agriculture enterprises. Business principles may also clash with cultural norms. One cultural constraint to business is the inability to refuse requests from friends and

relatives for loans of cash or produce; these are rarely repaid. Land disputes also commonly prevent or disrupt the development of commercial activities.

Gardening is the responsibility of both men and women, with the exception of tree felling, which is done only by men. In some cases, women do all of the gardening. Pig husbandry is also predominantly undertaken by women and, therefore, women should be the recipients of training and assistance. Fishing from boats and by diving is exclusively a male activity, but fishing from the shore is undertaken by both men and women. Gender roles in the handling of money are highly variable within and between villages; women handle the cash in some families, and men in others. Some women keep the money from sales of food they have marketed.

5.12 SUPPORT FRAMEWORK FOR AGRICULTURE

Overall, the support framework for agriculture in Makira/Ulawa Province is poor. Apart from project-based activities, nobody had received any information or support from DAL staff in the recent past, and there was a general sense that trying to get any help was a waste of the money needed for the transport to Kirakira.

There are 11 DAL staff in the province and all are men. Three are based at Kirakira, while the rest are stationed around the province. There is no support provided by government for DAL staff in the province, except for payment of their salaries. Currently staff are only involved in donor-funded activities, such as the ROC-funded rice and vegetable program, the EU Micro Project-funded agriculture projects and, recently, CPRF copra and cocoa dryers. Extension officers provide technical assistance to rice growers and monitor EU Micro Projects projects. Support funds are provided for travel (fuel costs) and staff allowance. Staff also organise training for CPRF-funded copra and cocoa dryer recipients. Staff will only visit farmers if they have fuel and are paid a travel allowance. In theory, staff can request an imprest for money to undertake nonproject activities. However, in practice, these funds take more than six months to be forwarded, if they are forwarded at all, and most staff have stopped sending imprest requests. As a result, only donor-funded projects are visited.

The buildings and grounds of the Agricultural Training Centre at Hauratarata are being maintained by the agriculture staff stationed there. Fruit and nut trees have not been maintained. No training has been conducted for some years, but the site remains a potentially valuable provincial resource centre. The Makira Provincial Assembly plans to develop this centre into a research and development centre.

There are four RTCs in Makira/Ulawa Province and all are run by churches. These include St Stevens Pamua (COM), Navote (South Seas Evangelical Church), Styvenburg at Nana (Catholic) and Manivovo (Catholic). Styvenburg is a mixed college with about 80 students, 25% of whom are girls. The Manivovo RTC, in the southeast, is for female students only, and there are currently 23 students enrolled in a three-year study program. RTCs generally teach life skills (including English and mathematics), agriculture, mechanics and carpentry. Girls also learn sewing, cooking, nutrition and home economics. The RTCs are financed by student fees, the churches, and the Solomon Islands Association of Rural Training Centres (currently through EU funding). They vary in their capacity, but overall these are potentially valuable for training, distributing planting material, and as buying centres. They need assistance to generate income from agriculture, produce food for students, and upgrade the skills and knowledge of teaching staff. Graduate students would greatly benefit from support to establish small, income-generating projects in their villages upon completion of training.

A number of NGOs are currently operating in Makira/Ulawa Province, including Kastom Gaden Association (KGA), Save the Children Fund — Youth Outreach Program, World Vision and Makira Community Conservation Foundation/Conservation International. KGA is the organisation that is most directly involved with agriculture. KGA is assisting Manivovo RTC with the development and multiplication of a banana germ plasm collection comprising 106 varieties. KGA has also assisted the Aboru community in Arosi in microprocessing local foods.

5.13 COMMERCIAL ENTERPRISES

A wide range of commercial activities are conducted within Makira/Ulawa Province. There are six commercial logging companies, working predominantly in the Arosi area. Logging companies pay a licence fee to the Provincial Government of \$15 000 per year, and pay small royalties to the owners of the logged land. Environmental problems caused by logging, such as soil compaction, fuel contamination and streams becoming dry, have already been reported. The road system that supports logging, which might have value for the community, is not suitable for light vehicles, erodes badly during high-intensity rainfall and is quickly covered by jungle when not maintained.

Licences are issued for a wide range of commercial and semicommercial activities, including merchant shipping, trade stores, hawking, cooked-food stalls, copra buying, cocoa buying, bakeries and butcheries.

Banking facilities are available at Kirakira through the National Bank of Solomon Islands (NBSI), which is operated by the Hanuato'o Diocese of the COM. There were previously a large number of small credit unions in Makira, but only one is currently operational. Most have been closed down following mismanagement of funds, despite reasonably high loan repayment rates. The Nurses Credit Union provides small loans to members for school fees and other urgent requirements.

5.14 TRANSPORT AND TELECOMMUNICATIONS

The lack of regular transport services is perhaps the most significant barrier to development in Makira/Ulawa Province. There is a total of 120 km of roads, 67 km of which are on Makira, 40 km on Ulawa and 7 km on Ugi. A lack of bridges over large rivers on the Makira road has made it impossible to travel the length of the road. Importantly, the potentially productive lands of the Warahito basin, and other areas to the east of Kirakira, are not accessible, and the road to the west can only be followed as far as Pamua, which excludes access to the Arosi area. The return trip from Arosi to Kirakira by small boat costs around \$600, and the trip to Star Harbour is even more expensive.

Commercial cargo vessels irregularly work the north coast of Makira, generally concentrating on the area from Arosi to Kirakira. Star Harbour and the weather coast are poorly serviced, as these routes are less commercially rewarding. The subsidised, provincial-owned, MV *Bulawa* was the most frequent and reliable vessel on the north coast until it was forced out of service in 2003 with hull damage. It is uncertain if, or when, the vessel will begin operating again. Timber buyers, and occasionally copra and cocoa buyers, charter boats to collect their cargo as required.

Several government and NGO offices in Kirakira have telephones and email, although no services are available to the public. Solomon Telekom has installed public phones in certain areas around Kirakira, and provides a fax service for the public at its office complex. A large number of two-way high-frequency radios operate at schools, churches and missions, RTCs and agriculture extension locations across the province.

5.15 PREVIOUS EXPERIENCE WITH AGRICULTURAL DEVELOPMENT

There has been considerable prior experience with agricultural development over many decades in Makira/Ulawa Province. In particular, there has been support for copra and cocoa production, which has been generally successful, and for cattle, which has been less so.

The SDP and FSP, financed by EU STABEX funds, previously provided financial support to the provincial DAL extension service, with budgetary, logistical and training support. The programs also provide direct support in the form of labour subsidy, tools, fertilisers and dryer parts to village producers. When the external funding ceased in 2000, the extension support from DAL also ceased. The copra oil mill at Kaonasughu owned by the Makira Provincial Government and CEMA also ceased operation in 2000.

The AusAID-funded CPRF operates from Kirakira. It provides funding for a range of community services, including schools, clinics and water supply. The main input into agriculture has been funding of 15 copra, and four cocoa, dryers. The CPRF staff

have received assistance from DAL extension in identification and training of recipients, and in design and costing of dryers. The CPRF has potential to be a conduit for providing agriculture support in the province, particularly if some technical assistance is available from DAL extension staff.

The EU-funded Micro Projects program has supported several small piggeries and broiler farms. These must adapt to locally available feeds and breeding stock if they are to survive.

5.16 OPPORTUNITIES FOR RURAL LIVELIHOODS DEVELOPMENT

Rural livelihoods can be enhanced through facilitation of both domestic and export markets for existing commodities (copra, cocoa, root and tree crops and livestock) and putting in place effective delivery mechanisms for assistance. Specific issues and activities for the three important aspects of rural livelihoods development are discussed in detail here.

MARKETING

- > New market houses for the sale of garden produce have been constructed at Pamua and Waimapura, but the main Kirakira market needs upgrading and expanding.
- > An information system is required to facilitate sales of commodities, including copra, cocoa, timber and other produce. Farmers need to know what they should be getting paid, and be able to more rapidly respond to changes in supply and demand.
- > Regular shipping services need to be provided for farmers at long distances from Kirakira.
- > An expanded road network should be planned to incorporate the Warihino basin. Bridges are needed, to provide all-weather access from Kirakira to Marou Bay.

COMMODITIES

- > *Copra*: Supply drums and mesh to the most disadvantaged farmers. This should be done through the existing buyers' network. The lack of regular shipping on less commercial

routes needs to be addressed. The long-term viability of DME coconut oil should be investigated by a marketing specialist.

- > *Cocoa*: Supply up-to-date technical information, and access to seedlings for replanting. This could be done by providing resources to RTCs to establish seed gardens.
- > *Subsistence crops*: Supply high-yielding and pest- and disease- resistant varieties, such as L16 leaf blight-resistant taro, African yam etc. Supply training in use of pesticides. Provide technical information on food security in the context of pest and disease control, declining soil fertility and declining garden yields.
- > *Livestock*: Provide technical and logistical assistance in small-scale livestock production and marketing, particularly for local pigs and chickens and, to a lesser extent, cattle.
- > *Tree crops*: Restart the ngali nut industry. Investigate potential products from cutnut and breadfruit.
- > *Food processing*: Continue support for microprocessing to establish efficient storage and marketing systems — storage is the key.

DELIVERY MECHANISMS

- > For provincial DAL to provide an effective extension service for farmers, they require housing for extension staff at appropriate locations in the province; support for farm visits through provision of fuel and allowances; access to new information and technology to disseminate to farmers; an effective, applied research backup capability at the national level; and strategic and operational plans to direct their work programs.
- > The DAL agricultural extension service should be engaged to supply technical assistance for the above interventions on a fee-for-service basis (with payment through the project). DAL should be funded to work with RTCs to bulk up vegetative material of new varieties for distribution.
- > RTCs, NGOs and schools should be engaged to evaluate and bulk up new planting materials for wide distribution. Where capacity exists, RTCs and NGOs should be engaged to run short courses for adult village groups in use of

pesticides, financial planning, microprocessing of local vegetables, and small livestock production. These should be based on real life examples, rather than theory.

- > RTCs should be supported to provide assistance to postgraduate students who have returned to their villages. This would include follow-up visits by RTC staff and provision of appropriate tools to establish small businesses.

Throughout the villages visited on Makira, people were unanimous on the following points with respect to future development assistance:

- > Support for income-generating activities should be targeted at families rather than towards communities. This is in contrast to assistance that clearly benefits the broad community, such as clinics, schools and water supply. Some women's groups felt that they could effectively manage group assistance, as long as men were not involved.
- > Assistance should be direct, rather than through national or provincial governments. Previous experience was that very little assistance reached the intended recipients when it was channelled through government systems. The CPRF system was generally well received, although it relied on agricultural extension officers to identify recipients, and these tended to favour recipients close to their centres.
- > Assistance should be given in the form of small-scale programs over an extended timeframe, rather than as large-scale, short-term projects.
- > Commodities supported by donors should not keep changing. Donors should select appropriate commodities and assist their establishment over an extended time period.
- > Farmers who are already engaged in activities should be supported, to avoid opportunism.

5.17 WRITTEN SOURCES OF INFORMATION

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Solomon Islands Ministry of Provincial Government and Rural Development (2001). *Makira/Ulawa Province Development Profile*. Rural Development Division, Ministry of Provincial Government and Rural Development, with technical assistance from UNDP/UNOPS Solomon Islands

Development Administration and Participatory Planning Programme, Honiara.

Wagatora D and Maemouri R (2004). Part 4. Report of the Participatory Rural Appraisal Workshop at Santa Ana Island in the Solomon Islands. Unpublished report, Department of Agriculture and Livestock, Honiara.

Wall JRD and Hansell JRF (1974). *Land Resources of the Solomon Islands. Volume 7: San Cristobal and adjacent islands*. Land Resources Study 18. Overseas Development Administration, UK.

5.18 PEOPLE CONSULTED

Aboru village meeting	Twenty women from Roohua, Aboru and Hawa'a women's community groups, represented by Lucy Maepuru and Rachel Rade
Aboru village meeting	Eight middle-aged men
Bea, Thomas	Manager, Qanaku Development Company, Makira Province
Boro'oni village meeting	Benson Haamori (plus 10 men of varying ages, many originally from other islands)
Carlos, Sam	Agricultural Extension Officer, DAL
Cyrin, Vica	General, Diocese of Hanuato'o, COM, Makira
E'eniara, Jeffrey	Agricultural Extension Officer, DAL
Gapu, Kemuel	Agricultural Extension Officer, DAL
Ha'anua, Henry	Tristar copra buyer, Moale Hanua village, Ugi Island
Hagasuramo, Gad	Bauro Farmers Support Association, also Provincial Member Ward 9 (West Bauro)
Hau, Eddie	Cocoa and teak farmer, Ago village, Ward 9 (West Bauro)
Kahia, Evalyn	Coordinator, CPRF, Kirakira
Kirakira town meeting with copra/cocoa buyers	Six buyers (Edward Keko, Peter Bonai, Francis Wuriterisi, Allan Campbell, Simon Talo, Benedict Tahir)
Kohaia, Victor	Makira Community Conservation Foundation
Laka, Vaa	Development Services Exchange, also coordinator of the Solomon Islands Parents Association, and vice-president of the Mothers' Union of the Church of Melanesia
Makorukoru village meeting	300 women in the district, represented by Florence Simana
Makorukoru village meeting	Jacob plus two other men
Mamau, Noel	Provincial Minister, Economic and Development Planning, Makira Provincial Assembly
Maniate village meeting	Seven adult males, four boys, 12 females (separate meeting)
Manivovo RTC	Two groups of female students, each with about 10 students
Mare, John	Agriculture and vegetable production teacher, Manivovo RTC
Masuguria, Gwen	Vegetable farmer (EU-Micro Project-funded) and member of Planting Material Network, Manibena village
Mawa, James	Business Studies Teacher, Manivovo RTC
Moses and Charlotte	Small piggery owners, (EU-Micro Project-funded), Manibena village

Nahusu, Daniel	Deputy Premier, Trade and Investment Department, Makira Provincial Assembly
Nanauoha, Andrew	Provincial Secretary, Makira Provincial Assembly
Oli, Moses	Manager, Kirakira butchery
Parisuri, Harold	Coordinator, CPRF, Kirakira
Pepena, Hyacinth	Livestock teacher, Manivovo RTC
Piringisau, Stephenson	Premier, Makira Provincial Assembly
Punia, Alphonsus	Agricultural Extension Officer, DAL (stationed at Tawapuna)
Rama village meeting	35 women and young females of varying ages
Rama village meeting	48 men and male youths of varying ages; active speakers at the meeting were middle-aged men – Sam, Andrew, Jack and Solomon
Rangi, Lawrence	Food crop and coconut/cocoa farmer, Nukukaisi village
Sanau, Benson	Agricultural Training/Extension Officer, DAL
Sitai, Brigette	World Vision Livelihood Project (AusAID-funded)
Siwa, Robert	Coconut mill manager, Arosi Vision Link Services, Tawani
Styvenberg Catholic RTC	Separate meetings with 8 staff (7 male and 1 female) and 10 students (7 male, 3 female)
Tagemae, Henry	Rice farmer and taro collection, Tawani village
Tahi, Benedict	Farmers Support Association; also Provincial Member Ward 11 (East Bauro)
Talanfei, Zakariah	Agriculture teacher, St Steven's Pamua RTC
Tawani village meeting	Ten middle-aged men, eight middle-aged women, six young women
Tawapuna village meeting	Twenty-one men of varying ages
Tawaroga village meeting	Alan Karitau plus 15 other males, and Elizabeth Kaapu, Julia Kauruhia and Regina Hagawato plus eight females (separate meetings)
Tepiowa, Andrew	Manager Tagorogu Cooperative Society, Makorukoru village
Tim, Sam	Senior Agricultural Extension Officer, DAL
Wagatora, Silas	Diocesan Secretary, Diocese of Hanuato'o, COM, Makira
Wamela, Irish	Youth Outreach Program, Save the Children Australia
Warohinou village meeting	Six women
Warohinou village meeting	Dominic plus 23 men of varying ages — about 10 active speakers at the meeting of varying ages
Watoto, Paul	Coconut mill manager, Arosi Vision Link Services, Tawani

6 Malaita Province

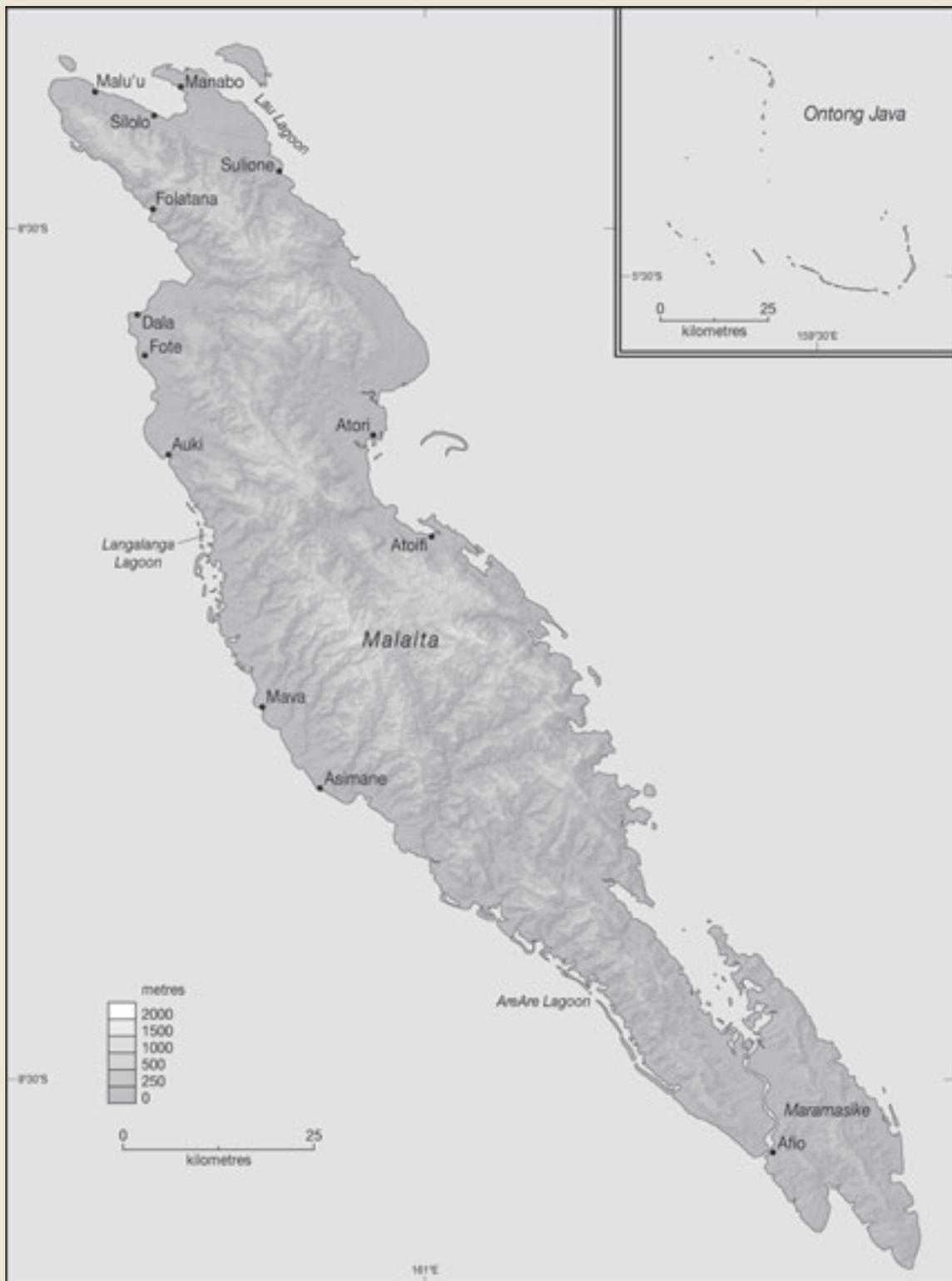


Figure 6.1 Malaita Province

6 Malaita Province

6.1 SUMMARY

Malaita Province consists of the main islands of Malaita and Maramasike, together with the outlying island of Ndai and the atolls of Ontong Java and Sikiana (see Figure 6.1). The total land area is about 4200 km². The provincial population at the 1999 census was 122 620 people, in 18 600 households, making Malaita the most populous province in Solomon Islands (SI) (SIG 2002). This number represented 30% of the national population and 34% of the national rural population. The population growth rate is high: 3.3% for the period 1986–99.

The interior of Malaita Province is generally rugged and mountainous. The mountains are flanked by hills and narrow coastal terraces, interspersed with swamps. There are only a few tracts of flat land that are readily accessible and relatively unused. Rainfall is high everywhere: more than 3000 mm per year on the western and northern sides of Malaita, rising to an estimated 6000 mm in the centre of the island.

The population of the province occupies four broad ecological zones, and the main food sources and cash income differ between these four zones. The coastal dwellers obtain most of their food from gardens, where sweet potato is the most important crop. The inland dwellers depend on food gardens, where sweet potato and some taro are the main crops, and the main source of cash income is sale of garden produce. Dwellers on the artificial islands trade fish

and marine foods for sweet potato and other garden produce with inland people and coastal dwellers. They also maintain pigs and some chickens. People on the atolls rely on imported rice, flour-based foods, swamp taro, taro, coconuts, fish, and some other garden produce for their food supply. The main source of cash income is bêche-de mer and some smoked fish.

Sweet potato is by far the most important crop in Malaita. Land use is quite intensive, given the high rainfall. There are clear indications of increasing intensity of land use, and declining soil fertility and crop yields throughout north Malaita. Generally, cash income levels are low for rural people. The main sources are copra, cocoa and fresh food marketed locally or in Honiara. However, for many people, the only way to find sufficient income to pay fees for high school children is for the husband or the entire family to migrate elsewhere for wage employment, or to sell produce or services in Honiara. The province produces about 20% of copra from SI, and is the second most important production region for cocoa. Honey provides some modest income to some people and about half the beehives in SI are in Malaita. Pigs are important for cultural reasons, and are a source of cash for some villagers. Chickens are common.

Overall, there is very limited support for agricultural producers, and the few who obtain some help get it from one nongovernment organisation (NGO). There are a number of rural training centres

(RTCs) in the province and these are a potential avenue for supporting villagers growing food and cash crops. There are a number of opportunities to support agricultural development. These include support for subsistence food production, domestically marketed food, cocoa production, and possibly copra marketing. Maintenance of existing roads and bridges and expansion of the road network would have a significant positive impact on agricultural production and the welfare of villagers in Malaita Province.

