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Food Security Strategies for Vanuatu

Shadrack R. Welegtabit

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Food Security Strategies for Vanuatu

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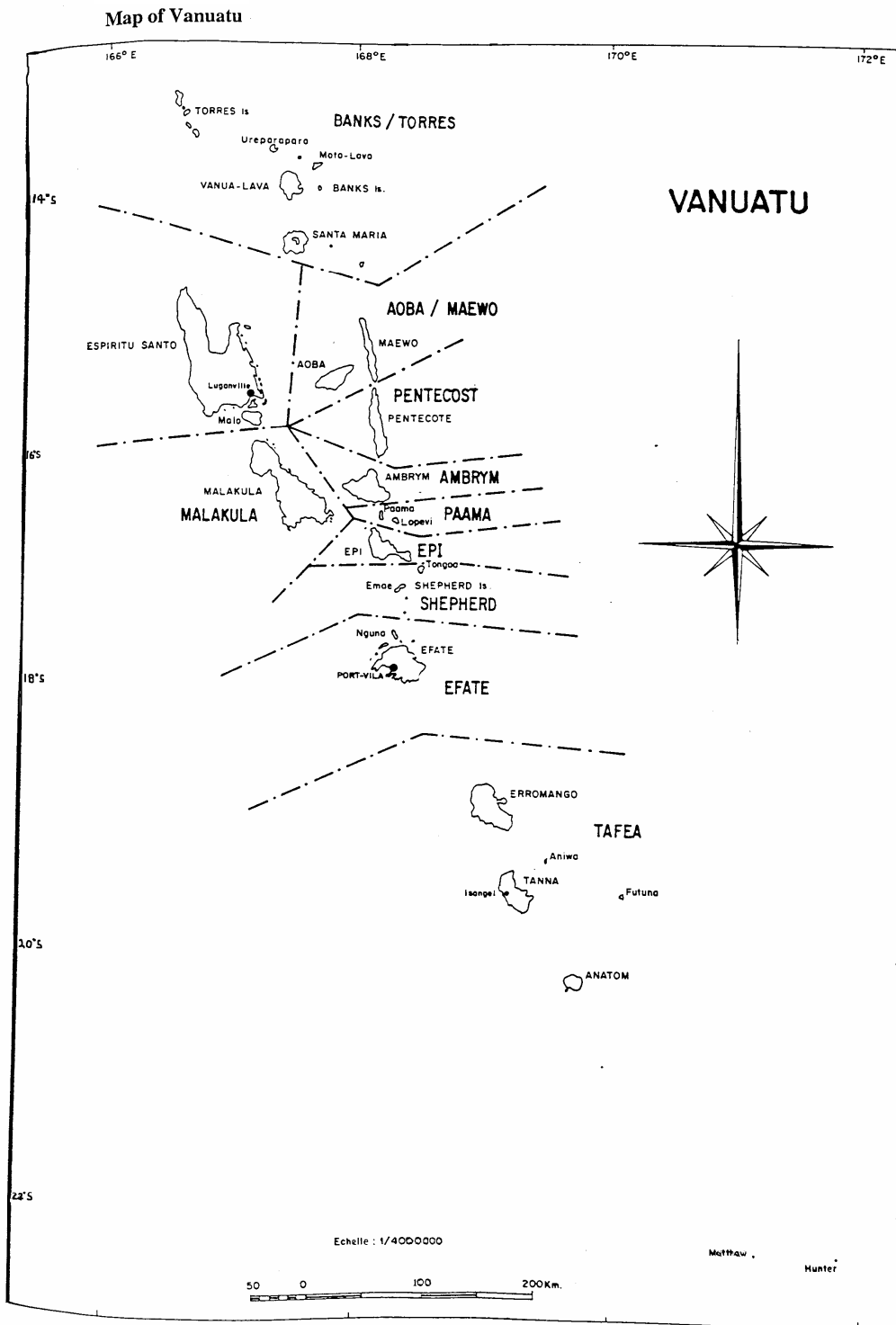
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Abbreviations

CRP	Comprehensive Reform Programme
DAH	Department of Agriculture and Horticulture
DALH	Department of Agriculture, Livestock and Horticulture
DARD	Department of Agriculture and Rural Development
GDP	Gross Domestic Product
NFNC	National Food and Nutrition Committee
PIM	Pacific Islands Monthly
VANRIS	Vanuatu Natural Resource Information System
VARTC	Vanuatu Agricultural Research and Training Centre
VAT	Value-Added Tax
VSO	Vanuatu Statistics Office

Map of Vanuatu



Foreword

In consideration of the importance of a stable supply of food to meet the needs of the increasing population and the changing dietary pattern in island countries located in the South Pacific, the CGPRT Centre implemented a research project “Food Security Strategies for Selected South Pacific Island Countries (SouthPIC)” in collaboration with four countries: Fiji, Papua New Guinea, Tonga and Vanuatu. The project started in July 1999 and was completed in December 2000.

The national experts appointed in each participating country carried out a country study with support from related institutions. The country studies covered a wide range of socio-economic aspects related to the food security. Based on the analyses and findings achieved in the study, policy recommendations on the food security strategies in both short term and mid-long term were elaborated.

It is my pleasure to publish “**Food Security Strategies for Vanuatu**” as the report of the country study of Vanuatu. I sincerely hope this report will contribute to the improvement of food security and nutritional conditions in Vanuatu, and to the further development of its agriculture.

I thank Mr. Shadrack R. Welegtabit for his intensive research which enabled this report to provide useful information on possible food security strategies in the country. I am very much obliged to Dr. Euan Fleming, University of New England, Australia, and Dr. Pantjar Simatupang, Center for Agro-Socio Economic Research, Indonesia, for their contributions to the project as the regional advisor and the project leader, respectively. I also thank Dr. Douglas R. Stoltz for his editing services. Finally, I express my sincere appreciation to the Government of Japan for funding the project.

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Haruo Inagaki
Director
CGPRT Centre

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Shadrack R. Welegtabit

Executive Summary

Economic growth in Vanuatu has not matched the current population growth of 3% per annum. This high population growth rate, coupled with a rapid increase in the number of people migrating into the two main urban centres and increasing unemployment, is creating social and economic problems. These problems are exacerbated by external shocks, such as world price instability, and internal shocks, due to natural and man-made disasters, which have a negative impact on the composition, stability and reliability of food availability and entitlements in Vanuatu.

Food security means the ability to grow and purchase food as needed. It is influenced by factors such as income levels, domestic and export markets, and natural resources. Food insecurity in Vanuatu is not primarily a case of inadequate volumes of food to feed people. At present, it is more related to what can be termed “hidden hunger”, or deficiencies of vital micronutrients in people’s diets. In rural areas, it is related to people eating unbalanced diets. In urban areas, it is related to changes in people’s eating habits, shifting away from nutritionally rich traditional staples to imported, less nutritious food items.

Poverty as known in other parts of the world does not exist in Vanuatu. People are more or less financially poor, but not materially poor. This is due to many factors but particularly to secure land ownership for most of the population. Approximately 95% of land in Vanuatu is traditionally owned. Therefore, access to land by the majority of the population in rural areas means food can be produced for home consumption, while cash crops and livestock can also be raised for cash income. However, with the current rapid population growth rate, more land will be cultivated for food and cash income. Therefore, pressure on this fundamental resource is becoming a concern, which requires addressing to remedy any long-term deterioration in food security that might occur in the future.

At present, Vanuatu is undergoing many changes with the recent introduction of its comprehensive reform programme (CRP). Therefore, it is highly desirable that policy measures be undertaken in areas that will accommodate the food needs of the people. Research activities are being undertaken by the Vanuatu Agricultural Research and Training Centre (VARTC) on food crops under its crop diversification programme. However, current emphasis should focus also on the marketing of food crops and the income-earning capability of households. Research activities should include the development of new methods of food conservation, preservation, processing and marketing.

Incorporating programmes and activities from both public and private sectors for food security needs of households and the general public should be seriously considered in the light of present factors directly or indirectly affecting food security.

1. Introduction

1.1 Background

Vanuatu is an archipelago of some 82 islands, of which 68 are inhabited, covering a total land area of 12,189 square kilometres. It consists of a Y-shaped chain of islands located in the southwest Pacific Ocean. The chain stretches over a distance of approximately 850 kilometres in a north-south direction. The islands lie between 13° and 22° south of the equator and between 166° and 172° east of Greenwich. Vanuatu is approximately 800 kilometres southeast of the Solomon Islands and 1,750 kilometres northeast of Sydney.

Most of the islands are volcanic in origin. There are nine active volcanoes, four of which are submarine. The climate varies from wet and humid in the north to dry and sub-tropical in the south. There are two distinct seasons, with the hot, rainy season from November to April, also known as the cyclone season, and the cool, dry season from May to October. Temperatures vary during these two seasons throughout Vanuatu but particularly in the south of the country. The average temperature on Efate, where the capital Port Vila is situated, ranges from 27°C in February (summer) to 22°C in July (winter).

Access to good clean water is not so much an issue, purely because of the abundant rainfall that occurs every year. "Rainfall varies from an average of 2,500 mm per annum in the southern part of the country to 4,000 mm per annum in the north" (McAlpine and Bouchard 1992).

Vanuatu is ranked among many developing countries as a least-developed country, with a very high population growth rate and a low and fluctuating economic growth rate. According to the 1999 Population Census, the total population of Vanuatu was 186,678, with a national growth rate of 3.0% per annum. Based on this annual increase, the population of Vanuatu is projected to be over 250,000 in 2010. The indigenous population is primarily Melanesian, representing 99.6% of the total population. The majority (78.5%) of this population lives in rural areas. The remaining 21.5% are in the two main urban centres of Port Vila on Efate and Luganville on Santo.

The 1989 Population Census recorded about 84% of the population aged 15 years and over to be economically active. About three-quarters of the work force were reported to be engaged in agricultural and related activities, and almost 60% of these were semi-subsistence farmers.

GDP growth has fluctuated in recent years. In 1999, GDP was estimated to have declined by 2.5% compared with a growth rate of 6% in 1998. In 2000, GDP is estimated to increase by 2.7%. The main reason for erratic GDP growth is that Vanuatu is vulnerable to external shocks, such as the recent fall of world copra price and the rise in world petroleum price, exacerbated by the distant location from its main trading partners.

Rural people depend on agriculture for much of their food supply and cash income. Their main sources of cash income are the sale of copra, cocoa, cattle, coffee, kava, food crops and green vegetables from local food gardens, and marine resources including fish.

"In contrast, much of the employment in urban areas is in the service industries (53%) with trade, restaurant and tourism (hotel) sectors accounting for just over 17%"(VSO 1991). The importance of the service sector has been reflected in the national accounts data. During the five-year period from 1983 to 1987, the service sector contributed 65% of gross domestic product (GDP). This was more than double the contribution by agriculture (26%) and more than seven times the 9% contribution by industry (VSO 1994). In more recent years, little has changed except for an increase in the contribution by industry. The 1999 figures show that the contributions to GDP by the three sectors are service 64%, agriculture 23% and industry 13%.

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While the contribution by agriculture to GDP has fallen slowly, the agricultural sector continues to grow domestically in absolute terms.

The agricultural sector still dominates the domestic export of commodities, contributing 96% in 1999. Copra remains the main foreign income-earner contributing 48%. The other contributors are beef (14%), kava (13%), timber (12%), cocoa (5%) and other agricultural products (4%) (VSO 1999a). Total domestic exports in 1999 were valued at 2,907 million vatu, while total imports for home consumption were 12,340 million vatu, resulting in a negative trade balance of 9,433 million vatu. The vatu/US \$ exchange rates for 1980-2000 are shown in Table 1.1.

Table 1.1 Vatu exchange rate (vatu/US \$).