6.2 OVERVIEW OF FIELD VISITS

A three-person team spent a week visiting Malaita Province in September 2004. The team consisted of Mike Bourke (agricultural consultant, Canberra), Stav Zotalis (Regional Assistance Mission to Solomon Islands (RAMSI), Honiara) and Nadira Mailewa (AusAID, Canberra). This report was written by Bourke and Zotalis. The team was accompanied throughout by staff from the AusAID-funded Community Peace and Restoration Fund (CPRF), based in Auki, Malu'u and Silolo. The CPRF team provided logistic support, and the organisational skills of Joy Maefilia and her colleagues are gratefully acknowledged. The team travelled by road from Auki to communities and institutions some kilometres south of Auki, and to the Malu'u and Silolo areas in the north; and by canoe to Langalanga Lagoon, the Asimana area south of Auki and the Manabo area in the northeast of the island. No visits were made to the populated centre of the main island, the south or east coasts or the atolls in the province. Information on the atolls is based on interviews with two people who had recently returned from a visit there, Mike Bourke's study of atolls just to the north in Papua New Guinea (PNG) in 2002, and literature, particularly that by Tim Bayliss-Smith.

6.3 INTRODUCTION

Malaita Province consists of the main islands of Malaita and Maramasike (small Malaita), together with the outlying island of Ndai and the atolls of Ontong Java and Sikiana. The atoll groups are some distance from Malaita, being 340 km north, and 230 km east, respectively, of northern Malaita. The

two main islands are separated by a narrow strait and are about 190 km long in total, and 30 km wide at the widest point. The total land area is about 4200 km². The interior is generally rugged and mountainous, rising to over 1300 metres above sea level. The mountains are flanked by hills and narrow coastal terraces, interspersed with swamps. There are only a few tracts of flat land that are readily accessible, relatively unused, and suitable for large-scale plantation development.

The Land Resources Study conducted in 1974 identified a number of areas as 'agricultural opportunity areas' (AOAs), with a total area of 536 km², which is 13% of the land area of the two larger islands (Wall and Hansell 1976). AOAs were defined as large blocks of little-used land with above-average agricultural potential — the best land for large-scale agricultural development. This concept has limited application in the modern SI, because development has to proceed on the land owned by villagers, and there are very limited prospects for large-scale agricultural development. Nevertheless, this study did indicate the best land in SI, where there was limited land use 30 years ago. In practice, some of the land identified as AOAs now has high population densities and low productivity because of the intensity of land use.

The climate is equatorial, with a maximum temperature of 30–32°C throughout the year. Rainfall is high everywhere. More than 3000 mm per year falls on the western and northern sides of Malaita, rising to an estimated 6000 mm in the centre of the island. The long-term averages at Auki and Dala are 3270 and 3680 mm per year, respectively. The north and northeast parts of the island (from about Auki north) receive more rainfall when the northwesterlies blow in November to April; most of the rest of the islands receive more rainfall when the southeast trades blow in May to October; and some locations south of Auki receive rain throughout the year. There are no months when regular soil moisture deficiency occurs. Rainfall of over 3000 mm per year is not optimal for cocoa, sweet potato or some other crops.

Much of the main islands is limestone, with volcanic rocks in the centre. Soils are not especially fertile. Potassium deficiency is common, and potash

deficiency symptoms are common in coconuts, cocoa and sweet potato in northern Malaita.

The atolls are typical of other Pacific Island atolls, with limited land area and an elevation just a few metres above sea level. Soils are derived from coral sand. People have dug pits into some of the atolls to plant swamp taro and *Colocasia* taro.

The provincial population at the time of the 1999 census was 122 620 people in 18 600 households, making Malaita the most populous province in SI (SIG 2002). This represented 30% of the national population and 34% of the national rural population. By 2004, the population had probably increased to about 140 000 people. The high growth rate can be appreciated when it is noted that the provincial total in the 1976 census (60 043 people) was half that in 1999 (Wall and Hansell 1974).

There is one small urban centre, Auki, in the province and a number of very small centres at Malu'u, Afio and Atori. The population of Auki was 1606 people in 1999. There has been rapid population growth in the province, with a growth rate of 3.3% for the period 1986–99. This high growth rate was contributed to by social unrest in Guadalcanal in 1988–89 and the return of many Malaita people from there. It is estimated that the growth rate before these events was 2.4% per year. The population density is moderately high at 29 people per km², which is more than double the national average of 13 people. The population density on the atolls is particularly high. The 1999 population of the atolls was 2075 people (compared with 1322 people in 1976). The area of these islands is only 14 km², so the density was 148 people per km² in 1999, and with the high growth rate there, it was likely to be about 170 people per km² in 2004. Given the high dependence on marine resources on the atolls, this is not yet excessive. The provincial population is young, with 45% of the people aged less than 15 years.

The provincial population of Malaita Province can be characterised as occupants of four broad ecological zones. The four groups are:

- > The coastal dwellers on Malaita, who form the bulk of the population. They have access to flat land on the coastal strip and foothills.

- > The inland people of Malaita (the 'bush people'), who live in the interior of the island and do not have access to marine resources.
- > Those living on artificial islands (made by moving rocks and timber to shallow areas of sea to trap sand and mud) along the northeast and western coasts of Malaita in the Lau, Areare and Langalanga lagoons ('the salt water people'). They have abundant marine resources, and their limited terrestrial resources consist mainly of coconuts and food gardens constructed in pits, which are used to plant taro.
- > Those on the isolated atolls of Ontong Java and Sikiana. The people on the atolls are of mixed Polynesian and Melanesian extraction and their Polynesian ancestors migrated there about 800 years ago.

6.4 LIVELIHOOD STRATEGIES

The main food sources and cash income differ between the four main ecological zones. The coastal dwellers obtain most of their food from gardens, where sweet potato is the most important crop. For those with cash income, rice consumption is often significant. Other important food sources are coconuts, some fruit and nut trees, and fish and other marine foods. Cash crops are copra, cocoa and fresh food.

The inland dwellers depend on food gardens, where sweet potato and some taro are the main crops. The main source of cash income is sale of garden produce, including taro, temperate climate vegetables and tobacco.

Dwellers on the artificial islands have access to mangrove fruit and timber, fish, and other marine foods, including crabs and shellfish. They trade fish and marine foods for sweet potato and other garden produce with inland people and coastal dwellers. They also maintain pigs and some chickens. Consumption of imported rice is sometimes significant.

People on the atolls rely on imported rice, flour-based foods, swamp taro, taro, coconuts, fish and some other garden produce for their food supply. The main source of cash income is bêche-de mer and some

smoked fish, although trochus shell has been sold in the recent past.

Overall, the level of cash income is low for most people in the province. Cash income is somewhat greater for those living on or near the coastal roads in northern Malaita and for those ‘salt water people’ living near Auki. However, for those who want a higher income or who wish to put their children through high school, migration is often the best option. Before the ethnic tension, which started on Guadalcanal in 1998, there were many Malaitan people living in and near Honiara, as well as near other economic enclaves, such as the tuna fish cannery in Western Province and the coconut plantation on Rennell Island. It is reported that as many as 20 000–30 000 people returned to Malaita as a result of the ethnic tension between Malaitan and Guadalcanal people in 1999–2000. However, it is likely that many Malaitan men, at least, have returned to Guadalcanal seeking employment. The driving factor is often the desire to pay fees for high-school education for their children (see Box 6.1).

6.5 SUBSISTENCE FOOD PRODUCTION

The main sources of food in Malaita Province vary between the major ecological zones. Overall, food gardens are the main source of carbohydrate food and vegetables. Other important sources are coconuts, fish, other marine foods, ngali (*Canarium*) nuts and other tree foods. Imported rice and flour-based foods are significant in the diets of some villagers, and traded or purchased garden food is important for the ‘salt water people’.

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*), 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 being grown as a result. A wide range of other vegetables are grown. The most common food-producing trees are ngali nut, cutnut (*Barringtonia procera*), pawpaw and mango. Betel nut and betel pepper are widely grown and consumed.

Land use is quite intensive for such a high-rainfall lowland environment. In coastal Malaita, the fallow vegetation is generally low, woody regrowth, with the highest shrubs no more than four to five metres in northern Malaita. Typically, people make two plantings before land is fallowed, with some people claiming to make three plantings. Sweet potato is planted in the first year, with a second planting of sweet potato or sometimes cassava planted in the second year. Cassava is commonly planted on the edges of sweet potato gardens. Fallow periods are claimed to be one year or less, but investigation of detailed plot histories suggested that periods of two to four years are more typical. For northern Malaita, the R-value⁶ of the gardens visited ranged from 20 to 67, with a mean of about 40. This means that, if the agricultural system ran unchanged for 100 years, the land would be planted with crops for 40 of those 100 years. This is quite intensive. The causal factor is rapid population growth, in the absence of a vibrant, nonagricultural economy. Population growth has resulted in shortening of the fallow period and extension of the cropping period, with a consequent decline in soil fertility and drop in crop yield. Concern with declining yields of sweet potato and other crops is widespread among villagers in northern Malaita.

As well as the long-term decline in sweet potato yield, there are some short-term problems. Sweet potato yields were particularly low in the second half of 2004. Villagers associate this with higher than normal rainfall throughout the year, and this belief is well-founded. A number of major pest and disease problems have also been reported. The most important is a beetle that attacks the leaves of slippery cabbage.

Firewood is obtained from land under fallow. The ‘salt water people’ and some coastal dwellers use

6 The R-value is a measure of land use intensity, where the value is the number of years per century that land is under a crop.

BOX 6.1 A LIVELIHOOD STRATEGY FOR THE DADALU FAMILY — AND A BIGGER PICTURE

Patricia and John Dadalu come from the Malu'u and Silolo areas, respectively, in north Malaita. They have three children, two sons and a daughter, all at high school. Patricia is living near Malu'u so that she can be near their daughter, who is in the local Malu'u Community High School, where her fees are \$300 per year. The oldest boy is studying at a secondary high school on Makira, where the annual fees are \$1800. Their second son is with his father in Honiara and attends a high school there, where the fees are \$600 per year. Therefore, Patricia and John have to find \$2700 this year for the school fees alone. There is no possibility of earning this sort of money in north Malaita, so John is working in Honiara as a security guard to gain the money necessary to pay the school fees for the three children.

Cash income is very hard for Patricia to find, and the high cost of living means that she cannot afford small luxuries, such as tinned tuna (about \$1.50 per tin). She lives mostly on sweet potato and cassava from her subsistence food garden. She has tried to sell some food in the Malu'u market, but there is little demand and not much cash around, so she gains very little income from this source. The few dollars that Patricia can earn from this are barely enough for basic needs, such as soap or kerosene. It is certainly not enough for a trip to Honiara to see her husband, because a return trip costs \$220 (\$30 by road to Auki and \$80 for the ship to Honiara). As Patricia expressed it, 'Everi samtin hemi barava expensive tumas' (every item or service is now very expensive). The separation brings other anxieties. There are many Malaitan men living and working in or near Honiara, with their families back home in the village. But the town has its temptations, and many Malaitan men are reported to have taken up with other women, started new families, and abandoned the family back home.

The livelihood strategy being pursued by the Dadalu family is not uncommon for Malaitan people, especially those with children attending high school. Their story illustrates a bigger picture: the Solomon Islands (SI) economy is weak and there is only limited demand for goods and services outside Honiara. The poor state of transport infrastructure and the low prices received for copra mean that it is difficult for a family living in the village to gain sufficient income to pay for big expenses, particularly high school fees. Thus, families have the choice of all migrating to Honiara or the husband migrating. This brings its own dangers and anxieties, particularly given the recent history of ethnic tension between people from Malaita and Guadalcanal. There is also the concern about the possibility of men taking new wives and abandoning their village families.

It is very difficult for rural villagers who want their children to gain an education to find cash income and stay together as a family. There are limited opportunities to earn cash at home from the sale of copra, and there is no information on alternative sources of income that can be gained from agriculture. Many people would like to try new ventures, but they lack information, they lack planting material and, in particular, there are no marketing arrangements for selling the produce that they can grow. Given this reality, their best option is for the husband to go to Honiara seeking paid work, which is the basis for the recent ethnic tension. The solutions lie in providing ways of gaining cash income for those who want more opportunities for their children and themselves, who are prepared to work, and who wish to use the two resources that they have — their land and their family labour. This is the challenge for donors and for the SI Government — to give this opportunity to the many people whose livelihood strategies are similar to those of the Dadalu family.

mangroves for firewood. It is reported that firewood for copra drying is becoming scarce for some people in north Malaita. It is also reported that mangrove resources are being depleted. It was not possible to investigate these claims.

Some rice is being grown on Malaita. There are seven rice mills in the province, although their current state of repair is uncertain. It is claimed that there are 73 hectares under rice cultivation, although the actual figure is likely to be much less. Production in 2004 is likely to be about 10 tonnes of rice, a minute fraction of that of sweet potato and other staple food crops.

All rice is produced in projects supported by the Republic of China (Taiwan) (ROC) rice project. Production is heavily subsidised, with inputs, including chemicals to control insect pests, being supplied by the ROC project. Assistance takes the form of direct funds for agricultural extension staff, with equipment, seed, fertiliser, chemicals and milling machinery supplied to villagers. The output is generally consumed within the producing households. The local crop is increasingly subject to insect attack, and the dependence on chemical, mechanical and external technical inputs means that most rice projects in Malaita fail soon after the standard two-year period of support provided by the ROC ends.

Substantial resources have been directed at increasing rice production in Malaita for several years now, without any significant or demonstrable success. There are no indications that this will change, and the scarce development resources being devoted to rice production would be much better directed at growing local staple food crops, which would reduce the dependence on imported rice.

6.6 DOMESTICALLY MARKETED FOOD, FISH, FIREWOOD AND BETEL NUT

Domestically marketed food is a significant part of the provincial economy. This is because of the marked differences in access to natural resources within Malaita Province, and the proximity of the major market in Honiara. Villagers in the three main ecological zones on Malaita have markedly different access to natural resources that they can market, but also have different items that they need

to purchase. In particular, food markets provide the principal avenue for the 'bush people' to interact with the cash economy. They sell taro, tobacco, betel nut, leafy green vegetables, temperate climate vegetables (including round cabbage, lettuce and tomatoes) and, increasingly, marijuana. The 'salt water people' have very limited ability to grow staple foods and vegetables, and purchase (or barter) most of their food needs from coastal dwellers and the 'bush people'. They do have access to abundant marine foods, which they sell or barter.

Thus the Auki town market is much larger, and has a much greater throughput, than one would anticipate for such a small urban centre. There are markets in the other smaller government centres of Malu'u, Afio and Atori, and also at Atoifi. There are also numerous markets along the coast, where people from the different ecological zones meet to barter or sell food. There are 12 such markets along the north coast of Malaita between Folatana and Sulione. The province is close enough to Honiara for a significant number of people to be able to sell food there. Produce transported to Honiara for sale includes pigs, chickens, fish, taro, betel nut, sweet potato, pineapple and watermelon. A number of informants noted that market turnover, both locally and to Honiara, is lower now than it was before the ethnic tension in 1999, because overall economic activity is greatly reduced in both places.

The marketplace at Auki operates seven days a week, with Saturday being the busiest day. The facilities are quite inadequate, with benches and shelters insufficient for the number of sellers. Hence the sellers and their produce are exposed to the sun and the rain, resulting in spoilage of some produce. The provincial government has a levy of \$1 per seller for fresh food and \$10 per seller for fish. This is collected by a private group, which is contracted to clean the market. Not all sellers pay, and it seems that the fees do not reach the government coffers. The Provincial Treasurer estimates that there are 300–400 sellers on Saturday and 150–200 sellers Monday–Friday. There are only a few sellers on Sunday. These figures suggest that 1000–1500 people sell food in the Auki market each week. These figures are consistent with the authors' counts of 485 sellers on a Saturday morning and 260 sellers on a Thursday afternoon.

(The authors' count is of all adults selling food and other items, and the number of family groups is about half this.)

The most important items sold, by volume, are sweet potato, banana, slippery cabbage, Chinese cabbage, cucumber, tomatoes and pawpaw. Other significant items are fish, betel nut, tobacco, cooked food made from flour, and coconuts. More than 30 species of food crops were noted. Both men and women sell items. Women are the main sellers of fresh and cooked food. Men sell fish, and both men and women sell betel nut.

There are markets in the other smaller centres of Malu'u, Afio and Atori, and also at Atoifi (see Box 6.2). There are also numerous markets at locations along the coast, where people from the different ecological zones meet to barter or sell food (see Box 6.3).

There are a number of constraints to marketing food in the province, and hence opportunities to improve the situation. The first constraint is the poor facilities at marketplaces, especially at the Auki town market. A new market facility was planned at a nearby site, to release the current site for development of a new wharf. However, the land was allocated to others during the ethnic tension. Until the land issue is resolved by the Provincial Minister for Lands, it will not be possible to construct a new marketplace.

More importantly, the range of both fruit and temperate climate vegetables being grown and sold could be increased. This could be done by propagating and distributing planting material of a number of species and providing advice to growers on how to grow and market the produce. Fruit species that could be distributed include improved types of mango, avocado, rambutan, langsat, durian and mandarin. Temperate vegetables and fruit that could be grown at higher altitude locations on Malaita include potato, round cabbage, carrots, tomatoes, and strawberry.

BOX 6.2 HENFRED AND JOY'S STORY

Henfred Ovarala and his wife, Joy Takari, live in Faurafu village in the interior of Malaita (or 'middle bush' as it is known locally). It takes them about three hours to walk to the small government station on the coast at Malu'u, where they come to sell fresh food. On Tuesday 14 September, the couple made the three-hour trip to Malu'u carrying 40 small, round cabbages. Next morning, they sold these at the regular Wednesday market. By the time the study team spoke with them at 0800, they had sold all cabbages except one, and had received \$80. They planned to walk back to their village later that day. They also sell other vegetables including tomato, potato and Chinese cabbage. Some people from their village sell other items, including tobacco and taro. This is their only way of accessing cash income. A return trip to Malu'u takes two days of their time, but the returns are reasonable, and the income does allow Joy and Henfred to make some modest purchases in town of both food and nonfood items.

BOX 6.3 OBTAINING SOME CASH INCOME IN MANABO

The village of Manabo is situated in northeast Malaita, across Suava Bay from Silolo. There are about 250 residents in the village. Cash incomes are very low and, for most people, there is insufficient income to pay for high school fees. Only one person from the village is currently attending high school. Land pressure is high, and sweet potato yields are low, because the fallow periods are too short (two to three years) to maintain crop yields. The village is not located on the road network, so selling copra is not an option. The only source of cash income is the sale of fish, which the men catch in the bay and in the open sea. Fish are sold at markets at Malu'u, Silolo, Kwai and Matakwala. This provides modest cash income, which people use to purchase sweet potato, other garden food, imported rice and nonfood items, particularly fuel for outboard motors.

6.7 VILLAGE CASH CROPPING

6.7.1 COPRA AND COCONUT OIL

Copra is an important source of cash income for coastal dwellers in Malaita. Before the ethnic tension, the province produced about 20% of SI copra.

The proportion in 2003 was also about 20%. In 1999, income from copra was \$190 per household, which was much less than for Choiseul, Western or Isabel provinces, where income was \$410–570 per household. In 1999, 60% of the copra was delivered by truck, and most of the rest came to buying depots by canoes powered by outboard motors.

Production of copra in 2003 was just over 3000 tonnes, which is about 70% of the average of 4200 tonnes for the period 1994–2000. Copra production in SI almost stopped in 2001 and 2002 because of marketing and management problems associated with the Commodities Export Marketing Authority (CEMA) and the Russell Islands Plantation Estate Ltd (RIPEL). In September 2004, production and sale of copra were quite prominent along the road between Auki and Malu'u. Significantly, most copra dryers were privately financed, rather than dependent on donations from overseas donors.

Most of the province's copra (70%) is produced in the Auki and Malu'u region, along the road network in north Malaita. This underscores the importance of road and bridge maintenance and construction for export cash production and sale.

It is estimated that fewer than half the coconuts grown on Malaita are processed into copra. The rest are used for subsistence food or animal feed or simply left to rot or grow wild. There are numerous self-sown coconut seedlings in coconut groves, indicating the large number of nuts that are not collected and used. Hence, there is a surplus of coconuts, which could be sold for copra or oil production.

There is a disused copra oil mill at Malu'u. This was operated as a joint venture between the Malu'u Integrated Co-operative Society and CEMA. Copra oil was sent to RIPEL on Rennell Island. Approximately 70–80 tonnes of oil were produced over a two-year period. However,

financial difficulties were experienced and the operation at Malu'u fell into disrepair.

There is a copra mill at Taalu, south of Auki, which has been operating for two months. Coconut oil is sold to John Volraith's operation in Honiara, Solomon Tropical Products Ltd. Capacity is 400 litres of copra oil per day. The capital cost of the mill was reported to be only \$80 000. The demand for coconut oil is likely to increase at the provincial level in SI if World Bank-funded mini-grid electricity schemes are initiated. These run on coconut oil, and can power small, industrial developments.

There are also a number of direct micro-expeller (DME) coconut oil units operating in Malaita Province. There are seven units in the Maua and Asimane areas. DME oil is sold to Pro Solutions in Honiara and exported to Canada. Production per unit can be as high as 40 litres of oil per day and the processor is paid \$8 per litre.

6.7.2 COCOA

Cocoa is another important source of cash income for villagers, especially in the area between Auki and Malu'u where production is concentrated. There are a number of fermentaries in the north of the province, and 11 fermentaries in northeast Malaita. In September 2004, the producing season was just concluding, but it was evident that there is considerable interest in cocoa production, because the prices have been high in recent years.

Provincial production was 345 tonnes in 1999, and 224 tonnes in 2000, which represented 14% and 9%, respectively, of national production. There are no current provincial production figures. However, national cocoa exports of 4600 tonnes in 2003 were considerably higher than the 2000–3000 tonnes per year in 1999–2002, and it is likely that provincial production will have increased similarly.

Most cocoa plantings seen in the Auki to Malu'u area were in poor condition, and there was little evidence of replanting. Many blocks require rehabilitation. Tasks required include removal of undergrowth, improved management of shade, pruning, and replacement of dead trees. Much stock seems to be

old and in need of replanting. Widespread potassium deficiency was noted in cocoa trees.

There is potential to expand cocoa production on Malaita. However, the high rainfall, of more than 3000 mm per year, means that production will always be limited by disease and other problems. Any replanting should be done with clones from the Papua New Guinea (PNG) Cocoa and Coconut Institute in East New Britain, which are more tolerant of high rainfall conditions.

6.7.3 HONEYBEES

The SI honey industry increased from about 300 hives in the late 1980s to 2500–3000 hives by 1996–97. The number of hives declined during the ethnic tension, but has since been building up, with support from two Canadian University Service Overseas volunteers based in Auki. It is estimated that there are now about 2000 hives in SI, with 800–1000 of these on Malaita. Production is still in an expansion phase, with many hives being split to produce new hives, rather than producing honey. Honey is providing modest income to more than 100 households on Malaita, and is particularly popular with dwellers on the artificial islands, who place hives in mangrove stands.