Year	Exchange rate
1980	72.99
1981	91.23
1982	96.15
1983	101.77
1984	102.58
1985	100.25
1986	116.24
1987	100.56
1988	105.05
1989	110.70
1990	109.25
1991	110.79
1992	119.00
1993	120.80
1994	112.08
1995	113.74
1996	110.77
1997	124.31
1998	129.78
1999	128.89
2000	144.23

1.2 Food insecurity in Vanuatu

Food insecurity can be defined as the condition where people do not have access to food, water, cultivable land and sources of cash income. There are two major concerns for policy makers on the nature of food insecurity. The first concern is the growing long-term deficit in domestic food production and its distribution to the general population. According to Knudsen and Scandizzo (1979), “This is the general problem of constrained food availability, brought about by low growth in agricultural output, compounded by high variability in yields and quality of the products, and foreign exchange limitations to import food”.

The second concern is the concentration of food insecurity among the poorest of the poor, who are overwhelmingly the unemployed, underemployed, low-income earners, landless and homeless. It is these people who suffer most from serious malnutrition, due to inadequate intake of kilojoules and other nutrients, because they lack land for cultivation of food crops and cash to purchase sufficient quantity and quality of food items. Either better access to cultivable land or increased cash income for the poor can increase their food security and thereby enable them to better fend for themselves.

Although the nature of food insecurity is similar in developing and developed countries, the environment in which it exists differs. Food insecurity in many parts of the world can be termed as lack of access to food, water, land and income. In some countries, food insecurity can be attributed to low crop yields, leading to the import of substitutes to feed the general population. Food insecurity can also be termed as lack of access to good nutritious diets,

particularly for pregnant and lactating women, infants, low-income earners and the unemployed. This is evident in many parts of the developing world, and indeed the developed world, where malnutrition and other nutrition-related diseases are increasing. This does not mean that the general public does not have adequate food to eat, but the fundamental problem lies with the social, cultural and economic status of the people. For instance, food security may be influenced by how meals are prepared, who should or should not eat what and what the meal comprises.

In both rural and urban Vanuatu, there is physical evidence of malnutrition amongst infants, pregnant and lactating women, low-income earners and the unemployed. However, more studies and data are required on this subject to assess the full extent of malnutrition at both the household and national levels. Although there are abundant food items such as root and tuber crops, nuts, fruits, livestock, marine food items and vegetables to feed everyone all year round, not all people are able to get access to enough food. Findings from the 1983 National Nutrition Survey (no other recent work of this kind has taken place since) indicate that malnutrition is noticeable amongst children between 1 and 2 years of age in rural Vanuatu. In urban areas the problem is more prominent amongst low-income earners, who cannot afford the luxury of different protein sources and vegetables in their daily high-carbohydrate diets. In urban areas people tend to prefer imported food items, in particular rice and flour, to domestically grown starchy foods. Apart from low prices for certain imported food items, there are other factors such as taste, cooking time and availability that make imports very competitive with domestically grown food crops.

Large family size means many mouths to feed on a daily basis. The problem is made more prominent if there is only one breadwinner in each household, as is common for the majority of households in urban Vanuatu. Apart from food, there are other expenses that households have to meet, such as rent, transport, school fees, medical expenses and other necessities. Findings from the 1998 Income and Expenditure Survey show that expenditures on food alone accounted for 32.5% of the average household disposable income but more than half of that of low-income households.

1.3 Objectives and scope of the study

The general objective of this project is to assess food insecurity and its causes in Vanuatu. Specific aims are to:

- describe the national food systems;
- analyze food security and its underlying vulnerability; and
- identify strategies and formulate policy options to improve national, provincial and household food security.

In analyzing factors affecting consumption behaviour and food security in Vanuatu, separate attention is given to rural and urban areas. General aspects of domestic food production, export, import and distribution are also considered. The present food policies of the government are examined, and other potential policies are assessed, in an attempt to address the current and growing problems of malnutrition and food insecurity. Some measures are suggested that the government can adopt in addressing issues relating to current food insecurity and development of the domestic food system in Vanuatu.

2. Method and Data Sources

This paper was prepared using national reports and other related materials, and personal conversations with key members of both the public and private sectors responsible for food and food-related matters in Vanuatu. Although most of the information was taken from national sources, some evidence is cited from other countries that have situations and problems similar to Vanuatu. No new collection of primary data was undertaken in the preparation of this report. Secondary data from the following publications were used:

- Food composition tables were obtained from the Pacific Islands Food Composition Tables, constructed by the South Pacific Commission (SPC 1994), to assess the nutrition content of the main food items used by individuals and households in Vanuatu.
- The 1998 Vanuatu Household Income and Expenditure Survey Report was used to assess household expenditure on food items (VSO 1999c).
- Bulletins and other publications of the Vanuatu Statistical Office were used to obtain information on exports, imports, population and other economic indicators.
- The 1998 Vanuatu Non-Communicable Disease Survey Report was used to obtain information and data on non-communicable diseases related to poor nutritional intake by people in Vanuatu (SPC/Vanuatu Ministry of Health 2000).
- Analysis of the competitiveness of domestically grown starches with imported rice in Vanuatu was based on Welegtabit (1996). This paper has been used as the core of this report with some sections deleted and others updated.
- The situation analysis of household food security in Vanuatu by Foy (1991) was also used for this report with updated information and data.
- A report by UNICEF (1998) was used to analyze the nutritional and health status of children and women in Vanuatu.

3. Description of National Food Systems

3.1 Domestic food production

Food crop production varies from purely subsistence in remote areas to semi-commercial and commercial, depending on the distance of locations from the money-oriented urban markets. Few households are still purely subsistence producers. Food items are produced mainly for home consumption but sometimes can be given away or shared with extended families and friends.

In more remote areas, food crop production consists of mixed cropping, inter-planting or inter-cropping of all food crops (root and tuber crops, bananas, vegetables and fruits) and often cash crops on the same piece of land. Mixed cropping is the simultaneous growing of more than one crop in the same plot, but each crop occupies a separate area. Inter-planting is where plants are grown simultaneously in the same cultivated area as other plants. Inter-cropping is where plants are grown simultaneously in the same cultivated area as other plants in alternate rows (Hoque 1984).

For semi-commercial production, farmers tend to have bigger gardens and sometimes separate food gardens enabling them to sell off surpluses from their harvests. Food production is still predominantly for home consumption, gifts to relatives and friends, and occasionally for cash income. DALH (1991) found that, throughout Vanuatu in 1990, 80% of households consumed at least some of what they produced, 40% shared or gave away some of their food crops, while 13% sold some of their food crops for cash income.

Commercial production is mainly found around and in close proximity to urban areas, where food crops (mainly vegetables and fruits) are grown for the domestic markets, some retail outlets, restaurants and hotels. Food gardens also contribute significantly to food needs both at the household level and in domestic markets. To date, there are no documented records of specific food crop yields per annum for Vanuatu. Information on crop yields given in Table 3.1 is based on estimates made by the Department of Agriculture & Horticulture (DAH), now the Department of Agriculture and Rural Development (DARD).

Table 3.1 Food crop yield estimates in Vanuatu.

	Yam	Sweet potato	Manioc (cassava)	Colocasia taro	Xanthosoma taro	Banana
Yield (t/ha)	37	14 - 38	42	30 - 52	20	3.2

Source: Department of Agriculture and Horticulture, Port Vila.

Nor are there formal records or studies to estimate total food production in Vanuatu. However, estimates of some selected food crops and livestock produced annually in rural Vanuatu can be obtained using information indicated in Table 3.2.

These estimates of food production were based on numbers of households producing each type of food crop and livestock. Potential yields that could be obtained from each farming activity were used to obtain the estimates. As the majority of households consume some of what they produce, the contribution to GDP by the food sector through the sale of food crops and livestock is relatively small. In 1999, the contribution of subsistence production was estimated at 36% of agricultural output and 7% of GDP.

As well as cash crop production, farmers raise livestock. In fact Vanuatu is the only small island nation that is currently exporting beef in the South Pacific. Therefore, in framing their policies, the present and previous governments tended to foresee more potential in national export capabilities than simply in supporting existing domestic activities such as food crop and

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small livestock production. A fair proportion of people in rural areas keep a considerable number of small livestock for food. Findings from the 1993 Agricultural Census indicate that 43% of cattle are in the smallholder sector. The census also found that, throughout Vanuatu, 90% of smallholders have chickens, 70% have pigs, 26% have goats and 10% have ducks (VSO 1994). Most of these small livestock are under free-range systems and have been for decades. This in itself should send a clear message to policy makers that improvements in small livestock husbandry must be seriously considered as one of the future measures to promote food security in rural areas.

Table 3.2 Selected food crop and livestock production in rural Vanuatu.

Commodity	% of households	Production (tons)	Value ('000 vatu)
Cassava	70	6,300	191,400
Sweet potato	65	3,900	158,000
Yams	67	10,200	612,800
Taro	49	12,000	480,000
Banana	70	32,200	1,611,200
Maize	53	4,800	293,100
Bele	47	2,800	142,400
Chinese cabbage	10	300	15,000
Beans	41	120	12,000
Orange	56	5,100	306,000
Mango	49	22,500	1,350,000
Watermelon	33	20,200	1,214,800
Pineapple	39	12,000	1,200,000
Chicken	90	630	189,000
Pigs	70	900	190,000
Cattle	31	370	56,500
Goats	26	250	15,000
Ducks	10	300	3,000

Sources: Agriculture Census 1993, Population Census 1999.

Apart from land-based food output, seafood also plays a vital role in people's diets. FAO (1994) pointed out that small island developing states have among the highest annual per capita rates of fish consumption in the world. Fish consumption in some small island states is as high as 50 kg per person per annum, many times the consumption levels in other developing countries. This pattern of high seafood consumption is common throughout Vanuatu because of the small sizes of islands. Fishing and harvesting of seafood items is almost a daily event for many rural households, particularly those living in coastal areas. Many different types of marine food sources can be harvested from the sea such as fish, shellfish and seaweed, to name a few. In some rural areas where high population densities are concentrated in specific locations, these marine food sources are declining at an alarming rate because of the unsustainable uses of the natural resources providing these foods. Although policy makers are aware of increasingly unsustainable use, no measure has been undertaken to conserve and develop these natural resources to enable their efficient and sustainable use, to meet the growing food needs of the people in the future.

The local forest also provides a lot of food items, such as root and tuber crops (notably, some yam species), fruits, nuts and vegetables. These food crops are so well adapted to growing in this environment that their domestication into food gardens has not been very successful. In most instances, it is best to grow these crops, or leave them to grow naturally, in forested areas. Customary land ownership in Vanuatu is such that anything (including food items) found on any land belongs to the people with tenure rights to that land. Therefore, these people can harvest and use anything on the land that belongs to them, and can also permit other people to do likewise. Although some aspects of domestic food production may sound primitive, it is a fact of life that still exists today in most parts of the country. However, in the long run some current

practices have potential for improvement, to ensure sustainable use of resources in safeguarding food security in Vanuatu.

3.2 Food exports and imports

Vanuatu exports a considerable volume of food items and other raw materials that can be later converted in processed food products in other countries. Apart from the traditional export of copra, food products that are currently exported are beef, cocoa, vegetables, other food crops, fish and other marine resources. The main export markets are in Asia and Australia. However, imports still far exceed exports.

The proportions of food exports to total exports and GDP are presented in Table 3.3 for the period from 1989 to 1999. Both series have oscillated quite widely around a constant trend.

Table 3.3 Food exports in Vanuatu, 1989-1999.

Year	Total food exports	% of total exports	% of GDP
1989	532,000	20.6	3.2
1990	825,000	37.5	4.6
1991	854,000	42.0	4.2
1992	827,000	30.9	3.8
1993	1,051,000	38.1	4.4
1994	1,039,000	35.7	4.1
1995	1,002,423	31.6	4.1
1996	847,230	25.2	3.4
1997	815,093	19.9	3.2
1998	1,452,831	33.6	5.3
1999	896,143	30.8	3.2

Source: Vanuatu Statistics Office.

Unlike other Pacific countries such as Fiji, Samoa and Tonga, the value of food exports from Vanuatu is quite small. Copra is not included in Table 3.3 because coconut products are also used in other products, such as cosmetics. Vanuatu has the potential to export many more horticultural food products such as spices, nuts and squash. However, there are technical and economic issues that must be addressed before venturing into these areas. At present, small quantities of some food products are exported to some overseas markets.

For a country with such a rich agricultural potential and one physically capable of achieving self-sufficiency, food imports in Vanuatu are remarkably high. This high level of food imports is viewed with great concern by the government, primarily because of the foreign exchange costs that could be diverted to capital imports with the potential to increase the rate of economic growth. Annual food imports throughout the 1980s and early 1990s amounted to 19% of total imports and 81.4% of domestic imports, as shown in Table 3.4.

A clearer picture of the trend in food imports is given in Figure 3.1. Over the two decades since 1980, the percentages of food imports to total imports and GDP have trended slightly downwards. While the percentage of food imports to total imports fluctuated quite a lot, the percentage of food imports to GDP remained quite stable at less than 10% throughout the study period from 1980 to 1999. This gives a more realistic and less alarming picture of the trend in imported food items, but it assumes an ability to increase GDP in the future to meet growing domestic food needs. It is notable, however, that the stable proportion of food imports to GDP indicates that food imports seem to vary according to the national capacity to pay for them.

Consumption of imported foods is not new to Vanuatu and cannot be associated solely with urbanization. Studies undertaken in the 1950s show that imported foods like rice were already well established in both urban and rural diets. Findings from a review undertaken by the Statistics Office in 1983 and 1984 indicate that rural rather than urban consumption has been the

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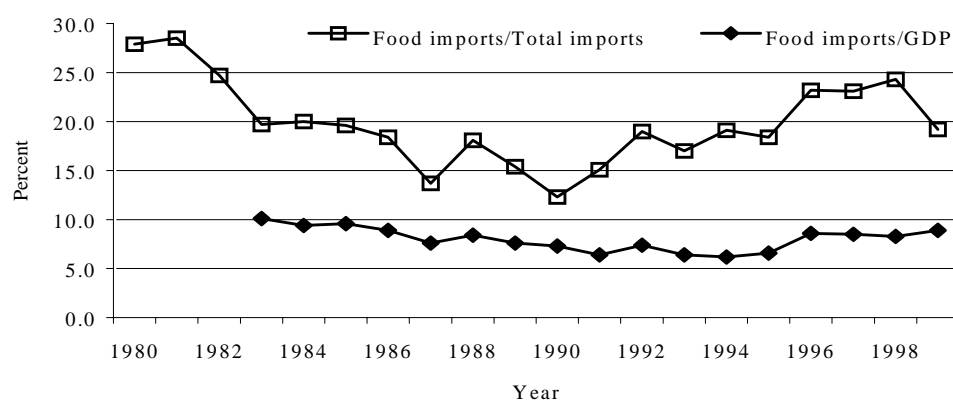
primary source of demand for imported foods. Estimated urban per capita consumption levels for imported items are generally higher than those in rural areas, but the predominance of rural ni-Vanuatu in the population means that the bulk of consumption occurs in rural areas. “In 1985 a year of high import, estimated rural consumption made up more than 70% of total demand, although per capita consumption was at 43 kg which was significantly less than the 78 kg estimated for urban areas” (Foy 1993).

Table 3.4 Vanuatu’s food imports, 1980-1999.

Year	Food imports (million vatu)	Food imports as % of total imports	Food imports as % of domestic imports	Food imports as % of GDP
1980	993	27.9	112.8	Na
1981	1,113	28.5	79.4	Na
1982	1,143	24.7	110.2	n.a.
1983	1,023	19.7	57.4	10.1
1984	1,166	20.0	35.1	9.4
1985	1,210	19.6	64.5	9.6
1986	1,089	18.4	112.3	8.9
1987	1,022	13.7	68.0	7.6
1988	1,263	18.1	81.1	8.4
1989	1,237	15.4	75.2	7.6
1990	1,312	12.3	80.8	7.3
1991	1,296	15.1	85.5	6.4
1992	1,606	18.5	85.0	7.4
1993	1,514	16.9	87.1	6.4
1994	1,560	15.7	86.1	6.2
1995	1,614	18.4	85.6	6.6
1996	2,134	23.2	87.6	8.6
1997	2,143	23.1	88.6	8.5
1998	2,273	24.3	86.2	8.3
1999	2,473	20.0	87.8	8.9
Average 1980-1999	1,236	19.0	81.4	8.0

Source: Vanuatu Statistics Office.

Figure 3.1 Food imports as a percentage of total imports, 1980-1999.



As pointed out by Cameron (1991), imported food items have become a significant factor with respect to total food availability in many Pacific island countries where reliance on domestically produced food has been declining. Increased self-sufficiency, measured in terms of reduced imports, has consequently become the prime food policy objective, and has figured prominently in the Third National Development Plan in Vanuatu (Republic of Vanuatu 1992). New policies that came about with the comprehensive reform programme (CRP) in 1998 include a value-added tax (VAT) of 12.5%. This tax was accompanied by the abolition of tariffs

on most basic imported food items such that rice and flour have no import duty, while the rate of import duty on canned fish is 30%. (Note that all imported food items attract the 12.5% VAT.) These three food items play a vital dietary role in almost all households and, in particular, among low-income earners in urban areas. Any high rates of duty on these items impose a potential threat to food security for this particularly vulnerable group.

It was suggested by Foy (1993) that the degree to which a tariff would succeed in reducing the consumption of any good depends upon the extent of the price rise it causes, and the price elasticity of demand for that good (the extent to which consumption responds to a change in price). The price elasticity of demand varies between households with respect to the ease with which alternative goods can be substituted. In the case of food, the ease of this substitution also determines the impacts of a tariff on food security, not only at the household level but nationally. For households living in rural areas, substitution would be easy given their ready access to own-produced food crops. Tariffs on items like rice and flour, which are substitutes for domestically produced foods, can achieve the objective of reducing demand for imports with no adverse effect on food security in rural areas.

This situation is very different in urban areas. The price elasticities of demand for imported items, particularly rice, are likely to be much lower, given the limited range of food options available to the urban population. "Substitution will be by necessity with another purchased food, and will only occur if the tariff succeeds in leaving imported items, and in particular rice, more expensive" (Foy 1993). Given the present price advantage that rice has over other food items, an increase in its price or tariff would force the urban population to switch to other locally grown starchy foods. However, the consequences of such a rise in price on a basic food item would leave low-income earners worse-off than before.

If such a price rise should ever occur, urban households would have to reallocate expenditure away from other basic needs to the purchase of food for consumption. Foy (1993) pointed out that any suppression in urban demand for imported foods thus achieved would not have been through the substitution effect, as initially intended, but rather by way of an income effect. Reducing the physical amount of food each household is capable of buying is almost the same as if their income levels were reduced in the same proportion. This would have more impact on the low-income earners than the medium-income and high-income groups.

3.3 Food marketing and distribution

Marketing in its true sense is the exchange of goods and services between individuals or groups of individuals. In today's societies, most goods and services are exchanged for cash, but goods and services are also bargained, such as one good for another or services provided for other goods or services. In Vanuatu, marketing of food items can be classified into four main categories, namely village local rural markets, island local rural markets, urban domestic markets and export markets. Each type of market is now briefly described.

3.3.1 Village local rural markets

Each island in Vanuatu has its own informal local market or markets, based mostly in or near rural villages. To date, it is uncertain how many local markets exist on each island. What is known is that a lot of marketing of local food items and other products is happening between villages and individual households on remote islands. Items marketed in these informal markets include kava, cooked food, artefacts, live animals and carcasses of livestock (cattle, pig, chicken, beef, pork), food crops and local building materials (local timber, thatched roof leaves, *Natangura* and bamboo).

These markets, which have existed for a long time, are very small and do not take place regularly at the same location or on the same days of the week. They are organized to coincide with days when people come together for a purpose, such as Sundays and other celebrations

such as Christmas and Easter. With the introduction of a cash economy, people increasingly prefer cash transactions to barter exchange of goods in these markets.

3.3.2 Island local rural markets

On many islands in Vanuatu, marketing opportunities for local foodstuffs and other products exist at a few locations, such as the provincial headquarters and on the boundaries of educational, health and church institutions. Potential markets also exist on populated islands where people have access to sources of cash income from other local products. Island local markets provide opportunities for the exchange of cash crops (copra, kava, spices and cocoa), root crops and vegetables, livestock (cattle, pigs and chickens), handicrafts, fish and other marine resources, local nuts and fruits, and local building materials (local timber, thatched roof leaves).

Island local markets mainly target those who are working and earning regular cash incomes in the form of salaries and wages. Local farmers produce (and frequently also market) the products sold in these markets. Therefore, from observations in many island local rural markets, it is clear that products are cheaper than in the urban markets. As most products are perishable, they must be sold during the same day.

3.3.3 Urban domestic markets

The two main urban domestic markets in Vanuatu are in Luganville on Santo and Port Vila on Efate. However, most provinces have their own food market centres, mostly located at provincial headquarters and other centres. The goods traded in these urban markets are mostly perishable food crops and vegetables. Producers living close to these centres sell almost all products sold in urban markets.

Apart from the fresh food markets, there are shops in urban centres, such as supermarkets, bakeries, fish shops and butcheries, which are restricted to these areas due mainly to the fact that there are facilities in place to make their operations possible.

Some producers on the outer islands currently send food products to be sold in urban areas by relatives and middlemen. These products are mainly root crops, such as yams and taro, that are not as readily perishable as other food crops such as banana, cassava and sweet potato and accordingly have a slightly longer shelf-life.

It must also be noted that the biggest markets for kava are currently in urban centres. Kava is both a beverage that is drunk by many people living in these centres and an export for use in the pharmaceutical industry. Marketing of kava in urban centres has paved the way to send food crops along this same marketing route. This was due exclusively to the more regular shipping schedules to the islands that grew with the expanding domestic trade in kava.

3.3.4 Export markets

A small quantity of food is currently exported from Vanuatu. The main commodities for export are beef, cocoa, root crops, vegetables and marine resources including fish. Vanuatu is at present the only Pacific island country to export beef to Japan and other neighbouring Pacific countries.

3.4 Food availability and demand

National demand for food depends on both the size of the population and income per head, particularly in urban areas. As more people become wage and salary earners, the demand for goods and services increases. This also applies to imported and domestically produced food. It is a fact of life that any increase in population will also increase the demand for food. Apart

from income, there are other economic and demographic factors such as taste, price and size of household that determine the demand for food.

In Vanuatu, as elsewhere in Pacific island countries, the demand for food changes as households move from rural to urban areas. In rural areas, the physical demand for food is met on a regular basis by households cultivating and harvesting crops when the need arises. On the other hand, household food requirements in urban areas are met on a regular basis by income earned through employment and other income-generating enterprises. Almost all food requirements, both imported and domestically produced, must be purchased. Fisk et al. (1976) observed that “the rapid growth of the demand for marketed foods is the result of the revolution of rising expectations, which has made a rising level of incomes and material welfare an inescapable political objective for virtually all governments in the Pacific”. This has created an economy within urban areas that enables all households to purchase almost everything they need and want. To provide for all these needs, the local economy must either produce what is needed or import the needed goods and services.

In rural areas of Vanuatu, food availability is currently not of much concern to most households. Each household tends to make one or two new food gardens every year. Yam is an important food crop in most rural societies. It is a seasonal crop that is grown only once each year. After harvesting yams, households consume whatever they want from the harvest and leave some tubers for use as planting material. Two to three months after harvesting, households are busy again clearing new forest areas to prepare another yam garden. Yams are planted in the same garden as many other crops. Old yam gardens are still kept and maintained as households continue to harvest other crops through the process of crop rotation practices. Crop rotation is practised on many islands whereby, after harvesting yams, another food crop is grown on this same piece of land. Crops used for this practice depend on the availability of planting materials and preferences by household members for the consumption of other food crops.

In urban areas, cash income acts as the most fundamental constraint to the quantity and quality of food that households can buy. Income spent on food items varies but, on average, around one-third is on the purchase of kilojoules, as indicated in Table 3.5. This is the aggregated total cash expenditure for all urban households throughout Vanuatu. Expenditure on rice and bread accounted for some 41% and 39%, respectively, of total expenditure on starches in 1985, with only 6% spent on domestically grown food crops (Table 3.5). A considerable amount of total expenditure was on meat and meat products (21%), and fruit and vegetables (15%).