6.8 PLANTATION CASH CROPS

There were a number of coconut plantations on the west coast, but the high rainfall, relatively infertile soils and relatively high population density inhibited alienation of land for plantation agriculture. All plantations have been returned to control of local landowners, and all copra and cocoa in the province is now produced by villagers.

6.9 SMALL-SCALE FORESTRY

There were five large-scale logging operations in the province in 2004, up from one operation a year before. A royalty rate of \$50 per m³ is meant to be paid to local landowners. No estimate of the current logging rate is available, as operations have only recently resumed. Plantings of teak and mahogany

are reported by the provincial forestry officer, with stands of teak relatively common in northern Malaita.

A number of small timber mills are operating in the province, but there is no available estimate of their number, or of the amount being milled.

6.10 LIVESTOCK

Raising pigs is a traditional practice in Malaita. They are used for traditional practices, including payment as compensation, bride price, gifts and feasts. Before the ethnic tension, Malaitans living in Guadalcanal were renowned for commercial breeding of pigs for sale to abattoirs and stores in Honiara. Many people in Malaita also raised pigs for sale in Honiara, particularly those living on artificial islands and in inland locations. Much of this commercial activity was curtailed by the ethnic tension, although commercial production has increased again. Imported breeds are generally sold for the Honiara market, and local breeds for the local market. Those raised for the commercial market are fed on waste from the Solomon Taiyo fish cannery in Western Province, mill-run either from the flour mill in Honiara or imported from PNG, copra oil mill waste, or imported feed. In the Malu'u area, it was reported that there are about 200 commercial pig producers, with 1–10 pigs per producer. The high cost of imported feed was mentioned as a constraint by almost all people consulted.

Before the ethnic tension, raising chickens for sale was popular around Auki, with frozen, dressed birds shipped to Honiara in insulated containers. Much of this commercial production stopped with the ethnic tension and has only partially recommenced. Chickens are found in most villages, and some people are producing chickens for sale in local markets. As with commercial pig production, the high cost of imported feed is stopping people from growing chickens commercially.

There were numerous cattle 'projects' on Malaita in the 1970s and early 1980s. The total herd increased from about 1100 cattle in 1970 to 5450 cattle in 1977, with an average herd size of 15 cattle. However, the industry experienced difficulties in the 1980s, including difficulty in selling stock, lack of technical support, and insufficient new stock. The industry

on Malaita went into decline. There are a number of cattle projects still operating, mostly on overgrazed and weedy pastures. The study team noted five small herds in the Auki area. The provincial herd is estimated at about 1000 head, mostly in central and northern Malaita. Animals are sold locally for \$2000–3000 per head.

6.11 SOCIAL AND CULTURAL ISSUES

It is difficult to gauge people's feelings in a postconflict situation, with only a week in the field. Nevertheless, the authors gained the impression that people are putting the disruption of the past five years behind them and attempting to move on with their lives, particularly with economic activity.

There is a long history of out-migration by Malaitan men for labour work, going as far back as the blackbird days of the nineteenth century. Many men, some women and some families have moved to Guadalcanal in recent decades seeking paid work or other income-generating opportunities. Many returned to Malaita following the ethnic tension of 1998–2003, but some have returned to Guadalcanal, along with new migrants.

Both men and women are involved in agricultural production and marketing, with tasks tending to be the realm of either men or women. However, the roles are not totally rigid. Women are more involved in garden food production. Men are involved in clearing fallow vegetation (working with women), and they form the mounds for sweet potato production. Women are primarily responsible for planting, weeding and harvesting food crops. As land use is intensified, the overall burden of producing food shifts more towards women: fallow vegetation is cleared less often, but the repetitive tasks of planting, weeding and harvesting remain. Fishing is almost exclusively men's work.

Sale of food crops is dominated by women, with sale of fish dominated by men. Betel nut is sold by both men and women. The person selling the produce is likely to retain the money and spend it, but the authors did not investigate this, and there is undoubtedly much variation between households.

6.12 SUPPORT FRAMEWORK FOR AGRICULTURE

In the Malu'u area, the support that villagers want for agriculture was summarised by the local Department of Agriculture and Livestock (DAL) extension officer as:

- > rehabilitation of cocoa and coconut plots
- > improved food security, especially addressing declining sweet potato yields and pest problems of food crops
- > a volunteer to run local agricultural businesses (because there is a long history of failure of locally managed businesses)
- > a copra oil mill and other value-adding enterprises for copra.

Overall, the support framework for agriculture in the province is poor. Only a few villagers that the authors spoke with had received any support in recent years, and that came mostly from the Kastom Gaden Association (KGA). Nobody had received any information or support from DAL staff and there was a general sense that even trying to get any help was wasting the money needed for transport.

There are 29 DAL field staff in the province, only one of whom is female. Half (15 staff) are based in the provincial capital, Auki. There is no support provided by DAL staff for agriculture in the province, except that for the ROC-funded rice plots. Technical assistance is given to rice growers, and funds are used for travel. As one DAL staff member expressed it, 'all of us are just sitting down'. Staff will only visit villages if they are paid a travel allowance.

The National Agricultural Training Centre at Fote has been closed since 1999, and the buildings have been vandalised. There are no staff on the site, and the roads are overgrown. The houses are occupied by local landowners, except for one house occupied by a former research assistant of the Field Experiment Station. The DAL collection of fruit and nut trees is still there, although somewhat overgrown, and a few trees have been lost. The tree collection is a valuable national resource, and will be needed for any multiplication of planting material for fruit and nut trees.

Dala Agricultural Training Centre is still being maintained, and the farm manager and two labourers

are looking after the grounds and buildings. Fruit and nut trees are also being maintained. No training has been conducted for some years. However, the site remains a valuable provincial resource centre.

Some RTCs are run by the churches and some by village communities. The Airahu Rural Training Centre north of Auki has 176 vocational students (one-fifth are women) and teaches life skills (including English and mathematics), agriculture, mechanics and carpentry. The age range of students is 16–30 years. The training centre is mostly supported by student fees, with some support from the Church of Melanesia.

The RTCs vary in their capacity, but overall they are a potential valuable resource for training, distributing planting material, and as buying centres. They need help with generating income from agriculture, with food production for students, and with upgrading the skills and knowledge of teaching staff.

A number of NGOs are currently operating in Malaita Province, including the Adventist Development Relief Agency, Family Planning Australia, KGA, Oxfam, Red Cross, Save the Children Fund and World Vision. The Australia-based Appropriate Technology for Community and Environment is also active in the province. KGA is the organisation that is most directly involved with agriculture. It conducts training courses on intensification of village agriculture (particularly for 'sup sup' gardens), and on pest control. Some of the concepts being promoted have not been subject to critical research, including the use of plant-derived insecticides for insect pest control. These are reported to be ineffective, and are not being adopted by villagers. The KGA 'Sustainable Livelihoods for Rural Youth Project' has provided training to 220 young people in pig and poultry production using locally grown foods and agroforestry techniques.

The email centre at Silolo in north Malaita is associated with a web-based support service, PestNet. The email service is a useful resource for the local community, helping people to maintain personal contact and to order goods from Honiara.

6.13 COMMERCIAL ENTERPRISES

Commercial activity in Malaita is limited, and businesses are largely confined to Auki centre. There are around 60 enterprises of varying sizes, the most common being retail stores. There are also around 20 transport businesses, mainly Auki-based taxis. The second biggest town in Malaita, Malu'u, has fewer than 10 shops. There are few processing and manufacturing operations. Businesses in the villages are typically small canteens selling a limited range of goods. Enterprises face several major problems. A key problem is credit, or 'kaon'. It is difficult for store owners to refuse credit to their friends and family. Other problems include poor financial and management skills and insufficient buyers.

Financial services in Malaita are extremely limited, and are mainly located in Auki. The National Bank of Solomon Islands (NBSI), ANZ, and the Development Bank of Solomon Islands (DBSI) have branches in Auki, and NBSI has agencies in Atoifi and Afio. DBSI have suspended their banking operations, and the other two banks, NBSI and ANZ, do very little lending in Malaita. For people outside provincial centres, it is costly to deposit money. Of the 42 Malaita credit unions registered, two are reported to be active. The largest, Central Kwara'ae, has more than 300 members, 10% of whom are female, and has made \$33 000 in loans since registration. Some women's groups have expressed interest in a revolving fund. Overall, performance of microfinance programs has been very poor, with many failed cooperatives, credit unions and other donor-funded schemes.

6.14 TRANSPORT AND TELECOMMUNICATIONS

Malaita is accessible by air and sea. There are five domestic airfields. The busiest, located near Auki, has two scheduled flights daily. However, flights are regularly cancelled or suspended because of land disputes. In 2004, the Auki airport was closed for two months. This coincided with the suspension of the major boat service between Auki and Honiara, *Ramos III*. Consequently, smaller, overcrowded boats are servicing the popular Auki–Honiara route several times a week. The current air and shipping services are insufficient to meet demand.

Within Malaita, major forms of transport are road, boats and walking tracks. Malaita has the second most extensive road network of any province (after Guadalcanal), almost 300 km, but public transport services are very limited. Intra-island shipping is limited, with main centres in Malaita being serviced on a fortnightly basis, and other places only having the option of chartering boats when this can be arranged by radio. Fuel is expensive, especially for places furthest from Auki. The irregularity of transport services results in delays and spoilage of products. Coastal people situated away from the ports incur additional costs when chartering motorised canoes. Most of the bush dwellers are dependent on hand-made walking tracks to transport their produce to markets. During the wet season, many of these tracks become impassable, leaving these populations isolated for several weeks at a time. As a result of these expensive and inadequate transport services, many Malaitans are reluctant to expand income-generating activities.

Only Auki has telephone services linking it to Honiara. Other places in Malaita use two-way radios. Email access is available at Silolo in north Malaita. Most people in Malaita rely on radio broadcasts by the Solomon Islands Broadcasting Corporation for information and messages. There is one post office in Auki. Other parts of Malaita rely on deliveries by ship or vehicles.

Solomon Islands Electricity Authority is responsible for providing electricity in Auki. The plants are old and, consequently, short- to medium-term blackouts are common. There are diesel generators located throughout the province, and hydropower is available in a few places. Smaller fuel generators are operated privately. The most common forms of energy used in villages are firewood for cooking and kerosene for lighting.

6.15 PREVIOUS EXPERIENCE WITH AGRICULTURAL DEVELOPMENT

There has been considerable prior experience with agricultural development in the province over many decades. In particular, from the 1950s to the 1980s, there was support at times for copra, cocoa and cattle production. Support for the

export tree crops resulted in the development of successful village-based production, but support for cattle production in the 1970s and early 1980s has not led to a sustainable industry.

The Farmers Support Programme, financed by European Union (EU) STABEX funds, previously provided financial support to the provincial DAL extension service, with budgetary, logistical and training support. Despite the title, it did not provide direct support to village producers. When the funding ceased, the extension support from DAL ceased.

A pineapple-processing plant operated in Auki for two years during 1992–94, but failed because of financial problems. It is claimed that \$10 000 would be needed to repair the plant, but this was not investigated. The pineapple juice found a ready local market in Auki.

The experiences with the copra oil mill at Malu'u have been mentioned in Section 6.7.

The AusAID-funded CPRF operates from five centres in the province. It provides funding for a range of community services, including some road maintenance. Funding for copra dryers was planned, but has not happened. The CPRF is an excellent vehicle to support agriculture in the province, particularly if some technical assistance was available to support field staff.

6.16 OPPORTUNITIES FOR RURAL LIVELIHOODS DEVELOPMENT

Some specific development needs for agriculture in Malaita Province are as follows:

- > provision of advice on food security in the face of increasing pressure on land in northern Malaita, declining soil fertility and declining garden yields; in particular, provision of advice to villagers on techniques to maintain sweet potato yields
- > rehabilitation and replanting of cocoa trees; new plantings should be based on SG2 hybrids, which have been developed by the Papua New Guinea Cocoa and Coconut Institute
- > assistance with production of copra and DME coconut oil

- > production and distribution of a range of fruit trees and temperate climate vegetables for sale locally and in Honiara
- > provision of advice to villagers on production, packaging, transport and marketing of fresh food for sale locally and in Honiara
- > upgrading the facilities at the Auki town market
- > continuing support for honey production
- > support for chilli production for the Solomon Taiyo tuna factory in Western Province
- > provision of relevant advice to villagers on control of pests of a number of important food crops, particularly slippery cabbage
- > support for the RTCs, both financial and for training of teaching staff
- > maintenance of roads and bridges; the poor state of the road network is inhibiting agricultural development
- > construction of feeder roads into the interior of Malaita and the east coast, to relieve pressure on existing land and open up areas for food and cash crop production; for example, an access road to Fulifo'oe would open up land for settlement and agricultural development.

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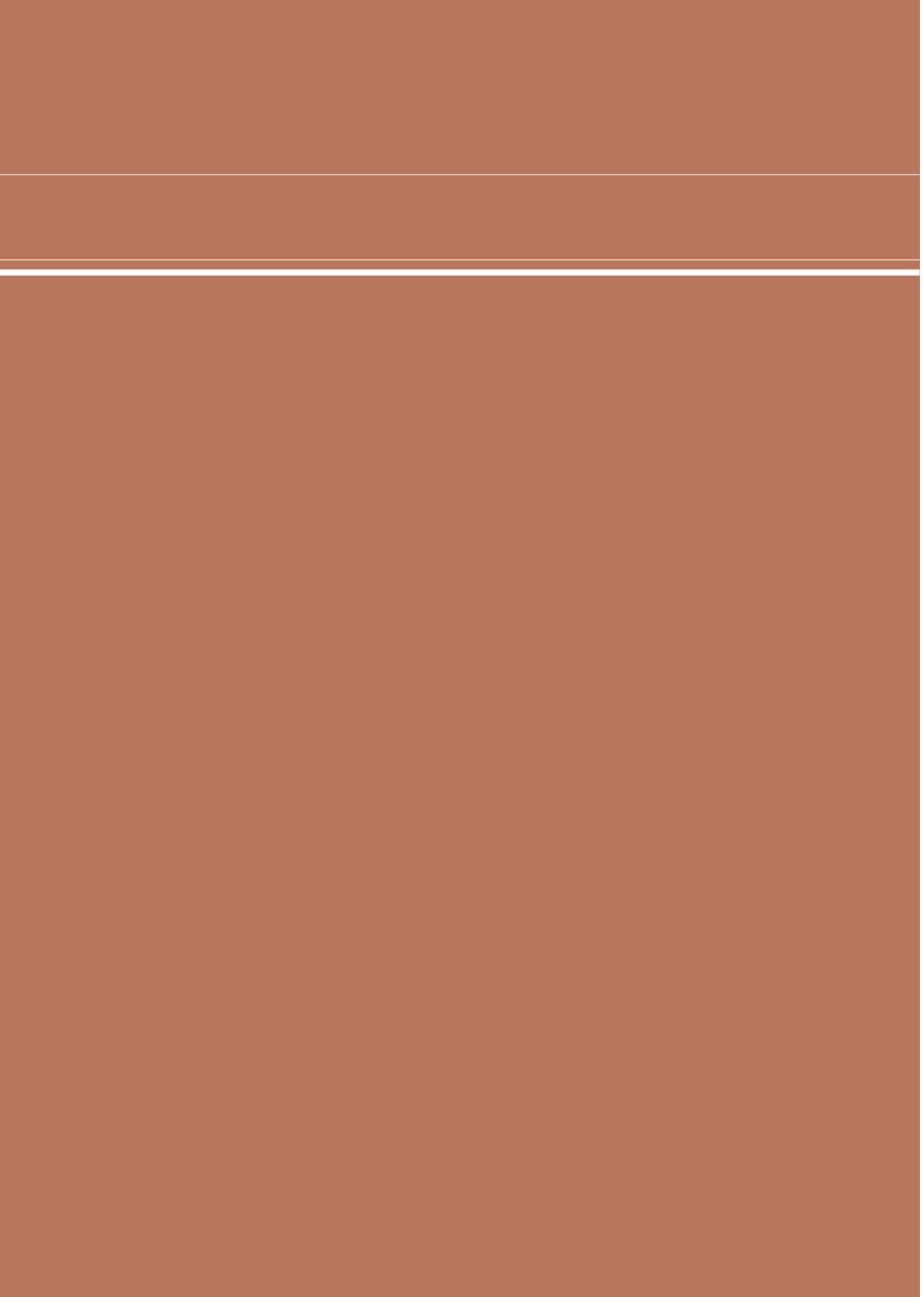
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6.18 PEOPLE CONSULTED

Ata, Matthew	Officer in Charge, Forest Department, Auki
Brown, Terry	Bishop, Auki
Cooper, Kathleen	Honey Cooperative, Auki
Dafe, Adam	Manager, DME Oil Mill, Kwainaben village, Asimana
Diko, Francis	Chief, Arabela village
Diudi, Ledley	Farm Manager, Dala Agriculture Training Centre
Dadalu, Patricia	Siufiwda village
Elliott, Adam	Caritas, Honiara
Faite'e, Cutlogg	Relieving Chief Field Officer, DAL, Auki
Faleka, John	Field Officer, Northern Region, DAL
Farimal, Peter	Field Officer, DAL, Auki
Fatalima, Mary	Senior Field Officer, DAL, Auki
Fil1a, Rex	Assistant Station Manager, Field Experiment Station, Fote
Hagamanu, David	Treasurer, Central Kwara'ae Farmers Credit Union
Hardie, Peter	Honey Cooperative, Auki
Iatob, Pritas	Auki female villager
Ifumae, Thomas	Provincial Coordinator, CPRF, Manu, East Malaita
Iliniace, Ambrose	Chief, Asimana Village
Kabui, David	Taalu Copra Milling, Ta'alu
Kanitolea, Ellen	Provincial Coordinator, CPRF, Malu'u, North Malaita
Konata, Lucian	Area Coordinator, CPRF, Silolo, North Malaita
Kwanaira, Daniel	Chairman, Malu'u Integrated Cooperative Society
Lio, Daniel	Vice-Chairman, Silolo Email Committee
Lio, Lynette	Email operator, Silolo
Lummis, Karen	Capacity Building Officer, Kastom Gaden Association, Honiara
Lowe, Michael	Australian National University, Canberra
Maefilia, Joy	Provincial Coordinator, CPRF, Auki, Malaita
Maefunu, David	President, Central Kwara'ae Farmers Credit Union
Maeluma, Wilfred	Provincial Minister for Agriculture, Auki
Maesue, Josiah	Principal, Airahu RTC
Maetua, Margaret	Women's Resource Centre
Mautei, Nathan	Provincial Minister for Health, Auki
Medo, Stanley	Vice Chairman, Manoho village
Moli, Abel	CPRF, Auki
Munro, Ken	Engineer, Roughton International, Honiara
Overela, Henfred	Faurufa village
Pople, Dennis	Holland Commodities International, Sydney
Prudence	Arabela Women Villager (also Eileen, Esther, Gemima, Eunice, Priscilla and Rachel)
Boat builder	Radisifolimae village
Ramo, Oswald	Deputy Provincial Secretary, Malaita Provincial Administration
Ramoi, Iro	Project Coordinator, Kastom Gaden Association, North Malaita
Rurue, Alan	Provincial Minister for Lands, Auki
Samana, Robert	Radefasu village, Areare Langalanga Constituency Apex Association
Samo, Cedrick	Treasurer, Manoho village

Saokwai, Eddy	Assistant Field Officer, DAL, Auki
Shell-money makers	Oibola village
Siliota, Joseph	Chairman, Arabela village (plus numerous villagers)
Sofa, Stanley	Deputy Premier, Malaita Provincial Assembly
Sove, Judith	Sidu village (and 10 other women)
Suibaea, Minity	Provincial Minister for Forestry, Malu'u
Tabasu, Henry	Principal, Manaho RTC
Takari, Joy	Faurufa village
Toate, Billy	Provincial Treasurer, Auki
Toli, Jane	Lilisiana Auki
Torano, Elysson	Training Officer, DAL, Auki
Trembath, Barry	East Asia Energy, World Bank, Honiara
Tuita, Willie	Senior Field Officer, DAL, Auki
Wale, Celina	Laulana Community High School
Wale, Harry	Oibola village
Wale, Louis	Assistant Field Officer, DAL, Auki
Walhuelo, Abraham	Areare Langalanga Constituency Apex Association
Women representatives	Arabela village



7 Rennell and Bellona Province



Figure 7.1 Rennell and Bellona Province

7 Rennell and Bellona Province

7.1 SUMMARY

Rennell and Bellona (RenBel) is the smallest province (885 km², with 2400 people) in Solomon Islands (SI). Figure 7.1 shows the main features of the province. The islands are isolated, uplifted coral atolls with no surface water and generally poor soils, limiting opportunities for agriculture. Most people are subsistence agriculturalists supported by remittances and the sale of some handicrafts from family members in Honiara. Despite a proportionally high number of government workers, there is no domestic marketing. The staple foods are rice, taro, sweet potato, pana/yam (and banana in Bellona), plus vegetables and some fruits. Production is limited by pressure on scarce and accessible gardens, a short planting season for sweet potato, and pest damage to taro and vegetables.

Agricultural production and marketing could be improved by extending feeder road access to garden areas; providing technical and training assistance in integrated pest management and soil fertility maintenance; introducing superior fruit and nut germ plasm from Santa Cruz; and developing domestic marketing infrastructure.

7.2 OVERVIEW OF FIELD VISITS

A three-day visit to Rennell Island was made by Barry Evans (AusAID agricultural consultant) and Roselyn Kabu (Manager of Kastom Gaden Association, KGA) from 19 to 22 September 2004. They were hosted, and escorted throughout the trip, by the

Community Peace and Restoration Fund (CPRF) coordinator and the agricultural extension officer for RenBel. On the first day, meetings were held with the premier, his executive, and agricultural extension officers in provincial headquarters at Tupuaki, west Rennell. The premier was particularly keen to assist and liaise with the team in order to incorporate the team's findings into a provincial plan that was being prepared. The meeting was followed by visits on foot to surrounding garden areas, and ad hoc meetings with farmers, including members of the Farmers Association, who are supported by CPRF. The first night saw the beginning of 36 hours of heavy rain — the first in two months. This delayed the next day's departure to Tengano Lodge at Lake Te Nggano in east Rennell, and resulted in the trip by truck and canoe taking nearly five hours, due to poor conditions and missed connections. A brief visit was made to nearby Hutuna village to hold discussions and inspect gardens. On day three, meetings and visits were made to villages and gardens surrounding Lake Te Nggano, including Tengano and Tevaitahe, before returning to the provincial headquarters by truck. The team departed by plane the next morning.

7.3 INTRODUCTION

Rennell (840 km²) and Bellona (15 km²) lie 180 km south of Guadalcanal, between 11 and 12° south. The climate is typical of small tropical oceanic South Pacific islands, with a 22°C mean minimum and 32°C mean maximum temperature, and

3000–4000 mm of rainfall per year, with a less wet period during the peak trade wind season between May and August, when water shortages can occur. The islands are located in the track of frequent and intense cyclones, which have a major impact on the environment and economy.