Table 3.5 Expenditure shares on different food items in urban Vanuatu, 1985.

Food item	Share of total expenditure (%)
Rice	13.67
Bread	12.98
Local starches	1.87
Other starches	5.04
Meat and meat products	21.44
Sea foods	8.20
Dairy products	6.39
Fruits and vegetables	15.00
Sugar and related products	8.17
Other food items	7.24
Total	100.00

Source: Statistics Office, Port Vila.

In 1985, 50% of households were classified in the low-income group yet they accounted for only 24% of total income (NPSO 1986b). The 39% of the population in the medium-income group accounted for 46% of total income while the 11% in the high-income category accounted for 30% of total income. There are marked differences between the three income groups in household expenditures devoted to food, as shown in Table 3.6.

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Table 3.6 Urban household income and expenditure on food, 1985.

Income Level	Proportion of urban households (%)	Average annual household income (vatu)	Average annual food expenditure (vatu)	Household income spent on food (%)	Household expenditure on food (%)
Low	50	326,000	125,093	38.3	42.7
Medium	39	797,000	181,405	22.7	35.3
High	11	1,865,000	294,678	15.8	29.8

Source: Statistics Office, Port Vila.

Low-income households spend less on food items than medium-income and high-income households. However, this expenditure accounts for a significant proportion of their total disposable income. Any increase in food prices will have more impact on the low-income group than on the other two income groups. With higher allocation of income to food by low-income earners, the flexibility of their household expenditure on other essentials is limited. Foy (1993) noted that any disruption to the flow of income to households, and in particular those with low incomes, will impair their access to food. This can occur through unemployment and under-employment. Short-term breaks in employment and under-employment seem to be more common among those earning low incomes than among the other two income groups. Low-income jobs in urban areas of Vanuatu tend to be casual, and hence do not guarantee long-term employment. This is attributed to the fact that casual labourers tend to be inadequately trained and unskilled, and therefore it is not difficult for employers to recruit replacements.

Another factor that is common amongst low-income earners is that their expenditure pattern is very narrow, concentrated on certain food items. Findings from the 1985 Income and Expenditure Survey (NPSO 1986b) indicate that low-income earners spent almost one-half of their income (48.7%) on five food items, namely rice, bread, locally grown food crops, canned fish and canned meat. Rice alone accounted for over 15% of this expenditure and provided an estimated 28% of daily adult energy needs. On the other hand, expenditure on these same food items by high-income earners is less than 10%, as shown in Table 3.7.

Table 3.7 Pattern of urban household expenditure, 1985.

Food items	% of total expenditure on food by income group		
	Low-income	Medium-income	High-income
Rice	15.7	12.7	2.7
Bread	14.4	11.4	3.3
Local starches	7.2	5.0	1.9
Canned fish	5.1	3.5	0.6
Canned meat	6.3	5.8	1.4
Total	48.7	38.4	9.9

Source: Statistics Office, Port Vila.

This pattern of food expenditure is not uncommon in Pacific Island countries covered by other food studies. As noted by Foy (1993), this pattern of expenditure is attributed mainly to non-price factors such as convenience and taste. Rice and bread provide cheap sources of energy relative to traditional food crops. A considerable proportion of income spent on food (62%, 63% and 61% for low-, medium- and high-income earners, respectively) goes towards the purchase of these two food items alone. The reason is that these two food items are cheaper and are readily available almost everywhere in urban areas. They also represent good value for money in terms of energy. However, the main factor that determines the differences in expenditure patterns for all households within the three income groups in urban areas is food prices.

3.5 Food prices

In 1998, the Vanuatu government abolished tariffs on most food imports, and introduced the VAT in an attempt to generate more revenue for the government. The introduction of the VAT kept food prices steady, but did not support past policies of import substitution to encourage the consumption of domestically grown food crops. To date, inflation in Vanuatu has been low compared with other countries and is currently almost zero. This is due mainly to good monetary policy measures by the Reserve Bank.

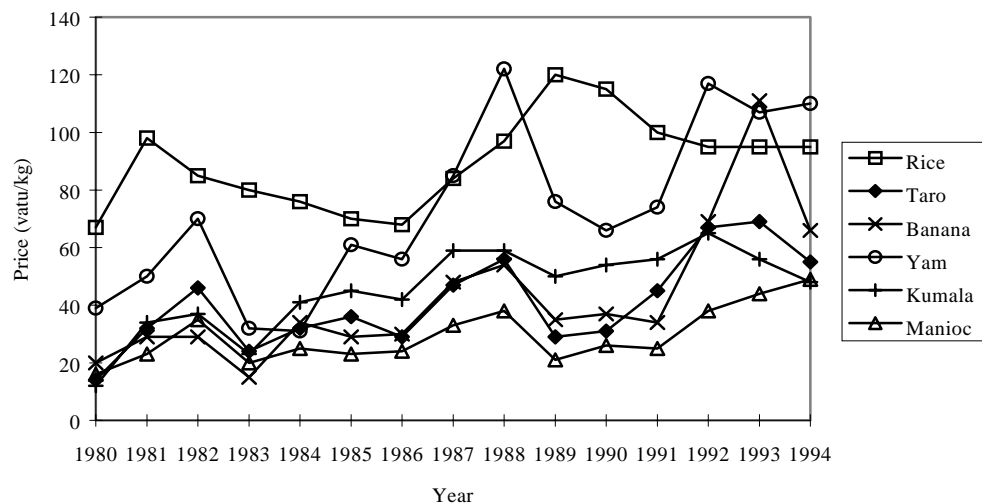
Prices for domestically grown food crops in rural areas have remained low relative to rice prices. However, prices for domestically grown food crops in Port Vila continued to rise from 1980 until 1994, as shown in Table 3.8 and Figure 3.2.

Table 3.8 Average prices of selected foods (vatu per kilogram) in Port Vila, 1980-1994.

Year	Rice	Taro	Banana	Yam	Sweet potato	Cassava
1980	67	14	20	39	12	16
1981	98	32	29	50	34	23
1982	85	46	29	70	37	35
1983	80	24	15	32	23	20
1984	76	32	34	31	41	25
1985	70	36	29	61	45	23
1986	68	29	30	56	42	24
1987	84	47	48	85	59	33
1988	97	56	54	122	59	38
1989	120	29	35	76	50	21
1990	115	31	37	66	54	26
1991	100	45	34	74	56	25
1992	95	67	69	117	65	38
1993	95	69	111	107	56	44
1994	95	55	66	110	48	49

Source: Statistics Office, Port Vila.

Figure 3.2 Average prices of selected commodities in Port Vila, 1980-1994.



Prices of locally grown foods continued to increase throughout the 1980s and increased more rapidly during the early 1990s. Particularly rapid increases can be noted during 1982, 1987, 1988 and 1992. In the 1980s, price increases were attributed mainly to the occurrence of several cyclones that led to shortages of certain food items, such as yams and taro, in local

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markets. This follows the law of demand and supply, where a fall in supply for a given level of demand causes prices for these commodities to increase.

During the early 1990s, price increases were attributed to the Gulf war crisis, which resulted in high world fuel costs. Most market vendors in urban Vanuatu are from rural areas and therefore must transport their produce by land to market locations. High fuel costs increased the costs of transportation to and from market locations. To accommodate these high transport costs, market vendors increased prices for almost all food items.

Other reasons that can be suggested for this increase in urban fresh food prices are higher incomes and population growth in urban areas. These factors shift the demand functions for food items upwards, thereby increasing prices so long as the price elasticity of food demand functions is less than infinity (a reasonable assumption given that the price elasticity of demand for foods is typically close to or much lower than unity). The more price-inelastic the demand for these items, the greater the increase in their price, other things remaining unchanged. Low-income earners suffer most from increases in fresh food costs, because they have to divert their limited incomes away from other necessities to purchase alternative cheap energy sources like rice and flour.

If bulkiness and quantity are to be considered, rice has advantages over all domestically grown food crops. Rice can be purchased in quantities as small as one kilogram and still be able to feed a family of five for at least two meals. One kilogram of domestically grown starches cannot feed a family of five for a meal. In Vanuatu, an average household will consist of both parents and at least three children. The other factor that might inhibit the purchase of small quantities of domestically grown starches is their different sizes and shapes. Domestically grown starches, such as roots and tuber corms and cormels, and bunches of bananas, are currently purchased in baskets, weighing from 5 to 20 kilograms, or individually depending on sizes and shapes. Unlike rice, domestic food crops are prepared in many different ways before they can be consumed. All domestically grown food crops have an inedible outer layer (skin), which must be peeled off before or after cooking. Only the inner white flesh of the crops is eaten after cooking. Cooking methods vary from boiling, cooking over open flame or using an earth oven. These forms of preparation all take more time and effort than the preparation of cooked rice.

As noted by Foy (1993), high relative prices of locally grown foods not only skew consumption patterns towards imported food items, but also limit food options open to urban households. Opportunities for import substitution with domestically grown starches are jeopardized because of these high prices. The narrowing nominal unit price differentials between rice and other domestically grown starches (Figure 3.2) and increasing differentials in price per kilojoule are such that rice will remain relatively cheap.

It is well known throughout Vanuatu that producers in rural areas never, or hardly ever, use inputs such as fertilizers and chemicals in the food production process. However, a lot of labour input is used for land clearing, planting, weeding and harvesting of crops. As labour is supplied mostly from within family units, there are no cash costs to producers in the production of food crops. However, family labour has its reservation price in rural areas, which appears to be quite high by developing country standards. Also, the other components of the food system (distribution and marketing) are open for scrutiny in an attempt to find the causes of these high food costs. A study of the marketing and transport of domestically grown foods should be undertaken to investigate mechanisms that determine prices within the locally produced fresh food system.

4. Food Security Condition and Problems

4.1 Food security condition

Food security can be viewed and addressed differently depending on geographical location, and demographic and economic variables within each country. For example, Valdés (1981) defined food security as the ability of food-deficit countries, or regions within those countries, to meet target consumption levels on a year-to-year basis. The above definition may be correct but is not detailed enough for Vanuatu. A more detailed description of food security is given by “the ability to meet target consumption levels in the face of fluctuating production, prices, incomes and unavailability of food supplies at any price” (Chisholm and Tyers 1982).

In Vanuatu, food security can be viewed from two contrasting perspectives. The first contrast is between the traditional rural smallholdings, operating on a shifting cultivation basis, and the money-oriented urban areas. The second contrast is between temporary food insecurity, brought about by natural disasters such as cyclones and more recently a tidal wave, and long-term chronic food insecurity, which results from many factors

In rural Vanuatu, food security means the ability to produce adequate food for home consumption throughout the year. The cultivation of gardens has remained an essential component of village life with food continuing to be produced under traditional farming practices. The predominant carbohydrate crops within food gardens are root and tuber crops, cooking bananas and in some cases breadfruit. The great majority (92%) of smallholder households are involved in the cash economy and 99% produce some of their own food requirements. Root and tuber crops are the mainstay of the rural diets. They include yams, taros, cassava and sweet potatoes. Results obtained from the 1993 Agricultural Census indicate that 98% of households throughout Vanuatu were growing bananas, 97% manioc (cassava), 93% yams and 90% kumala (sweet potatoes) during the census period. This result is consistent with findings by DALH (1990) that taro and bananas were the two most important food staples consumed by all rural households.

Results obtained from the 1999 Population Census indicate that there were 28,157 rural households. This is 78.5% of the total ni-Vanuatu population. It is also known that rural households throughout Vanuatu are predominantly semi-subsistence farmers, with only a few purely subsistence farmers. DALH (1992) indicated that 55% of rural households cultivated gardens solely for subsistence needs. The other 45% of rural households farmed for home consumption and sold surpluses for cash income. According to the results of the 1983/84 Agricultural Census, the smallholder sub-sector produced 25% of GDP. Some of this output was exported, but the great majority of it was used to meet the food needs of the population (NPSO 1986a). By 1999, however, the smallholder sub-sector produced only an estimated 9% of GDP, again with some output sold for export and most used to meet domestic food needs.

For semi-subsistence farming, rural households produce food crops, keep small livestock for home consumption, and produce some cash crops (coconut, cocoa, kava and coffee) and livestock (such as cattle and pigs) for cash income. In remote areas where access to local markets is difficult, there tends to be quite a strong dichotomy between cash cropping mainly for cash income and food cropping for own consumption. However, around and close to urban centres, where established marketing facilities are found, smallholders sell some of their food crops for cash income through local food markets to people working and living in urban centres.

This tendency to produce food items for home consumption is not followed if one observes the consumption pattern of people living in urban centres. For urban people, access to any food item depends entirely in most instances on wages and salaries earned through employment and other income-generating activities. There are three distinct categories of people

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living and working in urban areas: high-, medium- and low-income earners. For high- and some medium-income earners, food security is not an issue of too much concern, simply because they can afford any food items offered through local markets and retail outlets. However, for some medium income earners and in particular those with large households comprising low-income earners, food security is a growing concern that cannot be adequately addressed and possible solutions are simply not forthcoming.

From the above discussions, two types of long-term food security measures can be identified in Vanuatu. In rural areas, food security means having access to adequate cultivable land. Access to cultivable land is the fundamental factor influencing the amount of food crops grown for own consumption in rural areas. Apart from land, rural households also have free access to other resources such as forests and the ocean for other food items.

In urban areas, access to many food items is made possible through local food markets and retail outlets. Therefore households must, in most instances, have access to some sort of income (wages, salaries and other forms of cash inflow) to enable them to purchase whatever food items are available. Not all urban households have the same access to all food items, with access very much determined by the level of household income. To date, no thorough study of income and food expenditures has been undertaken in Vanuatu. This is one area that must be carefully investigated.

To date, Vanuatu has been fortunate that homeless and hungry people cannot be found in urban centres as in many other countries. However, there are indications of things to come such as increasing crime rates, the rapid inflow of people into the two main urban centres and increasing rates of unemployment in the two main urban centres. This problem is mostly related to unemployment, whereby people do not have adequate money to purchase whatever they want and need for daily living.

To sum up, food insecurity is increasing and does not have an even impact on the general population throughout Vanuatu. People in rural areas are unevenly affected by both short-term and chronic food insecurity. People in rural areas do not experience the same issues with relation to long-term food insecurity as those in urban areas. Policy makers have tended to ignore these differences and the fact that food insecurity is a growing problem that must be adequately addressed. The main long-term food insecurity issues are now discussed.

4.2 Long-term food security issues

4.2.1 Rapid population growth

In Vanuatu, national population censuses are undertaken every ten years. Table 4.1 shows that the total population of Vanuatu was just 77,988 in 1967, but it grew rapidly between the first national census in 1967 and the third one in 1989. This rapid growth rate has shown few signs of declining. The national population growth rate in the decade to 1999 was 3% per annum according to preliminary figures from the recently completed 1999 Population Census. At this growth rate, the population of Vanuatu is projected to be over 200,000 in the year 2001 and over 250,000 in 2010.

Table 4.1 Vanuatu's population, 1967-1999.

Population	1967		1979		1989		1999	
	Number	%	Number	%	Number	%	Number	%
Rural	70,216	90	95,467	85.8	116,650	81.6	146,584	78.5
Urban								
Luganville	2,564	3.3	5,183	4.7	6,983	4.9	10,738	5.7
Port Vila	5,208	6.7	10,601	9.5	19,311	13.5	29,356	15.7
Total urban	7,772	10	15,784	14.2	26,294	18.4	40,094	21.5
Vanuatu	77,988	100	111,251	100	142,944	100	186,678	100

Source: Statistics Office, Port Vila.

Apart from the food needs of the people, there are other sectors of the economy that must be considered in relation to this rapid population growth and its future impact on the natural resource base. With more people to add to the present population, policy makers must recognize this as an issue to consider when planning for the future. Policies that achieve employment growth, for instance, are important given that unemployment is becoming a major problem that is linked to food insecurity. Policies and strategies with regard to food should not only address the growing food problem, but also incorporate measures from other disciplines (health, education, etc.) that may have direct and indirect impacts on food availability and entitlements. For example, healthier and better educated ni-Vanuatu are able to produce more food output, because of their higher labour productivity, thereby increasing the availability of locally grown food. They are also able to earn higher incomes, improving their entitlements to food.

4.2.2 Migration and urbanization

Migrants are people who have moved from their usual place of residence (birthplace) to a new location (area, country) to live for a specific period of time. International migration, as seen in a number of other southwest Pacific island countries, is not common amongst indigenous people in Vanuatu. On the other hand, internal migration is quite common in Vanuatu today, as people frequently migrate from one island to another, from rural to urban areas or from one rural location to another on the same island. Internal migration can be attributed to many reasons that are economic, social, cultural, political and religious in nature.

Table 4.2 gives a decomposition of ni-Vanuatu residing on their home islands as permanent residents, defined as people who may have moved between islands or locations but have not stayed for more than four months away from their usual place of residence (the reference period used during the 1989 Population Census). Details are also provided in Table 4.2 of migration between islands and the two urban centres during the 1980s. In-migration refers to people moving to other islands and known to reside there for more than four months. Out-migration refers to people moving away from their usual place of residence to live elsewhere. Net migration is calculated as in-migration minus out-migration.

Table 4.2 Migration between islands and the two urban centres, 1980-1989.

Location	Stayers	In-migration	Out-migration	Net migration
Banks/Torres	3,792	340	585	- 245
Santo/Malo	8,205	846	674	+ 172
Ambae/Maewo	6,575	605	1,113	- 508
Pentecost	7,196	486	1,053	- 567
Malekula	11,648	1,085	1,175	- 90
Ambrym	4,597	409	945	- 536
Paama	1,054	261	886	- 625
Epi	2,207	396	252	+ 144
Shepherds	2,435	349	929	- 580
Efate	2,667	713	575	+ 138
Tafea	13,567	666	1,600	- 934
Port Vila	11,718	5,188	3,225	+ 1,963
Luganville	3,659	3,377	1,709	+ 1,668

Source: Statistics Office, Port Vila.

In 1967, 90% of the population lived in rural areas. By 1999, this percentage had declined to 78.5%. The number of people living and working in urban Vanuatu increased from 10% in 1967 to 21.5% in 1999. The negative figures in Table 4.2 indicate a net out-migration from many islands, notably Tafea, Shepherds, Pentecost and Ambae/Maewo.

On the other hand, Santo/Malo rural, Epi, Efate rural and the two main urban centres (Port Vila, on Efate, and Luganville, on Santo) have experienced a net in-migration. Although other islands in Vanuatu have recorded positive net migration of over 100, Port Vila and Luganville figures are well above 1,000, indicating a large influx of people into these two main

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centres. This indicates that more people prefer to live in these centres than rural areas when choosing their next place of residence. According to the 1989 Population Census, the number of people in the two urban centres of Port Vila and Luganville increased at an annual rate of 7.6% during the 1980s, while rural population over this same period rose by only 3% per annum. Port Vila gained 8,611 migrants, accounting for 34% of its usual residents. Luganville gained 3,035 migrants during this same period, making up 28% of its resident population. Preliminary results from the 1999 Population Census indicate that average population growth in urban centres during the 1990s was 5.8%, with a growth rate of 6.3% in Luganville and 5.6% in Port Vila. The rapid increase in urban population over the recent years can be attributed partly to natural increases but mainly to migration.

As experienced in other developing countries, most people who have migrated to urban centres are unskilled and many do not have secondary or tertiary education. Therefore, they are more likely to contribute to the ever-increasing number of people who are the urban poor. They comprise those urban dwellers who are currently unemployed, under-employed, employed in low-income jobs, or employed but with large households to support. In Vanuatu today, the urban poor represent the largest proportion of the rapidly growing urban population. The increase in their numbers is likely to increase food insecurity, because they are the group most vulnerable to urban food insecurity.

Urbanization alters people's ability to secure food in sufficient quantity and quality to maintain good health. The generally good access to food supplies ceases when households settle in urban areas. Food security at the household level becomes dependent on securing access to purchased food, rather than growing food for own consumption. Foy (1993) observed that, for the urban population, "any disruption to household income or unfavourable movement in food prices can potentially compromise household food security, more so among low income earners".

If current population trends continue, urban centres will experience a population expansion that will require sound policy issues to address the problem of a growing reliance on purchased food supplies. If urban food security is to be improved, it is essential that the reasons for this vulnerability be fully appreciated. "The Vanuatu government food policy has emphasised national self-sufficiency but little, if any, regard has been shown to food security needs at the household level. Measures implemented in support of this national objective have been detrimental to the food needs of the urban poor" (Foy 1993).

The problem with current and past food policy measures is that it was and always has been a top-down approach, which looks at what people need and not what they want. The current food system needs some improvement in order to address the food security status of urban people in Vanuatu.

4.2.3 Changing dietary pattern and dependency on imports

Most people prefer rice to local staples because of its taste, ease of cooking and its availability in retail shops all year round. The variety of rice that most people prefer in Vanuatu is the short-grain variety that, when cooked, is soft and sticky. In comparing cooking time, rice is easier to prepare and has a much shorter cooking time than local staples. Therefore, rice is an easy and cheap source of energy that most people can adapt to very easily and quickly. Vanuatu imports all of its rice. In 1999, imports of rice totalled 656.9 tons, worth approximately US\$4.4 million. Domestic prices are influenced by changes in world prices and the exchange rate.

Domestically grown food crops in the towns of Vanuatu are largely beyond the reach of the urban poor, who rely on imported rice and flour as cheap sources of energy. Foy (1993), gives a good summary of the current issue:

“Diversity in food options is lost and the food security of the urban poor becomes dependent on the price of rice and flour. National food policy, emphasizing self-sufficiency, has led to the introduction of a tariff on rice. While successful in containing rural demand, the tariff has failed to reverse the high urban price differential between rice and local substitutes and urban consumption patterns have remained unaltered. The tariff has however, raised the cost of food to the already vulnerable urban poor. It is argued that rapid urbanization will increase demand for imported foods unless consumption habits change. Tariffs will not achieve this. Emphasis must be placed on reducing the cost of local foods relative to rice by improving their production, distribution, marketing and widening food options to provide incentive to change consumption habits.”

The above argument by Foy (1993) is partly true at present in the sense that tariffs on most food items were abolished when the VAT was introduced in mid 1998. However, as indicated in section 3.5, prices of domestically grown starches have remained high relative to imported rice and flour, especially in Port Vila food markets. To date, very little has been done to reverse their rising costs, even though this issue has been recognized by the government and, in particular, DARD.

4.2.4 Increasing nutritional problems

Human productivity and other dimensions of performance potential later in life are determined during early childhood. One of the contributing factors to this human development is the quantity and quality of food that a child eats. Childhood nutrition intake will very much determine their physical development and other characteristics that can be displayed later in life. Foster (1992) identified four types of malnutrition as overnutrition, dietary deficiency, secondary malnutrition and undernutrition. All four types of malnutrition currently occur in Vanuatu. Findings from nutrition surveys undertaken during the mid 1980s indicate that malnutrition in one form or another can be found among all age groups in rural and urban areas.

Foster (1992) pointed out that overnutrition occurs mainly among some medium-income and high-income earners, where household diets consist mainly of kilojoules, saturated fats, salt and sugar. Nutrition-related diseases that can result from overnutrition are obesity, diabetes, hypertension and atherosclerosis. Dietary deficiency occurs when diets lack sufficient quantities of essential nutrients as vitamins and minerals. Diseases related to this condition are xerophthalmia (vitamin A), rickets (vitamin D), anaemia (iron), goitre (iodine) and scurvy (vitamin C). Secondary malnutrition occurs as a result of other diseases preventing digestion and absorption of food into the body. These are diseases like diarrhoea, respiratory illnesses, measles and intestinal parasites. Undernutrition is the condition brought about when people are simply not getting enough energy and/or protein in their diets. Known diseases such as kwashiorkor and marasmus are associated with undernutrition. These diseases are virtually unheard of in Vanuatu. Physical symptoms of undernutrition can be noticed among children such as abnormally slow growth in height and weight, poor performance in activities (school work, sports and jobs) and tiredness (fatigue) during the course of the day. To date, no detailed studies have been undertaken to assess the extent of malnutrition in the general population.