Rennell is the largest and highest uplifted coral atoll in the world, with two central depressions, and a steep-cliffed rim reaching 100 m above sea level. The eastern depression forms Lake Te Nggano, which, at 155 km² (about 28 km x 9 km), is the largest in the Pacific (Wall and Hansell 1976, Lees 1991). The lake and its surrounding area, totalling 370 km², are currently nominated as a United Nations Educational, Scientific and Cultural Organization (UNESCO) world heritage site,⁷ following continued project support by New Zealand Official Development Assistance throughout the 1990s (eg Wingham 1997). The UNESCO world heritage system stresses the importance of conservation of unique environments and their associated flora and fauna but, by precedent of East Rennell's nomination, also recognises customary land ownership and its associated right of access and resource use.

Soils on Rennell are generally shallow, reddish, sandy loams derived from weathered coral and organic matter that has accumulated in scattered and scarce microdepressions. Swamps often form at lower elevations, and these are prone to waterlogging after heavy rain. Unlike most places in SI, there is no volcanic or sedimentary enrichment. Bauxite deposits have been surveyed, but have not been mined. Wall and Hansell (1976) found most areas of uplifted coral on the island to be unsuitable for agriculture. A total of 125 km² of land was identified as suitable for coconuts, spices and gardens, and moderately suitable for cocoa.

Soils on Bellona are generally better, due to more uniform relief and accumulation of phosphate. Just 3.5 km² was identified by Wall and Hansell (1976) as being suitable for coconuts, cocoa, spices and gardens. Soils on both islands are deficient in potassium, but the symptoms in plants are much greater on Rennell (Wall and Hansell 1976). The lack of above-ground water, and the depth of the water table (wells

need to be sunk >20 m in most places) increase the island's vulnerability to seasonal water shortages.

The forests of RenBel are distinguished by the absence of common SI canopy species such as *Camnosperma* and *Pometia* (Lees 1991). The forest on Rennell is dominated by figs (*Ficus* spp). Other common canopy species include *Elaeocarpus sphaericus*, *Endospermum moluccanum*, *Terminalia sepicana*, *Sterculia parkinsonii*, *Burkella obovata* and *Palaquium amboinense*. There are three major vegetation types on Rennell: low mature forest on the karst ridge of the island perimeter; tall forest in the interior depression; and beech forest around Lake Te Nggano.

The population of RenBel in 1999 was 2377,⁸ with an average annual growth rate between 1986 and 1999 of 2.2% (Solomon Islands Ministry of Provincial Government 2001). Age dependency is high; nearly 50% of the population is less than 14 years or more than 65 years old. Although the average population density of 2.1 people per km² is well below the national average of 14.8 people per km², the population is highly concentrated around the provincial station in western Rennell, along the axis roads of both islands, and around the western edge of Lake Te Nggano in east Rennell. The largest village is Hutuna, on the lake, with an estimated population of 300 people. An estimated 60% of all ethnic Rennell and Bellonese (of Polynesian descent) live outside the province, mostly in Honiara (Solomon Islands Ministry of Provincial Government 2001).

7.4 LIVELIHOOD STRATEGIES

The majority of households in RenBel are subsistence farmers, supported by remittances from family members working in Honiara. Occasionally, cash income is obtained from the sale of handicrafts (via family members in Honiara), contract fishing on overseas-owned boats, and sale of coconut crab. Because of the small population of the province, there is a relatively large number of government employees. These people must rely largely on food produced by their families and extended families, because there are no domestically marketed foods or well-stocked stores.

7 See http://www.wcmc.org.uk/protected_areas/data/wh/eastrenn.htm (Accessed 30 Aug 2004).

8 This is thought to be an underestimate, because many enumerators were unpaid.

7.5 SUBSISTENCE FOOD PRODUCTION

The main staple foods in Rennell are rice, taro (*Colocasia esculenta*), sweet potato and yam/pana (*Dioscorea* spp). In Bellona, banana is dominant, followed by rice, taro, sweet potato and yam/pana. Other important foods include coconut, pawpaws, slippery cabbage, fresh fish (east Rennell only), tinned fish, noodles, pineapples, citrus, pumpkin, eggplant, tomatoes, chinese cabbage, ferns, sweet potato leaves and sandpaper cabbage (*Ficus* sp). Cassava is only a minor crop. Seasonally important fruits include mangoes and breadfruit. Traditionally, the flesh of gemugi fruit (*Haplolobus floribundus*), a small-seeded relative of ngali nut, is classed as a seasonal staple (Henderson and Hancock 1988), but its importance as a food appears to be diminishing.

Nuts that are cultivated and eaten include Polynesian chestnut (*Inocarpus fagifer*), sea almond or alite (*Terminalia catappa*) and cutnut (*Barringtonia* spp). According to informants, citrus perform well on the islands, despite the old age of the trees. There is a general shortage of vegetable seed in the province.

Shortfalls in food self-sufficiency were exposed during the ethnic tension, when supply ships failed to arrive, and the population increased as family members returned home from Honiara.

Most gardens are located in areas of soil accumulation, known as microdepressions, around villages and along the islands' road axes. The cropping cycle is normally two to five years before fallow. Taro is usually planted first, followed by other staples or vegetables. Alternatively, yams and pana are followed by sweet potato. The overall cycle is governed by the need to plant sweet potato between July and August; potatoes planted outside this period produce much lower yields. This narrow planting season can lead to periodic food shortages. Taro can be planted all year round, but pest problems (see below) have diminished its role as a backstop. The fallow period is generally three to five years, depending on which staple is planted first, the general quality of the site, and distance of the site from the village.

Declining soil fertility, caused by increased cropping periods, shortened fallow periods, and a shortage of suitable and accessible garden sites, is a major problem in Rennell. It is apparently less of a problem

on Bellona. There is little knowledge of, or use of, nontraditional soil fertility maintenance techniques. Farmers attribute declining yields of sweet potato to declining soil fertility. One farmer stated that his approximately 0.1-hectare plot of sweet potato could no longer yield enough to feed his family.

The major constraint to taro production is damage caused by taro leaf hopper (*Tarophagus proserpina*) and, possibly, the associated spread of Alomae or Bobone viruses. Symptoms include leaf curl, rust spots on the stems, and eventual stem/tuber rot. The hoppers are particularly prevalent during dry weather.

Melon aphid (and associated scale and viruses) causes significant damage to pawpaw and cucurbits. The fruits are harvested while immature to minimise losses. Farmers spray Orthene (acephate), a systemic pesticide, which is recommended by the Republic of China (Taiwan) (ROC) for rice, to treat the hoppers and aphids (and just about anything else), but control is usually only temporary. According to the head of the Department of Agriculture and Livestock (DAL) research division a biological control agent (thought to be an insect, *Cyrtorhinus fulvus*) that eats the taro hopper's eggs, was introduced in the late 1990s, but there was no follow-up, and clearly it has failed either to establish or to control the hopper.

Upland rice has been planted in the past, with encouragement from DAL and ROC, but this has been discontinued because of pest problems.

7.6 DOMESTICALLY MARKETED FOOD, FISH, FIREWOOD AND BETEL NUT

There are no formal markets in RenBel. Surplus food (usually sweet potato and a few vegetables) is occasionally bartered or sold within villages. Gardening and fishing activities are primarily to meet consumption needs of the family. Any production surplus is sold locally during fundraising and training activities in the communities. One farmer, who has a farm close to the school and the provincial headquarters, sells his produce to the school and at training workshops.

Handicrafts are produced by men and women and sold informally, via relatives, in Honiara for

food or cash. There is potential for harnessing production of this sector, and providing job opportunities to the unemployed in the area, because local materials are abundant.

There is abundant firewood available for everyone, so none is marketed.

Betel nut was formerly grown on the island, but was wiped out by cyclones in the past decade. Now betel nuts are imported from Honiara, and sold in Rennell for \$2 per fruit.

7.7 VILLAGE CASH CROPPING

There are some smallholder-based groves of coconuts. However, there are no buying agents for copra (or any other bulk agricultural commodities), and there are unlikely to be any in the future, unless access to markets via shipping is radically improved.

A few cocoa trees have been planted, but no cocoa is produced.

7.8 PLANTATION CASH CROPS

Ironically, Rennell gives its name to the tall variety of coconut planted throughout SI and used in breeding programs, but it is not commercially grown within the province. No copra has been produced for many years; the last time is thought to have been in Bellona in 1979.

7.9 SMALL-SCALE FORESTRY

A total unlogged commercial forest area of 30 000 hectares has been identified by the Solomon Islands Government's (SIG) forest resource inventory, but none is earmarked for future operations because of socioeconomic and environmental constraints (URS Corporation 2003). According to the Forestry Department, several landowners have begun to establish small teak plantations, of 200–800 trees each, which are expected to provide small incomes from 2013 onwards (URS Corporation 2003).

There are thought to be more than 20 chainsaws in the province, which are used to help clear land for agriculture. They are also used, with a chainsaw guide, to cut and mill timber for local construction.

There appears to be no shortage of timber; many houses are panelled with 20-mm planks, and there are significant amounts of milled timber awaiting transport along the main axis road in Rennell.

Chainsaws can be rented for \$150 per day, plus labour and fuel. Cut timber sells for an average of \$900 per cubic metre.

The true value of RenBel's forests is in their nontimber products. Local people continually harvest fruits, nuts (including the staple gemugi nut), building materials, ropes, medicines, and firewood for everyday use, and often rely on emergency forest foods after cyclones (Henderson and Hancock 1988).

7.10 LIVESTOCK

Livestock is confined to occasional tethered domestic pigs in non-Seventh Day Adventist Church (SDA) villages, scavenging chickens and a few wild goats. The main constraint is a lack of supplementary feed. There are no cattle, because the jagged limestone terrain is unsuitable.

There are a few unmanaged beehives in the province.

7.11 SOCIAL AND CULTURAL ISSUES

The main tasks of women in Rennell are gardening, weeding, harvesting, weaving mats and baskets, and other household jobs. Women hold the main responsibility for earning and handling cash, and this money is spent on basic needs, such as kerosene, salt and soap. There is, however, a general need for women to better understand how to handle money.

Women are also engaged in other household activities, such as cooking, cleaning, and looking after children. Women are the main child educators, resource managers and food providers in the community, but are always left out of decision making at both community and national levels. Some of the constraints women face in Rennell and Bellona are a lack of training in gardening techniques, protecting soil fertility and using pesticides; a lack of economic activities at the village level, and of market opportunities within the province; and a lack of opportunities to share information.

Migration to Honiara to take advantage of its economic opportunities provides income from remittances, but has significant social and cultural impacts on Rennell and Bellona, particularly the splitting of families.

7.12 SUPPORT FRAMEWORK FOR AGRICULTURE

There are two agricultural extension officers (field officer and assistant field officer) in RenBel, both based at, and largely confined to, the provincial headquarters station in west Rennell. The field officer would like to station an officer in east Rennell and to recruit another for Bellona, but there are no funds or housing currently available.

The field officer deals directly with the Director of Extension in Honiara, but has also received assistance in identifying crop pests from the ROC entomologist.

There is a People's First Network email station at Hutuna village on Lake Te Nggano in east Rennell, but it is currently not used to access information on agriculture through networks such as KGA and PestNet.

A small rural training centre (RTC) with 26 students, at Tabaieha on the west shore of Lake Te Nggano in east Rennell, is currently being expanded with assistance from CPRF. The RTC currently teaches short courses in theology, carpentry, mechanics and domestic science, but the principal expressed interest in teaching agriculture in the future, if appropriate capacity could be obtained. The RTC plans to operate a three-tonne truck and sell furniture to raise income.

7.13 COMMERCIAL ENTERPRISES

In 2001, there were 16 stores in RenBel (Solomon Islands Provincial Government 2001), but the number is thought to have decreased since then. These stores sell only a very limited inventory of goods, such as rice, noodles, tinned fish and kerosene, and depend on the sporadic shipping services. Fuel is usually only available at ship anchorages and offloading points, such as Kanggava Bay in Rennell.

There are a few privately owned and operated tourist and accommodation lodges operating in the

province. Most tourists are special-interest groups, such as birdwatchers and ecotourists. These are attracted to the flora, fauna and geography of the islands, especially to Lake Te Nggano in east Rennell, where there are some tourist lodges (although one of these is understood to be inoperative). Another lodge, by the airstrip at the provincial headquarters in west Rennell, mainly services transit, provincial and development workers. Tourist numbers dropped dramatically during the ethnic tension, and have yet to recover. The anticipated tourism benefit of nomination of East Rennell as a UNESCO world heritage site has also been adversely affected by the ethnic tension and, to a lesser extent, by the protracted, and now stalled, process of full listing of the site.

Neotraditional carvings and baskets are made by RenBel men and women, respectively. Some are sold directly to the few tourists and development workers who visit the province, but most are sold in Honiara via relatives who live there.

No banking facilities or credit unions operate in RenBel; the province is essentially a cash economy. Most saving is done directly in Honiara, or via relatives there. These relatives often sell handicrafts on behalf of province-based producers.

7.14 TRANSPORT AND TELECOMMUNICATIONS

In Rennell, the main (almost) all-weather axis road connects the provincial capital and airfield in the west to Lake Te Nggano in the east, via Lavanghu Bay. The 46-km journey takes three hours in good weather. There are a further 30 km of road and 10 km of bush tracks. There are fewer than five vehicles on Rennell, and petrol costs \$8–12 per litre, when available. The Provincial Government has plans to develop a deep-sea wharf at Lavanghu Bay, where ships must currently be offloaded via canoe. This would significantly reduce shipping costs.

Bellona has a central east–west axis road of 32 km, and a proportionally longer network of feeder roads, which allow greater access to the agricultural areas. Although the road network on both islands is limited, it is of crucial importance to agriculture and all other sectors. Most people live in the interior of the island, and there are few natural breaks in

the fringing reef, making access to coastal areas by canoe difficult. Away from population centres in the interior and around the western edge of the lake, most agricultural activity is within a short distance of the main road axis. A small increase in feeder roads would result in a significant extension of land accessible for agriculture. This would mean an increase in food supply and security and a decrease in the problems associated with the intensification and nonrotation of farming systems.

Despite being more than 30 years old and receiving very little maintenance, the current road system is in reasonable condition, and passable even in heavy rain, because of its coral base. It can therefore be reasonably assumed that maintenance costs of any new extension to the road system would not be as high as in other provinces, where base and building materials might not be so suitable.

SolAir currently flies Honiara–Bellona–Rennell–Bellona–Honiara twice a week. The 10-minute flight between Rennell and Bellona costs more than \$300 (two-thirds the cost of the 55-min flight to Honiara), out of the reach of most people, but it is effectively the only way of travelling between the two islands. There is no air freight facility.

Shipping services have significantly declined since the SIG disbanded its provincial service fleet in the late 1990s. In theory, supply ships visit RenBel every three months but, in practice, this can be every six months, and only after the province charters a boat. Not surprisingly, this is seen by all stakeholders as the major impediment to agricultural (and other sector) development in RenBel. The trip to Honiara takes one-and-a-half days, and costs \$100 per person. Asian fishing boats periodically visit the province to fish the productive Indispensable Reef off the south coast but, despite requests to the SIG's Marine Department from the province, they are not permitted to carry passengers or fuel.

There are no telephones on RenBel. About a dozen radios (including CPRF's) are operating in the province, and some can be temporarily connected to external telephones via Telekom. There is a People's First Network email station at Hutuna village on Lake Te Nggano in east Rennell. Post is delivered via SolAir.

7.15 PREVIOUS EXPERIENCE WITH AGRICULTURAL DEVELOPMENT

Most national agricultural development initiatives fail to include RenBel in their official activities. The major agricultural programs of the 1990s (the Smallholder Development Programme and the Farmers Support Programme) had no specific activities in RenBel. More often than not in RenBel, initiatives are made by individuals and extension, based on their experience elsewhere in SI.

ROC, through extension, has promoted the cultivation of dry-land rice for local consumption in RenBel, but there has been little follow-up, and there have been significant problems with pest damage.

Some beehives have been trialed in Rennell, but they are mostly inoperative due to lack of maintenance. However, the potential for increasing honey production for local consumption is high. The relative isolation of the islands provides a quarantine buffer, and a lack of alternatives (such as jams and sugar) in stores means that demand would be high.

CPRF currently supports two agriculture-related activities in RenBel: providing tools and equipment for a farmers association in east Rennell to help increase food supply (staples and vegetables) to the school and for sale, and assistance to taro farmers. There are no copra- or cocoa-related project activities.

EU Micro Projects has provided \$50 000 to the Central Bellona Women's Association Marketing Centre for construction of a market building.

7.16 OPPORTUNITIES FOR RURAL LIVELIHOODS DEVELOPMENT

Staple food production shortfalls caused by narrow seasonal production of sweet potato and pest and disease damage to taro could be addressed by introduction of early- and late-season varieties of sweet potato and disease-resistant taro.

Poor supply and diversity of food, especially in west Rennell, could be improved by:

- > support for horticultural production
- > support for domestic marketing — infrastructure and transport

- > introduction of improved tree germ plasm, for species such as fruits (especially chestnut, *Inocarpus fagifer*, and breadfruit) and nuts (especially Santa Cruz ngali nuts, *Canarium harveyi*, from Santa Cruz, which has a very similar climate and geomorphology)
- > support for bee keeping for honey production and fruit tree pollination.

Declining soil fertility in gardens surrounding population centres in central western Rennell could be addressed by:

- > development of a feeder road system to extend potential growing areas and relieve pressure on existing garden sites (excellent base and road building materials provide value for money and low maintenance costs, and maximise return on investment in landlocked areas)
- > training and assistance in permaculture and soil fertility maintenance methods, such as composting, mulching and leguminous cover crops.

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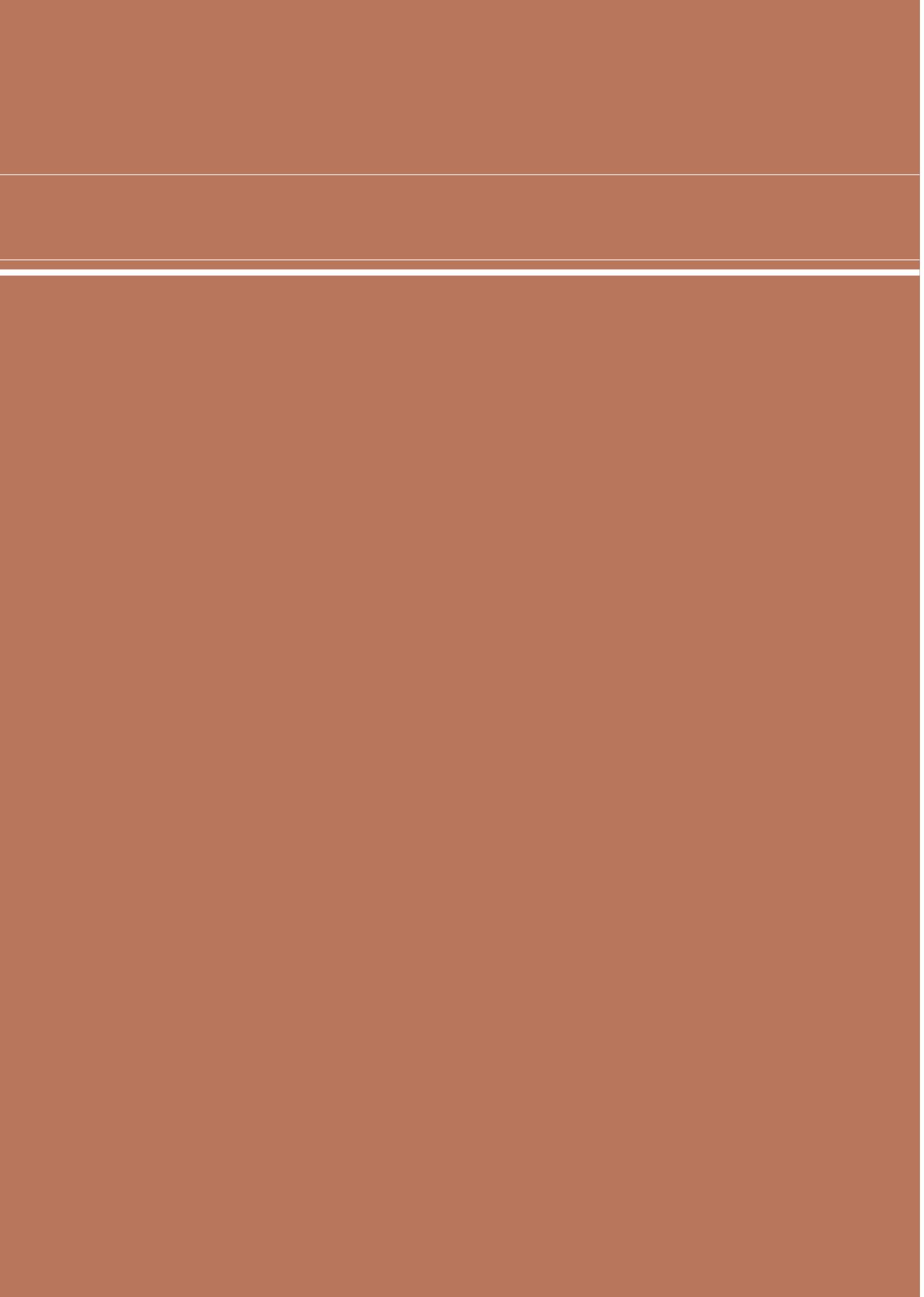
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7.18 PEOPLE CONSULTED

Dyall	CPRF Provincial Coordinator
Niuata, Mulbery	President, Provincial Council of Women
Stanley	Deputy Provincial Secretary
Tango'eha, Kendrick	MAL field officer
Taupongi, Matthew	Premier, RenBel
Teikahoko, Rueben Billy	Farmers' Association, Tingoa
Tenge'maona, Sulli	Deputy Provincial Secretary
Tevaitahe, John	Chief
Tuhagenga, Evans	Provincial Secretary
Villagers	Hutuna and Tenggano, east Rennell



8 Temotu Province

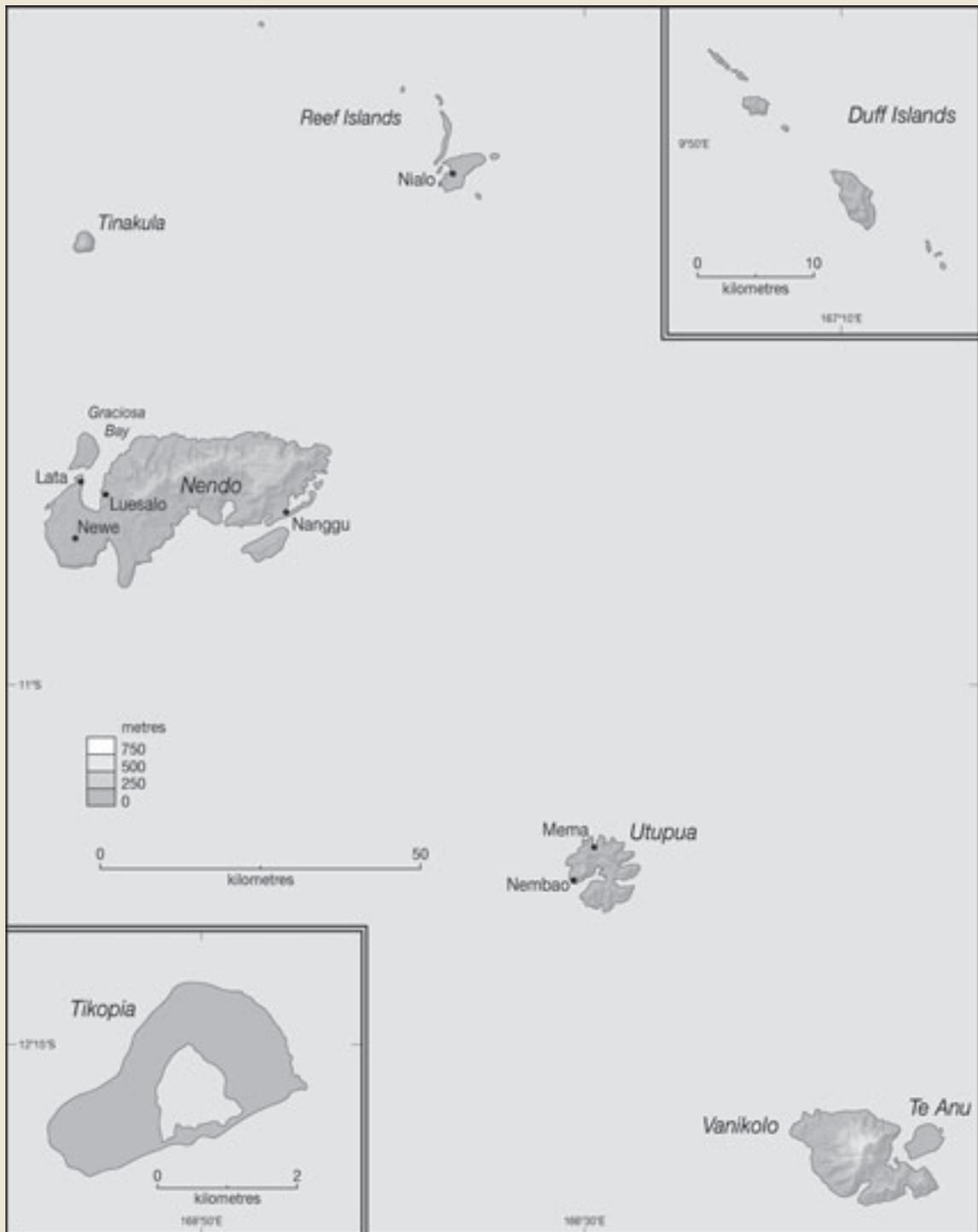


Figure 8.1 Temotu Province

8 Temotu Province

8.1 SUMMARY

The people in Temotu Province (see Figure 8.1) live predominantly on the coastal fringe and are engaged in subsistence farming, with sweet potato and bananas the staple foods. Copra is the primary source of cash income. Other important sources of cash are wages, cocoa, fish, livestock (mainly pigs), and dried breadfruit (nambo).