Factors affecting nutritional status of individuals within households are the quantity and quality of food items available in markets and farms, ability of households to obtain food items, desire of households to obtain food, and utilization of these food items by households to meet nutritional needs. All of these factors can have direct and indirect impacts on the food security status of households throughout Vanuatu.

In 1983, a National Nutrition Survey was undertaken on 1,200 children to determine the extent of malnutrition among children five years and younger. This survey found that 23% of these children were underweight. There was a variation of underweight infants across the country, ranging from a low of 3% to a high of 48%. There was also a marked difference

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between breast-fed and bottle-fed babies in each age group. The number of underweight babies who were bottle-fed was three times higher than breast-fed babies.

Another survey was undertaken in 1985 on non-communicable diseases of 1,400 adults aged 20 years and above. Findings from this survey indicate that diseases such as diabetes and hypertension were two to three times higher in urban areas than in the rural remote areas of Vanuatu. Non-communicable diseases such as diabetes are not uncommon in other Pacific island countries. Tuwal (1996) noted that: "thirty years ago, diabetes was a relatively unknown medical condition to the islander populations throughout the South Pacific. Today, the region rates the highest diabetes prevalence in the world."

He also mentioned that studies are currently being undertaken in health centres around Australia to identify ways to control this growing problem. Findings from the 1998 Vanuatu Non-Communicable Disease Survey indicate that 43.6% of the general population is obese or overweight (SPC/Vanuatu Ministry of Health 2000). Obesity is related to heart diseases, diabetes and hypertension.

Infection and malnutrition are mutually related. Repeated respiratory infections, malaria, diarrhoea and chronic worm infestations contribute significantly to a lowered nutritional status. Poor nutritional status also increases susceptibility to infectious diseases. Another problem found during the 1985 survey is that the prevalence of dental decay had increased with the consumption of sugar and dietary changes.

The problem of malnutrition in rural areas can be attributed in part to a lack of knowledge by indigenous people of how to utilize the abundant food resources in preparing nutritious meals. Apart from traditional varieties of food crops, introduced varieties can also be found anywhere in the country. The introduction of exotic tropical fruits, nuts and vegetables has tended to attract more attention than traditional varieties. To date, no studies have been undertaken on traditional varieties of food crops and their potential as substitutes for imports. Although most traditional varieties of food crops are still commonly used throughout Vanuatu, policy makers are paying lip service to their improvement and making people aware of their usefulness. It was pointed out by Fisk et al. (1976) "that indigenous agricultural systems have been neglected during the past 100 years, and that agricultural experts and specialists, who have come to help, have been more familiar with exotic plants and technologies, and consequently continued to support these systems rather than trying to adapt traditional crops or practices, of which they knew comparatively little."

Imported food items such as rice may contain more energy and protein than locally grown starches. However, locally grown starches such as taro and yam have more nutrients such as potassium and calcium and various vitamins (Table 4.3). Most locally grown starches are organically grown compared with imported food items that are grown commercially using a lot of chemicals such as fertilizers and pesticides.

Table 4.3 Composition of some common foods in Vanuatu.

Food	Energy (kJ/kg)	Protein (g/kg)	Fat (g/kg)	CHO (g/kg)	Fibre (g/kg)	K (mg/kg)	Ca (mg/kg)	Thiamine (mg/kg)	Vitamin E (mg/kg)
Taro	339	0.8	0.4	19	0.7	264	28	0.07	2
Yam	338	2.0	0.1	18	1.5	271	7	0.04	4
Rice	509	2.3	0.2	28	0.8	10	4	0.03	T
Bele	229	3.4	2.0	6	1.5	376	431	0.14	
Carrot	111	0.9	0.1	6	4.4	235	29	0.07	4
Mango	268	0.7	0.2	15	2.1	225	10	0.06	1
Raw fish	458	21.4	2.4	T	0.0	353	29	0.07	
Crab	426	19.2	2.3	1	0.0	166	226	0.30	4
Veal	674	29.2	4.8	0	0.0	355	8	0.18	T

Source: SPC (1994).

The fundamental problem lies with the difficulty in assessing whether traditional varieties of food crops are more nutritious than imported substitutes. Another factor that many food consumers fail to recognize is that some imported food items, such as some vegetables, fruits and canned meats, are not as fresh and nutritious as those displayed in domestic food markets (Table 4.3). The former tend to be more attractive in presentation than their domestic counterparts, because they have to meet certain market requirements. Another factor that might explain this type of behaviour is the availability of produce in the markets. Some domestic food items such as yams, mangoes, pineapples and other fruits and nuts can only be harvested at certain times of the year. Therefore, their availability in domestic food markets is restricted. Imports have to be brought in during the off-season periods for these particular food items. With steady incomes, most people in urban centres consume whatever they want, ignoring the nutritional advantages that local foods may have over the imported foods that they consume.

The story is very different in rural areas for seasonal food items. Access to these foods remains restricted until the following season. But access to other food items such as roots and tubers (except yams, some fruits and nuts, and green leafy vegetables) is possible throughout the year. It therefore can be reasonably assumed that people in rural areas are living on healthier diets than their urban counterparts. Non-price factors play a major role in rural areas as cash income is not readily available to people. However, in most instances eating choices have more to do with food availability than price and non-price factors.

In urban areas, the problem of malnutrition is more prevalent among the jobless, low-income and certain medium-income and high-income earners. In the case of the poor, this is brought about by inadequate finance to purchase some of the more nutritious food items that are found in retail outlets and local markets. Malnutrition amongst some medium-income and high-income earners is mainly attributed to high consumption of poor-quality food items in their diets.

Findings from the 1985 Income and Expenditure Survey indicate that 43% of cash income for low-income earners, 35% of income for medium-income earners and 30% of income for high-income earners was spent on food alone (NPSO 1986b). Although these three income groups might be consuming the same quantity and quality of food, the proportion of disposable income spent on food varies considerably between the three categories. The 1998 Vanuatu Income and Expenditure Survey results indicate that urban households spend 31.1% of their income on food, while rural households spend 68.7% of their income on food. Rural households thus do not have as many cash expenses as urban households, and a greater proportion of their cash income is spent on food items. This is also due to the fact that imported food items such as rice, sugar and canned meat tend to be more expensive in rural areas than in the two main urban areas.

Another factor worth mentioning is the different size of households. Small households have lower expenditures on food than larger households. Expenditures on food in most instances can be restricted to those who have steady sources of cash income, in particular those in urban areas. It is not so much the case in rural areas, where people grow much of their own food and do not have many cash expenses. The only people who may spend some of their incomes on food in rural areas are those employed as public servants and other salaried workers based away from their home islands, such as primary school teachers and nurses.

4.2.5 Increasing land pressure

As elsewhere in Melanesia, land tenure systems in Vanuatu are based on traditional or customary ownership of land whereby land is passed by family units through heritage from one generation to the next. However, land can also be leased from landowners or acquired through monetary and customary means from traditional owners. It was estimated by Weightman (1989) that 95% of total land area is currently under customary ownership. Population pressure on land is a growing concern in Vanuatu, and particularly in the smaller outlying islands. It was also suggested by Weightman (1989) that certain populations, such as those in north Pentecost,

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Paama, Motalava, Merelava, West Ambae, Tongoa and East Malekula, should be resettled in areas where expansion can be carried out through land use such as food gardens, cash crops and improved livestock husbandry.

In the past, when good health and access to better medical facilities were scarce, population pressure was much lower than it is today. Population density varies from 6 persons per square kilometre on Santo/Malo to the highest of 46 persons per square kilometre in the Shepherds island group. “With a total land area of 12,270 square kilometres, 4,380 square kilometres is forested land and a further 2,870 square kilometres is used land. Total population density for Vanuatu is 12 persons per square kilometre. This population density is much lower for rural Vanuatu with 9.5 persons per square kilometre” (McAlpine and Bouchard 1992).

Population density can be dealt with more thoroughly by examining areas of forested land and used land in Table 4.4. Santo/Malo and Malekula account for 52% of the total land area, while the other 48% is shared between some 70 islands. As urban populations are mainly found in the two main towns, they do not have any direct influence on total land pressure. For land cover, forested land mainly refers to land under forest with big trees that have potential for logging. Used land refers to all land cultivated for food and cash crops plus infrastructure.

Table 4.4 Regional distribution of population and land cover in Vanuatu, 1999.

Location	Area (km ²)	Rural Population	Land Cover (km ²)			Population Density	
			Forested	Used	Other	Crude	OUL*
Banks/Torres	887	7,757	432	88	366	9	68
Santo/Malo	4,246	20,162	1,623	1,151	1,471	5	16
Ambae/Maewo	710	12,589	180	166	364	18	65
Pentecost	495	14,057	102	168	225	28	67
Malekula	2,067	18,984	753	345	970	9	55
Ambrym	673	7,369	60	109	503	11	65
Paama	60	1,633	<1	28	32	27	61
Epi	447	4,554	109	93	246	10	40
Shepherd	86	3,896	1	54	31	45	73
Efate	970	12,772	230	380	360	13	29
Tafea	1,628	25,840	892	284	453	16	79
All Vanuatu	12,269	151,720	4,383	2,867	5,020	12	40

* OUL: on used land.

Source: Land Use Planning Office.

Other land under cover in Table 4.4 refers to vegetation types such as grassland, mangrove swamps and low growing shrubs. In describing population density, crude population density refers to persons per square kilometre. The national crude population density was recorded at 12 persons per square kilometre in 1999. The same principle is also applied to “on used land” (OUL), as the whole population divided by used land for all regions. The highest population densities on used land were recorded in Tafea, Shepherd, Pentecost and Banks/Torres. This can be explained by people living in large communities and not widely spread as on other islands. For the whole country, the population density on used land was recorded at 40 persons per square kilometre in 1991, and it will continue to increase over the years.

Population pressure on land in Vanuatu is quite low compared with many other island countries. However, only 41% of this total land area is of any agricultural potential (Bellamy 1992). The remaining 59% is steep slopes and other land forms that have little to no agricultural potential. Based on current estimates (Table 4.4), approximately 57% of this agricultural land has been used. With rapid increases in population size, available land devoted to food production and other agricultural activities is becoming smaller. Careful planning for the use of land is becoming a major concern in light of the present high population growth rate. This is an issue that must be considered by policy makers for the wellbeing of the future population of Vanuatu.

4.2.6 Declining soil fertility

A typical traditional food garden in Vanuatu consists of root and tuber crops, vegetables, fruits and other edible herbs. Most of these crops are inter-cropped or mixed cropped, occupying almost all available cleared land within the garden area. According to Weightman (1989), intercropping in Vanuatu: “exploits a complementary association of plants with a variety of preferences and growth habits—tall and short, shallow and deep rooted, etc.—that can be accommodated by a range of microclimates created by clearing and burning forest or woody fallows, and is thus generally more productive than monoculture. Such diversity also contributes to food security by limiting losses to pests, disease and climatic factors, and by providing a continuity of supply. Lack of specialization in food production makes the family largely independent, and thus secure, in providing for its own nutritional needs.” DALH (1990) found that 75% of all garden plots contained food crops that had been inter-cropped in 1989.

Monocropping is another farming system practised in some parts of Vanuatu, where only one crop variety occupies the entire area, particularly on cash crop plantations such as coconut, cocoa, coffee and more recently kava. Permanent cash crops can tie up land for long periods of time, resulting in shortages of suitable land for food crop production.

Shifting cultivation is still widely practised in the rural areas of Vanuatu, where land is cleared, cultivated for a number of years, and left fallow while producers move to a new piece of land to repeat the process. After each cultivation period, the land is drained of almost all available nutrients that were once present in the soil. Therefore, a long fallow period is required to let the soil recover its physical and chemical properties through the decay of leaves and other plant materials. In this way, it has been possible to restore some of the soil nutrients taken away during the cropping period.

It has been estimated that it can take as long as 15 to 20 years for land to recover fully in the tropics. In the past, when population pressure was low this fallow period was feasible. However, in more recent years, the fallow period has been shortened to as short as two years or even less, particularly on the more populated islands. Long fallow periods are becoming scarce in many islands and densely populated areas throughout Vanuatu. Findings from a survey conducted in 1985 on fallow periods indicated that “34% of garden fallows were from five to seven years, 25% from eight to ten years, and 20% over ten years” (Weightman 1989). This leaves approximately 21% of garden fallows below five years.

At present, there are no recorded data to indicate the decline in crop yields. However, people themselves notice differences between yields of crops harvested each time a piece of land is re-cultivated. It is frequently postulated that declining food crop yields are directly related to declining soil fertility, which is an outcome of shorter fallow periods, which in turn are a consequence of land pressure that is linked to increased monoculture of cash crops and rapid population growth. However, more thorough research is needed to test these propositions.

The issue of declining soil fertility and decreasing crop yields is being addressed by some research activities currently being undertaken by DARD. Results from these research activities are still being studied.

4.3 Risk-coping systems

There are two distinctive food insecurity risk-coping systems in rural and urban areas in Vanuatu. These two systems are practised by people today through various activities and other traditional ways of coping with temporary food shortages. The distinction is not so much traditional versus modern techniques, but has more to do with people’s culture and customs.

In rural Vanuatu, people tend to cope with occasional food shortages by having a plot of emergency or disaster-resistant food crops available at all times. These crops are typically wild yams and other root crops. Other food crops such as banana, fruits and vegetables are easily damaged during natural disasters such as cyclones and droughts. The disaster-resistant crops are

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not planted with the idea of food shortages in mind, but rather as a practice from one generation to another to have reserve food resources somewhere in the forest.

Traditional food preservation techniques such as breadfruit drying and fermentation have been used for generations on some islands. Breadfruit drying is still practised by households on some islands in the north of the country, mainly in the Banks group of islands. This practice of breadfruit drying usually occurs during the breadfruit season where mature breadfruit are harvested and cooked over an open fire. The skin, seeds and middle softer flesh are removed and the entire cooked and cleaned flesh is dried for several days before it is wrapped using leaves for preservation over a long period of time. The practice is to keep the wrapped dried breadfruit hanging above an open fire to collect soot until it is dark, with the soot acting as another airtight barrier to preserve the dried breadfruit. Dried breadfruit can be kept up to two years using this method of food preservation. It is mostly used during temporary food shortages, such as after cyclones and other natural disasters.

The process of breadfruit fermentation is no longer widely practised, but the knowledge of how it can be done is still kept by people in rural Vanuatu. Breadfruit is fermented through a process whereby breadfruits are harvested and placed in a sealed pit for several days. The process of fermentation takes place before the breadfruit pulp is removed and used in various food preparations.

Another method of traditional food preservation, again used in the Banks group of islands, is preserving local nuts (*navele*, *Barringtonia* and *Nagai*). This method involves harvesting the ripe nuts, removing the outer softer layers and drying the whole nut over a drier or under the sun for several days before placing these nuts in a traditional woven basket for further drying and storage. The dried nuts are used in traditional puddings and during periods of temporary food shortages.

There are other methods and practices of preparing some food crops that are still available for use by people in rural areas. These practices are not in use today, but were used by people in the past during severe food shortages. Knowledge of the processes still exists.

In urban areas, risk-coping systems are mainly put into effect through continuous access to personal disposable income and the assured availability of a variety of fresh and processed food items in food markets and retail outlets. Cash income for the majority of urban people is the single most important factor that determines the quantity and quality of food each household can have at any time. Some people in urban areas have begun to cultivate food crops around their backyards and even in some peri-urban areas surrounding the main urban centres. However, this is only to supplement the low incomes they are receiving in comparison with the high cost of living in the urban areas.

Another important factor influencing entitlement to food is the extended family ties that still exist and are widely practised and traditionally binding throughout Vanuatu. Rural people visiting urban areas find food and a roof to live under with relatives in urban areas. This is in itself a solution and a problem. It is a solution for those visiting in the sense that they do not have problems with food and accommodation. It is a practice among all ni-Vanuatu that any visiting relatives become the responsibility of those relatives living and working in urban centres.

However, over a long period of time, it becomes a burden for those living in urban areas to continue supporting relatives who do not find paying jobs. This can also happen in rural areas, but it is not regarded as a problem simply because basic items such as food and water are readily available. Further, because rural people farm all year round, any additional labour inputs from visiting relatives are most welcome.

5. Policy, Information and Research Implications

5.1 Dual approach: rural and urban

Household food security implies that members of the household have access to food at all times of the year. For a small country like Vanuatu, food policies are best examined separately in rural and urban settings. Food security is due mostly to having access to good cultivable land in rural areas and having access to cash income in urban areas.

A lot of documented work has been undertaken in many developing countries on formulating specific food policy options for both rural and urban populations. Governments in different countries adopt and implement different food policy measures according to the social, cultural, economic, political and other factors that best suit their environment. "Designing strategies and policies that will alleviate poverty and improve household food security and nutritional wellbeing is one of the most important challenges facing government policymakers in developing countries. The choice of strategies and policies depends in large part on understanding the dynamics of poverty, especially the mechanisms by which households acquire and spend incomes and cope with crises such as poor harvests or loss of employment" (Alderman and Garcia 1993).

The chronic problem of food shortages, as experienced elsewhere around the world, is rare and hardly an issue in either rural or urban Vanuatu. Households without access to any material goods, including money and food, can always depend on assistance from their relatives and friends. It is a common practice throughout many Pacific island countries, including Vanuatu, where extended family ties are still maintained today. But the habits and behaviour of people are changing as more people are educated and western or outside values are being adopted and absorbed into present social systems. Therefore, policies have to be implemented in an attempt to address the issue of food security for the wellbeing of the general population in the long run, taking into account the changing culture of the people.

5.1.1 Rural areas

In rural Vanuatu, where food is plentiful, people rarely suffer from any chronic food shortages, except after cyclones. Malnutrition in terms of dietary deficiency and secondary malnutrition amongst infants, pregnant and lactating women is a growing concern. Therefore, specific food policy options should be formulated and implemented to combat these types of malnutrition and other nutrition-related diseases. These policies should be specific to target groups of people in areas or socio-economic classes that are known, and have the potential, to suffer from malnutrition and related diseases.

In Vanuatu today, the rural population suffers more from substantially higher costs of imported food items such as rice, flour, canned meat and fish than the urban population. Most households in rural areas earn little cash income. Imported food items sold in retail outlets in rural settings are more expensive than in urban centres due to the high mark-ups by local shop owners in order to cover the high transport and other costs. However, access to food items that are substitutes for imports from domestic sources such as food gardens, forests and the ocean is currently at the disposal of all rural people.

The Vanuatu government is at present powerless to provide rural households with alternative means of obtaining cash incomes, apart from their existing cash cropping and other income-generating activities. The only means of government support given to rural people is during short-term food shortages, after cyclones and other natural disasters. In such instances,

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the government has always requested food aid from neighbouring countries such as Australia, New Zealand and other diplomatic missions within the country, to assist those in the affected areas. This is a short-term solution to a short-term problem of food insecurity.

In the long run, alternative food policy measures must be undertaken to assist and cope with the long and gradually unfolding problems of food insecurity and related issues in rural areas. One such measure would be to improve the present food farming systems. Improving present farming systems would be the only way farmers could adopt and adapt to any new technologies. New technologies have failed in the past and can fail again. Alternative technologies such as mixed farming systems, involving crops and small livestock, should be investigated. Throughout Vanuatu, free-range and penned pigs, chickens and more recently goats are very popular with the indigenous population. Therefore, present farming systems could be further improved by some mixed farming practices using food crops and livestock rotation techniques. This has been done very successfully with cattle under coconuts in the plantation sector. It must be done differently for food crops and small livestock, but the principle is the same.

An alternative to the above farming system would be integrated farming practices. Instead of mixing farming practices, food crops and small livestock can be used to benefit one another. Food crops can be used for both home consumption and as feed for small livestock. Livestock can be used both for home consumption and to bring in cash income from domestic market sources. Livestock waste such as manure can always be used as organic fertilizer for crops. Like all agricultural enterprises, such undertakings will take a lot of resources and, in particular, time, capital and proper planning.

The other factor that needs mentioning is that in most rural areas, surplus production of food crops is not uncommon, and always has potential in land-abundant islands. Therefore, unharvested or unconsumed crops in food gardens will rot and go to waste. One possible solution would be to set up processing facilities in strategic locations to enable local producers to sell off their surpluses for processing into other food products. This would not only bring in additional income for rural households but also substitute for some imports, if successful. Processing of food crops is not new to rural areas in Vanuatu. However, improved modern processing, packaging and storage facilities must be investigated for their potential adoption to make processed food products attractive to consumers.

Also, processed food items can be stored for longer periods when properly packaged. This in itself provides food security for people during times of temporary food shortages. Some processing of local food items is currently being done in Vanuatu. Examples are biscuits, nuts, juice, meat products and root crops converted into chips and powdered form to be used in local puddings. However, these small processing facilities are not slowing down imports of food items.

5.1.2 Urban areas

Continuing urbanization in Vanuatu will require policy makers to turn their attention towards meeting a growing household food security challenge. Four approaches can be implemented to enhance food security at the household level. The first is to improve household purchasing power through transfer payments. Second, food prices can be subsidized. Third, steps can be taken to reduce dependency upon purchased foods. The final option is to increase the diversity of food options.

Approaches 1 and 2 would be almost impossible to achieve. More attention should be focussed on approaches 3 and 4, which are more realistic for a country like Vanuatu. Reducing dependency on purchased foods and increasing diversity of food options can be brought about through increased domestic production of food crops. In the 1988 Urban Garden Survey, 8% of urban households in Port Vila were contacted. It was found that over 80% of these households were meeting some of their food needs by growing food crops on available land around their residences. However, this is not going to solve the ever-increasing food needs of the general

urban population. An appropriate measure would be import substitution, by increasing domestic food crop production in an attempt to arrest the rising food costs in domestic markets. Increasing the supply of domestically grown food crops to urban food markets should in economic terms decrease prices of these food items and thereby decrease the demand for imports.

Increasing the supply of domestic food items by producers offers one important way to reverse the current high and increasing prices for locally grown food crops. This would mean that producers who are presently producing at the semi-subsistence level must undertake more commercial production of food crops. Increasing the production of domestically grown food crops can be brought about by improving methods of cultivation, extension of area devoted to food crops and to some extent by controlling pests and diseases.

Commercial production of local food crops needs investment by producers. Some policy measures, such as input subsidies on farm equipment, fertilizers, chemicals and improving current transport infrastructure, should be undertaken by the central government. However, the costs and benefits of such policies should be investigated before they can be implemented. Producers, on the other hand, would still meet on-farm costs such as labour and other related costs. In order to sell their produce to earn cash income, producers need good accessible transport infrastructure, such as roads and storage facilities for their farm produce, and access to available domestic and overseas markets. As well as producers from areas around and in close proximity to urban centres, other producers in outer rural areas also have the potential to produce adequate food crops for both domestic and overseas markets. Therefore, policy makers must consider improving transport infrastructure and frequent transport means for these areas.

Transportation (land, sea and air) of produce from rural to urban areas is at present undertaken by private sector operators, who charge very high fees for freight. Policy makers must consider alternative means to make these transport arrangements for produce cheaper without too many implications for their operators. To date, the government has been unable to do anything about these transport arrangements. Sea transportation is vital as a cheap means of transportation for most people. Marketing studies on the profitability of sea transportation of food crops from rural to urban areas should be undertaken to assess the scope for improving its viability. At present, there is no fixed cost per unit of food transported from one location to another. Freight is currently charged at an average of 6,155 vatu (US\$42.67) per cubic metre, 1,000 vatu (US\$6.93) per sack of kava, and 500 vatu (US\$3.47) per sack of other food crops. Charges on food crops seemingly do not vary according to distance on all trading vessels, regardless of volume. Air freight is charged by weight, and varies according to distance from the urban centres.

Once the objective of increasing domestic food supply has been achieved, the government can adopt other policy measures to sustain supply in the long run. One such measure would be to decrease, or at least maintain, the prices of local food crops and increase the prices of imports, particularly rice, by reintroducing tariffs. Another measure would be to impose quantitative restrictions on the importation of rice, whenever adequate supply of domestically grown starchy food crops is available in the markets. These restrictions can also be imposed in line with the harvest seasons for domestically grown food crops.