Major constraints to agriculture development are lack of market access, inadequate road infrastructure, and irregular and unreliable shipping. The lack of budgetary support for the Department of Agriculture and Livestock (DAL) extension for general agriculture is a further serious constraint. There are local opportunities to support rural livelihoods through assistance to activities currently being undertaken in the province. These include support for copra and cocoa dryers for those who cannot afford them, improved production from subsistence crops, development of improved subsistence-level and semicommercial livestock production (particularly pig production), and support for village-level microprocessing operations involving production of dried breadfruit (nambo), ngali nut products, and virgin coconut oil. Benefits from these activities to most villagers will depend on access to information and markets, which will involve appropriate inputs from existing institutes like the Agricultural Extension Service, the rural training centres (RTCs) and locally active nongovernment organisations (NGOs), such as the Mothers' Union.

8.2 OVERVIEW OF FIELD VISITS

Due to transport problems, Morgan Wairiu (agricultural consultant, Honiara) could not go to Temotu as planned, but spent a week, in Honiara in October 2004, consulting and conducting face-to-face interviews with people from Temotu. The consultant received additional information from the Community Peace and Restoration Fund (CPRF) coordinator in Temotu.

8.3 INTRODUCTION

Temotu Province consists of seven main islands, with a total land area of around 835 km². Santa Cruz is the largest island, covering 519 km². Other Islands includes Tinakula (an active volcano), the Reef Islands (a small group of low reefs and terraces), Duff Islands and Utupua (small hilly islands), and Vanikoro Island, which is located 115 km from Santa Cruz. At an even greater distance from Santa Cruz (400 km southeast) are the Polynesian Islands of Tikopia and Anuta, with areas of 5 and 1 km², respectively.

Santa Cruz Island consists of a central high core of volcanic ridges, flanked in many areas by calcareous sediments. The western side consists of high elevated reefs, while a thin belt of alluvium encircles the northern and eastern coasts. A hilly plateau, 300–500 metres above sea level, in the east of the island, is formed by high-level alluvial valleys and low volcanic ridges. Tinakula is the only active volcano

in Solomon Islands (SI), and is only 8 km² in area, rising to just over 800 m above sea level. Tikopia and Utupua islands are extinct, eroded and partly submerged, volcanoes.

The average annual rainfall is around 4000 mm, with the rainy season from November to May. Rainfall is highest around Lata on Santa Cruz. There are still large tracts of natural lowland rainforest on Santa Cruz, Utupua and Vanikoro, but there is no natural forest on Lomlom, the main island in the Reef Islands group. Temotu is prone to cyclone damage, with 22 cyclones on record since 1950. The cyclone frequency was highest during the period 1970–2000.

Soils are of volcanic origin, and volcanic ash is found on parts of Santa Cruz and the Reef Islands. This ash has been deposited by Tinakula volcano. Soils formed from this volcanic ash are known as allophanic soils, and are found nowhere else in SI. The soils are weakly acid to alkaline, with a high proportion of carbonate-rich rocks, which supply the soil with high levels of calcium, moderate levels of magnesium and phosphorus, but little potassium. Some parts of the Reef Islands group are low coral terraces, sand cays and reefs.

The Land Resources Study, conducted in 1974, identified only one agricultural opportunity area (AOA): Graciosa Bay on Santa Cruz Island, with a land area of 183 km², or 23% of the total land area in Temotu Province. This area is suitable for agricultural development, but remains largely underused. The land systems found in the AOA are the Noepe, Nambalue, Mbomalua and Lomousa land systems. Other small areas of agricultural potential exist, but these were omitted from the analysis because of their small size. The lack of

wharf and road infrastructure is a major constraint to development of these areas.

The people of Temotu are predominantly Melanesian (82.1%), with a small Polynesian population (17.4%), mainly on Tikopia, Anuta and Pileni in the Reef Islands.

The Temotu provincial population at the time of the 1999 census was 18 912 people, living in 3415 households, of which only 72 households were urban, located at Lata town, the provincial headquarters (SIG 2002). The province accounts for 4.6% of the country's population. About 7775 people, or 41% of the population, are under 15 years of age. The annual population growth rate from 1986 to 1996 was 1.9%, substantially lower than for the preceding decade, when the growth rate was 2.8%. By extrapolation, the population in 2004 would be 21 500 people, and will double every 35 years. The dependent population is 46.1% of the total.

The average population density for the province is 23 people per km², higher than the national average of 14.8 people per km². It is highest on the islands of Tikopia and Anuta (224 people per km²) and Reef Islands (189 people per km²). Land area and population densities for the islands of Temotu Province are shown in Table 8.1.

According to the 1999 census, only 110 households, or 3.2%, have access to electricity, while the rest (3415 households) use traditional methods of generating energy, such as kerosene for home lighting and wood and dry coconut for cooking (SIG 2002). Housing is predominantly constructed from bush materials (87% of houses), and about 80% of the population is engaged in subsistence farming and fishing.

Table 8.1 Land area and population density by island, Temotu, 1999

ISLAND	POPULATION	LAND AREA (KM ²)	POPULATION DENSITY (PEOPLE/KM ²)	CROPPABLE LAND (KM ²)
Santa Cruz	9 911	519	19.1	247
Reef Islands	5 484	29	189.1	27
Duff Islands	439	14	31.4	2
Utupua	848	69	12.3	6
Vanikoro	884	190	4.7	8
Tikopia/Anuta	1 346	6	227.3	5

Source: Solomon Islands Ministry of Provincial Government and Rural Development (2001)

Throughout the seven main islands of Temotu Province, 92% of the population live on the coast, with the exception of a few villagers who live in inland villages, about 10–20 km from Lata township. Internal migration and resettlement within the province has increased within the last two decades. The shift is from the smaller islands in the Reef Islands group, Duff Islands, Tikopia and Anuta, to Santa Cruz.

The Christian faith is followed by most people in Temotu Province, with the Church of Melanesia accounting for 86.1%. Other denominations include Christian Outreach Centre (7.2%), Jehovah's Witnesses (2.1%), Church of the Living Word (1.6%) and Seventh Day Adventist (1.5%). The churches provide significant services to their communities by way of schools, RTCs, trade stores, two-way radio communications and other facilities.

8.4 LIVELIHOOD STRATEGIES

There are three basic livelihood strategies used in Temotu Province. The first is based on domestic consumption of sweet potato, bananas and fish, income from sale of root crops, dried breadfruit (nambo), copra, cocoa, and pig, and cash from wages at Lata.

The second livelihood strategy, used by the predominant rural population of Temotu, is based on subsistence production of sweet potato and banana. Banana production reduces the risk of food shortages in very wet years, when sweet potato crops fail. Leafy vegetables, particularly slippery cabbage, are also grown for home consumption. Surplus foods are sold for cash at local markets, but local markets are limited and lack cash. A wide range of additional activities are undertaken to provide further cash income. Copra production and dried breadfruit (nambo) are the most widespread source of income, whereas other sources are situation specific. These include cocoa, pigs, chickens, betel nut, fish, bêche-de mer and trochus shell.

A third livelihood strategy is that of the wage-earning households based around the provincial capital and substations. These households buy root crops, fish, meats and other items from their local markets, and rice, tinned fish, biscuits and luxury foods from trade

stores. Commonly, some production of root crops, bananas, vegetables and tree crops is undertaken in the home garden, or in land close to the town.

8.5 SUBSISTENCE FOOD PRODUCTION

Sweet potato (*Ipomoea batatas*) and banana/plantain (*Musa* spp) are the most important food crops in Temotu, holding equal status as staples. Their cultivation dominates food gardens in Temotu. In 1999, 93% and 91%, respectively, of the province's households produced banana/plantain and sweet potato for home consumption. Other staple food crops are cassava (*Manihot esculenta*), fruit trees, mainly breadfruit (*Artocarpus altilis*), and Santa Cruz ngali nut (*Canarium* sp.), pana (*Dioscorea esculenta*) yam (*D. alata*), taro (*Alocasia* and *Xanthosoma*), and swamp taro (*Cyrtosperma chamissonis*). The swamp taro is a major staple on Vanikoro and Utupua. Other important food sources are coconuts, fish, and other marine foods. The main green vegetable grown is slippery cabbage. Other common food-producing trees and legumes are cutnut (*Barringtonia procera*), sea almond (*Terminalia catappa*), Tahitian chestnut (*Inocarpus fagifer*) and peanut. Betel nut and betel pepper are widely grown and consumed or sold at the domestic market. Imported rice and flour-based foods are significant in the diets of some villagers and people in Lata.

Land use is intensive in the Reef Islands, but less intensive in other areas. The fallow vegetation is generally low, woody regrowth, with trees and shrubs growing to a maximum height of four to five metres. Typically, people plant two crops of sweet potato before land is fallowed. Sweet potato is often intercropped with banana, either on the garden edges or randomly throughout the plot. In some cases, banana is planted as a sole crop. Fallow periods range from one year or less in villages in the Reef Islands, to two to four years on Santa Cruz. Population growth has resulted in shortening of the fallow period and extension of the cropping period, with consequent declines in soil fertility and crop yield. This is particularly a problem in the Reef Islands group and outlying islands, and needs urgent attention, because it will have a profound impact on food security. Reasonable yields of sweet

potato and other crops were being maintained in areas with recent deposits of volcanic ash on Santa Cruz. To address the current low yields and loss of soil fertility, the DAL extension, and some farmers, developed a farming system known as the Improved Temotu Traditional Agriculture (ITTA). The system is tree-based, integrated with legumes, root crops and vegetables. It is being adopted by more than 400 farmers, mainly in the Reef Islands, where declining soil fertility and crop yields are real problems. The average size for an ITTA garden is around 0.5 hectares. The members of ITTA have organised themselves into a group to further develop and promote ITTA in the province.

Natural events, such as prolonged periods of high rainfall and cyclones, can have great impact on crop yield, and damage food gardens. Cyclone damage in early 2003 on Tikopia and Anuta islands resulted in temporary shortages of food crops, and necessitated relief supplies from Honiara. Insect pests were also reported to cause serious damage to sweet potato and taro tubers, and the leaves of slippery cabbage.

Firewood is in plentiful supply, and is obtained from land under fallow and regrowth under coconut plantations on Santa Cruz, but is in short supply on outlying islands.

Rice is becoming an important food in most rural households and, therefore, smallholder rice growing is being promoted in Temotu under the Republic of China (Taiwan) (ROC) Agriculture Mission. Production is, however, heavily subsidised with external inputs. Assistance to villagers takes the form of direct funds for technical support from agricultural extension staff, equipment, seed, fertiliser, chemicals and milling machinery. Two rice mills have been installed in Temotu, but one requires repair work, and the other was installed under private arrangement and not through the DAL extension. It remains underused, because the area in which it is located is no longer producing enough rice. The policy put in place by ROC Agriculture Mission to have a 20-hectare area producing rice as a precondition for supply of a rice mill is difficult, and a disincentive to most farmers. Currently, two additional rice mills are needed on Reef Islands and Bekapoa (north coast of Santa Cruz). The rice is generally consumed within the producing

households, and surplus is sold locally. The rice crop is increasingly subject to insect attack, especially during the second and third crops. The dependence on external inputs (chemical, mechanical and external technical inputs) makes it difficult for most smallholder rice growers in Temotu to sustain their production. Substantial resources have been directed at rice production for the last six years.

The main constraints to increased production of subsistence foods are:

- > limited land on the outlying islands (Reef, Duff, Utupua, Anuta), so that most gardening takes place on marginal lands
- > pests and diseases reducing yields of slippery cabbage and taro; the *Papuana* beetle is a serious problem for taro production, because it destroys corms before harvesting
- > declining yields, especially of sweet potato on the Reef Islands and the outlying islands
- > use of inefficient tools (such as the digging stick) because of the nonavailability of modern hand tools, such as hoes and mattocks
- > a lack of seed or vegetative material for production of fruits and vegetables.

8.6 DOMESTICALLY MARKETED FOOD, FISH, FIREWOOD AND BETEL NUT

The primary products sold at the Lata market, in decreasing order of volume, were sweet potato (several varieties), plantain and banana (several varieties), nambo, pana, yam, bread (as buns), ngali nuts and cutnuts, tomatoes, and leafy vegetables. Fishermen sold skipjack tuna, and occasionally reef fish, on most afternoons during the week. Chickens and pigs were reported to be sold irregularly.

Several villagers reported conducting informal markets for the sale of produce, although the markets sometimes suffer from a lack of cash within the purchasing communities (see Box 8.1). Cash income from copra, pig, nambo and cocoa and other commodities is the key to having these markets function effectively.

Although cash income from betel nut is lower than for copra and cocoa, betel nut is widely grown by households for both domestic use and sale at the

domestic market. In 1999, 2635 households (77%) were involved in production and marketing of betel nut. There are no production data available, but it was evident that new planting and production is increasing. The domestic market for betel nut is also expanding, with the increasing number of people now chewing betel nut. Betel nut is sold at most informal and formal market outlets in Lata. Prices at Lata market ranged from \$0.10 to \$0.50 per fruit, depending on supply and demand. Betel nut is occasionally sold into the Honiara market, where a 20-kg bag can fetch \$100–150.

Dried breadfruit (nambo) and shelled ngali nut and cutnut are sold at Lata market. Nambo is not only a local staple; over the years it has become a major Temotu export to Honiara market. The mature or ripe breadfruit is dried over a purpose-built dryer, using mesh and a single 44-gallon drum. Once dried, it can keep for up to two years before losing its quality. It is eaten by local people as a snack and in some urban households it is consumed at breakfast as a substitute for bread and biscuits. In December 2003, 150 tonnes of nambo were sold at Honiara market at \$4.00 per 1-kg packet. There is a continuous supply from Temotu, and demand in Honiara is increasing. Several people from Temotu now bring in supplies but, because of irregular transport and high freight costs, not all the nambo reaches the Honiara market (see Box 8.2). Breadfruit is a major tree crop in the ITTA system and, in 2003, ITTA farms alone produced about three tonnes of nambo. About 80% of households are involved in nambo production.

To facilitate the export of nambo from Temotu Province, there needs to be better market coordination and arrangement, provision of storage facilities, both at Lata and in Honiara, and support for those already marketing.

BOX 8.1 JOCELYN INONI — SALE OF ROOT CROPS AT HONIARA MARKET

Jocelyn comes from Malo, Santa Cruz and grows root crops, fruits and vegetables in her garden. The soil is fertile and she produces more than her family needs for home consumption, and sells the surplus. However, she could not sell much of her produce at Lata market. She said, 'I can't sell my produce at Lata, there is no-one to buy, so I go home with my produce at the end of the day'. She has joined with others to bring their produce, mainly root crops (yam, pana, sweet potato, taro and ngali nut) by boat to Honiara market. She only brings crops that can be stored for long periods, although she has other produce, including fruits and vegetables. She normally brings about 50–60 bags or baskets of root crops per trip, and pays for freight at \$20 per bag or basket. Her sea fare is \$240.00 one way. It normally takes her one week to sell all her produce at Honiara market, but she has to wait for three to four weeks to catch the next boat back to Temotu. This is a problem, because she spends a lot of money in town while waiting, and she also becomes a burden to the relatives she resides with.

If there were reliable and regular transport to Temotu, Jocelyn could sell more produce and earn more money through marketing her root crops. Jocelyn said, 'It's tough as a woman to do marketing, but this is the only way to earn income'. Sometimes Jocelyn's husband assists her to come to Honiara to do the marketing. There are others in the province bringing their produce to Honiara, but unreliable, irregular shipping, and lack of capacity of boats currently operating, are major hurdles.

Jocelyn said that to produce is not a problem, but transport and marketing are real problems.

BOX 8.2 CHARLES BONIE — PIG AND NAMBO MARKET IN HONIARA

Charles works in Honiara. Every month, two or three members of his family travel from Nanggu on Santa Cruz to Honiara, and bring about 30 live pigs and 30 bags (of 50 kg) of nambo. They come and stay with Charles, and sell their produce. Charles has constructed a small temporary holding pen close to his residence, where his relatives can temporarily keep their pigs. They sell all 30 live pigs and 30 bags of nambo within the month, before the next boat back to Temotu. The income is used to purchase household supplies before their return home. They have been doing this for the last three years. Pigs are sold at \$500–1000, and people from within Honiara and from the Guadalcanal Plains, as far as the Gold Ridge area, come to buy. A lot of customers know where Charles lives, and place orders before the pigs arrive from Temotu. The nambo is sold in 1-kg bags at the Honiara main market for \$4.00 per bag. Charles says this is his family's marketing arrangement. However, there are many people from Temotu who would like to market pigs and nambo in Honiara, but cannot do so because of a lack of logistics and the high transport costs. Other families from Temotu have similar marketing arrangements, but there is no overall coordination.

Charles recommended that, to explore the full potential of the commodities and meet the current market demand in Honiara, a proper marketing system needs to be set up, with storage and holding facilities established at both Honiara and Lata. He pointed out that, to enhance marketing, private entrepreneurs should operate these facilities.

8.7 VILLAGE CASH CROPPING

8.7.1 COPRA

Copra is the most important source of cash income for rural coastal villagers. The 1999 census showed that 55% of households produce copra for cash income (SIG 2002). The income from copra was \$338 per household, ranking Temotu fifth, after Choiseul, Western, Isabel and Makira/Ulawa provinces, where income ranged from \$346 to \$570 per household. Most (83%) of the copra produced was delivered by canoe and outboard motor to Commodities Export Marketing Authority (CEMA) buying centres and points; the rest was transported by truck and ship. This reflects the extremely limited road system in the province. Copra production in Temotu fell drastically during 2001 and 2002 because of financial problems experienced by CEMA, and the impact of the ethnic tension. During this time, most copra dryers rusted and became unserviceable. Production picked up again in 2003, after the Solomon Islands Government (SIG) privatised the copra industry. Production of copra in 2003 was around 950 tonnes, up from a record low of 14 tonnes in 2002. All this copra was produced by smallholders. Sufficient numbers of copra dryers were repaired, using private finance, to support production requirements, but many remain unserviceable.

Fewer than half of the nuts produced from current coconut stands in Temotu are processed into copra. The rest are used for subsistence food or animal feed or are simply left to rot or grow wild. No copra buyer operates in the Reef Islands group or the outer islands. There is potential for the surplus coconuts to be sold for copra or oil production. Processing of direct micro-expelled coconut oil offers potential, and the economic viability of this option should be explored.

8.7.2 COCOA

Cocoa is another important source of cash income, but production is relatively small, and is mostly restricted to certain areas on Santa Cruz, such as Bekapoa and Lata wards. Others wards, such as Nevenema, Nanggu, Nea and Neo, produce

small quantities. In 1999, less than 20 tonnes of cocoa were produced in Temotu; this increased to 26 tonnes in 2000, which accounted for 11% of total national production for that year. The price increase in 2002–03 has resulted in further increased production. Fermentaries have been built in areas where cocoa production is high, and are generally owned by smallholders, who buy wet cocoa beans (at \$1.50 per kg) in addition to producing their own cocoa. Some older cocoa plantings in the Bekapoa and Lata areas are in poor condition and require rehabilitation by removing undergrowth, managing shade, pruning, and replacing dead or old trees. There is potential to expand cocoa production in Temotu, but the high rainfall, which encourages disease, and transportation problems mean that production will always be limited.

8.8 PLANTATION CASH CROPS

There are no large, commercial coconut or cocoa plantations in Temotu.