Another measure that needs attention to enhance food production is self-reliance in the domestic production of food crops. Vanuatu has the potential to produce sufficient food crops for both domestic and export markets, as is the case of taro in Fiji, Tonga and at one time Samoa. However, the organized domestic marketing of food crops is not well developed at present. The formulation of measures to improve domestic fresh produce marketing needs a lot of thought and work, internally and externally, before implementation. This option will be left open for other marketing studies that may be undertaken in the future.

The policy measures mentioned above will not solve all the issues associated with high domestic food prices. Therefore, all resources used within the food system should be considered

and somehow integrated into current and future national food policies, in an attempt to address food security at the household, provincial and national levels.

5.2 Sustainable food production

Sustainability of food systems can be defined as the efficient and effective use of available resources such as labour, capital, land, ocean, forest, transport, crop and livestock species, without adverse effects for the same use of these resources by future generations. Sustainable food crop production demands improved production practices, remedying problems such as declining soil fertility and depleting livestock and marine food resource stocks. Declining soil fertility is noticeable in many highly populated areas throughout Vanuatu.

It should be possible to improve the natural resource base, and thereby expand food production, using existing technologies that suit people's needs and well-being. Many traditional technologies that have been practised for generations are still in use today, without too much adverse effect on resources and the environment. Therefore, these types of technologies should be investigated and improved for further use by farmers. Technologies based on traditional practices can also be incorporated into development projects as alternatives to more expensive ones in order to reduce production costs.

Introduction of high-yielding varieties of food crops will not solve all the problems associated with food security. People are more accustomed to cultivating and consuming traditional food crops, so that the introduction of any new crops or livestock will always be treated with suspicion and can fail. The case of black pepper (*Piper nigrum*) is well documented for this experience. Food crop production throughout Vanuatu has been left entirely with the rural people. Therefore, any measures undertaken to improve food status nationally must be addressed at this level.

Alternatives to shifting cultivation should be examined, and research undertaken to address the environmental problems associated with this practice. Appropriate approaches, such as inter-planting, inter-cropping and crop rotation practices using leguminous plants with traditional food crops, should also be investigated. The Department of Agriculture and Rural Development is currently undertaking some research activities into improving soil properties under a mixed cropping system and also cropping on slopes using barrier crops and food crops. Results from these research activities will be made available to farmers for improving and increasing crop yields.

Programmes in other disciplines must be improved to address existing food insecurity in Vanuatu. All factors that may have direct and indirect impacts on the food security of the population must be considered for sustainable use of resources. Some issues that need immediate attention are slowing down the current population growth rate by better family planning practices and increasing food production on limited areas by better farming practices with improved technologies. As mentioned by Swaminathan (1995), for the introduction of ecologically sound practices in agriculture and in capture and culture fisheries, development programmes are needed that are environmentally friendly and will not disrupt the social and cultural wellbeing of indigenous people. The role of women in the process of food production must also be appreciated and integrated in future programmes addressing food security at the household level.

There are many other issues associated with sustainable food production that must be addressed in one way or another. Therefore, instead of thinking about further development in terms of transforming the agricultural economy, policy makers should think of ways and means to improve the current food production systems in Vanuatu. The food system should be examined from production to consumption. There are participants who have varied roles within this food system. Improving the individual roles of these participants should help ensure food security for the entire population.

5.3 Research and development in the food sector

Increasing domestic food crop production is vital to reduce domestic prices for locally grown starches and to encourage people to eat more local starches relative to imported substitutes. More intensive and more commercially oriented agricultural production systems for food crops, livestock and other food sources will have to be developed to serve food security needs. Optimal methods for sustainable food production may well differ between peri-urban and rural producers.

DARD currently formulates and implements domestic food production policy based on a farming systems approach to production, where subsistence food production is integrated with cash cropping. This strategy has been evolving in recent years in line with changing food production research needs.

At present, DARD is the only government body directly responsible for food crop research and food crop development programmes. In the past, most food research and development programmes were externally funded. The Vanuatu government policy for food crop production has been very weak since the First National Development Plan was drawn up in the early 1980s. More emphasis was then given to cash cropping for export than to food crop production for domestic consumption. Although food self-sufficiency has been mentioned in all three national development plans in Vanuatu, the government, through DARD and other government departments, is presently undertaking very little activity that is directly aimed at improving food security by raising the status of the domestic food system anywhere between production and consumption.

In the 1990s, DARD undertook a project on food security and had one officer in charge of this project in the urban areas. This project tended to focus more on improving food security for those living in urban areas.

Since 1998, the Vanuatu Agricultural Research and Training Centre (VARTC) has undertaken food crop research under the crop diversification programme. DARD has also recognized work done by past research programmes in collecting, identifying and maintaining both domestic and exotic root crop varieties. Food crop research programmes are problem-focussed and producer-orientated. Food crop researchers at the VARTC currently have two objectives. The first objective is to develop and promote the utilization, processing and marketing of root crops within sustainable cropping systems so as to reduce dependence on imports and to improve socio-economic welfare of smallholders. The second objective is to improve the productivity of root crops (yam, taro, sweet potato, manioc and kava) through the introduction and selection of varieties and improved practices in intensified and organic cropping systems.

Research activities at the VARTC are being undertaken into:

- maintaining the germplasm collection and distributing selected varieties;
- identifying packages for sustainable cropping systems;
- introducing and developing food processing technologies for adoption by the private sector;
- enquiring about requirements of domestic and export markets for agricultural products, and assessing the ability of ni-Vanuatu suppliers to enter these markets; and
- co-ordinating the regional network for taro and yam research.

Results from past research activities have been made available to farmers by distributing improved planting materials of some food crops such as manioc and sweet potato.

Current programmes undertaken by DARD entail the identification and distribution of suitable crop varieties to producers for domestic and potential export markets. It is stipulated that root crop research should now concentrate on providing producers with necessary information on root crop varieties that can meet export requirements. Some specialised farming of horticultural produce has been noticed in specific locations in close proximity to urban

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centres. DARD has assessed this activity as needing further investigation and cooperation to tap into current domestic markets and potential export markets during off-peak seasons.

DARD has some interest in the development of the fruits and nuts industry, where there is great commercial potential in both the domestic and export markets. DARD needs to identify, multiply and distribute appropriate varieties of seeds of these crops to interested producers throughout Vanuatu. Research activities should also be investigated in other areas of food production and processing, such as fish and other marine food sources and small livestock.

Research in the food sector by the government should involve all departments and agencies concerned with food matters to formulate and implement complementary and relevant research policies. One particularly important agency is the National Food and Nutrition Committee (NFNC). NFNC was established in 1984 by the Vanuatu government to formulate and implement a national food and nutrition policy. Its establishment was in recognition of the importance of the nutritional well-being of the population. Agencies in other sectors within the government have some influence on NFNC. A national food and nutritional complex was set up in Port Vila to help pregnant and lactating women recognize balanced diets in daily meals and to assist those with underweight babies. It is planned to establish similar programmes throughout Vanuatu to assist other women who may be confronting the same nutritional problems.

DARD should focus on food production in a way that is consistent with the aims of NFNC, particularly by assisting producers to adopt production technologies that promote food security for households. It should also examine prospective technological advances in food marketing that increase the income-earning capability of producers. Agencies in the health sector should conduct research, which reflects the mutually reinforcing impacts of poor health status and malnutrition, into nutrition deficiencies to reduce malnutrition in both rural areas and urban centres.

Food security research and development activities should not be restricted to government agencies but should be viewed as a major concern for everyone. Private sector involvement and contributions to food security research should be appreciated. Therefore, government food research and development initiatives should also reflect the potential for involvement of private firms and individuals, taking into account economic and financial matters. Food processing is one such area involving the private sector that is in need of an appropriate policy stance by the government. Currently, some food items are processed domestically, but diversifying into more food products is an option still open for investigation. Processing some food products domestically using mainly domestic and some essential imported inputs has the potential to save foreign exchange spent on imports of processed foods.

5.4 Food import policy

Food import has been a part of the local economy since the first settlers came to the then New Hebrides (renamed Vanuatu in 1980). The settlers imported food from abroad because they could not adjust to the traditional food crops grown by the indigenous people. As more ni-Vanuatu settle in urban areas and become wage and salary earners, imported food becomes a more important element in their daily diets. Yet imported foods have also long been part of the diets of rural people. Local merchants introduced food items such as rice, flour, canned meat and fish throughout the country during the colonial era, and these items became well established in rural diets.

Hence, income-earning households throughout Vanuatu are currently determining the demand for imported food items. Households generate this demand in rural areas with occasional incomes from cash cropping, small businesses and remittances from relatives working in towns, and urban households with steady incomes from employment and other income-generating enterprises. Rice and flour, as very important sources of energy in people's diets, have had to be imported because attempts to produce rice in Vanuatu were unsuccessful.

Policy, Information and Research Implications

Import substitution would be a policy measure to combat high food imports. In the past, the government set tariffs in an attempt to discourage the consumption of imported food items. More recently, value-added taxes have replaced tariffs. But neither is likely to decrease importation of certain food items such as rice and flour that are highly price-inelastic. Therefore, alternative policy measures must be undertaken to counter the increased reliance on food imports.

6. Conclusions and Recommendations

A rapid population growth rate, compounding pockets of high population density, is presenting the small open, remote and high-cost economy of Vanuatu with many potential future problems. Most government emphasis and attention has been focussed on providing adequate social infrastructure such as housing, health, sanitation, water and education. Policy makers have yet to appreciate the existence of food insecurity in a country so richly blessed with agricultural potential.

Very little attention has been given to the differential food needs in rural and urban Vanuatu in recent decades. Policy makers must realize that the food security needs of people vary as they move from rural to urban areas. Urbanization has changed the determinants of food security for the ever-increasing numbers of ni-Vanuatu residing in the urban areas. Rural food security, assured by good access to abundant agricultural resources (land, labour and natural resources), has been replaced by a dependency upon the ability to obtain cash to buy adequate food.

Vulnerability to food insecurity in urban areas varies with economic status. Low-income earners and the unemployed are clearly most at risk. Their vulnerability is due to low and insecure incomes, and their dependency on a very narrow range of imported foods, notably rice and flour. Diversity in food options is almost absent in urban Vanuatu. If food security is to be adequately addressed, diversity must be re-established in people's daily diets.

Food systems in developing countries are not simply about food production. They are a complex network of production, distribution, marketing and consumption. In the case of Vanuatu, it is an issue of constraints to food marketing and distribution rather than production constraints alone. Production constraints remain important in that food production costs have determined the relative food prices in favour of imported food items over the years. The capability to achieve national food self-sufficiency provides no guarantee of food security, either at the household level or nationally. A comprehensive understanding and appreciation of the multi-factorial and interrelated nature of food systems is central to the successful formulation of initiatives for national food security at all levels.

In formulating and implementing national food policies, policy makers need to consider carefully the possible impact at the household level, in particular. A single policy measure, such as a tax, is unlikely to have a common influence on all households. Its implications for food security will vary according to location and socio-economic status. Not all households are the same in either the rural or urban setting. Policies implemented in support of national objectives can conflict with the needs of individual households.

There are no easy approaches to improving the situation of food security in Vanuatu. The solution of present problems of growing food insecurity, and future development of the food system, will require policy makers to start paying more attention to this issue now. A more analytical approach must be undertaken using data from national surveys on income, expenditure, consumption, nutrition and demographic variables. To date, there has been little food policy analysis undertaken to assess the food security status of the general population. This lack of food policy analysis has led to the adoption of reactive policy measures that carry an inequitable burden for the vulnerable low-income earners in urban areas and those on limited cultivable land and exhausted soils in rural areas. Present food policy measures have also failed to address the fundamental causes of the problems of food insecurity that they seek to remedy. If these causes are to be appropriately and effectively addressed, policy makers must understand the food system, from production to household consumption. It is envisaged that further studies are required to address the issue of food security in Vanuatu, such as analyses of the present

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food security situation and future trends, food dependency causes and consequences, and malnutrition amongst the general population.

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