8.9 SMALL-SCALE FORESTRY

There are no logging operations on Temotu, and it is unlikely that there will be any in the future, because the Provincial Government has indicated that the forest resources will not be sold as round logs, but must be processed internally. A forest plantation of 2980 hectares, mainly mahogany (1260 hectares), was planted on Santa Cruz by the Forestry Department, following logging by Allardyce Lumber Company between 1975 and 1979. Natural regeneration of kauri, which is indigenous to Santa Cruz and Vanikoro, has been encouraged by the government. Currently, about 2250 hectares of land is under kauri, and this is a potential Provincial Government asset. Small-scale sawmilling, using chainsaw mills, is common in most regions around Temotu.

8.10 LIVESTOCK

The 1999 census found that 66% of Temotu households kept pigs (SIG 2002). Numbers varied from village to village, ranging from 1 to 20 pigs per household, but most commonly two to three

pigs were kept per household. Pigs have cultural significance and are used for important feasts, bride price, funerals and to pay debts. Pigs are also sold within and between communities, sometimes without cash payment. Traditionally, pigs are fed coconuts, food scraps and garden wastes, and their reproduction and growth rates are moderate at best. The over-fat condition of native pigs is caused by the large quantities of coconut, and the lack of high-quality protein, in their diet.

Sale of pigs is an important income earner for villagers in Temotu. Pigs are often sold at the Honiara market, and the current supply to Honiara is around 200–300 pigs per month. Villagers start selling the live pigs as soon as the boat arrives at the Honiara wharf. There is potential to increase both production and sales, but major constraints are irregular transport, high freight costs, and the lack of holding pen facilities and sources of feed in Honiara (see Box 8.2, above).

There are about seven small herds of cattle in Temotu, most of them on Santa Cruz Island. Smallholder cattle herds of two to five head are usually tethered, and management is generally, but not universally, poor. With a small amount of assistance from DAL extension staff, the small cattle industry could be reinvigorated, and provide meat for local requirements.

Village chickens make up the bulk of the poultry in the province, and about 43% of households own chickens. These are raised in the typical zero-input village system as a source of occasional meat or cash. Future production will need to be in dual-purpose systems, using breeds capable of producing both eggs and, ultimately, meat, and be based on local chickens and predominantly local feeds.

8.11 SOCIAL AND CULTURAL ISSUES

The following social and cultural issues are obstacles to agricultural development in Temotu Province:

- > land disputes, which commonly prevent or disrupt the development of commercial activities
- > social and community obligations, which take precedence over commercial activities

- > the lack of commitment to agricultural enterprises (most farmers shift rapidly from one enterprise to the next, often attracted by expectations of higher economic returns)
- > the lack of full-time farmers (most farmers engage in a range of livelihood activities)
- > the traditional culture, which makes it difficult to refuse requests from friends and relatives for loans of cash or produce; these are rarely repaid
- > the small amount of DAL technical support, which is currently a serious impediment to development.
- > provision of fuel and allowances to support farm visits
- > access to new information and technology to disseminate to farmers
- > an effective applied research back-up capability at a national level
- > strategic and operational plans to direct their work programs, rather than the current directionless system of simply assisting with the latest donor project.

There are two RTCs in Temotu: Luesalo on Santa Cruz and Mena on Utupua. Both are run by the Church of Melanesia. RTCs generally teach life skills (including English and mathematics), agriculture, mechanics and carpentry. Girls also learn sewing, cooking, nutrition and home economics. RTCs are financed by student fees, the church, and the Solomon Islands Association of Rural Training Centres (SIARTC) (currently through EU funding). These centres are potentially valuable for training, for distributing planting material, and as buying centres. They need assistance to generate income from agriculture, produce food for students, and upgrade the skills and knowledge of teaching staff. Graduates would greatly benefit from support to establish small income-generating projects in their villages upon completion of training.

Two NGOs that are directly involved in agriculture are the Planting Materials Network (PMN) and ITTA. These are village or farmer-based organisations and are coordinated by the villagers themselves. Any donor-funded assistance should help strengthen the ability of these organisations to meet their objectives of directly working for the villages.

8.12 SUPPORT FRAMEWORK FOR AGRICULTURE

Overall, the support framework for agriculture in Temotu is poor. Actual and potential support organisations are DAL, RTCs and various NGOs.

There are six DAL staff in the province, all men. Most are based at Lata, and an extension assistant is based in the Reef Islands. Government provides no direct support for DAL staff in the province, except for payment of their salaries. Currently, staff are only involved in donor-funded activities, such as the ROC-funded rice and vegetable program, European Union (EU) Micro Project-funded agriculture projects and, recently, CPRF-funded copra and cocoa dryers. Extension officers provide technical assistance to rice growers and monitor EU Micro Project projects; donors provide funds for travel (fuel costs) and staff allowances. Staff will only visit farmers if they have fuel and are paid a travel allowance.

The buildings and grounds of the Agricultural Training Centre and Research Field Experimental Station at Newe are being maintained, but no agriculture staff are stationed there. Fruit and nut trees have not been maintained, and no training has been conducted for some years. However, the site remains a potentially valuable provincial resource centre.

For the provincial DAL to provide an effective extension service for farmers, they require:

- > housing for extension staff at appropriate locations in the province; officers are currently without housing and stay in their home villages

8.13 COMMERCIAL ENTERPRISES

A wide range of commercial activities are conducted within Temotu. Licences are issued for commercial and semicommercial activities, including merchant shipping, trade stores, hawking, cooked-food stalls, copra buying, cocoa buying, bakery, and butchery.

Banking facilities are available at Lata through the National Bank of Solomon Islands (NBSI), and are operated by the Diocese

of Temotu of the Church of Melanesia. No other rural credit schemes are available.

Temotu Coconut Products Ltd operates a copra crushing mill at Lata, but output has been sporadic over recent years, due to the breakdown of CEMA and a lack of copra to crush. During four months of full operation in 2001, it produced 29 962 litres of coconut oil. The crushing mill is still operating.

There are three rural fisheries centres in the province, located in Lata, Nanggu and Nialo (Reef Islands). All three centres were built by Japanese donor funding. They are not currently operating, due to a combination of lack of sufficient financial and logistical support, high fuel costs, a lack of technical personnel, and poor management. The remoteness of the islands is also a contributing factor.

CEMA used to operate four buying points, at Carlise Bay, Nanggu, Nialo and Nembao, and a buying centre at Lata. All except the buying centre at Lata ceased operating in 2000, when CEMA's operations collapsed. No-one is using these facilities and they remain inactive.

8.14 TRANSPORT AND TELECOMMUNICATIONS

The lack of a road network, particularly on Santa Cruz, is perhaps the most significant barrier to development in Temotu Province. There is a total of 103 km of roads, mainly on the western side of Santa Cruz. Most of these roads are deteriorating, and will become unusable at some point. They need urgent maintenance. Logging roads were constructed in the past on some parts of Santa Cruz and Vanikoro, but they are no longer in use. The only road on Reef Islands, the Manuopo–Nialo road, is also no longer in use. The existing road network is accessible to only 28% of the population. As well as maintenance, the existing roads require extension to access areas of agricultural potential, particularly on Santa Cruz. As Temotu is made up of a number of islands, wharves at major boat ports of call also require maintenance, and new ones need to be constructed. Currently, there are only two permanent wharves, at Lata and at Nialo in the Reef Islands. Three semipermanent wharves at Carlise Bay, Ndedu and Nembao are unusable, and need to be upgraded to make them permanent.

Few commercial cargo and passenger vessels travel between Honiara and Temotu. The provincial boat, MV *Temotu*, makes fortnightly trips to the province, and several privately owned boats, including MV *Baruku*, MV *Graciosa*, MV *Yandina* and MV *Neptune Gale*, also travel to Temotu on charter. Their frequency depends on the availability of general cargo and the number of passengers. Freight costs on the chartered boats are very high, and this places constraints on movement of produce.

The major forms of sea transport between the islands of Temotu Province are outboard motor-driven canoes and traditional canoes, sailed or paddled. Solomon Airlines operates a weekly service to the only airstrip in the province at Lata, but the service is unreliable, with many cancellations.

Several government and business offices in Lata have telephones and email, although no services are available to the public. Solomon Telekom has installed public phones around Lata township and provides a fax service for the public at its office complex. A large number of two-way high-frequency (HF) radios operate at schools, churches and missions, and RTCs and agriculture extension officer locations across the province. A 1997 survey recorded 18 two-way HF radio installations (Ministry of Finance 1997). The Solomon Islands Broadcasting Corporation has a radio station at Lata called 'Radio Temotu'.

8.15 PREVIOUS EXPERIENCE WITH AGRICULTURAL DEVELOPMENT

There has been considerable prior experience with agricultural development in Temotu Province over many decades. In particular, there has been support for copra and cocoa production, which has been generally successful, and for cattle production, which has been less successful.

The Smallholder Development Programme (SDP) and the Farmer Support Programme (FSP), financed by EU STABEX funds, previously provided financial support to the provincial DAL extension service, with budgetary, logistical and training support. The programs also provided direct support, in the form of labour subsidy, tools, fertilisers and dryer parts to village producers. When the funding ceased in 2000, the extension support from DAL also ceased.

The AusAID-funded CPRF operates from Lata. It provides funding for a range of community services, including schools, clinics and water supply. The main input into agriculture has been the funding of 15 copra, and 4 cocoa, dryers. The CPRF staff have received assistance from DAL extension in design and costing of dryers. The CPRF has potential to be a conduit for provision of agriculture support in the province, particularly if some technical assistance is available from DAL extension staff.

8.16 OPPORTUNITIES FOR RURAL LIVELIHOODS DEVELOPMENT

The types of support needed for development of agriculture in the province, not ranked in order of priority or economic justification, are listed below:

- > construction of roads, and regular maintenance of existing roads (the poor state of the road network is inhibiting agricultural development, especially marketing)
- > construction of storage facilities at Lata market for produce such as nambo, and of holding pens for pigs at transit points leading to shipment to Honiara
- > provision of advice to villagers on production, packaging, processing, transport and marketing of food to be sold locally, especially for nambo
- > provision of technical information to improve food security (pest and disease control, halting the decline of soil fertility and the decline of garden yields, supplying improved planting materials, and increasing home vegetable production)
- > technical and logistical assistance in small-scale livestock production and marketing, particularly for local pigs and chickens and, to a lesser extent, cattle
- > rehabilitation and replanting of cocoa trees, and provision of cocoa and copra dryers
- > regular provision of marketing information, such as prices for agricultural products in Lata, Honiara and world markets
- > assistance with production of copra and DME coconut oil

- > assistance in drawing the RTCs into providing short-term agricultural training information to their neighbouring communities
- > support for the review and reproduction of the ITTA handbook, and support for further development of the tree-based farming system among Temotu farmers.

Marketing-related support needed includes:

- > an information system to facilitate the sale of commodities, including copra, cocoa, and other produce, such as nambo and pigs
- > provision of international, Honiara and local prices being paid for commodities
- > provision of regular shipping services, and an improved road network.

Support needed for production of various commodities includes:

- > copra — supply copra dryers, on a needs basis, to the most disadvantaged farmers; this should be done through the existing buyer network
- > cocoa — supply up-to-date technical information, and access to seedlings for replanting; the latter could be achieved by providing resources to RTCs to establish seed gardens, and rehabilitating existing stock
- > subsistence crops — introduce new high-yielding varieties, and varieties with pest and disease resistance
- > tree crops — build shipping and storage facilities at both Honiara and Lata to enhance marketing of nambo, and investigate the possibility of processing it into flour
- > food processing — continue support for Temotu Province to establish efficient storage and marketing systems.

Village-based farmers were uniformly of the opinion that assistance for income-generating activities should be delivered to individual families rather than community groups, should not pass through National and Provincial Government systems, and should be delivered as small-scale assistance over an extended timeframe rather than as large-input, short-term projects.

8.17 WRITTEN SOURCES OF INFORMATION

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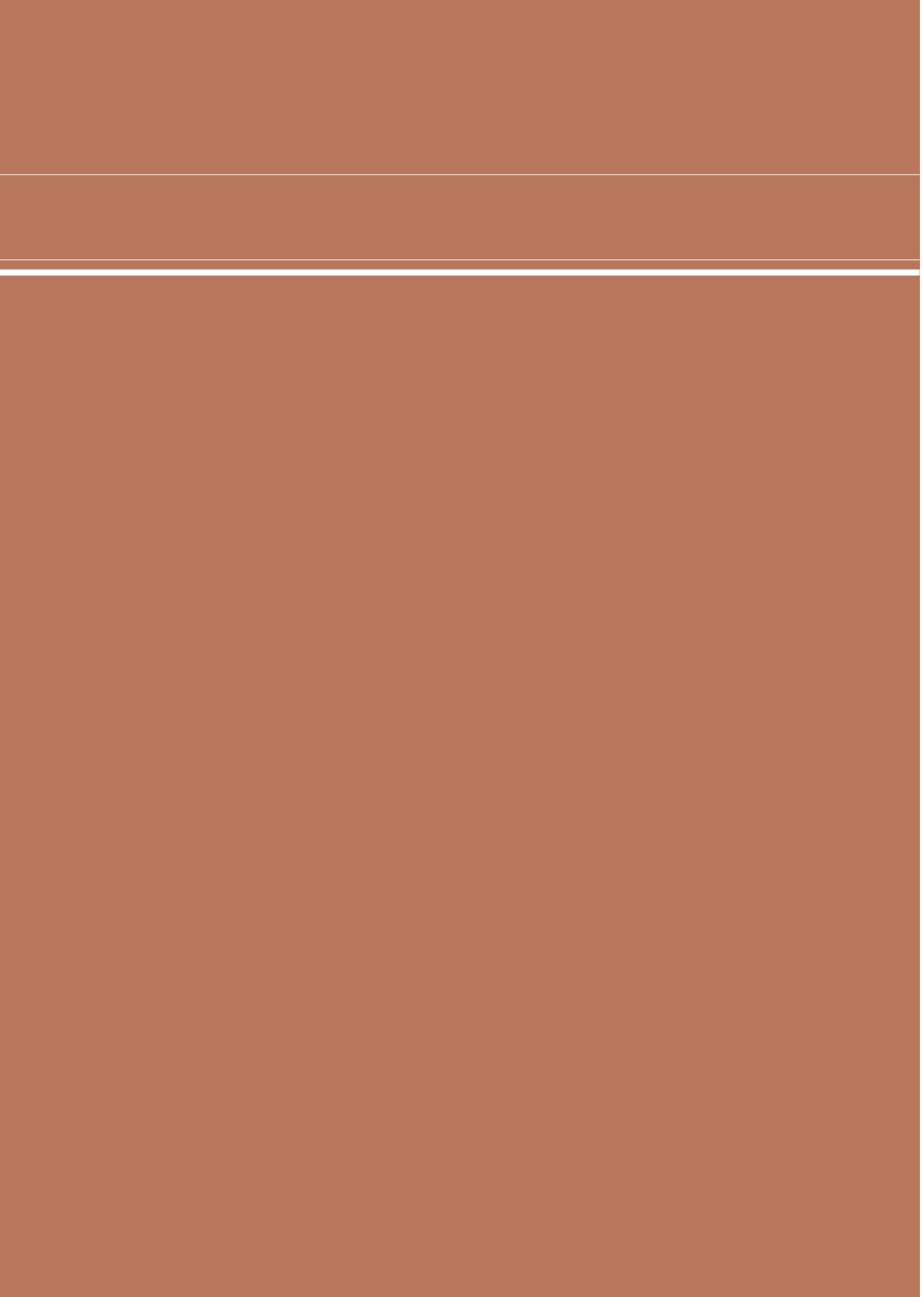
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Wall JRD and Hansell JRF (1974). *Land Resources of the Solomon Islands. Volume 8: Outer Islands*. Land Resources Study 18. Overseas Development Administration, UK.

8.18 PEOPLE CONSULTED

Akomane, James	Senior Agricultural Extension Officer, DAL
Bonie, Charles	Nambo and pig family transit, Honiara
Bonnie, Jasper	Senior Agricultural Extension Officer, DAL
Hoahania, Betty	Coordinator, CPRF, Lata
Farmers	
Bade, Hilda	Malo, Santa Cruz
Bonagi, Chris	Reef Islands
Dawi, Willy	Malo, Santa Cruz
Ikaria, Magdalene	Neo, Santa Cruz
Inoni, Dorina	Malo, Santa Cruz
Inoni, Jocelyn	Malo, Santa Cruz
Inoni, Victoria	Malo, Santa Cruz
Natei, Loise	Reef Islands
Nawo, Edwin	Malo, Santa Cruz
Nika, Nika	Reef Islands
Polau, Frank	Fenualoa, Reef Islands
Sapolau, Janet	Reef Islands
Tepule, Doreen	Reef Islands



9 Western Province

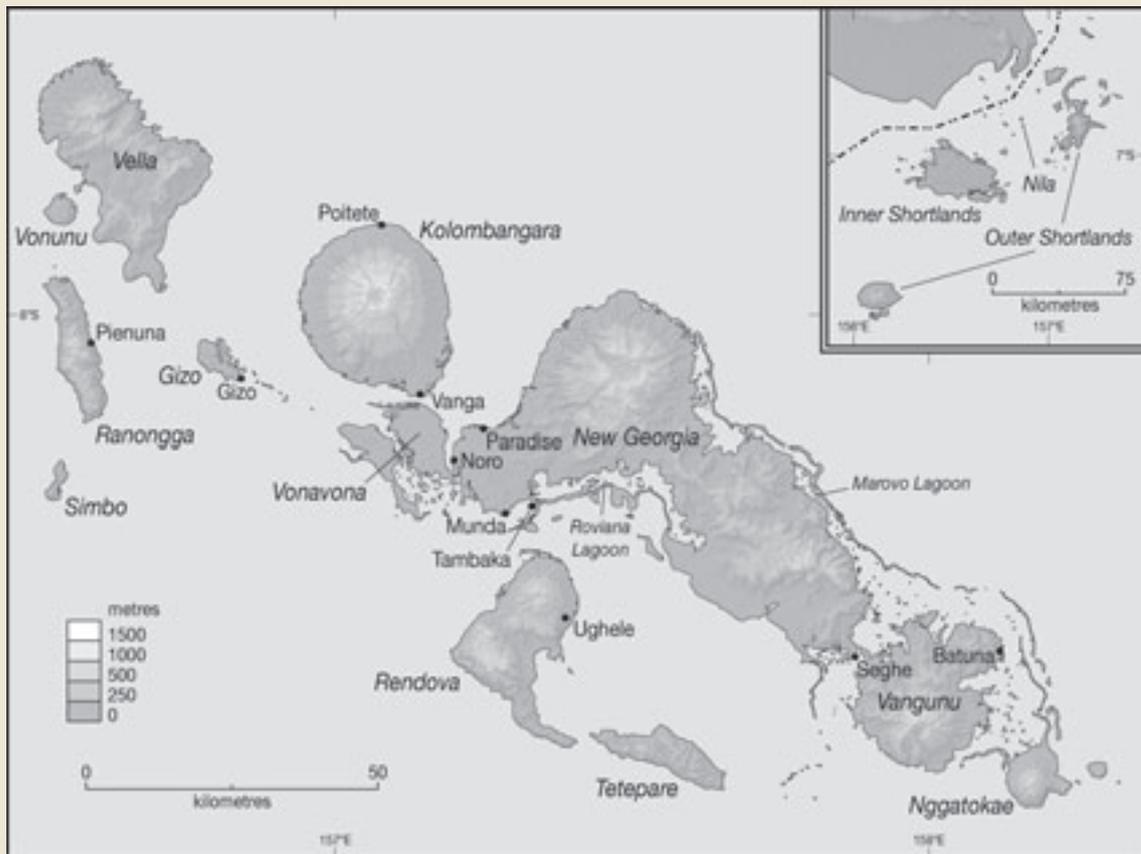


Figure 9.1 Western Province

9 Western Province

9.1 SUMMARY

Western Province is the largest province (5500 km²) in Solomon Islands (SI). Figure 9.1 shows the main features of the province. The province's rich marine and forest resources have provided rural people, the province and the country with significant income for many years. However, forest log resources are nearly exhausted, and royalties from bait fishing have decreased significantly with the decline in tuna fleets caused by the ethnic tension. Most people rely on subsistence farming and fishing, but Western Province has a significant internal cash economy based on urban demand and incomes from logging and fishing.

Staple foods are rice, cassava and sweet potato. Yams, pana and taro are less significant. In many places, population pressure and poorer access to, and availability of, garden land is producing agronomic problems. These are associated with decreased fallow periods and increased cropping cycles, which result in lower yields and pest and disease buildups. The province could benefit from the experience and techniques of other provinces and islands (such as Santa Cruz), where more sustainable tree-based, intensive land-use practices have evolved in response to long-term population pressure.

Western Province has large stocks of coconuts and cocoa trees, but production is significantly below capacity because there are no buyers, and because of high transport costs and low levels of liquidity in the supply–marketing chain. These market factors, plus

competition from alternative land use practices for the prime coastal land presently used for coconuts and cocoa, will limit the long-term impact of efforts to rehabilitate the industry in Western Province. The province also has large, high-quality stocks of indigenous nuts, which could be simply processed in subprovincial centres that have electricity, and sold domestically and overseas.

Rehabilitation and replanting of logged-over land is a priority in Western Province and previous initiatives aimed at small-scale sustainable forestry should be revived. Opportunities also exist for increased production and marketing of locally produced food and poultry products for sale in Gizo and Noro, and of chilli for the cannery in Noro.

9.2 OVERVIEW OF FIELD VISITS

This report has been compiled by Mr Barry Evans (agriculture expert) and Ms Claudine Watoto (AusAID). The team conducted a seven-day rapid rural appraisal in four areas of Western Province: Kolomobangara, Gizo, Vona Vona, and Roviana. Unfortunately, a scheduled two-day visit to Marovo lagoon was not able to proceed because of flight cancellations and poor boating weather.

The team visited St Dominic Rural Training Centre (RTC) and Ghatere village on Kolomobangara; Gizo; Parara Island; Vona Vona; Munda, Noro and Bulelava on New Georgia Island; and Raduvu on Rendova Island.

9.3 INTRODUCTION

Western Province is the largest province in SI, with a total area of 5500 km² (see Table 9.1). The province is made up of two sets of islands. The Shortland Islands, with three main islands, are in the far northwest of the country on the Bougainville–Papua New Guinea border at 7° south. The New Georgia group, which consists of a chain of young volcanic and volcanic-derived islands with extensive surrounding fringe reefs and large lagoons, runs from northwest to southeast between 7° and 9° south (see Figure 9.1).

There are three major lagoons in Western Province: Vona Vona, Roviana and Marovo. Marovo, which stretches 100 km, is one of the world's largest lagoon systems, and has been nominated as a United Nations Educational, Scientific and Cultural Organization (UNESCO) world heritage site.

The New Georgia group are mostly derived from black basalt, and soils are well structured and well drained. Acidity increases with altitude, as a result of heavy leaching, and this diminishes agricultural potential.

The geomorphology and landforms of the province are complex and extensive; Wall and Hansell (1976ab) describe 40 land systems. Bauxite deposits have been identified in New Georgia. Gold, other minerals and geothermal power have been prospected in Vella (SIG 1979).

Western Province is less affected by cyclones than provinces further to the southeast in SI. Seismic activity, however, is a real threat. Simbo Island has been evacuated several times for fear of the volcano erupting, and a large earthquake in 1959, near Vella, caused extensive damage there and in Ranongga, resulting in villages being abandoned and people being displaced.

Average annual rainfall ranges from 3500 mm in low areas to more than 6000 mm on the mountain peaks, with most areas receiving around 4000 mm (Wall and Hansell 1974). In the southeast of the New Georgia group (Ghatokae, Vangunu and southeast New Georgia), rainfall is highest during the southeast trade wind season, between May and October. In the rest of the group, northwest monsoonal rains

Table 9.1 Area, population, and population density (persons per km²) of main islands of Western Province, 1970 and 1999

ISLAND	AREA (KM ²)	POPULATION		POPULATION DENSITY	
		1970	1999	1970	1999
Shortland	420		3 495	5	8
Vella	670	652	9 160	6	14
Ranongga	145	2 250	5 059	16	34
Gizo	35	50	5 262	63	150
Simbo	12		1 670	79	139
Kolombangara	685	689	5 603	3	8
Vonavona	180		4 494	8	25
New Georgia and Marovo	2 145	5 514	19 312	3	9
Rendova	400	1 565	3 679	4	9
Tetepare	120	30	0	0	0
Vangunu	520	1 968	2 212	4	4
Nggatokae	110	481	2 367	4	22
Others	58		687		12
Total/average	5 500	(13 199)	63 000		11 ^a

Source: Wall and Hansell (1976ab) and SIG (2002)

^a According to the 1999 census (SIG 2002), the population density of Western Province is eight people per km² (50% less than that shown), but the census erroneously gives the land area of Western Province as 7509 km², approximately 2000 km² (36%) more than that given by Wall and Hansell (1976ab). Hence, average national figures for population density quoted in the 1999 census are underestimated by approximately 10%.

(November to March) dominate. Some central areas in New Georgia and the Shortland Islands are affected by both airflows (Hansell and Wall 1976).

Nearly half of the 54 agricultural opportunity areas (AOAs)⁹ identified by Hansell and Wall (1976), covering a total area of 3500 km², are in the New Georgia group. However, although soils in Western Province are generally physically good, the AOAs are mostly located in less hilly coastal areas, where, particularly in New Georgia, the haplorthox (oxisol) soils are least fertile. Hence, large-scale cash cropping on AOAs could only be realised with the input of relatively large amounts of costly fertilisers. Ironically, most AOAs identified by the Land Resources Study in the 1970s have been logged over (see Section 9.9).

The total population of Western Province in 1999 was 63 000 people; the third largest provincial population, and approximately 15% of the national population. Population growth between 1986 and 1999 averaged 3.2% per year, the highest rate of increase in provincial SI (average of 2.8%). The number of households in Western Province has more than doubled since 1986. A total of 43% of Western Province's population is under 14 years (40%) or over 65 years (3%). The average population density is 11 people per km², which is slightly lower than the national average, but there are pockets of comparatively high density that have doubled from 1970 levels (see Table 9.1). Virtually the entire population lives in coastal areas. Major urban areas include Gizo (5500 people) and Noro (3500 people). Western Province has the highest proportion of people in paid work (35%) in provincial SI – a reflection of the number of jobs available in the forestry, fishing, tourism and services sectors.

About 80% of the land is held under customary ownership, and 12% is held as alienated crown land. Major areas of alienated land exist over most of Kolombangara, and to a lesser extent New Georgia, Vangunu and the Shortland Islands. Tetepare is the largest uninhabited island in the South Pacific.

Western Province has 200 000 hectares of 'commercial forest', containing about 12 million cubic metres of timber, by far the largest area in the country (URS 2003). The absence of cyclonic damage means that the forest is generally of high quality.

9.4 LIVELIHOOD STRATEGIES

A greater proportion (10%) of people in Western Province live in urban areas (Gizo and the Noro–Munda catchments) than in any other province except Guadalcanal (SIG 2002). The combination of a sizeable urban population, tourism, fishing, logging and relative isolation from the main Honiara market has produced a significant and relatively independent local cash economy in Western Province.

Households in Western Province are heavily reliant on fish and marine products for both food and cash. Production of seafood for consumption and sale is greater than in any other province, and undertaken by 87% and 44%, respectively, of households (SIG 2002). Shellfish and lobsters are particularly important sources of income for households in Western Province because of its rich lagoons and religious prohibitions on shellfish and lobster consumption.

Therefore, the dominant livelihood strategies in Western Province are subsistence farming and fishing, combined with significant and relatively high cash income generation from local marketing of food and marine products. This is supplemented by sporadic income from the sale of copra, small-scale timber production, and royalties from logging and bait fishing, if and when they are available.

9.5 SUBSISTENCE FOOD PRODUCTION

Male and female informants both stated that the most important staple foods, in order of importance, are (purchased) rice, cassava, sweet potato, yams and pana (seasonally), and taro. This has changed significantly over a relatively short period of time.

⁹ AOAs are defined as large blocks of little-used land with above-average agricultural potential, and aimed primarily at identifying areas suitable for the development of large-scale cash cropping with low population densities.

Traditionally, taro (*Colocasia esculenta*) was the main staple, but it was replaced by sweet potato following a prolonged decline in taro yields caused by pest and disease problems. In 1973, the staple diet in villages in Vella consisted of 80% sweet potato and 20% taro (McKinnon 1973). This had shifted to an even greater reliance on sweet potato (90%) among farmers in Simbo and Kolombangara by 1989 (Mackay 1989ab).

This means that, within a single generation, the staple diet of people in Western Province has undergone enormous change. According to the 1999 census, 89% of households in Western Province produced sweet potato; 89% produced banana; 88% produced cassava; 69% produced yam and pana; 62% produced taro; and 74% produced coconut (SIG 2002). However, it appears that the contribution of these crops to total *consumption* has changed. People are now dependent on imported rice and nutritionally inferior cassava. Many informants stated that this dependence was exposed during the ethnic tension around 2000, when many villages faced shortages of food. Women interviewees identified shortages in potato production between June and July each year, as a result of cycles of planting.

Other important foods include fish, vegetables (especially slippery cabbage, Chinese cabbage and beans), fruits (especially banana, which is also classified as a major staple, pawpaw and citrus), nuts (especially ngali nuts and cutnuts) and purchased foods (noodles, tinned fish and sugar). In 1989, sugarcane was frequently grown within mixed gardens, but it appears to be less common today.

Traditionally, when new gardens were cleared, taro was planted. When yields declined, banana and yam (*Dioscorea* spp) would be planted until gardens were finally abandoned for fallow (Wall and Hansell 1976a). With the steady decline in the cultivation of taro, precedence has switched to growing sweet potato (and, to a lesser degree, yams) in new gardens, until decreasing yields force land to be fallowed. Alternatively, tree cash crops, such as coconut and cocoa, are planted (Mackay 1989ab). Informants stated that sweet potato is still planted first in new gardens, but because of shortened fallows, yields are relatively low and quickly decline. Eventually, cassava starts to dominate new plantings, because it tolerates low soil fertility better.

The lengths of cropping (cultivation) and fallow periods are largely a function of access to, and overall pressure on, land. Under traditional shifting agricultural systems, fallows are essential to restore soil fertility, in particular to replenish potassium, which is liberated from woody growth by burning. In 1973, McKinnon recorded a cropping period of one to four years in Vella. In 1975, the average cultivation and fallow periods were given as 5.1 months and 5.6 years, respectively, for Western Province (Wall and Hansell 1976a). In 1989, Mackay (1989a) recorded an average cultivation period of 15 months and a fallow of 3.3 years in Simbo (which has a relatively high population density); and an average cultivation period of 21 months and a fallow period of 4.7 years in Kolombangara (which has a lower population density) (Mackay 1989b).

Informants on Kolombangara, Vona Vona Lagoon and Roviana Lagoon stated repeatedly that cropping periods were increasing to more than 36 months, and fallow periods were decreasing to less than two years. Observations by the team of poor tuber size, pest incidence and damage, and the absence of any woody fallow on many gardens, supported this assessment.

In 1989, 20% of farmers cited pest and disease problems as a factor affecting food production (Mackay 1989ab). In contrast, most informants now stressed that pests were largely responsible for poor yields and eventual abandonment of gardens. Without the phytosanitary effect of burning woody regrowth, pests can quickly build up. Informants stated that taro beetle, melon fruit fly and beetles (especially on slippery cabbage) all significantly affect food production. Rice growing was particularly problematic; many growers complained that they had had to abandon cultivation because of pest buildup and damage.

Soil erosion was not noted as a significant problem by farmers during interviews. However, the same people often cited siltation of reefs as a problem. It is likely that other land uses, most probably logging, are responsible for this.

9.6 DOMESTICALLY MARKETED FOOD, FISH, FIREWOOD AND BETEL NUT

The main regular markets in Western Province are at Gizo, Noro and Munda. Smaller regular markets are held at Seghe and Batuna (on Marovo), Ugehe (Rendova) and Nila (Shortlands). Vendors arrive mostly by outboard motorised canoes which can take up to five hours each way. Some vendors travel much further (see Box 9.1).

The most common items for sale at markets are seasonal root crops, vegetables and fruits, plus betel nut, marine products and fish all year round. The larger (urban-based) markets also have cooked items, such as cakes, for sale and some firewood. Betel nut is sold in Western Province, but not as commonly as in other provinces because of the general abundance of trees, and religious discouragement of its use.

Root crops, vegetables and reef products are traditionally and predominantly sold by women, while men normally provide transport and sell betel nut, peanuts and fish. Gender segregation in marketing is, however, being slowly eroded, especially with the formation of women's and producer groups. Proceeds from sales generally remain with the seller. Most food is sold by the producer farmers. Occasionally, some items (such as eggs) are sold direct to trade stores and hotels.

The market in Gizo has covered tables and benches for about 20 vendors. These are next to the water, allowing easy access for offloading canoes. The market runs every day (even on Sundays, when Seventh Day Adventist villages supply produce) and usually has about 30 or more vendors, many of whom must sell from the floor. The area has recently been fully paved, which is a great improvement.

In contrast, market facilities at Noro are inadequate. According to the town clerk, the number of vendors has increased from 300 to 400 vendors per month in 2001 to nearly 700 vendors per month in 2004. One explanation is that farmers who used to supply Solomon Taiyo direct have to sell in the local market since the closure of Taiyo and the subsequent downsizing of the tuna fleet and cannery under a new company.

Ngali nuts, when in season, are sold at local markets in a number of ways: as nuts-in-shell (NIS), as parcels (leaf or plastic) of kernels-in-testa, and in plastic bags and tins of roasted kernels. Tins of roasted kernels, which have a longer shelf life, are also occasionally sold out of season. At Munda, in September 2004 at the height of the season, NIS from Baraulu village (Roviana Lagoon, about 20 minutes by outboard motor) was on sale for the equivalent of \$2.50 per kg. Roasted kernels in 400-g tins sell for \$6–10 in Western Province, but can fetch double that in Honiara.

Nearly half of all households in Western Province sell fish at local markets — more than in any other province. Marine products such as mangrove pods and shellfish are also very common.

BOX 9.1 MARKETING AND TRAVEL COSTS

Vendors often only determine the cost of travel (basically the cost of rent and/or petrol) when considering the net revenue benefit of selling produce at markets. Conversely, marketing is often used as a means to fund travel.

Alice is from the remote Reef Islands of Temotu Province. Her husband works for a logging company in Western Province. To help fund the cost of her long boat journey from the Reef Islands to Noro (four boats and at least seven days) to visit her husband, she brought with her 10 bags (about 200g) of nambo (dried breadfruit) for sale at \$5 per bag at the Noro market. The nambo is light and nonperishable, making transport feasible, especially for a woman. Nambo is not generally produced in Western Province (despite there being many breadfruit trees), and it is generally purchased by expatriate Temotu people, but an increasing number of locals from Western Province are purchasing it too.

9.7 VILLAGE CASH CROPPING

9.7.1 COPRA

Copra has traditionally been a major cash crop for smallholders in Western Province. In 1985 (the time of the last coconut census), Western Province had nearly 15 000 hectares of coconuts (about two million palms), the largest area of any province, representing about 25% of the national total (Mackay 1989a). Most were owned by smallholders. In 1999, about 55% of households in Western Province produced nearly 7000 tonnes of copra for sale, worth \$533 per household (SIG 2002, CEMA 2000). Recently, copra was ranked the third most important income source (behind livestock and salaries) by men in Simbo (DSAP 2004).

Before 2001, copra was purchased by Commodities Export Marketing Authority (CEMA) via their network of 11 buying points and 13 points of call, and was shipped to their storage sheds at Noro for bulking and processing before export as copra or copra oil. Most of this (84%) was delivered by outboard motor to the buying points (CEMA 2000).

Following the deregulation and collapse of CEMA and its network, production of copra in Western Province fell dramatically. Most copra is now purchased by Western Province Copra Ltd (WPCL), via a network of 43 village-based copra buying agents around the province. Three privately owned boats, with a total capacity of 800 bags (about 64 tonnes), ply the coasts buying hot air-dried copra at \$1.30 per kg, under contract for sale to WPCL at Noro. After the CEMA-owned copra oil mill was destroyed by fire in December 2001, a new (privately owned) heat-treatment oil mill was built in October 2002.

Chronic problems in the supply and marketing chain are hampering copra production in Western Province. Current production is estimated to be 1200–1500 bags of copra per month (about 100–120 tonnes per month), almost double the current shipping capacity. An estimated 13 000 bags of copra (about 1000 tonnes) are sitting in villages awaiting pickup. WPCL is burdened with debt, and is unable to raise credit for purchasing via its agents and unable to meet minimum volumes for export. As a

result, WPCL's Singapore-based buyer has stopped importing. WPCL has now started to sell to an exporter in Honiara.

The major economic constraint to copra production in Western Province is the cost of fuel for outboard motors, which makes it uneconomic, or marginally economic, for producers to deliver copra to the remaining buying points or agents. Another constraint is the absence of credit for buying agents, to enable them to purchase the copra when it is delivered. While a one-off injection of credit to buying points or agents may stimulate supply and further production in the short term, it is questionable whether it is economically sustainable without an improvement in margins. This would mean a decrease in costs (price of petrol), or an increase in revenue (price of copra), or both, or a lowering of the opportunity cost of labour (a decrease in availability of, or returns from, alternative sources of income generation). The cost of transporting copra to Noro could be reduced by switching from relatively fast and expensive petrol-driven outboard motor canoes to slower, diesel-powered vessels. There are a large number of diesel Taiyo bait-fishing launches dry docked and idle at Noro that could potentially be recommissioned for use in shipping copra.

In the long term, any increase in production of copra in Western Province is likely to be constrained by the old age of existing palms and poor returns from investment in replanting.

9.7.2 COCOA

Smallholder cocoa in Western Province is concentrated in south Vella and north New Georgia. In 1999, 60–80% of households grew cocoa for sale in these areas (SIG 2002), but there is currently no production, due mainly to the absence of a reliable central buyer based at Noro.

The potential for cocoa production in Western Province is considered high, due to relatively good soils, low risk of cyclones, and land availability, but the commodity has performed below expectations. This is despite receiving donor assistance, via the Smallholder Development Programme (SDP) and Farmers Support Programme (FSP), aimed at increasing production. Problems with disease (black

pod) and a shortage of manpower (caused by demand from logging) have resulted in many smallholder plots being abandoned, and in some cases being cut down to make way for gardens and other tree crops.

9.7.3 BETEL NUT

The significance of betel nut as a village-based cash crop has increased dramatically. In 1982, just 1% of households sold betel nut. By 1986, this had risen to 17% (Mackay 1989a), and by 1999, betel nut had become the single most important cash crop in some parts of Western Province. In the Shortland Islands, north Vella, south Ranongga, and northwest Vangunu, 40–60% of households grew betel nut for sale in 1999, and in south New Georgia 60–80% of households grew betel nut, compared with a national average of 30% (SIG 2002).

Betel nut is a native fast-growing tree that can be integrated into existing farming systems. The fruits can be kept on the vine for more than seven days during transport, and the nuts enjoy strong demand. Neither betel nut growing nor marketing has received any donor or government-funded assistance.

9.7.4 VANILLA

Vanilla has previously been trialed in Western Province by the Department of Agriculture and Livestock (DAL). The trials showed that vanilla did not fruit well because of the absence of a pronounced dry season (needed to initiate flowering) in the province. In north New Georgia, for example, there are five-year-old vines that have so far failed to produce any fruit. The trial also showed that farmers had a poor understanding of the need for, and techniques used in, hand pollination, and that, even when fruits did set, the quality of vanilla produced was very low because of poor curing.

Despite these agronomic and husbandry problems, DAL are now supporting a large expansion of vanilla planting (in response to the price boom of 2002–03) by supplying cuttings and some initial training to farmers.

9.7.5 CHILLIES

The demand for chilli for the production of chilli tuna at the cannery in Noro has resulted in a significantly higher proportion of farmers producing chillies in the province. In 1999, 22% of households in Western Province produced chillies for subsistence (three times the national average), and 5% produced them for sale (more than double the national average) (SIG 2002). Production of chillies in SI reached 18 tonnes per year in 1995 and 1996, but subsequently rapidly declined to less than 1 tonne by 2000 (CEMA 2000), with the onset of the ethnic tension, closure of the (then Japanese-owned) Taiyo cannery at Noro, and collapse of the CEMA buying network. Figures for total production post-ethnic tension are not known.

9.8 PLANTATION CASH CROPS

There are medium-sized copra plantations at Ruruvi, Beiporo and Liapari (all on Vella), Rendova Harbour, Vila (Kolombangara) and Paradise (New Georgia), but none is thought to be currently operating. Most coconut plantations occupy prime flat coastal land, which is under pressure for gardening, and which could be better used for multispecies plantings. Changes are happening informally, as landowners reclaim land by slowly replanting other species and gardens. At Rendova harbour, an estimated 2500 Santa Cruz ngali nuts (*Canarium harveyi*) were interplanted in 1990 between about 10 hectares of existing mature coconuts, in an attempt to increase and diversify revenue without affecting copra yields. The trees are now, on average, about 10 m high and more than 20 cm in diameter, but are not producing nuts, possibly because they are being excessively shaded by secondary forest, which has grown up in the unmanaged plot. If the plantation was rehabilitated, there would be an opportunity to assess the feasibility of diversifying ageing monocrop coconut plantations by interplanting indigenous nuts and other multipurpose species.

There are medium-sized cocoa plantations in Vella and north New Georgia, but none is operative, probably because of management and ownership disputes and the lack of a buyer in Western Province.

Oil palm was first trialed in SI in logged-over land in Kolombangara, but there, as in the rest of the province, the steep slopes and thin, infertile soils were considered unsuitable.

Approximately 800 hectares of oil palm have been planted on alienated logged-over land on Vangunu Island in Marovo Lagoon, by a Malaysian-owned logging company. Planting began in the late 1990s, with plans for a total of 15 000 hectares. The project is environmentally, socially, politically and economically controversial (Hviding and Bayliss-Smith 2000). The site is steep and unsuitable for oil palm without terracing. Much of the area should not have been logged initially; soils are poor and will require heavy inputs of fertilisers (Wall and Hansell 1976a). Runoff from the plantation goes directly into the lagoon, threatening marine ecosystems, livelihoods and lucrative ecotourism. The indigenous Marovo community is deeply divided over the logging (Hviding and Bayliss-Smith 2000), and the need to employ thousands of non-Marovo labourers for the proposed plantation. The proposal is seen by many as an attempt by the logging company to back- and clear-fell remaining forest by obtaining an agricultural licence. Clear-felling and logging are, apparently, continuing unabated on alienated and neighbouring customarily owned land, but oil palm planting is significantly behind schedule. The company now claim that the original alienated land is unsuitable, and so they have to log (clear-fell) adjacent customary land. The environmental (and social) costs of the plantation have not been taken into account, and the net economic benefits of the oil palm are less than those from traditional and alternative uses of the land (LaFranchi 1999, Shearman 2000). In short, it is hard to imagine a less appropriate form of 'development' for Marovo Lagoon.

9.9 SMALL-SCALE FORESTRY

Large-scale logging has been a major industry in Western Province for the past 40 years, and the past 15 years in particular, with major economic, environmental and social impacts (Hviding and Bayliss-Smith 2000). The industry is controlled by overseas (mainly Asian) companies, and is based on

the export of round logs. Almost no milling, value adding, replanting or site rehabilitation is carried out (Bennett 2000). Major logging operations (new concessions, back-cutting, and in some cases clear-felling) are currently taking place on Vella, Rendova, Vangunu, Nggatokae, New Georgia and Kolombangara islands (see Figure 9.2), with a total production of more than 400 000 cubic metres per year, which represents more than 50% of total national production. For calendar year 2004, this will exceed 500 000 cubic metres, a new record for Western Province. The Forestry Department has just 20 staff, most of them reliant on their logging hosts for accommodation, to control the industry in Western Province.

Logging affects agricultural production in a number of ways. These include:

- > decreasing the amount of land available for cultivation, by displacement of, and damage to, existing gardens
- > increasing pest damage to food gardens by disturbing the delicate balances in the ecology and habitat of forest-dwelling animals, birds and insects (especially of rhinoceros beetle, which breeds in dead wood)
- > increasing the opportunity cost and decreasing the availability of labour by payment of royalties and raising the demand for labour for logging operations (especially among young men), respectively
- > decreasing cash crop production, because of comparatively low rates of return compared with wage-labour in logging
- > increasing local demand for fresh food and vegetables for supply to logging camps.

Small-scale sawmills have been operating in Western Province for more than 30 years. In the 1990s, numbers rose dramatically with the increase in timber prices, the availability of relatively cheap and fully mobile chainsaw rigs, and growing support from nongovernment organisations (NGOs), such as Solomon Western Island Fair Trade, who encouraged the development of long-term sustainable forest management practices through forest certification. In the mid-1990s, production of sawn timber in Western Province probably exceeded 10 000 cubic

metres. The collapse of the log price following the Asian crisis, and the suspension of NGO-supported services following the ethnic tension, saw production fall dramatically.

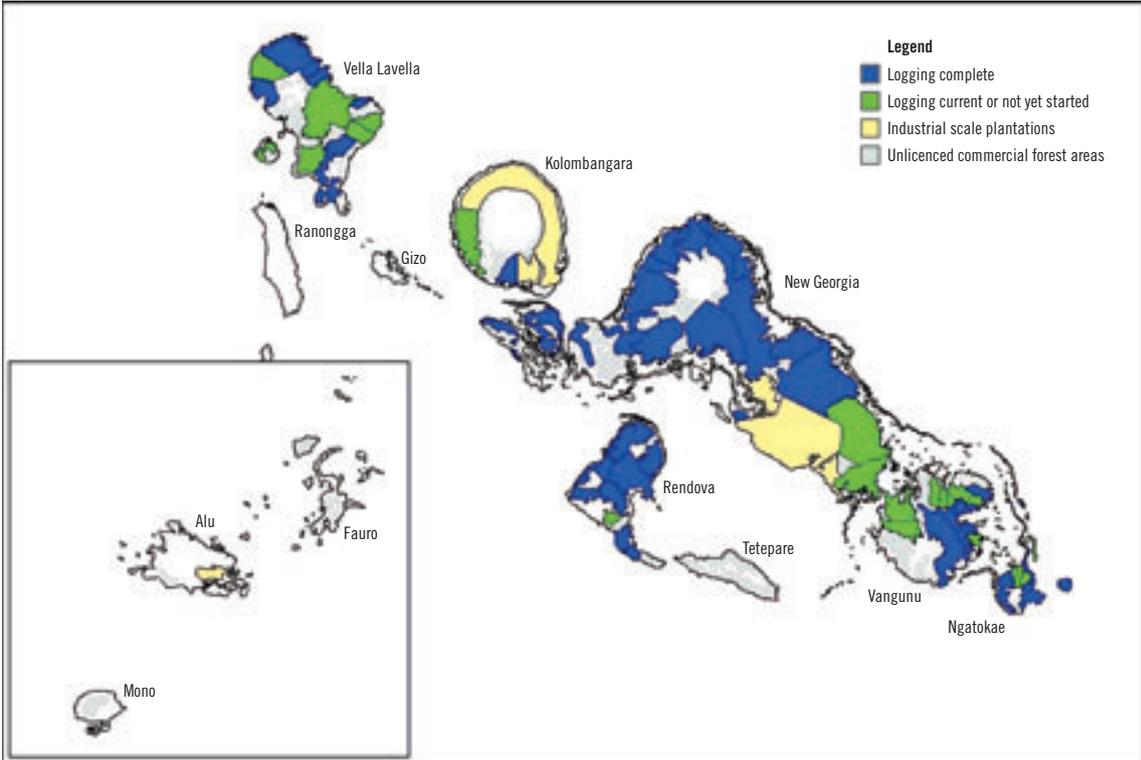
According to the Forestry Department, there are now between 50 and 100 small sawmills operating in the province, producing 100–200 cubic metres of timber for export. The main constraints are lack of technical and business (in particular financial) management skills and a lack of barge transport. The Forestry Department offers only very limited support for small-scale operators.

Despite the Standard Logging Agreement specifying that one-third of the licensed area be reforested, there is little or no replanting. This has led to large areas of land being rendered unusable for either agriculture or forestry in the near future, because of soil damage and lack of regrowth of timber species. Rehabilitation and replanting are priorities.

The North New Georgia Sustainable Social Forestry and Rural Development Project is a relatively

novel partnership initiated and managed by a local community and church (Christian Fellowship Church; CFC) group within a trust arrangement with The University of Queensland. The project is aimed at sustainable forestry, reforestation of logged-over land and income generation (Makim 2002). Despite its inception being severely disrupted by the ethnic tension, the project has built a community-run tree nursery, and has replanted more than 1000 hectares. The use of an audited trust to oversee and manage the project is aimed at ensuring long-term financial independence and integrity. In turn, this will help the community to obtain funds to support the reforestation of the whole logged area, and also to better manage the area’s natural resources. It remains to be seen whether this model of ownership and management can be replicated elsewhere in non-CFC areas of SI, because CFC is able to exert a level of unanimity among its constituents that other churches and community-based organisations may find hard to achieve (Makim 2002).

Figure 9.2 Logging in New Georgia Group, Western Province, September 2003



Source: URS (2003)

9.10 LIVESTOCK

Small livestock are an important component of rural livelihoods in Western Province. In 1999, approximately one-third of households kept pigs and more than half kept 'other livestock' (most probably chickens) (SIG 2002). Pigs are generally not kept in Seventh Day Adventist villages, or on some smaller islands, such as Simbo, where they are not used for bride price (Mackay 1989a). Most pigs are tethered or penned, and are fed coconut, scraps, and occasionally potato. Reliance on coconut leads to high fat levels, and has resulted in Soltai refusing to purchase some pigs.

Scavenging chickens were ubiquitous in villages in the 1980s, but many villages now insist on them being confined to runs, because of the damage they cause to new 'sup sup' gardens. More intensive forms of chicken husbandry, such as penned broilers and layers, are generally confined to the RTCs and larger church missions. Vanga RTC provides most of Gizo's eggs, and proceeds from their sale are the major income source for the centre. Vanga RTC no longer sell chickens because they found it unprofitable. The major constraint to more intensive chicken husbandry in Western Province is the cost and availability of feed.

The European Union (EU)-funded Micro Projects supports two small piggeries, with about five sows each, and three poultry projects, with 300–500 layers, in the province.

In 1985, there were nearly 5000 cattle (25% of the national total) in the province. Under the Cattle Under Trees Project (1970s–1980s), production was centred in Kolombangara, but cattle numbers have slowly declined as project aid and DAL assistance have diminished.

A major constraint to cattle production is a lack of breeding stock. The cattle at Vanga RTC, one of the most significant herds in the country, are now inbred. During the tensions in Guadalcanal, what was left of DAL's cattle breeding stock were transferred to Mile Six Station in Gizo, but the stock are now further depleted, in poor condition, and of limited use. Some breeding stock are also said to be left at Kukundu, Kolombangara.

Demand for meat is high in Gizo and Noro/Munda. Most beef is imported because the local supply is limited. Local production of pork and chicken is comparatively higher, but still less than local urban demand, and is hampered by poor slaughtering, processing and storage infrastructure.

Beekeeping has been a popular income-generating activity for farmers in Western Province, but a lack of support from the Solomon Islands Government (SIG) and the NGOs has resulted in shortages of both queens and hives.

9.11 SOCIAL AND CULTURAL ISSUES

The two main ethnic groups in Western Province are Melanesians and Micronesians. The latter were resettled from the Gilbert Islands (Kiribati) in the 1970s by the British administration.

Generally, land is passed between generations through clans, tribes, families and individuals. The matrilineal land system is traditionally recognised and followed, but it is occasionally bypassed when the realities of modern economic life contradict traditional beliefs. Furthermore, women often feel powerless, and end up transferring their power to their male relatives to make decisions.

Traditional leadership is often a male preserve, while the women's position is seen as secondary. In most cases, women still play a powerful role in decision making in the family arena, even if not always at the community level. The social connection between women and men often falls apart when it comes to money matters.

Subsistence agriculture is still the main livelihood for women; 88% of their time is spent on agriculture activities. Women do most of the work in the gardens, including weeding, planting, and harvesting, while the men chop down big trees and clear new areas for gardens.

In some parts of the province, the influence of major economic activity such as logging is seen by women as a social distraction. The social impact of logging is a key factor in women and children becoming the most vulnerable people in the society.

Cash income is primarily used to pay for school fees, church contributions and domestic needs. The need to find cash to pay school fees is a major incentive for seeking cash income.

9.12 SUPPORT FRAMEWORK FOR AGRICULTURE

Agricultural extension currently has 20 staff in Western Province, including two livestock officers and one quarantine officer (at Noro). Gizo headquarters has four staff; Munda has four staff; Seghe has two staff; and single staff members are based at various other stations. There is only one support staff member in Gizo. Most informants could not remember the last time they were visited by extension staff. If they want extension officers to visit, farmers now have to supply a canoe and petrol to transport the officer. The Republic of China (Taiwan) (ROC) Agricultural Mission has one officer attached to the Munda extension base, to assist with rice growing in the province.

DAL has a field experimental station at Ringi on Kolombangara, but it has been effectively unmanaged for at least five years. The station was originally established to conduct applied research on volcanic soils, and to hold duplicate collections of tree and field crop material. There is a potential opportunity to manage and use the fruit and nut tree crop collection as a locally run commercial nursery.

Applications from farmers to the AusAID-funded Community Peace and Restoration Fund (CPRF) in Western Province, for assistance in purchasing copra-drying drums and mesh, have been evaluated by agricultural extension, but no funds from the allocated \$350 000 have been released so far.

There are four church-run RTCs operating in Western Province, with a combined capacity of about 300 students: St Anne's (girls only) at Nila, Shortland Islands; St Dominic's (boys) at Vanga, Kolombangara; Batuna (mixed) in the Marovo Lagoon; and Tambaka (youth) at Munda. The first three RTCs offer residential courses in agriculture. Vanga offers multidisciplinary courses in food production, horticulture, livestock and sustainable forestry, and includes an RTC teacher training school.

The Solomon Islands Association of Rural Training Centres (SIARTC) is keen to develop appropriate commercial enterprises for RTCs, to provide greater independent income generation and on-the-job training for students. One possibility is for RTCs to act as subprovincial buying, bulking, processing, storage and marketing agents for low-volume, locally produced, simply packaged foods and other commodities. A SIARTC trading company could be established to market selected RTC-produced commodities in Honiara. Assistance needs to be provided to RTCs and SIARTC to help them develop plans, as well as the necessary skills, equipment and infrastructure, to expand their income-generating activities. SIARTC's capacity is very weak.

There is a forestry training school (with research plots and a herbarium) at Poitete on Kolombangara.

A number of NGOs support agriculture directly and indirectly in Western Province. The Kastom Garden Association (KGA) has two full-time staff working in partnership with the Vanga RTC Teachers College and Sausama Farmers School. KGA's main focus is building networks, providing access to local seed production and strengthening local farmers' knowledge and ideas.

The World Wildlife Fund (WWF), an international conservation NGO, has an office in Gizo with seven staff. The main focus of its program is on marine conservation and developing alternative, sustainable livelihood activities, such as breeding butterflies for export to collectors in Western countries, and producing vanilla, coconut oil and ngali nuts. WWF report that they have difficulty obtaining practical information on alternative income-generating activities and that they would like closer links with agricultural extension.

Noro is the only government-approved point of entry for imports and exports by ship outside of Honiara. The protected, deep-water port and surrounding industrial park has a large wharf, storage facilities and 24-hour power, plus customs, excise and quarantine facilities.

Several villages on Kolombangara and New Georgia have mini hydroelectric power generators providing the opportunity for them to process and store fresh, perishable commodities.

9.13 COMMERCIAL ENTERPRISES

Gizo has the largest private business sector outside Honiara. Trade store retailing is dominated by ethnic Chinese, who mostly import goods from China, but they also purchase local produce, such as eggs. Gizo is the centre of the diving tourist industry in SI, creating demand for hotel and guesthouse rooms, and services such as banking and catering.

A number of trading companies operate in Western Province, including Western Province Copra Ltd (WPCL) (co-owned, 50% each, by the province and CEMA) which purchases copra (see Section 9.7.1 for details), and Rendova Trading Company, which owns trade stores in Gizo and Honiara, and several cargo boats.

The Soltai (51% owned by SIG and 49% by Western Province) and National Fisheries tuna cannery and associated operations at Noro provide jobs for more than 1000 people, who create strong demand for fresh food.

The National Bank of Solomon Islands (NBSI) has a branch in Gizo and an agency in Munda. ANZ and Westpac have branches in Gizo and Noro. Most informants stated that they were reluctant to open savings accounts with the commercial banks because of excessive charges on passbook accounts (because the banks wish to phase these out, in order to cut costs). They also noted that it was virtually impossible to obtain a loan.

In 1999, there were 15 active credit unions (with a total membership of nearly 1000 people) operating in the province (Solomon Islands Ministry of Provincial Government 2001), but this number was drastically reduced during the ethnic tension, as a result of the collapse of the Development Bank of Solomon Islands (DBSI) and Honiara-based parent companies, and a fall in rural incomes. Some new credit and savings cooperatives have recently been formed by groups of women, to assist with managing the costs and proceeds of local marketing. Given that there is very little access to formal banking in rural areas, women tend to be primarily responsible for managing their family income and savings.

9.14 TRANSPORT AND TELECOMMUNICATIONS

The main form of transport in Western Province is the outboard motorised canoe. The province has the highest number of canoes and outboard motors in the country (Solomon Islands Ministry of Provincial Government 2001). The increasing cost of petrol is therefore having a severe impact on transport and economic activity within the province. Petrol costs range from \$6 per litre in Gizo to as high as \$15 per litre in Marovo.

Three ships currently ferry passengers between Gizo and Honiara, via Munda and Marovo, for \$150 per person one-way. Five cargo boats operate in the province.

The province has a total of 210 km of roads, mostly unconnected and poorly maintained, scattered among the larger islands. The strategic Noro–Munda road, which links two major population and infrastructure centres, is currently impassable due to a lack of maintenance. In addition, hundreds of kilometres of roads have been cut by logging companies, but are seldom built to last longer than the logging operations, and have added little to Western Province's long-term infrastructure.

The airstrip at Munda is very long and in relatively good condition and, with minor upgrades, and approval from SIG and relevant authorities, would be capable of taking international flights.

9.15 PREVIOUS EXPERIENCE WITH AGRICULTURAL DEVELOPMENT

Western Province was the centre of the Australian International Development Assistance Bureau-funded Cattle Under Trees Project, which aimed to combine plantation timber (and coconut) production with cattle production, on logged-over alienated land on Kolombangara. The project suffered technical problems with pasture development, and also land disputes, because it was seen as a continuation and re-enforcement of the original land alienation on the island.

Spices have been promoted by DAL at least three times in the past with mixed success. In the 1970s, cardamom and chillies became popular with growers, but falling prices led to gradual neglect of

the crops. Chillies were successfully promoted again by DAL when Taiyo moved its tuna factory to Noro.

The EU-funded SDP and FSP of the 1990s provided significant assistance to copra and cocoa growers in the province, but the increase in production was below project expectations.

According to agricultural extension in Western Province, the major lessons learned from previous agricultural development projects are:

- > a need to fully integrate projects into existing extension and support services before projects finish
- > a recognition that most agricultural interventions and innovations are site- and crop- specific
- > a recognition that most agricultural marketing initiatives are thwarted by a lack of business skills and suspicion about the role of middlemen.

A useful reminder of the effect of the higher opportunity cost of labour in Western Province, and its effect on agricultural production, can be found in CEMA's efforts to purchase ngali nuts between 1989 and 1994. Despite resource inventory assessments suggesting that there were large stocks of underused ngali nuts in the New Georgia group (in particular, Rendova, Roviana and Marovo), supply was very poor. At the time, income from bait fishing and logging royalties was comparatively high, and better income-generating activities existed, particularly carving in Marovo.

9.16 OPPORTUNITIES FOR RURAL LIVELIHOODS DEVELOPMENT

9.16.1 FOOD PRODUCTION AND MARKETING

Western Province could benefit from the experience and techniques of other provinces and islands (such as Santa Cruz), where more sustainable, tree-based intensive land-use practices (eg mixes of larger multipurpose species, such as *Gnetum gnemom*, breadfruit and *Canarium*, with smaller understorey species, such as cutnut and pawpaw) have evolved, in response to long-term population pressure.

There are good opportunities to increase the production and marketing of locally produced

food in Western Province, because of the existence of significant urban centres (Gizo, Noro and, to a lesser extent, Munda and Seghe). There is also high demand for fresh food and snack food at logging camps.

The major constraint to local and cash crop marketing is affordable transport. This could be addressed by educating produce-sellers about the role that middlemen can play in marketing, and by assisting the middlemen with credit, business management skills, and appropriate, less expensive, transport options, such as diesel launches. A long-term move towards low-volume, high-value export cash crop commodities would also help reduce transport costs.

9.16.2 CHILLIES

Good opportunities exist for increased chilli production in Western Province (and elsewhere in SI). Production of chilli tuna at the Soltai cannery in Noro is currently constrained by limited supplies of dried chilli. Soltai only produces batches of chilli tuna when it receives a shipment of chillies. The cans are then immediately sold in the domestic market (mainly Honiara), but ideally they should be stored for six months to allow the chillies to thoroughly permeate and flavour the tuna. Soltai have so far purchased 80 kg of dried chilli this year (to August 2004) from a few growers, but would like to purchase up to 500 kg per year, just to satisfy estimated domestic demand for chilli tuna. In a bid to increase supply, they have raised the buying price of chilli from \$8 per kg to \$50 per kg, but producers have so far failed to significantly respond.

Soltai feel there are excellent opportunities to increase production of chilli tuna by exporting to neighbouring Melanesian markets, where the brand is well known, and, in the longer term, direct to niche (returned expatriate and Melanesian) markets in Australia and New Zealand and, via internet sales, worldwide.

Export opportunities for dried, raw, Nepalese akabare chillies to Australia and New Zealand are limited, because the variety is unknown there and the market is dominated by Indian-produced birdseye chillies. In order to enter the market and compete, SI would have to either roast and grind the akabare

chillies, or switch production to the birdseye variety (Marketshare 1997, 1998).

The major constraints to chilli production in Western Province and SI are a shortage of seeds; reluctance to grow chillies, because they are unpleasant to handle during harvesting and drying; broken or weak supply lines; and insufficient drying.

9.16.3 INDIGENOUS NUTS

There are large stocks of high-quality indigenous nuts in Western Province. The average kernel content of ngali nuts in Western Province is high, making them more economic to transport and ship. Relatively high local market prices (even in season) provide an opportunity for commercial purchasing below local prices, without removing nutrition from local diets. Potential also exists for processing and value adding, using diesel and hydroelectric power, for indigenous nuts (including betel nuts) and other local products, in provincial and subprovincial centres. It may also be possible to market Western Province ngali nuts in Vanuatu, because the season in Western Province begins about four months before Vanuatu's season. In the medium to long term, supply from existing scattered trees could be supplemented, and jobs created, by enrichment planting of logged-over land with ngali nuts and other multipurpose indigenous species.

9.16.4 REFORESTATION AND SMALL-SCALE FORESTRY

Western Province has a natural comparative advantage for timber production because of its lower frequency of destructive cyclones. The province was a major producer of 'ecotimber' before the ethnic tension. Community-based rehabilitation and replanting of logged-over land with mixed timber and multipurpose species, and private-based, small-scale milling operations, should be encouraged and supported.

9.16.5 COPRA AND COCOA

There are only limited opportunities to increase production of copra and cocoa in Western Province

by the rehabilitation of existing plantings and processing infrastructure. Supply in the short to medium term will be constrained by high transport costs and opportunity costs of labour, and associated low margins. In the long term, competition for prime coastal land from alternative land use practices will limit new planting.

9.16.6 LIVESTOCK

Opportunities exist for commercial poultry farming (for eggs and meat) to service local urban markets, but low production and costs of feed will constrain supply.

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9.18 PEOPLE CONSULTED

Bayron, David	Production Manager, Soltai, Noro
Bero, Mali	Assistant Officer, Lauru Land Conference, Munda
Bero, Tibett	Coordinator, Tetepare Descendant Association
Brother Tony	Principal, St Dominic Rural Training Centre
Cummins, Karen	Adviser, Capacity Building, KGA
Daga, Edi	Community Leader, Munda
Glendon, Mary	PMN staff, KGA
Leve, Frank	Farmer, Sausama Green, Kolombangara
Leve, Mini	Sausama Women's Farmers Network, Kolombangara
Lumba, Willie	Provincial Coordinator, CPRF
Maeli, Felix	Head of Forestry Division, Western Province
Mr Maezama	Deputy Premier, Western Province
Makoi, Robert	Head of Agriculture and Livestock Division, Western Province
Makini, Julie	Program Officer, WWF
Mamupio, David	Town Clerk, Noro
Men and women	Buni Community, Western Province
Men and women	Ghatere Community, Kolombangara
Men and women	Vavanga Community, Kolombangara
Panasasa, Irwin	Chairman, Western Development Cooperation Limited
Pule, Nercily	Provincial Secretary, Western Province
Talasasa, John	Community Leader, Munda
Topo, Salome	Program Officer, WWF
Tufuakalo, Francis	Head of Fishery Division, Western Province
Tuza, Esau	Adviser, Lauru Land Conference, Munda
Wickam, Jeffery	Director, Western Province Copra Ltd, Noro
Zorivo, William	Provincial Coordinator, Western Province
Zutu, Robert	Head of Lands Division, Western Province

Appendix 4.1 Summary of livelihood strategies in different regions of Central Province

AREA	VILLAGES VISITED	SOURCES OF INCOME	SOURCES OF FOOD	REMARKS
Sandfly Island, West Florida Islands	Tumbila	1. Sales of fish and clam shells to middlemen 2. Marketing of fresh food and betel nut to Tulagi and Siro Community School	Gardens: pana, cassava, sweet potato, yam, banana	Not many leafy greens in gardens. Insect pest of slippery cabbage. Shortening fallow periods. People making some gardens in grassland areas.
Southwest Big Gela, Florida Islands	Haleta	1. Sales of fish at Tulagi market 2. Marketing of fresh food and betel nut to Tulagi and Honiara 3. Small-scale timber milling	Gardens: pana, sweet potato, yam, cassava, taro, banana	Land disputes over commercial logging areas. Wild pig damage to gardens as a result of logging. Not many leafy greens in gardens.
Southeast Small Gela, Florida Islands	Vuturua, Toa	1. Copra 2. Marketing of fresh food and betel nut to Tulagi and Honiara 3. Small-scale timber milling	Gardens: sweet potato, pana, yam	Fresh produce marketing difficult during trade winds season. No regular shipping service.
Gela Passage, Florida Islands	Ghairavu	1. Marketing of fresh food and betel nut to Honiara 2. Small-scale timber milling 3. Cocoa production	Gardens: pana, sweet potato, yam, cassava	Regular shipping service through the Gela Passage.
Savo Island	Sisiaka, Pokilo	1. Marketing of fresh produce to Honiara and copra 2. Remittances	Gardens: sweet potato, cassava, banana Imported rice	Incomes are relatively high on Savo due to close proximity to Honiara. Imported food is commonly consumed.
Loun Island, east Russell Islands	Buka	1. Copra 2. Marketing of fresh produce to Yandina 3. Harvesting and sale of marine produce	Gardens: banana, sweet potato, cassava Imported rice	Severe shortage of land for gardening.
West Pavuvu	Losiolen	1. Copra 2. Marketing of fresh produce to Yandina and Pepesala 3. Minor sales of cocoa	Gardens: sweet potato, cassava, banana, taro, pana, yam	Commercial logging on customary land in 1990s. Some royalties paid. Wild pigs damaging gardens.
Maraloan Island, West Russell Islands	Maraloan	1. Copra 2. Marketing of fresh produce to Yandina and Pepesala 3. Harvesting and sale of marine produce	Gardens: sweet potato, cassava, banana, pana, yam, taro Imported rice	Shortage of land for gardening.
East Pavuvu	New Savo	1. Marketing of fresh produce, including tobacco, to Yandina 2. Copra	Gardens: sweet potato, cassava, banana, pana, yam	Insect pest of slippery cabbage. Tobacco is an important source of income.